

MAKING VICTIMS WHOLE: COMPENSATION OF NUCLEAR INCIDENT VICTIMS IN JAPAN AND THE UNITED STATES

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INTRODUCTION

The commercialization of nuclear power has always been accompanied by concerns over the consequences of an accident. Growth of the industry was facilitated by federal legislation to create mechanisms to compensate victims of any untoward event.¹

Interest in building new nuclear plants in the United States has revived in recent years. For the first time in decades, new units are

1. Those mechanisms have been tested only once in the U.S.: after the Three Mile Island (TMI) accident in 1979. See discussion *infra* Part II.D.

under construction.² This renewed interest in nuclear power may be driven in part by recognition that global climate change not only is real, but can be traced significantly to carbon emissions from fossil fuels.³ Nuclear plants are the base load electricity source that emits the least atmospheric carbon over its life cycle.⁴

However, the nuclear energy equation was altered once again by the Fukushima Daiichi accident in March 2011. The images of thousands of people displaced from their homes, their jobs, and their communities in a nation celebrated for its overall engineering and management competence has chilled the prospects of nuclear energy like an icy fog on a summer morning. Japan's other nuclear units were shut down temporarily,⁵ and the accident triggered a move to phase out nuclear power in Germany altogether.⁶

In light of the potential need for nuclear energy, and the intense public concern over the effects of power plant malfunctions, careful attention should be paid to the way Fukushima reactor accident victims have been treated. The program to compensate victims of the accident has raised a number of issues, including adequacy of funding, who pays, fairness to victims, and efficiency of the compensation process.

In addition to reviewing the Japanese experience, it is timely to revisit the claims and compensation mechanisms available in the

2. Two units in Georgia and two in South Carolina are under construction. *Nuclear Power in the USA*, WORLD NUCLEAR ASS'N, <http://www.world-nuclear.org/info/Country-Profiles/Countries-T-Z/USA—Nuclear-Power/> (last updated Apr. 8, 2014).

3. "The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions." INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS 11 (Thomas Stocker et al. eds., 2013), available at http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf.

4. "[N]uclear energy is in no way 'carbon free' or 'emissions free,' even though it is much better (from purely a carbon-equivalent emissions standpoint) than coal, oil, and natural gas electricity generators, but worse than renewable and small scale distributed generators" Benjamin K. Sovacool, *Valuing the Greenhouse Gas Emissions from Nuclear Power: A Critical Survey*, 36 ENERGY POL'Y 2940, 2950 (2008), available at <http://www.sciencedirect.com.proxy.uchicago.edu/science/journal/03014215/36/8>.

5. And reopening them remains controversial. See Kanoko Matsuyama, *Shutdown of Japan's Last Nuclear Reactor Raises Power Concerns*, BLOOMBERG (Sept. 15, 2013, 9:00 PM), <http://www.bloomberg.com/news/2013-09-16/shutdown-of-japan-s-last-nuclear-reactor-raises-power-concerns.html>.

6. Caroline Jorant, *The Implications of Fukushima: The European Perspective*, BULL. ATOMIC SCIENTISTS, July–Aug. 2011, at 14, available at <http://bos.sagepub.com/content/67/4/14.abstract>.

United States. How prepared are we to quickly and efficiently compensate victims if a major nuclear incident occurred here? What legal and practical processes are available for compensation, and would they be adequate to handle a worst-case scenario involving thousands of claimants and billions of dollars in damages? It is important that the answers to these questions be informed by lessons learned from the aftermath of previous disasters.

It has been suggested, moreover, that assurance of sufficient reactor accident victim compensation can reduce public fear of nuclear energy.⁷ If nuclear technology indeed can help mitigate climate change, perhaps better understanding of the law of reactor accident victim compensation as revealed by the Fukushima tragedy can provide policy makers with reasonable choices for improving outcomes and addressing some of the dread.

Part I of this article reviews the Japanese experience in the wake of Fukushima and compares it to the legal underpinnings and mechanisms available to handle a major compensation event in the United States. It provides a snapshot of the situation in Japan, which is still unfolding three years after the event.

Part II summarizes the Price-Anderson Act (PAA) and the nuclear insurance system that implements it, which is the primary compensation mechanism for incidents at U.S. nuclear facilities. The PAA requires nuclear facility operators to provide assurance of the ability to pay compensation up to a pre-determined limit if offsite damage occurs; the requirement has been met through insurance policies.

Part III, IV, and V survey other models for mass compensation following a disaster. Part III describes the disaster compensation process authorized by the Stafford Act, the primary authority for federal disaster assistance of all kinds, which is invoked for assistance many times every year. Part IV considers the possibility of special legislation, as exemplified by the compensation system that was implemented under the Cerro Grande Fire Assistance Act (CGFAA).⁸ The CGFAA was enacted to provide compensation to victims after a “prescribed burn” on federal land got out of control and spread to neighboring areas.⁹ Stafford Act assistance, and/or a federal compensation

7. Professors Faure and Skogh observed in 1992 that an international convention to increase nuclear reactor accident victim compensation “reduces the public’s disutility of risk aversion thus the fear of nuclear power in general.” Michael G. Faure & Göran Skogh, *Compensation for Damages Caused by Nuclear Accidents: A Convention as Insurance*, 17 GENEVA PAPERS ON RISK AND INS.—ISSUES & PRAC. 499, 511 (1992), available at <http://www.jstor.org/stable/pdfplus/41952126.pdf>.

8. Pub. L. No. 106-246, 114 Stat. 583 (2000).

9. *Id.*

program like that implemented for the Cerro Grande fire, might complement or supplement compensation provided under the PAA.

Part V describes the compensation system that was set up along the Gulf Coast after the Deepwater Horizon oil spill. British Petroleum (BP) developed and funded a claims center to address victims' immediate needs while liability for the event was being debated in the court system. As a recent technological disaster with thousands of victims and billions in damages, it is another model for how to handle a mass-compensation event.

Part VI reviews the regulatory system that governs emergency preparedness for U.S. nuclear power plants, and the extent to which it covers preparedness for this compensation function. It also briefly summarizes some recent developments in federal emergency preparedness doctrine that place an increased emphasis on planning for disaster recovery.

Finally, Part VII provides analysis and recommendations on preparedness for compensation. In light of the Fukushima experience, current mechanisms and models for compensation, and recent developments in doctrine, it may be worthwhile to review the various preparations in place and how well they are coordinated.

In discussing payments to victims of a nuclear incident, the authors distinguish between compensation and assistance. Compensation refers to payment in return for damage inflicted. Assistance, as used here, describes monetary and other forms of support provided to disaster victims, as a government service or a humanitarian gesture, not as repayment for a wrongful act but simply to help the victims. For example, in Fukushima the compensation system provides funds to people displaced by the emergency, but that compensation is complemented by many other forms of assistance including temporary housing, whole-body scanning for contamination, thyroid screening, hazard assessment surveys, decontamination, provision of dosimeters, medical monitoring, low-interest loans, business services, and job fairs, among other things.¹⁰ All of these benefit the people who were affected, and in many cases can be regarded as a substitute for compensation—e.g., providing housing directly instead of compensating

10. NUCLEAR EMERGENCY RESPONSE HEADQUARTERS, MINISTRY OF ECON., TRADE & INDUS., PROGRESS OF THE "ROADMAP FOR IMMEDIATE ACTIONS FOR THE ASSISTANCE OF RESIDENTS AFFECTED BY THE NUCLEAR INCIDENT" (2011), *available at* http://www.meti.go.jp/english/earthquake/nuclear/roadmap/pdf/111216_assistance_02.pdf. For example, Fukushima Prefecture established a "Health Fund for Children and Adults Affected by the Nuclear Accident" for mid- to long-term projects (funded at 80 billion yen [about \$833 million] as of Dec. 2011).

them for the cost of a rented hotel room or apartment. This paper will concentrate primarily on financial compensation, with some review of available assistance under the Stafford Act.

The distinction between compensation and assistance may be more important to the authorities administering these programs than to the victims at the receiving end; the money is equally green regardless of its source or the rationale for providing it. The specific practicalities and legalities of the situation will affect what mix of compensation and direct assistance is best. For example, compensating people who have been exposed to small doses of radiation and subsequently develop cancer is problematic due to the difficulty of proving causation; for any given cancer victim, their cancer may or may not be due to the additional radiation. An assistance program to provide medical monitoring may be a superior way to address the issue of increased risk.

I.

COMPENSATION FOR FUKUSHIMA VICTIMS

A. *Summary of Event and Protective Actions for the Public*

On March 11, 2011, the magnitude 9.0 Great East Japan Earthquake and subsequent tsunami damaged the six-unit Fukushima Daiichi nuclear power plant.¹¹ The combination of the earthquake and tsunami cut off offsite power and disabled the plant's emergency generators, leading to station blackout and failure of cooling.¹² The situation soon deteriorated and a substantial quantity of radionuclides was released to the environment. The full extent of damage to the reactors is still unknown. A 2013 World Health Organization (WHO) report concluded that "no discernible increase in health risks from the Fukushima event is expected outside Japan. With respect to Japan, this assessment estimates that the lifetime risk for some cancers may be somewhat elevated above baseline rates in certain age and sex groups that were in the areas most affected."¹³ In addition, alleged stress-

11. Yoichi Funabashi & Kay Kitazawa, *Fukushima in Review: A Complex Disaster, a Disastrous Response*, BULL. ATOMIC SCIENTISTS, Mar.-Apr. 2012, at 9, 9-21, available at <http://bos.sagepub.com/content/68/2/9>.

12. *Id.* Since many essential cooling and control functions rely on electricity, station blackout is considered a very serious problem and is much studied as a component of reactor failure. See also *State-of-the-Art Reactor Consequence Analyses (SOARCA)*, U.S. NUCLEAR REG. COMM'N, <http://www.nrc.gov/about-nrc/regulatory/research/soar.html> (last updated July 15, 2013).

13. WORLD HEALTH ORG., HEALTH RISK ASSESSMENT FROM THE NUCLEAR ACCIDENT AFTER THE 2011 GREAT EAST JAPAN EARTHQUAKE AND TSUNAMI 9 (2013), available at http://apps.who.int/iris/bitstream/10665/78218/1/9789241505130_eng.pdf. In addition, the report stated: "The present results suggest that the increases in

related deaths among evacuees have spawned lawsuits against plant owner Tokyo Electric Power Company (TEPCO) and the Government of Japan.¹⁴ The event has been characterized as level seven on the international accident-severity scale, the most severe.¹⁵

Protective actions for the local population took place in several steps:¹⁶

- March 11, 2011: Evacuation of residents within 3 kilometers (1.9 miles) and shelter-in-place for residents within 10 kilometers (6.2 miles).
- March 12, 2011: Evacuation of residents within 20 kilometers (12.4 miles). About 77,000 people evacuated.

the incidence of human disease attributable to the additional radiation exposure from the Fukushima Daiichi NPP accident are likely to remain below detectable levels.” *Id.* at 92. However, the report also concluded that because the risk of thyroid cancer among the young “in the most affected area in Fukushima prefecture” is “comparatively high, “[m]onitoring children’s health is therefore warranted.” *Id.* at 92–93. Effects on emergency workers were characterized as follows: “For around two thirds of the emergency workers . . . all calculated risks are of similar magnitude as the normal fluctuations in the baseline cancer risks. For about one third of the workers . . . the relative increase over background for thyroid cancer is estimated to be up to 20% for the youngest workers. For less than 1% of workers . . . the relative increase over background for leukemia and thyroid cancer is as high as 28% in the youngest workers. For those few emergency workers who received very high doses to the thyroid . . . a notable risk of thyroid cancer is estimated, especially for young workers.” *Id.* at 93. In addition, some emergency workers who received the highest doses may face “increased risk of long-term circulatory disease.” *Id.* at 94.

14. John Hofilena, *Japanese Government, TEPCO Being Sued for Fukushima’s Stress-Related Deaths*, JAPAN DAILY PRESS, Sept. 10, 2013, <http://japandailynews.com/japanese-government-tepco-being-sued-for-fukushimas-stress-related-deaths-1035639/>. One 2013 report asserts: “As of August, the number of people in Fukushima who died from illnesses connected to the evacuation stood at 1,539, just short of the 1,599 deaths in the prefecture caused by the 11 March tsunami.” Justin McCurry, *Fukushima Residents May Never Go Home, Say Japanese Officials*, GUARDIAN, Nov. 12, 2013, <http://www.theguardian.com/environment/2013/nov/12/fukushima-daiichi-residents-radiation-japan-nuclear-power>.

15. *Fukushima Moved to Level 7*, WORLD NUCLEAR NEWS (Apr. 12, 2011), http://www.world-nuclear-news.org/RS_Fukushima_moved_to_Level_7_1204111.html. The international nuclear and radiological event scale is published by the International Atomic Energy Agency to characterize the severity of incidents and accidents, similar to the Richter scale (and the newer Moment Magnitude Scale) used for rating earthquakes. See INT’L ATOMIC ENERGY AGENCY, THE INTERNATIONAL NUCLEAR AND RADIOLOGICAL EVENT SCALE (2008), available at www.iaea.org/Publications/Factsheets/English/ines.pdf.

16. The time sequence of events is primarily derived from CHARLES MILLER ET AL., U.S. NUCLEAR REG. COMM’N, RECOMMENDATIONS FOR ENHANCING REACTOR SAFETY IN THE 21ST CENTURY: THE NEAR-TERM TASK FORCE REVIEW OF INSIGHTS FROM THE FUKUSHIMA DAI-ICHI ACCIDENT (2011), available at <http://pbadupws.nrc.gov/docs/ML1118/ML111861807.pdf>. See also *Timeline of the Fukushima Daiichi Nuclear Disaster*, WIKIPEDIA, http://en.wikipedia.org/wiki/Timeline_of_the_Fukushima_Daiichi_nuclear_disaster (last updated Apr. 14, 2014).

- March 15, 2011: Sheltering of residents from 20 to 30 kilometers (18.6 miles). About 62,000 people sheltered.
- April 11, 2011: “Planned Evacuation Areas” (also sometimes referred to as “Deliberate Evacuation Areas”) and “Evacuation Prepared Area” established in the areas beyond 20 kilometers (12.4 miles).
- April 14, 2011: Sheltering in place recommendation lifted for 20—30kilometer zone.
- April 21, 2011: Restricted area within 20 kilometers (12.4 miles) established to allow temporary access and exclusion area of 3 kilometers (1.9 miles) established for members of the public.
- June 16, 2011: Established “Specific Locations Recommended for Evacuation.”
- September 30, 2011: Evacuation Prepared Area discontinued.
- March 30, 2012: Restricted Areas and Evacuation Areas revised (Kawauchi, Tamura, Minami-soma).
- June 15, 2012: Deliberate Evacuation Area in Iitate revised.
- August 10, 2012: Restricted Area and Evacuation Area in Naraha revised.¹⁷

The early evacuation areas—the 20-kilometer restricted area and the irregular Deliberate Evacuation Area—are illustrated in Figure 1. In the Deliberate Evacuation Area, some businesses have been allowed to continue operating.

In addition to the evacuation and restricted zones, Japanese authorities identified many specific hot spots in and near the deliberate evacuation zone. “Specific Spots Recommended for Evacuation” were identified where the cumulative dose over a one-year period after the accident was estimated to exceed 20 millisievert (mSv), located in areas outside the Deliberate Evacuation Areas or Restricted Areas.¹⁸ Hundreds of such spots were identified.¹⁹ The general locations of the Specific Spots are shown in Figure 2.

17. TEPCO, CURRENT STATUS: FUKUSHIMA DAIICHI NUCLEAR POWER STATION (2012), available at http://www.tepco.co.jp/en/nu/fukushima-np/f1/images/f12np-gaiyou_e_4.pdf.

18. INT’L ATOMIC ENERGY AGENCY, ADDITIONAL REPORT OF JAPANESE GOVERNMENT TO IAEA—ACCIDENT AT TEPCO’S FUKUSHIMA NUCLEAR POWER STATIONS: ATTACHMENT II-4 (2011), available at www.iaea.org/newscenter/focus/fukushima/japan-report2/attachments.pdf. Millisievert is a commonly accepted international measure of radiation dose and figures into radiation safety standards. See *Radiation Safety*, INT’L ATOMIC ENERGY AGENCY, <http://www.iaea.org/Publications/Booklets/Radiation/radsafe.html> (last visited Apr. 22, 2014).

19. *Radiation Safety*, *supra* note 18.

The zones were revised in 2012 and are subject to continuing review and revision.²⁰ A revised zone map from December 2012 is shown in Figure 3, illustrating a more nuanced division of the area. As of that time, some areas were considered ready for reoccupation, some for visitation (but not reoccupation), and others were expected to be restricted for “a long time.”²¹ By late November 2013, about a third of the 160,000 area residents who evacuated initially still remained displaced from their homes.²²

20. See, e.g., *More Revisions to Fukushima Zones*, WORLD NUCLEAR NEWS (Dec. 3, 2012), http://www.world-nuclear-news.org/RS-More_revisions_to_Fukushima_zones-0312128.html; *Nuclear Evacuation Zone Revised in Fukushima's Tomioka*, JAPAN TIMES, Mar. 26, 2013, <http://www.japantimes.co.jp/news/2013/03/26/national/nuclear-evacuation-zone-revised-in-fukushimas-tomioka/#.UuKe77RMH3g>.

21. INT'L ATOMIC ENERGY AGENCY, FUKUSHIMA DAIICHI STATUS REPORT: 28 DECEMBER 2012 (2012), available at <http://www.iaea.org/newscenter/focus/fukushima/statusreport281212.pdf>.

22. Sophie Knight & Antoni Slodkowski, *For Many Fukushima Evacuees, the Truth Is They Won't Be Going Home*, REUTERS (Nov. 11, 2013, 4:09 AM), <http://www.reuters.com/article/2013/11/11/us-japan-fukushima-idUSBRE9AA03Z20131111>. A March 2012 paper reported with respect to evacuees living outside of Fukushima prefecture that: “A majority of evacuees either live in their own temporary residential houses/units or rely on their relatives and acquaintances.” Many of those living inside Fukushima prefecture also were living in temporary housing or staying with relatives, and were “scattered across the prefecture.” TAKASHI ODA, TOHOKU GEOGRAPHICAL ASS'N, A SNAPSHOT OF THE DISPLACEMENT OF FUKUSHIMA'S RESIDENTS AS OF THE FIRST ANNIVERSARY OF JAPAN'S 3.11 DISASTERS (2012), available at <http://www.tohokugeo.jp/disaster/articles/e-contents28.pdf>. Other evacuation systems might have produced a different evacuee distribution pattern. In Cuba, for example, hurricane evacuations are managed by community-based family physicians. Evacuees and their medical records are moved by neighborhood to pre-planned locations. Communication with Miguel Coyula, Professor of Architecture, University of Havana (Jan. 4, 2010) (on file with author).

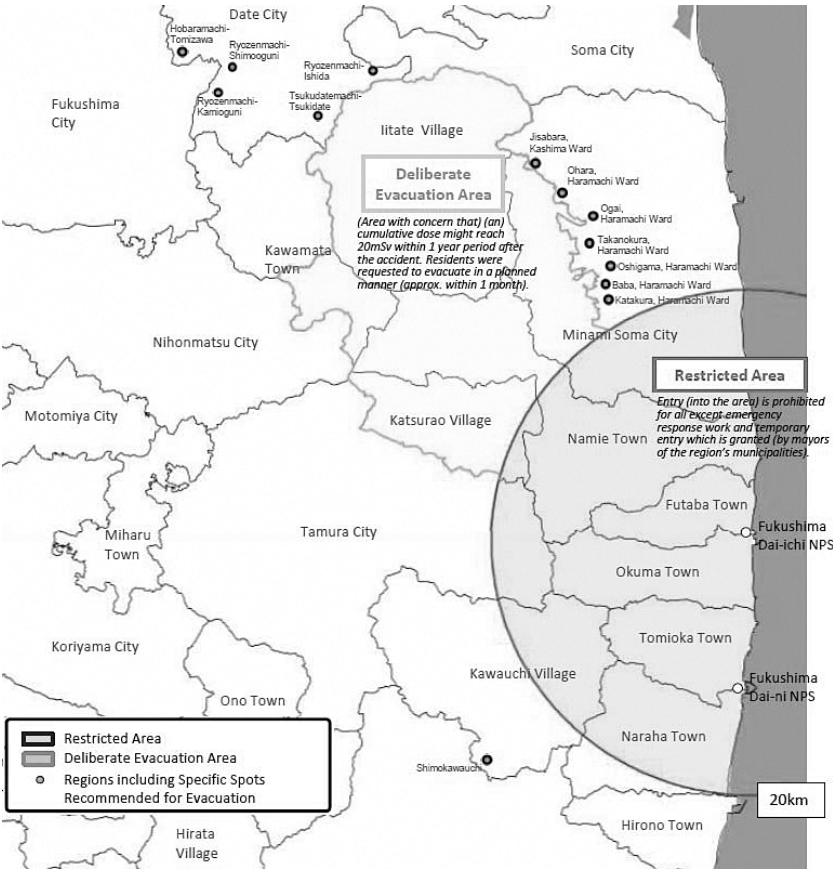
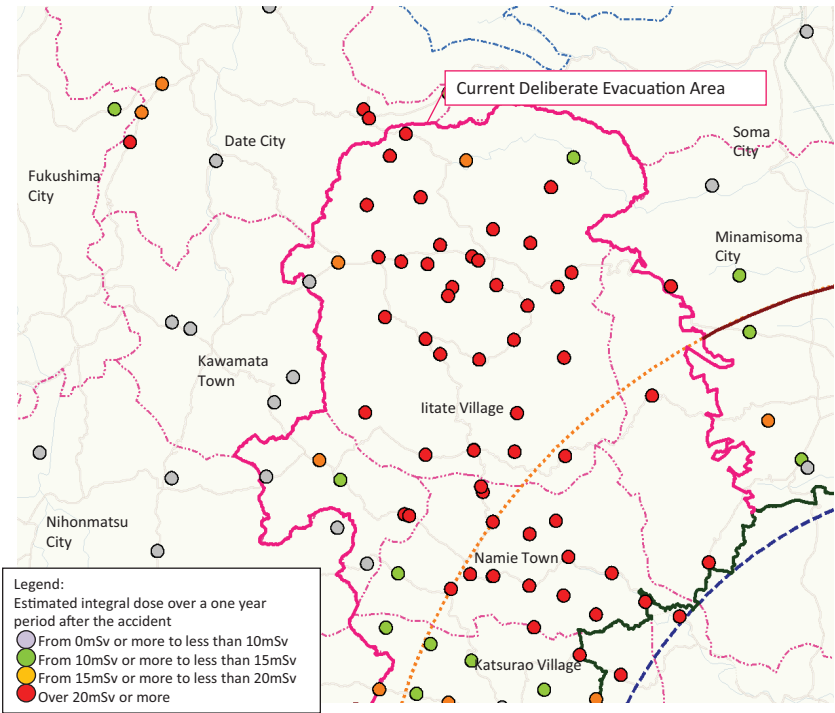


FIGURE 1: INITIAL FUKUSHIMA DAIICHI EVACUATION AREAS²³

23. INT’L ATOMIC ENERGY AGENCY, FUKUSHIMA DAIICHI STATUS REPORT: 23 FEBRUARY 2012 (2012), available at <http://www.iaea.org/newscenter/focus/fukushima/statusreport230212.pdf>.

Deliberate Evacuation Area and Specific Spots Recommended for Evacuation



Based on the material published by the Ministry of Education, Culture, Sports, Science and Technology on 3 June

| | Deliberate Evacuation Area | Specific Spots Recommended for Evacuation |
|-----------------------|--|---|
| Applicable Area | Spots with an integral dose over a one year period after the accident exceeding 20mSv are wide spread within the area. | Spots exist in some areas where an integral dose over a one year period after the accident exceeds 20mSv (Exist per residence that is not easy to decontaminate). |
| Safety Viewpoint | There is a risk of exceeding 20mSv through daily life in general. | The dose decreases by moving away from high dose spots, so a risk of exceeding 20mSv through daily life in general is low. |
| Governmental Response | Deliberate evacuation (The Government requires across-the-board evacuation.) | Call for attention, provision of information, evacuation assistance, etc. (The Government does not require across-the-board evacuation.) |

FIGURE 2: FUKUSHIMA DAIICHI SPECIFIC SPOTS FROM JUNE 30 THROUGH NOVEMBER 25, 2011²⁴

24. MINISTRY OF ECON., TRADE & INDUS., DELIBERATE EVACUATION AREA AND SPECIFIC SPOTS RECOMMENDED FOR EVACUATION (n.d.), *available at* http://www.meti.go.jp/english/earthquake/nuclear/roadmap/pdf/evacuation_map_b.pdf.

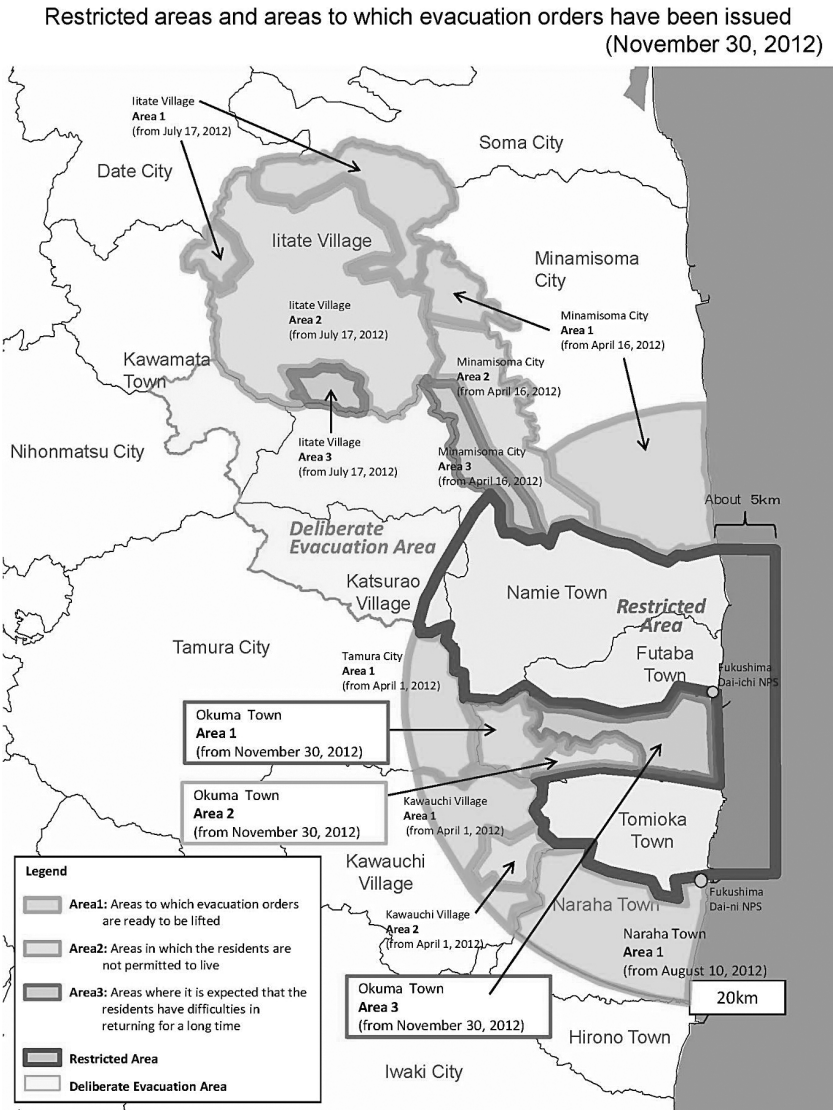


FIGURE 3: FUKUSHIMA EVACUATION AREAS AS OF NOVEMBER, 2012²⁵

It should be noted that in the restricted areas, there was considerable earthquake and tsunami damage in addition to concerns about radioactive contamination. Whether and when these areas can be reoccupied is a function of both kinds of damage. Decontamination efforts

25. INT’L ATOMIC ENERGY AGENCY, *supra* note 21, at 14.

have been made, but the cost has been controversial²⁶ and the schedules have been debated. As stated in the March 2013 WHO assessment: “As of November 2012, many residents are still unable to return to their homes, and for some there is uncertainty about when—or whether—they will ever be able to go back to their homes and communities.”²⁷

B. Compensation Legislation²⁸

The key statute for nuclear accident compensation in Japan is the Act on Compensation for Nuclear Damage. It provides:

Where nuclear damage is caused as a result of reactor operation etc. during such operation, the nuclear operator who is engaged in the reactor operation etc. on this occasion shall be liable for the damage, except in the case where the damage is caused by a grave natural disaster of an exceptional character or by an insurrection.²⁹

The operator of a nuclear power plant (TEPCO, in the case of Fukushima Daiichi) is held strictly liable for damages.³⁰ Claimants need not prove that the operator was negligent in its operation of the plant. The operator is required to maintain financial security (essentially, insurance) to pay damages.³¹

Due to the strength of the earthquake and tsunami, which exceeded what TEPCO anticipated, the issue was raised whether the damage to the power plant was the result of “a grave natural disaster of an exceptional character.” Such a determination would have re-

26. Ida Torres, *Fukushima Decontamination and Cleanup Estimated at \$50 Billion, Five-Times Gov't Budget*, JAPAN DAILY PRESS, July 24, 2013, <http://japandailynews.com/fukushima-decontamination-and-cleanup-estimated-at-50-billion-five-times-govt-budget-2432822/>.

27. WORLD HEALTH ORG., *supra* note 13, at 86; see Knight & Slodkowski, *supra* note 22.

28. For a detailed analysis of applicable Japanese law, see Eri Osaka, *Corporate Liability, Government Liability, and the Fukushima Nuclear Disaster*, 21 PACIFIC RIM L. & POL'Y J. 433, 442 (2012).

29. Act on Compensation for Nuclear Damage, Law No. 147 of 1961, ch. 1, § 3 (Japan) (amended 2009).

30. *Id.*; see Toyohiro Nomura, Taro Hokugo & Chihiro Takenaka, *Japan's Nuclear Liability System*, in JAPAN'S COMPENSATION SYSTEM FOR NUCLEAR DAMAGE 15, 15 (2012), available at <https://www.oecd-nea.org/law/fukushima/7089-fukushima-compensation-system-pp.pdf>.

31. See generally X. Vásquez-Maignan, *Fukushima: Liability and Compensation*, NEA NEWS, no. 2, 2011, at 9, 9–11.

lieved TEPCO of liability.³² The Japanese government decided, however, that this event did not constitute such an occurrence.³³

C. Cost estimates

Under the statute, TEPCO was required to maintain 120 billion yen, roughly \$1.25 billion,³⁴ in financial security. TEPCO, like other Japanese nuclear plant operators, met this requirement through an insurance policy from the Japan Atomic Energy Insurance Pool (JAEIP), which provides liability coverage to nuclear power plant operators.³⁵ However, the JAEIP policies do not provide coverage for earthquake or tsunami damage,³⁶ so TEPCO did not benefit from this coverage.

There is no limit on claims against TEPCO; however, the law authorizes Japan's federal government to provide assistance if liability will exceed the financial security amount.³⁷ The likelihood of exceeding the financial security limit was recognized early on. A framework for government assistance was proposed in May 2011 and approved by the Diet (Japan's national legislature) on August 3, 2011. The Diet created the Nuclear Damage Compensation Facilitation Corporation, funded by the government and by contributions from nuclear facility operators, to provide support for compensation of victims. The Corporation provided its first installment of 558.7 billion yen (about \$5.8 billion) to TEPCO for the compensation fund in November 2011, and has added to it periodically since then; according to TEPCO, as of January 2014 the fund had provided 3.4 trillion yen (about \$34 billion) in compensation.³⁸

32. See Law No. 147 of 1961, ch. 1, § 3.

33. Taiga Uranaka, *Japan Says No Limits to TEPCO Liability from Nuclear Disaster*, REUTERS (May 2, 2011, 11:31 AM), <http://uk.reuters.com/article/2011/05/02/uk-tepco-idUKTRE7410TE20110502>. Osaka argues that the exemption was inapplicable because the tsunami was neither "unforeseeable nor far beyond the design basis for reactors." Osaka, *supra* note 28, at 444–47.

34. Currency conversions in this document from Japanese yen to U.S. dollars were calculated using the Oanda on-line currency converter. *Currency Converter*, OANDA, <http://www.oanda.com/currency/converter/>. Most were done in March 2013, with a few done in February 2014.

35. Mary Williams Walsh, *Disasters' Costs to Fall on Japan's Government*, N.Y. TIMES, Mar. 15, 2011, http://www.nytimes.com/2011/03/16/business/global/16insure.html?_r=0.

36. Joanne Wojcik, *Coverage Restrictions Expected to Limit Nuclear Claims*, BUS. INS. (Mar. 20, 2011, 6:00 AM), <http://www.businessinsurance.com/article/20110320/ISSUE01/303209974#>.

37. Vásquez-Maignan, *supra* note 31.

38. *TEPCO Seeks More Aid as Fukushima Clean-Up Costs Rise*, BBC NEWS (Nov. 7, 2012, 4:50 AM), <http://www.bbc.co.uk/news/business-20234489> [hereinafter

D. Compensation Process

The Japanese Ministry for Education, Culture, Sport, Science and Technology (MEXT) established a Dispute Reconciliation Committee for Nuclear Damage Compensation in April, 2011 to set guidelines for compensation and resolve disputed claims outside the litigation process.³⁹

TEPCO began provisional payments in April 2011 to those displaced by the evacuation order.⁴⁰ While provisional payments were being made, work was proceeding on setting up the main claims process. The latter was established to operate in stages, paying compensation for a few months at a time.⁴¹ The first 60,000 packages to evacuees were sent out in September 2011, to cover expenses from the date of the accident through August 31 (about 6 months).⁴² The packages included three forms to fill out, one of which was 56 pages long. The packages also included a 156-page instruction booklet.⁴³ Claimants were expected to provide receipts and other records to support their claims, including records from doctors and employers to validate medical claims and claims for lost income. A TEPCO spokesperson indicated that missing receipts would be dealt with on a case-by-case basis.⁴⁴ The instruction booklet also stated that claimants would have to waive their right to challenge the compensation amount in order to receive payment.⁴⁵ The long forms and stringent requirements caused a negative public reaction.⁴⁶

Initial response to the claim invitation was underwhelming; after more than a month (October 18), only 7,100 claims had been filed by

TEPCO Seeks More Aid]; see Press Release, TEPCO, Financial Support from the Nuclear Damage Liability Facilitation Fund (Jan. 22, 2014), available at http://www.tepco.co.jp/en/press/corp-com/release/2014/1233755_5892.html.

39. Nomura et al., *supra* note 30.

40. Shigekazu Matsuura, *The Current Progress of Relief of Victims of Nuclear Damage Caused by Fukushima Daiichi Nuclear Power Plant Accident*, in JAPAN'S COMPENSATION SYSTEM FOR NUCLEAR DAMAGE, *supra* note 30, at 29.

41. *TEPCO Announces Compensation Details*, YOMIURI SHIMBUN, Sept. 1, 2011, available at <http://ontd-political.livejournal.com/8638388.html>.

42. Tsuyoshi Inajima & Chisaki Watanabe, *Japan Evacuees Angered by TEPCO Red Tape*, BLOOMBERG (Sept. 16, 2011, 4:33 AM), <http://www.bloomberg.com/news/2011-09-16/evacuees-angered-by-tepco-compensation-forms.html>.

43. *Id.*

44. *Id.* In contrast, forms used by insurance companies for earthquake and tsunami damage were one to two pages; insurance companies simplified the process due to the scale of the disaster.

45. *Id.*

46. *Id.*

individuals, and about 300 by businesses.⁴⁷ About 5.3 billion yen (about \$55 million) was paid out to 2,340 households during the first round.⁴⁸ In July 2011, Japan enacted the Nuclear Disaster Victims Prompt Relief Law, to authorize “the government to pay a part of the compensation to victims, which should be paid by TEPCO, in advance if the permanent compensation procedure is delayed.”⁴⁹

The second round of claims began in December 2011 for the three-month period from September 1 to November 31. In response to complaints about the previous form, this round featured a simplified (4-page) claim form, and the waiver requirement was dropped.⁵⁰ By December 14, 2011, 44.1 billion yen had been paid to approximately 160,000 individuals and households.⁵¹ In addition, about 32 billion yen (about \$333.2 million) was paid to agricultural and fishery associations, and 8.3 billion yen (about \$86.4 million) to 7,300 small and medium businesses.⁵² The total paid for evacuation costs, living expenses, lost income, and other items was reported to be 491 billion yen (about \$5.1 billion) as of April 2012.⁵³ As of January 1, 2013, a TEPCO report states that 2.1 trillion yen (about \$21.9 billion) had been paid in compensation,⁵⁴ and as noted earlier, by a year later the figure was up to 3.4 trillion yen (about \$34 billion).⁵⁵

Thousands have been employed in processing claims. In August 2011, TEPCO announced plans to increase the number of personnel handling claims to 6,500 by October.⁵⁶ By February 2012, the number was up to 7,600, with plans to increase it to 10,000. As of January

47. Yoko Kubota, *Fukushima Victims: Homeless, Desperate and Angry*, REUTERS (Oct. 18, 2011), <http://www.reuters.com/article/2011/10/18/us-japan-nuclear-compensation-idUSTRE79H08C20111018>. As of October 2011, only about 10 lawsuits had been filed, reflecting local cultural reluctance to sue. *Id.*

48. *2nd Round Fukushima Compensation Claims*, HOUSE JAPAN (Dec. 5, 2011), <http://www.houseofjapan.com/local/2nd-round-fukushima-compensation-claims>.

49. Osaka, *supra* note 28, at 442. “Currently, small tourist businesses in Fukushima, Ibaraki, Tochigi, and Gunma prefectures are able to receive compensation for damage to their reputation under this law.” *Id.* (internal footnote omitted).

50. Kubota, *supra* note 47.

51. NUCLEAR EMERGENCY RESPONSE HEADQUARTERS, *supra* note 10, at 23.

52. *Id.*

53. Yuka Hayashi, *Japan Tallies Upheaval's Toll*, WALL ST. J., Apr. 2, 2012, <http://online.wsj.com/article/SB10001424052702304177104577311070878121072.html>.

54. FUKUSHIMA REVITALIZATION HEADQUARTERS, TEPCO, IMPLEMENTATION PROGRESS STATUS OF MEASURES RELATED TO COMPENSATION, DECONTAMINATION AND REVITALIZATION PROMOTION 1 (2013), available at http://www.tepco.co.jp/en/fukushima-revital/images/k130204_01-e.pdf.

55. *TEPCO Seeks More Aid*, *supra* note 38.

56. Inajima & Watanabe, *supra* note 42.

2013, TEPCO reported more than 10,000 employees were engaged in the compensation effort.⁵⁷

The compensation statute has only a very general definition of “nuclear damage” and does not go into detail about what types of expenses are covered.⁵⁸ The Reconciliation Committee has issued a series of guidelines to flesh out the compensation system with respect to scope, eligibility, amounts, and so on. Guidelines were issued in April, May, and August 2011. The guidelines address types of damage that are compensable including evacuation costs, travel costs for temporary entry to the restricted area, unemployment, agricultural and marine business losses, bankruptcy, and decontamination costs.⁵⁹ A commonly mentioned figure is the 100,000 yen per month (about \$1,041) being paid to evacuees for psychological distress—basically, compensation for the fact of displacement; in December 2013 this was supplemented with a one-time payment of seven million yen (about \$66,000) for those who would not be able to return to their towns.⁶⁰ Most evacuees received government-provided regular or temporary housing.⁶¹ The Committee decided on December 6, 2011 to include claims by people who evacuated voluntarily rather than in response to a government recommendation.⁶²

In March 2012, the Committee decided to implement a three-tiered system for compensation to displaced residents, based on radiation levels in the affected area. As reported in the *Yomiuri Shimbun*:

- Areas where the accumulated radiation dose exceeds 50 mSvs [5 REM] per year will be designated as “zones where residency is prohibited for an extended period.”
- Areas with annual doses of above 20 and up to 50 mSvs [2–5 REM] will be designated as “zones with restricted residency.”

57. FUKUSHIMA REVITALIZATION HEADQUARTERS, *supra* note 54.

58. Act on Compensation for Nuclear Damage, Law No. 147 of 1961, pt. 1, § 2 (Japan) (amended 2009).

59. English translations of the guidelines may be found in JAPAN’S COMPENSATION SYSTEM FOR NUCLEAR DAMAGE, *supra* note 30.

60. Takuro Negishi, *TEPCO to Pay Evacuees Additional 7 Million Yen for ‘Loss of Hometowns,’* ASAHI SHIMBUN, Dec. 27, 2013, <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312270055>.

61. NUCLEAR EMERGENCY RESPONSE HEADQUARTERS, *supra* note 10.

62. Press Release, TEPCO, Regarding Start of Reparation Payouts for Losses due to Voluntary Evacuation (Feb. 28, 2012), *available at* <http://www.tepco.co.jp/en/press/corp-com/release/2012/12022803-e.html>.

- Areas where the radiation dose is 20 mSvs [2 REM] or less per year will be designated as “zones being prepared for residents’ return.”⁶³

Residents whose homes are in the first category will receive the full value of their home pre-disaster, plus 6 million yen (about \$62,400) (the equivalent of 5 years of 100,000-yen monthly payments) as compensation for mental suffering.⁶⁴ Those whose homes are in the second category can continue either to be paid 100,000 yen every month or to receive a lump sum of 2.4 million yen (about \$25,000) (equivalent to two years of monthly payments) as they are unlikely to be able to return to their homes for the time being.⁶⁵ Those whose homes are in the third category are anticipated to be able to return once decontamination and other repairs are completed, and can continue to receive the monthly payments until their area is re-opened.⁶⁶ The Committee also decided that voluntary evacuees from the 20–30 km zone (the former shelter-in-place zone) would continue to receive the monthly payments but only until the end of August 2012.⁶⁷

In addition to compensation being provided to individuals and businesses, measures are being taken to assist and compensate local governments including affected municipalities and host communities.

The strains of the crisis, including compensation costs, expected cleanup and decommissioning of the damaged reactors, and increased fuel costs due to shut down of nuclear plants, led to effective nationalization of TEPCO in June 2012, when the Japanese government acquired a 50.1% stake in the company.⁶⁸

63. *Panel Urges 6 Million Yen for Nuclear Evacuees*, YOMIURI SHIMBUN, Mar. 18, 2012, available at <http://www.asianewsnet.net/news-28724.html>. REM is “Roentgen Equivalent Man,” a radiation dose measure commonly used in the United States. One REM is 10 millisieverts. See *Radiation Doses in Perspective*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/radiation/understand/perspective.html> (last visited April 2, 2014).

64. *Panel Urges 6 Million Yen for Nuclear Evacuees*, *supra* note 63.

65. *Id.*

66. *Id.*

67. *Id.*

68. Mitsuro Obe, *TEPCO Shareholders Approve Nationalization*, WALL ST. J., June 27, 2012, <http://online.wsj.com/article/SB10001424052702303561504577492331995963886.html>.

II.

NUCLEAR INCIDENT COMPENSATION IN THE UNITED STATES

Nuclear power plant operators in the United States are subject to the Price-Anderson Act (PAA), which addresses “public liability” relating to nuclear incidents, and requires nuclear facility licensees to maintain financial protection to cover the cost of compensation to victims.⁶⁹ The PAA was enacted in 1957 and has been updated and amended several times since, most recently in the Energy Policy Act of 2005,⁷⁰ which made revisions and extended the term of the act for another 20 years. The scope of the PAA includes power reactors, test and research reactors, Department of Energy nuclear and radiological facilities, and transportation of nuclear fuel to and from covered facilities. The operation of the Act is not limited to emergency situations; insurance required by the Act has paid claims due to more mundane events.⁷¹ The financial protection requirement in the Act is described as “the amount of liability insurance available from private sources.”⁷² In practice, licensees have satisfied the requirement by purchasing insurance from American Nuclear Insurers (ANI), a joint underwriting association⁷³ set up specifically for this purpose.⁷⁴

The PAA assigns liability for nuclear accidents, limits liability for nuclear accidents, provides for consolidation of claims into a single court venue, and sets up a process to provide funding for payment of claims.⁷⁵ In addition to enacting the PAA, the United States has ratified the Convention on Supplementary Compensation for Nuclear Damage.⁷⁶

69. 42 U.S.C. § 2210(b)(1) (2006).

70. Pub. L. No. 109-58, §§ 604–610, 119 Stat. 594, 779–82.

71. MARJORIE BERGER, AM. NUCLEAR INSURERS, *MANAGING NUCLEAR RISKS IN THE UNITED STATES* (2009), available at <http://www.nuclearinsurance.com/library/INLA-2009.pdf>.

72. 42 U.S.C. § 2210(b)(1). The NRC is authorized in the statute to make adjustments and exceptions.

73. *About ANI*, AM. NUCLEAR INSURERS, <http://www.amnucins.com/About%20ANI.html> (last visited April 2, 2014).

74. *Insurance*, AM. NUCLEAR INSURERS, <http://www.amnucins.com/Insurance.html> (last visited April 2, 2014).

75. AM. NUCLEAR SOC’Y, *THE PRICE ANDERSON ACT: BACKGROUND INFORMATION* (2005), available at <http://www.ans.org/pi/ps/docs/ps54-bi.pdf>.

76. INT’L ATOMIC ENERGY AGENCY, *CONVENTION ON SUPPLEMENTARY COMPENSATION FOR NUCLEAR DAMAGE* (2013), available at http://www.iaea.org/Publications/Documents/Conventions/supcomp_status.pdf. “The Compensation Convention provides the world community with the opportunity to deal with legal liability and compensation for nuclear damage through a global regime that includes all countries that operate nuclear power plants (nuclear power generating countries) and most countries

A. Liability

The PAA provides that ordinary standards of liability apply under ordinary circumstances.⁷⁷ In other words, a nuclear plant operator is held to the same legal standards as any other industrial facility. To receive compensation, a claimant generally must show (a) that the power plant operator caused damage to person or property, and (b) the power plant operator breached a duty—in other words, the damage to the claimant was caused by negligence or another wrongful act.⁷⁸ If the operator was not at fault, it will not be liable.⁷⁹

However, if there is an “extraordinary nuclear occurrence (ENO),” then the operator must waive certain tort defenses pertaining to breach of duty.⁸⁰ Waiving these defenses means that *de facto* a strict liability standard is applied. Under that circumstance, to recover compensation the claimants need only show the first part above—that they were damaged by the power plant.⁸¹

So how bad does an accident need to be, to be extraordinary? An ENO is defined in the statute as an occurrence that results in substantial levels of radiation or radiological contamination offsite, and that “has resulted or will probably result in substantial damages to persons offsite or property offsite.”⁸² U.S. Nuclear Regulatory Commission (NRC) regulations expand on this, with specific criteria in terms of dose received, contamination levels for various types of isotopes, and dollar amounts of damage.⁸³ It should be noted that just as the Japanese government did not declare that Fukushima was due to an extraordinary natural disaster, the NRC did not declare the TMI accident

that do not operate nuclear power plants (non- nuclear power generating countries).” Ben McRae, *The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage*, 61 NUCLEAR L. BULL. 25 (1998). The Government of Japan reportedly intends to ratify the Compensation Convention, which would have the effect of bringing it into force. *Japan Looks to Ratify Liability Accord*, WORLD NUCLEAR NEWS (Dec. 13, 2013), <http://www.world-nuclear-news.org/NP-Japan-looks-to-ratify-liability-accord-1312134.html>.

77. 42 U.S.C. § 2014(hh) (2006); *see also* Taylor Meehan, Note, *Lessons from the Price-Anderson Nuclear Industry Indemnity Act for Future Clean Energy Compensatory Models*, 18 CONN. INS. L.J. 339 (2011).

78. *See* Meehan, *supra* note 77, at 346–47.

79. *See id.*

80. *See id.*

81. *See id.*

82. 42 U.S.C. § 2014 (j).

83. 10 C.F.R. §§ 140.84, 140.85 (2002).

as an ENO.⁸⁴ In subsequent litigation, plaintiffs had to show a breach of duty.⁸⁵

B. *Claims and Defendants Covered*

The PAA defines the term “public liability” as including “any legal liability arising out of or resulting from a nuclear incident or precautionary evacuation (including all reasonable additional costs incurred by a State, or a political subdivision of a State, in the course of responding to a nuclear incident or a precautionary evacuation)”⁸⁶ Together with other provisions in the statute and regulations, essentially it means that liability is what one would expect for displaced people and businesses: costs associated with evacuation, damage to property, medical expenses for injuries, unemployment, and lost business. A couple of significant points that the definition raises: first, state and local response costs are covered; second, precautionary evacuations are covered, so even if there is no actual release of radioactivity at harmful levels, claims can be made based on the disruption caused by a precautionary evacuation.

Public liability also does not include damage to the facility itself. In that sense the PAA requirements resembles a state-required auto insurance policy: the driver is required to have liability insurance but is not required to have collision coverage on the vehicle. There is, however, a separate requirement for nuclear plant operators to have at least \$1 billion of property damage coverage on their own facilities.⁸⁷

Nuclear liability coverage provided pursuant to the PAA also extends to nuclear suppliers, contractors, and anyone else who can be held liable for accident damages.⁸⁸ Thus for example the firms involved in design and construction of a plant would be covered.

Public liability as defined in the Act also does not include workmen’s compensation claims or events due to acts of war. However,

84. P. BAILEY ET AL., U.S. NUCLEAR REGULATORY COMM’N, NUREG/CR-6617, THE PRICE-ANDERSON ACT—CROSSING THE BRIDGE TO THE NEXT CENTURY 93 (1998), available at <http://pbadupws.nrc.gov/docs/ML1217/ML12170A857.pdf>.

85. A federal appeals court ruled that plaintiffs could show breach of duty by showing that radiation was released to the environment in excess of regulatory limits. *In re TMI*, 67 F.3d 1103, 1119 (3d Cir. 1995). It should also be noted that state law liability standards may also impose strict liability. P. BAILEY ET AL., *supra* note 84, at 11 (“The importance of the ENO provision has diminished due to the adoption of strict liability in almost all States, which accomplishes a similar result.”).

86. 42 U.S.C. § 2014(w).

87. 10 C.F.R. § 50.54(w)(1) (2014).

88. See Michael G. Faure & Tom Vanden Borre, *Compensating Nuclear Damage: A Comparative Economic Analysis of the U.S. and International Liability Schemes*, 33 WM. & MARY ENVTL. L. & POL’Y REV. 219, 247–48 (2008).

ANI and NRC have stated that acts of terrorism similar to 9-11 *would* be covered by the PAA.⁸⁹

C. Limits on Liability and Amounts Available

Public liability of facility operators is capped at the amount of financial security required.⁹⁰ Thus the amount available to fund claims is a function of the size of the insurance policies carried by the licensees. The system as implemented has two tiers. The first tier consists of insurance that each nuclear operator carries. The operators currently carry a liability coverage policy of \$375 million per unit; that amount has been adjusted periodically.⁹¹

The second tier would take effect if an event resulted in public liability greater than the \$375 million in primary coverage; in that case, all operators (including the operator of the plant that had the incident) would be required to contribute up to \$117 million for each unit operated.⁹² The first and second tiers, then, collectively add up to a payment capacity of about \$12.6 billion. Figure 3 illustrates the two-tiered system.

If valid claims exceed the amount defined by the two tiers of coverage, the PAA provides that:

Congress will thoroughly review the particular incident . . . [and] take whatever action is determined to be necessary (including approval of appropriate compensation plans and appropriation of funds) to provide full and prompt compensation to the public for all public liability claims resulting from a disaster of such magnitude.⁹³

89. See *Price-Anderson Act Reauthorization: Hearing Before the Subcomm. on Transp., Infrastructure, & Nuclear Safety of the S. Comm. on Env't & Pub. Works*, 107th Cong. 2 (2002) [hereinafter *Price-Anderson Act Reauthorization Hearing*] (statement of John Quattrocchi, Senior Vice President, Underwriting, American Nuclear Insurers); Letter from Richard A. Meserve, Chairman, Nuclear Regulatory Comm'n, to Sen. Ernest F. Hollings, Chairman, Comm. on Commerce, Sci. & Tech. (Dec. 11, 2001).

90. 42 U.S.C. § 2210(e).

91. See *Fact Sheet on Nuclear Insurance and Disaster Relief Funds*, U.S. NUCLEAR REGULATORY COMM'N (June 2011), <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/funds-fs.html>.

92. *Id.* The average annual premium for a single-unit reactor site is \$830,000. *Id.* The second tier of coverage is referred to as a "retrospective premium"—ANI would pay compensation costs, and bill each operator for its share. Total potential retrospective premium per unit is \$117 million, but not to exceed \$15 million per year. 10 C.F.R. § 140.21. The nuclear operators are required to furnish evidence of ability to pay retrospective premiums. See U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-04-654, NUCLEAR REGULATION: NRC'S LIABILITY INSURANCE REQUIREMENTS FOR NUCLEAR POWER PLANTS OWNED BY LIMITED LIABILITY COMPANIES 1 (2004).

93. 42 U.S.C. § 2210(e)(2006).

Since the PAA cannot actually bind future Congresses to take any particular action, this is essentially a statement of good intentions.

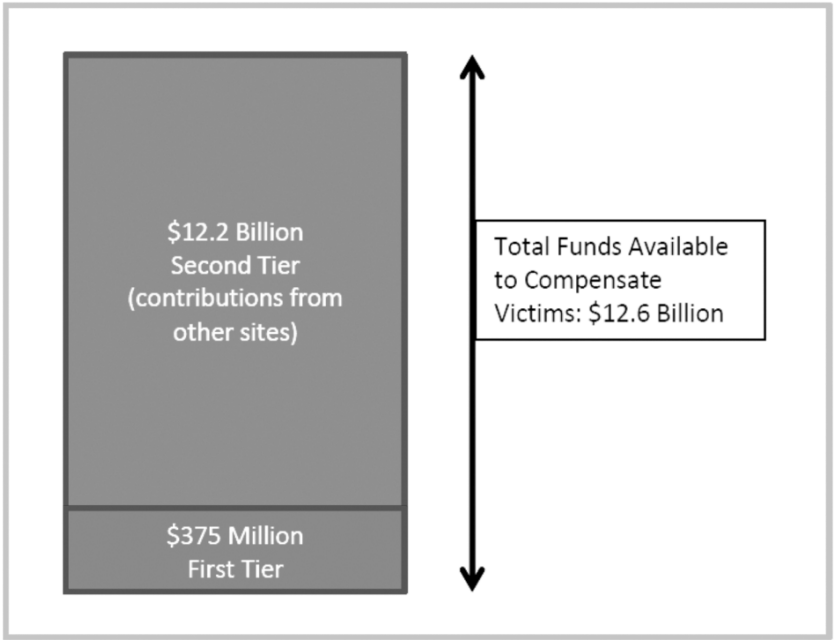


FIGURE 4: COMPENSATION FUNDING UNDER THE PRICE-ANDERSON ACT

D. Experience at Three Mile Island

In March 1979 when the TMI accident occurred, the primary coverage requirement was \$140 million.⁹⁴ By 2009, the total expenses for TMI claims (including claim settlements and legal expenses) was \$71 million,⁹⁵ well within the primary coverage limit in place at the time of the accident.

Initial response by the insurance adjusters at TMI was prompt. According to an American Nuclear Society summary:

Representatives of the insurance pools arrived in Harrisburg, PA, the day after the accident and a local office was established on March 31. Advertisements were placed in local newspapers. The insurance paid for the living expenses of families who decided to

94. See P. BAILEY ET AL., *supra* note 84, at 95; *Price-Anderson Act Reauthorization Hearing*, *supra* note 89.

95. See *Fact Sheet: Price-Anderson Act Provides Effective Liability Insurance at No Cost to the Public*, NUCLEAR ENERGY INST. (Mar. 2014), <http://www.nei.org/Master-Documents-Folder/Backgrounders/Fact-Sheets/Insurance-Price-Anderson-Act-Provides-Effective-Li>.

evacuate, although evacuation was not ordered. On the first day of operations, the office made payments of almost \$12,000. By April 2, the pools had advanced funds to 2400 persons. The payments increased daily and reached a per day peak of \$167,286 on April 9. A total of about \$1.2 million in evacuation claims was paid to 3170 claimants. The pools also paid over \$92,000 in lost wage claims to 636 individuals.

Following the TMI accident, numerous lawsuits were filed in State and Federal courts in Pennsylvania, alleging various injuries and property damages. These suits were consolidated into one suit before the Federal District Court in Harrisburg. In September 1981, a settlement agreement was signed, under which the insurance pools paid into a court-managed fund \$20 million for economic harm to businesses and individuals within 25 miles of the plant and \$5 million for the establishment of a public health fund in the area. Although no health damages from the accident were substantiated, payments to more people took place in the following years amounting to a total of more than \$70 million through 1997 (\$42 million in indemnity settlements and \$28 million in expenses). Payments were all from the primary insurance coverage and funds from the secondary insurance were not needed.⁹⁶

And as reported by the Nuclear Energy Institute (NEI):

In addition to the cash advances and reimbursements, the insurance pools later settled a class-action suit for economic loss filed on behalf of people living in a 25-mile radius around Three Mile Island. The last of the litigation was resolved in early 2003.⁹⁷

E. American Nuclear Insurers Planning and Practice

As noted in an NRC analysis of the PAA, “[t]he nuclear insurance industry has established emergency response procedures to enable it to respond quickly to emergency situations. Member insurance companies are required to furnish emergency claim personnel who can be sent to temporary claim offices in the event a nuclear incident results in an evacuation of the public.”⁹⁸

ANI has an emergency response and planning program to be prepared for a nuclear accident, and retains a third-party claims contractor with the resources and expertise necessary to reimburse evacuees in the event of a covered nuclear loss.⁹⁹ ANI anticipates that internet and

96. See AM. NUCLEAR SOC’Y, *supra* note 96, at 3.

97. See NUCLEAR ENERGY INST., *supra* note 95, at 2.

98. P. BAILEY ET AL., *supra* note 84, at 93.

99. Communication with Rich Jones, Manager for Emergency Response & Planning, Am. Nuclear Insurers (Mar. 27, 2012) (on file with author); see also ANI Events

telephone claims intake would be available within 24 hours of an accident and that claims centers would be operational within 48–72 hours after the event.¹⁰⁰ Claims documentation is streamlined and designed by experienced professionals from the contractor. Claims information would be published through all available media including social media.¹⁰¹

III.

ASSISTANCE UNDER THE STAFFORD ACT

The Stafford Act¹⁰² authorizes provision of financial and other forms of assistance to individual households, businesses, and state and local governments following presidentially declared major disasters and emergencies. It is the main authority for federal aid to disaster-stricken communities. The aid programs it created are mainly administered by the U.S. Federal Emergency Management Agency (FEMA), with involvement of other federal agencies. Stafford Act-authorized programs are activated frequently for natural disasters such as floods, hurricanes, tsunamis, tornadoes, winter storms, earthquakes, and wildfires, where there is widespread physical damage to homes, businesses, and community infrastructure.¹⁰³

As noted in the introduction, Stafford Act programs provide assistance rather than compensation. Disaster assistance under the Stafford Act is not intended to be a substitute for insurance or to “make the victim whole.” The goal of Stafford Act programs is to alleviate suffering and allow people and communities to get back on their feet; it is not intended to compensate for all losses or to return victims to their pre-disaster position.

A. Assistance Provided

The Stafford Act authorizes a number of programs for disaster assistance; the main ones are:

2013: *Emergency Response Program*, AM. NUCLEAR INSURERS, http://www.amnucins.com/Media_Center.html#ERFAQ [hereinafter *ANI Events 2013*] (last visited April 2, 2014).

100. See *ANI Events 2013*, *supra* note 99; *Price-Anderson Act Reauthorization Hearing*, *supra* note 89.

101. Communication with Rich Jones, *supra* note 99.

102. Robert T. Stafford Disaster Relief and Emergency Assistance Act, Pub. L. No. 93-288, § 402, 88 Stat. 143 (1988).

103. See, e.g., BRUCE R. LINDSAY & FRANCIS X. MCCARTHY, CONG. RESEARCH SERV., R42702, STAFFORD ACT DECLARATIONS 1953–2011: TRENDS AND ANALYSES, AND IMPLICATIONS FOR CONGRESS (2012), available at <https://www.fas.org/sgp/crs/homsec/R42702.pdf>.

- *Individual Assistance Program (IAP)*. Displaced residents may be eligible for assistance with temporary housing. Assistance can include money to reimburse temporary lodging expenses or rent payments, and/or to help with repair or replacement of homes that were damaged.¹⁰⁴ Only uninsured losses are covered. Temporary housing assistance is limited to eighteen months. Funding is also available for “necessary expenses and serious needs [of disaster victims] in cases in which the individuals and households are unable to meet such expenses or needs through other means.”¹⁰⁵ This can include payments for medical, dental, and funeral expenses, personal property, and transportation. Individual assistance is generally limited to no more than about \$30,000 per person.¹⁰⁶
- *Unemployment Assistance*. Disaster unemployment assistance authorized by section 410 of the Stafford Act¹⁰⁷ is administered through the U.S. Department of Labor. It is available for persons unemployed as a result of the disaster. The assistance cannot exceed compensation limits established by the state and continues to be provided until the individual is reemployed, but for not more than twenty-six weeks after the major disaster is declared.¹⁰⁸
- *Small Business Administration Disaster Loans*. The Small Business Administration (SBA) can make federally subsidized loans to repair or replace homes, personal property, or businesses that sustain damages not covered by insurance.¹⁰⁹ Types of disaster loans provided by SBA include: (1) home disaster loans, to homeowners and renters to repair or replace disaster-related damages to homes or personal property; (2) business physical disaster loans, to business owners to repair or replace disaster-damaged property, including inventory and supplies; and (3) economic injury disaster loans, which provide capital to small businesses and to small agricultural cooperatives to assist them through the disaster recovery period.¹¹⁰

104. 42 U.S.C. § 5174 (2006).

105. Disaster Mitigation Act of 2000, Pub. L. No. 106-390, § 206(a), 114 Stat. 1552.

106. 44 C.F.R. 206.110(b) (2013).

107. See 42 U.S.C. § 5177 (2010).

108. *Id.* § 5177(a).

109. 15 U.S.C. § 636(b) (2012).

110. *Id.* § 636; see *Disaster Loan Fact Sheets*, U.S. SMALL BUS. ADMIN., <http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans/disaster-loans-fact-sheets> (last visited April 2, 2014).

- *Farm Service Agency Loans*. The U.S. Department of Agriculture can make loans of up to \$500,000 for the repair or replacement of damaged farm and aquaculture property and supplies.¹¹¹ Assistance is authorized after a presidential declaration of a major disaster or upon declaration by the Secretary of Agriculture.¹¹²
- *Assistance to State and Local Governments/Public Assistance*. The Stafford Act authorizes assistance to state and local units of government and to certain non-profit organizations to meet immediate needs of communities and to repair or rebuild public buildings and infrastructure. Assistance can include help with debris removal, repair or replacement of damaged public facilities and infrastructure, reimbursement of emergency response costs, and replacement of lost tax revenue.

B. Activation Process

Assistance under the Stafford Act depends on a presidential declaration of necessity. The Act establishes two categories of presidential declarations: emergency and major disaster.

An *emergency declaration* can be requested by a governor under 42 U.S.C. § 5191(a) or can be initiated by the President under 42 U.S.C. § 5191(b) if the emergency situation is “one for which the primary responsibility rests with the United States.”¹¹³ Federal assistance authority for emergencies is limited and does not include all of the programs described above; however, it does include temporary housing assistance and assistance to state/local governments with provision of food, medicine, and emergency response.¹¹⁴ Overall expenditures are limited to \$5 million unless the Administrator determines that “a) [c]ontinued emergency assistance is immediately required; b) [t]here is a continuing and immediate risk to lives, property, public health, and safety; and c) [n]ecessary assistance will not otherwise be provided on a timely basis.”¹¹⁵

The first use of the President’s authority to self-initiate an emergency declaration was in 1995 after the attack on the Alfred P. Murrah

111. See 7 U.S.C. § 1961 (2012).

112. *Id.* § 1961(a)(2)(B).

113. 42 U.S.C. § 5191.

114. 44 C.F.R. § 206.62 (2013).

115. *Id.* § 206.66.

Federal Building in Oklahoma City; an emergency was declared by the President on April 19, within seven hours of the explosion.¹¹⁶

A *major disaster declaration* authorizes assistance of various kinds, including long-term housing, disaster unemployment assistance, individual and family grant programs, grants to restore public facilities, community disaster loans, and others, with no overall financial limit.¹¹⁷ Unlike a declaration of emergency, the President may not initiate a declaration of major disaster; the state's governor must request it.¹¹⁸ Procedures for this request are outlined below.

President Clinton declared a major disaster in Oklahoma City one week after the Murrah Building bombing, following a request from the Governor of Oklahoma.¹¹⁹

FEMA regulations outline the procedure for requesting relief assistance. Procedures for requesting a presidential declaration of *emergency* are found in 44 C.F.R. § 206.35. A request may come from the governor or, for emergencies where the primary responsibility rests with the federal government, from the FEMA Regional Administrator, or from another federal agency acting through the FEMA Regional Administrator.¹²⁰ Procedures for requesting a presidential declaration of a *major disaster* are found in 44 C.F.R. § 206.36. A request for a major disaster declaration must come from the governor and should be submitted to the appropriate FEMA Regional Administrator.¹²¹

The statute and regulations lay out requirements for the content of requests for declarations. In general they must include a statement to the effect that the governor has activated the state response plan, that the emergency is beyond the state's capabilities to effectively respond, and that federal assistance is needed.¹²² The governor's request for a major disaster declaration must include a pledge to pay a share of the costs incurred.

FEMA has published criteria for evaluating requests for a major disaster declaration at 44 C.F.R. § 206.48. There are separate criteria

116. See OKLA. DEP'T OF CIVIL EMERGENCY MGMT., AFTER ACTION REPORT: ALFRED P. MURRAH FEDERAL BUILDING BOMBING 19 APRIL 1995 IN OKLAHOMA CITY, OKLAHOMA 71 (1995), available at <http://www.ok.gov/OEM/documents/Bombing%20After%20Action%20Report.pdf> (Exhibit D).

117. For a listing of available programs, see FEMA, DISASTER ASSISTANCE: A GUIDE TO RECOVERY PROGRAMS (1995), available at <http://www.fema.gov/media-library-data/20130726-1538-20490-9100/recoveryprograms229.pdf>.

118. 42 U.S.C. § 5170.

119. OKLA. DEP'T OF CIVIL EMERGENCY MGMT., *supra* note 116.

120. 44 C.F.R. § 206.35 (2013).

121. *Id.* § 206.36.

122. See *id.* § 206.48.

for the PAP and the IAP. Factors considered in determining the need for assistance under the PAP include estimated cost per capita for the state (with a benchmark of about \$1.35 per capita); presence of concentrated local impacts; insurance coverage; hazard mitigation (i.e., whether available means were used to mitigate damage); other recent disasters; and availability of assistance from other federal programs.¹²³ Factors considered in determining the need for assistance under the IAP include concentration of damages; trauma; presence of affected people with disabilities or access and functional needs; insurance coverage; assistance available from other sources; average dollar costs per affected individual; and the number of homes that have been severely damaged or destroyed.¹²⁴

These criteria do not limit the discretion of the President; during a radiological emergency the President may choose to issue a declaration regardless of whether the criteria are met.¹²⁵

C. *Application to a Radiological Emergency*

It is an open question whether a nuclear power plant emergency or other emergency covered by the PAA would result in a presidential declaration and activation of compensatory assistance under the Stafford Act. A 1996 NRC document stated that “[a]n accident at a nuclear power plant does not fit the definition of a Major Disaster under the Stafford Act,”¹²⁶ but it was superseded by the 2005 NRC Incident Response Plan.¹²⁷ The 2005 document aligns the NRC’s response planning with the National Incident Management System (NIMS)¹²⁸ and mentions the Stafford Act as part of the federal government’s response program, but does not directly address the possibility of a Stafford declaration for a nuclear incident.

123. *Id.*

124. *Id.*

125. The statute authorizes issuance of regulatory guidelines for determining when damage and costs are sufficiently severe to justify declaration of a major disaster, but does not limit the President’s discretion. *See* 42 U.S.C. § 5192(c) (2010).

126. INCIDENT RESPONSE DIV., U.S. NUCLEAR REGULATORY COMM’N, NUREG/BR-0230, RESPONSE COORDINATION MANUAL 1996, at P-5 (1996), *available at* <http://pbadupws.nrc.gov/docs/ML0919/ML091980222.pdf>.

127. OFFICE OF NUCLEAR SEC. & INCIDENT RESPONSE, U.S. NUCLEAR REGULATORY COMM’N, NUREG-0728, REV. 4, NRC INCIDENT RESPONSE PLAN (2005), *available at* <http://www.nrc.gov/about-nrc/emerg-preparedness/respond-to-emerg/incident-response.pdf>.

128. The National Incident Management System is a system to coordinate federal, state, and local emergency response planning. *See National Incident Management System*, FEMA, <http://www.fema.gov/national-incident-management-system> (last updated June 4, 2013).

FEMA criteria for determining whether particular assistance programs should be activated include prospects for assistance from other sources, and availability of insurance to cover damage.¹²⁹ Therefore, if it is felt that victims will be adequately cared for through PAA-established mechanisms, then that might argue against a Stafford Act declaration.

In addition, there is precedent for the idea that Stafford Act assistance programs will not be activated if assistance is available from other sources. The Deepwater Horizon incident in the Gulf of Mexico caused widespread economic damage and response costs across several states. Assistance was available from the Oil Pollution Act trust fund and through agreements negotiated with BP, and Stafford Act assistance was not activated.¹³⁰

Factors that might enter into a decision about activating assistance programs under the Stafford Act include:

- *Adequacy of coverage under the PAA.* If damages appear likely to exceed the coverage provided by the PAA (as would a Fukushima-like event), additional assistance under the Stafford Act might be warranted.
- *Coincident natural disaster.* Similar to Fukushima, there might be a coincident natural disaster that led to problems at a nuclear facility but also caused widespread damage more directly; possibilities include earthquake, tsunami, or flooding. An assistance program set up to compensate victims of the natural disaster (e.g., people displaced by flooding) might also then be extended to cover victims of the radiological situation.
- *Unreimbursed expenses.* A selective activation of Stafford Act programs might occur to “fill in the gaps” of PAA coverage. For example, to compensate local governments for lost revenue due to loss of sales or property taxes.

IV.

SPECIAL LEGISLATION

In the event that no existing legal mechanisms are considered adequate to compensate disaster victims, the federal government can create a new mechanism. The legislation that followed the Cerro Grande wildfire illustrates how that can work.

129. 44 C.F.R. § 206.48(a) (2013).

130. See THAD ALLEN, U.S. COAST GUARD NAT’L INCIDENT COMMAND, NATIONAL INCIDENT COMMANDER’S REPORT: MC252 DEEPWATER HORIZON 26 (2010), available at [http://www.nrt.org/production/NRT/NRTWeb.nsf/AllAttachmentsByTitle/SA-1065NICReport/\\$File/Binder1.pdf](http://www.nrt.org/production/NRT/NRTWeb.nsf/AllAttachmentsByTitle/SA-1065NICReport/$File/Binder1.pdf).

The Cerro Grande wildfire started with a prescribed burn on federal land, the Bandelier National Monument in New Mexico. The U.S. National Park Service initiated the burn on May 4, 2000, intending to burn up to 900 acres. The fire escaped control and eventually burned 48,000 acres in four counties and two Indian pueblos.¹³¹ Over 200 residential structures were destroyed and 18,000 residents evacuated. The President issued a major disaster declaration on May 13.¹³²

The Stafford Act response to the Cerro Grande fire included provision of temporary housing and other assistance from FEMA, disaster unemployment assistance, small business assistance, and public assistance.¹³³ However, as noted in the preceding section, Stafford Act programs do not aim to cover all costs and are not a substitute for compensation where compensation is due. In view of the fact that the federal government bore responsibility for initiating the fire, there was strong sentiment to compensate victims through a direct federal program.

Legislation was quickly crafted and the Cerro Grande Fire Assistance Act (CGFAA) was signed into law on July 13, 2000.¹³⁴ FEMA implemented the compensation scheme through the Office of Cerro Grande Fire Claims (OCGFC). Interim rules for claims processing were published on August 28, 2000, and final rules on March 21, 2001.¹³⁵ About \$600 million in claims were eventually paid via this process. The claims process established through the CGFAA was not an exclusive remedy; claimants could opt to bring a claim through the Federal Tort Claims Act (FTCA) instead. Accepting a CGFAA award, however, required waiver of any FTCA claim.¹³⁶

FEMA tried to structure Cerro Grande claims like an insurance claims process. Customer service was emphasized in order to minimize the adversarial aspect of the process.¹³⁷ A total of 138 federal staffers were processing claims by January 2001, mostly in customer

131. See U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-04-129, *FEMA CERRO GRANDE CLAIMS: PAYMENTS PROPERLY PROCESSED, BUT REPORTING COULD BE IMPROVED* 3 (2003), available at <http://www.gao.gov/assets/250/240893.pdf>.

132. See *id.*

133. Press Release, FEMA, FEMA and New Mexico State Disaster Recovery Programs Exceed \$22.8 Million (Aug. 15, 2000), available at <http://www.fema.gov/news-release/2000/08/15/fema-and-new-mexico-state-disaster-recovery-programs-exceed-228-million>.

134. Cerro Grande Fire Assistance Act, Pub. L. No. 106-246, 114 Stat. 583 (2000).

135. 66 Fed. Reg. 15,948 (Mar. 21, 2001) (codified at 44 C.F.R. pt. 295).

136. Cerro Grande Fire Assistance Act § 104(e), 114 Stat. at 587.

137. Interview by Ken Lerner of Ernest Abbott, General Counsel, FEMA (1997–2001), and Founder, FEMA Law Associates PLLC (Nov. 2000) (on file with author).

service. GAB Robbins (an insurance adjuster organization) was hired to help handle claims.¹³⁸

Although the claims process for Cerro Grande was developed essentially ad hoc—legislation completed within fifty days, interim regulations completed within forty-five days after that—a number of factors simplified the process. One was the clear causation of the event and the fact that it was the direct result of federal government activities. Once the federal government accepted responsibility, it was clear who should pay. In addition, the disaster had a familiar and conventional cause (fire) and procedures for damage assessment, cleanup, and repair were relatively straightforward. The extent of the damage was well known, so there was not much concern over determining who was affected and to what degree.

The Cerro Grande fire is a relatively recent and well-documented event. Other noteworthy programs where the federal government addressed large numbers of claims include the Spring Valley chemical-weapons cleanup (beginning in 1991 and continuing to the present); the Teton Dam collapse in 1976; compensation programs for victims of atomic bomb testing; and the 9/11 Victim Compensation Fund.

V.

COMPENSATION FOLLOWING THE DEEPWATER HORIZON OIL SPILL

On April 20, 2010, the offshore oil rig Deepwater Horizon was drilling a deep well in the Gulf of Mexico, when the rig suffered a blowout with a devastating explosion and fire fed by oil and gas from the well. Eleven crewmen were killed and seventeen injured. The rig was evacuated but the fire could not be put out; two days later it sank, breaking off the riser pipe. The well's underwater blowout preventer failed and oil leaked from the well into the Gulf of Mexico for almost three months, until it was capped on July 15.¹³⁹ Estimates of the total amount of oil spilled vary between four and five million barrels; the leaked oil contaminated the waters of the Gulf and the shorelines of Louisiana, Mississippi, Alabama, and Florida.¹⁴⁰ The oil sheen from the spill was visible from space (see Figure 5).

138. *Id.*

139. *Timeline of the Deepwater Horizon Oil Spill*, WIKIPEDIA, http://en.wikipedia.org/wiki/Timeline_of_the_Deepwater_Horizon_oil_spill (last updated Apr. 9, 2014).

140. Tom Bergin & Jonathan Stempel, *BP Oil Spill Trial Delayed for Settlement Talks*, REUTERS (Feb. 27, 2012, 2:45 PM), <http://www.reuters.com/article/2012/02/27/us-bp-idUSTRE81P0Q320120227>; see Angela Monaghan, *BP Oil Spill: '4.4m Barrels' Leaked into Gulf of Mexico, According to Independent Study*, TELEGRAPH (Sept. 23, 2010, 8:37 PM), <http://www.telegraph.co.uk/finance/newsbysector/energy/oiland>

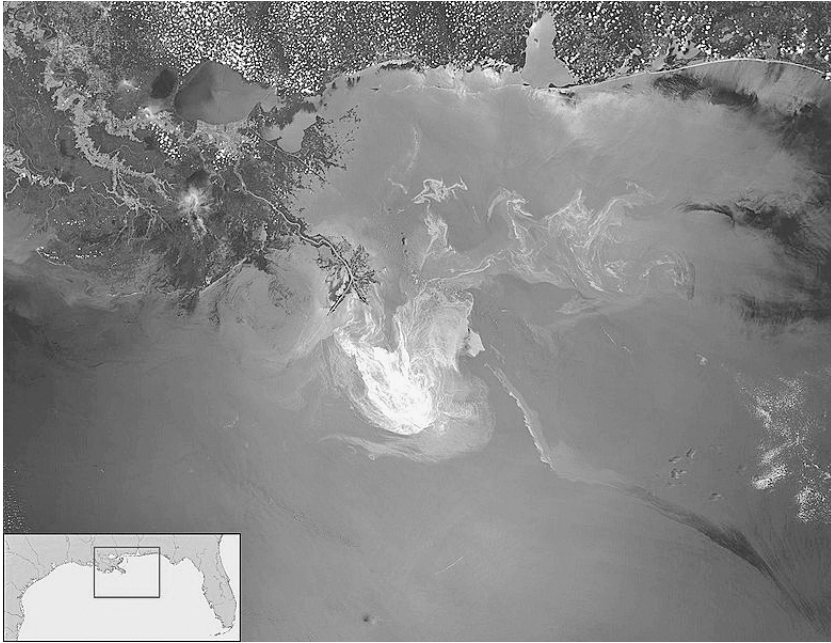


FIGURE 5: OIL SHEEN FROM DEEPWATER HORIZON SPILL¹⁴¹

Consequences of this event included the deaths and injuries that occurred on the rig itself; loss of the rig; extensive spill response and cleanup efforts, both public and private; loss of business and employment in the extensive Gulf Coast fishery and tourism sectors; natural resource damage in the Gulf and coastal areas; and alleged health effects to cleanup workers, among other things.

Several major corporations were involved in the project and bore potential liability. BP owned 65% of the well.¹⁴² Other involved parties include Anadarko, which co-owned the well and co-leased the drilling rig with BP; Transocean, which owned and operated the drilling rig; and Halliburton, which performed cementing services on the well.¹⁴³

gas/8021225/BP-oil-spill-4.4m-barrels-leaked-into-Gulf-of-Mexico-according-to-independent-study.html.

141. Michon Scott, *NASA's Terra Satellite Sees Spill on May 24*, NASA (May 24, 2010), http://www.nasa.gov/topics/earth/features/oilspill/20100525_spill.html (showing the image from the Moderate-Resolution Imaging Spectroradiometer (MODIS) on NASA's Terra satellite).

142. Bergin & Stempel, *supra* note 140; see Guy Chazan, *Anadarko to Pay BP \$4 Billion*, WALL ST. J., Oct. 18, 2011.

143. Bergin & Stempel, *supra* note 140; see *In re Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico*, on Apr. 20, 2010, 910 F. Supp. 2d 891 (E.D. La. 2012) (order and reasons granting in part and denying in part the United States' mo-

An oil spill is obviously different from a nuclear power plant accident. However, the two situations have enough similarities to make a comparison worthwhile. Both involve a hazard arising from complex technical activities, with potential for widespread effects. Either accident could be caused by operator error, mechanical failure, natural disaster, or a combination of these. Both also are the subject of various regulatory programs including requirements for financial security and a backup fund to handle claims in case the financial security requirement for an individual facility is exceeded. In addition, the compensation program initiated by BP is an interesting and well-documented instance of how such a program can be carried out.

A. *The Oil Pollution Act*

The Oil Pollution Act of 1990 (OPA)¹⁴⁴ addresses liability and compensation to persons and businesses damaged by oil spills. It is analogous in some respects to the PAA, and different in others.

The OPA was passed in response to the *Exxon Valdez* incident that spilled oil into the Prince William Sound in Alaska.¹⁴⁵ The OPA established a cause of action against the responsible party for damage caused by oil spills, with strict liability as the legal standard.¹⁴⁶ The claim covers a variety of damages including cleanup costs, damage to real estate or personal property, lost profits, damage to natural resources, damage to subsistence use of natural resources, and lost tax revenue by local government.¹⁴⁷

Under the OPA, liability for offshore facilities such as Deepwater Horizon is unlimited for cleanup costs, but limited to \$75 million for

tion for partial summary judgment; denying Anadarko's motion for partial summary judgment; and granting in part and denying in part Transocean's motion for partial summary judgment, at Docket Entry No. 5809 on Feb. 22, 2012), *aff'd sub nom. In re Deepwater Horizon*, 739 F.3d 790 (5th Cir. 2014).

144. Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484 (codified as amended at 33 U.S.C. §§ 2701–2720).

145. At about 260,000 barrels, the Exxon Valdez spill was less than a tenth the estimated size of the Deepwater Horizon spill. However, the type of oil spilled and conditions in Prince William Sound led to extensive adverse effects.

146. NATHAN RICHARDSON, RES. FOR THE FUTURE, DEEPWATER HORIZON AND THE PATCHWORK OF OIL SPILL LIABILITY LAW 2 (2010), available at <http://www.rff.org/rff/documents/RFF-BCK-Richardson-OilLiability.pdf>.

147. 33 U.S.C. § 2702(b) (2011); see JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., R41679, LIABILITY AND COMPENSATION ISSUES RAISED BY THE 2010 GULF OIL SPILL 4–5 (2011), available at <http://www.fas.org/sgp/crs/misc/R41679.pdf>; Ronen Perry, *The Deepwater Horizon Oil Spill and the Limits of Civil Liability*, 86 WASH. L. REV. 1, 52 (2011).

natural resource and economic damages.¹⁴⁸ Responsible parties are required to show evidence of financial ability to meet liabilities.¹⁴⁹

The OPA also set up a mechanism to address oil spill costs that exceed the liability limits, the Oil Spill Liability Trust Fund (OSLTF). The OSLTF is funded by a per-barrel tax on oil production administered by the National Pollution Funds Center (NPFC), an office within the Coast Guard. For the years 2004–2009, the fund paid about \$50–\$150 million per year in removal costs and claims.¹⁵⁰ Payments from the fund are subject to a \$1 billion per incident cap.¹⁵¹ As part of a November 2012 settlement with the U.S. Department of Justice for criminal charges relating to the Deepwater Horizon incident, BP agreed to restore \$1.15 billion to the fund.¹⁵²

It should be noted that the liability cap provided by the OPA is not absolute; indeed it may be very porous. First, the cap does not apply if the incident is found to be due to gross negligence, willful misconduct, or a violation of federal safety standards. In addition, the OPA explicitly does not preempt state law that may impose additional liability or requirements.¹⁵³

The system set up by the OPA resembles the PAA system in some respects, but differs in others. It resembles the PAA in providing for strict liability, subject to a cap, and channeling liability to facility operators. It also sets up a two-tier system where facility operators are responsible for a certain amount of liability coverage, backed up by a fund that is provided for by the industry as a whole. The OPA scheme is also different in a number of respects from the PAA: among other

148. Richardson, *supra* note 146, at 3.

149. Regulations governing demonstration of financial responsibility can be found at 30 C.F.R. § 254.

150. NAT'L POLLUTION FUNDS CTR., U.S. COAST GUARD, OIL POLLUTION ACT (OPA) LIABILITY LIMITS: FISCAL YEAR 2010 REPORT TO CONGRESS 18 (2011), *available at* http://www.uscg.mil/npfc/docs/PDFs/Reports/Liability_Limits_Report_2010.pdf.

151. 26 U.S.C. § 9509(c) (2012).

152. JONATHAN L. RAMSEUR & CURRY L. HAGERTY, CONG. RESEARCH SERV., R42942, DEEPWATER HORIZON OIL SPILL: RECENT ACTIVITIES AND ONGOING DEVELOPMENTS 5 (2013), *available at* <http://www.fas.org/sgp/crs/misc/R42942.pdf>.

153. 33 U.S.C. § 2718 (2011). As noted by Nathan Richardson, *supra* note 146, at 3, "It is impossible to say for sure whether either exception [gross negligence/willful misconduct, or violation of federal regulation] will be applicable in the *Deepwater Horizon* case, but it is a possibility. Drilling operations are subject to a large number of federal regulations, and any violation, however trivial, would be sufficient to eliminate the cap, so long as the violation can be connected to the spill." See Perry, *supra* note 147, at 52; Derek Thompson, *Why Do We Need a Liability Cap?*, ATLANTIC (June 15, 2010, 12:00 PM), <http://www.theatlantic.com/business/archive/2010/06/why-do-we-need-a-liability-cap/58147/>.

things, the numbers are different (OPA has lower first-tier liability numbers); there is no federal preemption of state actions; and excess liability is covered by a federally-funded fund rather than a second tier of insurance/private contributions.

B. *Litigation and Settlements*

As one might expect, there has been voluminous and complex litigation over the Deepwater Horizon spill, and it is not yet over. An Environmental Law Institute publication summarized the claims filed under federal law as of December 2013, including claims for economic losses and medical injuries, securities losses, oil removal and restoration claims, and civil and criminal penalties.¹⁵⁴ Claims brought by individuals, businesses, and state and local governments for economic losses and medical injuries were consolidated into Multi-District Litigation (MDL) 2179.¹⁵⁵ A settlement of economic and property damages was approved on December 21, 2012, and a settlement of medical claims was approved on January 11, 2013.¹⁵⁶ The economic damage settlement addresses, among other things, compensation for business's economic losses, individual economic losses, loss of subsistence, coastal and wetlands real property damage, and real property sales losses.¹⁵⁷ The medical damage settlement provides for benefits to residents and cleanup workers who lived or worked in certain areas during certain time periods.¹⁵⁸ Interpretation and administration of the economic damages settlement has led to additional

154. ENVTL. LAW INST., BP OIL DISASTER: RESTORATION & RECOVERY CLAIMS & LITIGATION OVERVIEW (2013), available at <http://eli-ocean.org/gulf/files/Claims-Litigation-Overview.pdf>.

155. *Id.* Current developments in MDL 2179 may be found at the U.S. District Court For the Eastern District of Louisiana Website, which has links to the settlement documents and other case documents. See *Current Developments*, U.S. DISTRICT CT. E. DISTRICT LA., <http://www.laed.uscourts.gov/OilSpill.htm> (last updated July 15, 2011).

156. *Current Developments*, *supra* note 155.

157. *In re Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico*, on Apr. 20, 2010, 910 F. Supp. 2d 891 (E.D. La. 2012) (order and judgment granting final approval of economic and property damages settlement and confirming certification of the economic and property damages settlement class, at Docket Entry No. 8139 on Dec. 21, 2012), *aff'd sub nom. In re Deepwater Horizon*, 739 F.3d 790 (5th Cir. 2014).

158. *Id.* (notice of filing of the medical benefits class action settlement agreement as amended and as preliminarily approved by the Court, at Docket Entry No. 6427 on May 3, 2012).

litigation.¹⁵⁹ The Deepwater Horizon Claims Center is handling economic and medical claims.¹⁶⁰

Deepwater Horizon has also produced criminal charges. In January 2013 a federal district judge approved a plea agreement with BP settling a number of criminal charges (including charges relating to the eleven deaths on the drilling rig) for approximately \$4 billion, much of which will go to coastal restoration projects.¹⁶¹ Transocean reached a separate criminal settlement for \$400 million.¹⁶²

C. Claims Handling at the Gulf Coast Claims Facility

The process of settling claims based on Deepwater Horizon began well before the MDL litigation settlements. In June 2010, following negotiations with the White House (and at a point when the spill had not yet been capped), BP agreed to fund a \$20 billion escrow account to pay economic damages resulting from the spill, and set up a claims processing facility to handle claims.¹⁶³ Kenneth Feinberg, who had administered compensation to victims of 9/11, was hired to run the claims process as an independent, impartial third party.¹⁶⁴

The Gulf Coast Claims Facility (GCCF) was up and running by August 23, 2010, replacing a previous claims facility that had been set up by BP. Administration of the GCCF by an independent third party was a response to criticism of the earlier process.¹⁶⁵

159. ENVTL. LAW INST., *supra* note 154.

160. Information on economic damage claims may be found at DEEPWATER HORIZON CLAIMS CTR., <http://www.deepwaterhorizoneconomicsettlement.com/> (last visited Mar. 5, 2014). Information on medical claims may be found at DEEPWATER HORIZON CLAIMS CTR., <https://deepwaterhorizonmedicalsettlement.com/> (last visited Mar. 5, 2014).

161. Mark Schleifstein, *Federal Judge Accepts \$4 Billion BP Guilty Plea for Deepwater Horizon Oil Disaster*, TIMES-PICAYUNE (New Orleans), Jan. 29, 2013, http://www.nola.com/news/gulf-oil-spill/index.ssf/2013/01/what_others_are_saying_about_b_1.html; see Ramseur & Hagerty, *supra* note 152.

162. Claudia Assis, *Transocean Rises on Deepwater Horizon Settlement*, WALL ST. J. MKT. WATCH (Feb. 14, 2013, 1:09 PM), http://articles.marketwatch.com/2013-02-14/markets/37092579_1_transocean-deepwater-horizon-rig-operator.

163. Press Release, President Barack Obama, Statement by President After Meeting with BP Executives (June 6, 2010), available at <http://www.whitehouse.gov/the-press-office/statement-president-after-meeting-with-bp-executives>; see also Colin McDonell, Comment, *The Gulf Coast Claims Facility and the Deepwater Horizon Litigation: Judicial Regulation of Private Compensation Schemes*, 64 STAN. L. REV. 765 (2012).

164. McDonell, *supra* note 163, at 766. Mr. Feinberg has also served as a court-appointed special master to administer settlement of cases involving asbestos and Agent Orange exposure.

165. See Press Release, *supra* note 163.

During the first few months of the claims process (until November 23, 2010), Emergency Advance Payments were made available. Emergency advance payments did not require a release of liability and were intended to cover immediate expenses on the part of the affected persons and businesses. Beyond the emergency advances, claims available from the GCCF included Quick Payment Final Claims, Interim Payment Claims, and Full Review Final Payments. Quick Payment Final Claims of \$5,000 for individuals and \$25,000 for businesses were available, with minimal additional paperwork, to those who had earlier received an Emergency Advance Payment.¹⁶⁶ Quick Payment Final Claims required signing a release; i.e., to obtain payments, each claimant had to sign a form releasing BP and all other potentially responsible parties from any further liability.¹⁶⁷

For Interim and Final payments, costs eligible for compensation included removal and clean-up costs, damage to real or personal property, lost earnings or profits, loss of subsistence use of natural resources (individuals only), and physical injury or death (individuals only).¹⁶⁸ Interim Payment claims could be submitted quarterly; the general idea was to provide compensation on a periodic, continuing basis for claimants with continuing costs (e.g., unemployment or lost business revenue) until a final amount could be determined. A Full Review Payment Claim would be in compensation for all past, present, and future losses. To receive a full review payment, an individual or business had to sign a similar release of liability as with Quick Final Payments.¹⁶⁹

The GCCF claims process could be accessed via the website, a toll-free telephone number, or by visiting one of sixteen claims site offices.¹⁷⁰ Documents and assistance were available in English, Spanish, Vietnamese, and Khmer. A full final claims form was fourteen pages long.

The GCCF website provided extensive information including claim forms, FAQs, news releases, information about free legal assis-

166. McDonell, *supra* note 163, at 771.

167. *Id.*

168. See GULF COAST CLAIMS FACILITY, FREQUENTLY ASKED QUESTIONS 4 (2010), available at http://www.restorethegulf.gov/sites/default/files/imported_pdfs/library/assets/gccf-faqs.pdf.

169. McDonell, *supra* note 163, at 771.

170. The sixteen centers were identified on the GCCF website when checked in March 2012. A BP statement in July 2010 stated that it had 37 claims centers operating at that time. See Brenda Kirby, *Oil Spill: State and Local Leaders Divided over Federal Disaster Declaration*, AL.COM BLOG (July 26, 2010, 5:00 AM), http://blog.al.com/live/2010/07/oil_spill_state_and_local_lead.html.

tance, links for filing claims online, an attorney portal, a link for reporting fraud, a link for checking the status of your claim, updates on Deepwater Horizon litigation, and claims statistics.¹⁷¹

The claims statistics from the website showed a robust claims program. As of March 22, 2012, over one million (1,065,649) claims had been filed by 576,094 claimants, including 454,351 individuals and 121,743 businesses. Over six billion dollars (\$6,111,931,123) had been paid to 221,748 claimants. Payments included the following:¹⁷²

TABLE ONE

| Type of Claim | No. of Claimants | No. of Claimants Paid | Total Amount Paid |
|---------------------------|------------------|-----------------------|-------------------|
| Emergency Advance | 449,807 | 169,202 | \$2,583,962,060 |
| Quick Pay Final | 130,525 | 128,369 | 1,312,795,000 |
| Interim Payment | 132,794 | 35,489 | 507,405,818 |
| Full Review Final Payment | 160,493 | 67,692 | 1,707,768,245 |

The GCCF published extensive statistics on the numbers and types of claims, county of origin of claims, claims status, and payments made. In fact at any time, anyone could download a summary report with basic information about each claim (with claims identified by claim numbers only).

D. Stafford Act Response

Following the spill, there was considerable discussion about the possibility of a presidential disaster declaration. The Congressional Research Service (CRS) performed an analysis of the issue in May 2010, listing key points for and against a Stafford Act declaration.¹⁷³ An SBA loan program was activated, but there was no presidential disaster declaration; no governor asked for one. The presence of other assistance and compensation mechanisms—including federal response by the U.S. Coast Guard, supporting agencies under the National Con-

171. See GULF COAST CLAIMS FACILITY, <http://www.gulfcoastclaimsfacility.com/index> (last visited Mar. 3, 2014). This website still existed as of March 2014, but was simplified to one page following closure of the claims facility.

172. GULF COAST CLAIMS FACILITY, OVERALL PROGRAM STATISTICS (2012). Note that the total number of claimants adds up to more than 576,094 since many claimants submitted more than one type of claim.

173. See generally FRANCIS X. MCCARTHY, CONG. RESEARCH SERV., R41234, POTENTIAL STAFFORD ACT DECLARATIONS FOR THE GULF COAST OIL SPILL: ISSUES FOR CONGRESS (2010), available at <https://www.fas.org/sgp/crs/misc/R41234.pdf>.

tingency Plan, and the BP compensation program—may have been factors in not activating more Stafford Act programs. Another issue may have been lingering mistrust in the area after the poor handling of the Hurricane Katrina response.¹⁷⁴

VI.

RADIOLOGICAL EMERGENCY PREPAREDNESS IN THE UNITED STATES

In the United States, radiological emergency preparedness (REP) has matured along with the nuclear power industry. Following the TMI accident, a robust program was put into place to integrate licensee, local, state, and federal preparedness efforts. REP communities have been considered leaders among local emergency preparedness programs for the thirty-plus years since the REP Program was put into place. More recently, a concerted effort has been made to integrate and upgrade emergency preparedness plans for a variety of hazards among all communities. Planning and preparedness for disaster recovery has been newly emphasized in the aftermath of 9/11, Hurricane Katrina, Hurricane Sandy, and other wide-impact events.

This section briefly reviews these programs and trends, and examines the extent to which compensation of victims has been integrated into the REP Program.

A. *Radiological Emergency Preparedness Framework*

In the United States nuclear regulatory system, emergency preparedness starts where “defense-in-depth”¹⁷⁵—the layered safety and backup systems internal to nuclear installations that are supposed to prevent nuclear incidents—might fail. In 1979, the NRC and FEMA jointly established the REP Program, which works with NRC licensees and state and local governments to develop preparedness plans to cope with offsite effects of nuclear power plant radiological emergencies.¹⁷⁶ Integrated licensee, federal, state, and local planning

174. See Kirby, *supra* note 170.

175. This term is defined as follows: “An approach to designing and operating nuclear facilities that prevents and mitigates accidents that release radiation or hazardous materials. The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.” *Defense-in-depth*, U.S. NUCLEAR REGULATORY COMM’N, <http://www.nrc.gov/reading-rm/basic-ref/glossary/defense-in-depth.html> (last updated Apr. 2, 2014).

176. See 44 C.F.R. § 350.3(d)–(e) (2010).

is a pillar of this program.¹⁷⁷ As the foundational joint NRC-FEMA guidance document on reactor emergency preparedness explains:

[The NRC and FEMA have] a shared belief that an integrated approach to the development of response plans to radiological hazards is most likely to provide the best protection of the health and safety of the public. NRC and FEMA recognize that plans of licensees, State agencies, and local governments should not be developed in a vacuum or in isolation from one another. Should an accident occur, the public can be best protected when the response by all parties is fully integrated.¹⁷⁸

In the final analysis, these plans must, in the words of the federal regulation, provide “reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.”¹⁷⁹ To meet this standard, the plans must satisfy sixteen planning standards.¹⁸⁰ Among these are requirements for:

- Assignment of responsibilities for emergency response;
- Adequate licensee on-shift facility staffing responsibilities;
- Arrangements for tapping assistance resources;
- Use of a standard emergency classification system;
- Procedures for notifications to emergency responders, state and local organizations, and the public;
- Prompt communications with the public and emergency responders;
- Public education about emergency plans;
- Emergency response facilities and equipment;
- Mechanisms for monitoring and assessing offsite consequences;
- Protective action options to be developed for the public and emergency workers;
- Means of radiation exposure control;
- Medical service arrangements for contaminated injured victims;
- Development of general recovery and reentry plans;
- Periodic exercises of response capabilities;
- Training of those who may be requested to assist in responses; and

177. See 44 C.F.R. § 350.6(a).

178. U.S. NUCLEAR REGULATORY COMM’N, NSIR/DPR-ISG-01, INTERIM STAFF GUIDANCE: EMERGING PLANNING FOR NUCLEAR POWER PLANTS 55 (2011), *available at* <http://pbadupws.nrc.gov/docs/ML1130/ML113010523.pdf>.

179. See 10 C.F.R. § 50.47(a)(1)(i) (2014).

180. 44 C.F.R. § 350.5(a) (2013).

- Planning responsibility assignment to trained planners.¹⁸¹

The plans also must be exercised periodically. Exercises begin with hypothetical reactor nuclear incident scenarios, and require field demonstration of key response activities. Incident scenarios for the “plume exposure pathway emergency planning zone”¹⁸² plans must be exercised every two years in on-the-ground exercises that test training, facilities, and equipment required to implement an effective integrated response.¹⁸³ Scenarios for the larger “ingestion exposure pathway emergency planning zone”¹⁸⁴ must be exercised at least once every eight years.¹⁸⁵

FEMA evaluates both the plans and the exercises against the standards (except for the standard relating to licensee staffing) to determine whether they meet the “reasonable assurance” standard and “are capable of being implemented.”¹⁸⁶ Weaknesses identified in plans or response capabilities must be remedied,¹⁸⁷ or else FEMA’s approval can be withdrawn.¹⁸⁸

NRC reactor operating permits are conditioned on licensee compliance with the emergency planning standards.¹⁸⁹ If the NRC deter-

181. *Id.* § 350.5(a)(1)–(16).

182. In the plume exposure pathway emergency planning zone, which encompasses about a 10-mile radius around each reactor, detailed planning is necessary to protect the public from exposure to radiation from a passing plume of radioactive material in the event of an accident. *See* FED. EMERGENCY MGMT. AGENCY & U.S. NUCLEAR REGULATORY COMM’N, NUREG-0654, FEMA-REP-1, REV. 1, CRITERIA FOR PREPARATION AND EVALUATION OF RADIOLOGICAL EMERGENCY RESPONSE PLANS AND PREPAREDNESS IN SUPPORT OF NUCLEAR POWER PLANTS 10 (1980) [hereinafter 1980 CRITERIA FOR PREPARATION], available at <http://pbadupws.nrc.gov/docs/ML0404/ML040420012.pdf>.

183. 44 C.F.R. § 350.9 (2013).

184. In the ingestion exposure pathway emergency planning zone, which encompasses a 50-mile radius from each reactor, detailed planning is required to protect the public from ingesting water, milk, or food that may be contaminated by a radiological incident. *See* 1980 CRITERIA FOR PREPARATION, *supra* note 182, at 9.

185. FED. EMERGENCY MGMT. AGENCY & U.S. NUCLEAR REGULATORY COMM’N, NUREG 0654/FEMA-REP-1, REV. 1, SUPP. 4, CRITERIA FOR PREPARATION AND EVALUATION OF RADIOLOGICAL EMERGENCY RESPONSE PLANS AND PREPAREDNESS IN SUPPORT OF NUCLEAR POWER PLANTS 12 (2011), available at <http://www.fema.gov/pdf/about/divisions/thd/FEMA-REP-1%20Rev-1%20Supp-4%20Oct%202011.pdf>.

This guidance document explains the basis for ingestion exposure pathway exercise frequency as follows: “44 C.F.R. Part 350.9(c)(4) requires that states within the 50 mile EPZ of a site exercise the ingestion exposure pathway at least once every 5 years. This was modified to 6 years in 10 C.F.R. Part 50, Appendix E, Section IV.F.2.d and GM PR-1, ‘Policy on NUREG 0654/FEMA-REP-1 and 44 C.F.R. 350 Requirements’ (Oct. 4, 1985). The cycle was changed to 8 years in this Supplement.” *Id.* at 7 n.3.

186. 44 C.F.R. § 350.12(b).

187. *Id.* § 350.9(c)(5), (d).

188. *Id.* § 350.13.

189. 10 C.F.R. § 50.54(q) (2014).

mines after reviewing FEMA's findings and determinations that reasonable assurance does not exist for a reactor, that reactor can be shut down.¹⁹⁰

In the aftermath of the Fukushima accident, the NRC established an interim staff task force:

[T]o conduct a systematic and methodical review of U.S. Nuclear Regulatory Commission processes and regulations to determine whether the agency should make additional improvements to its regulatory system and to make recommendations to the Commission for its policy direction, in light of the accident at the Fukushima Dai-ichi Nuclear Power Plant.¹⁹¹

The resulting report included a recommendation that the NRC Staff should:

[W]ork with FEMA, States, and other external stakeholders to evaluate insights from the implementation of EP at Fukushima to identify potential enhancements to the U.S. decision making framework, including the concepts of recovery and reentry.¹⁹²

Following release of the interim staff task force report, the Commission decided to carry out the report's recommendations by establishing the Japan Lessons Learned Project Directorate.¹⁹³

B. Recent Developments in Federal Emergency Preparedness Doctrine

Several changes have taken place in federal emergency preparedness doctrine since the REP Program's basic policies were adopted. After the September 11, 2001 attacks, federal emergency planning infrastructure expanded greatly. In 2004, Homeland Security Presidential Directive 5 (HSPD-5) directed the Secretary of Homeland Security to adopt the National Incident Management System (NIMS) to:

provide a consistent nationwide approach for Federal, State, and local governments to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity.¹⁹⁴

190. See *id.* § 50.54(s)(2)(ii)–(s)(3).

191. MILLER ET AL., *supra* note 16, at vii.

192. *Id.* at 62.

193. *Japanese Lessons Learned Project Directorate*, U.S. NUCLEAR REGULATORY COMM'N, <http://www.nrc.gov/reactors/operating/ops-experience/japan/japan-lessons-learned.html> (last updated May 9, 2013).

194. Homeland Security Presidential Directive 5: Management of Domestic Incidents, 39 WEEKLY COMP. PRES. DOC. 280, 282 (Feb. 28, 2003).

Under this rubric, the National Preparedness Goal (NPG)¹⁹⁵ developed pursuant to Presidential Policy Directive 8,¹⁹⁶ identifies compensation and other financial assistance for those who evacuate or take other protective actions as a component of the recovery mission area.¹⁹⁷

Recovery includes those capabilities necessary to assist communities affected by an incident in recovering effectively. It is focused on a timely restoration, strengthening, and revitalization of the infrastructure; housing; *a sustainable economy*; and the health, social, cultural, historic, and environmental fabric of communities affected by a catastrophic incident.¹⁹⁸

The NPG also calls for an integrated effort to achieve successful recovery:

State and local governments play the lead role in planning for and managing all aspects of their jurisdiction's recovery and ensuring that key community organizations and individuals in community leadership roles are included. A successful recovery process requires unity of effort among resource providers and recovery managers, respecting the authority and expertise of each participating organization while coordinating the support of common recovery objectives.¹⁹⁹

This view is elaborated in the National Disaster Recovery Framework, which "provides guidance that enables effective recovery support to disaster-impacted States, Tribes and local jurisdictions."²⁰⁰ The guidance is replete with references to the need for local and state governments to take the lead in a recovery planning process that includes both government and private sector partners:

The speed and success of recovery can be greatly enhanced by establishment of the process and protocols prior to a disaster for coordinated post-disaster recovery planning and implementation. All stakeholders should be involved to ensure a coordinated and comprehensive planning process, and develop relationships that increase post-disaster collaboration and unified decisionmaking

195. U.S. DEP'T OF HOMELAND SECURITY, NATIONAL PREPAREDNESS GOAL (2011), available at http://www.fema.gov/media-library-data/20130726-1828-25045-9470/national_preparedness_goal_2011.pdf.

196. Presidential Policy Directive 8: National Preparedness (Mar. 30, 2011), available at <http://www.dhs.gov/xlibrary/assets/presidential-policy-directive-8-national-preparedness.pdf>.

197. See U.S. DEP'T OF HOMELAND SECURITY, *supra* note 195, at 2.

198. *Id.* at 15 (emphasis added).

199. *Id.* at 16.

200. FED. EMERGENCY MGMT. AGENCY, NATIONAL DISASTER RECOVERY FRAMEWORK 1 (2011), available at <https://www.fema.gov/pdf/recoveryframework/ndrf.pdf>.

Partnerships and collaboration across groups, sectors and governments promote a successful recovery process. Partnerships and inclusiveness are vital for ensuring that all voices are heard from all parties involved in disaster recovery and that all available resources are brought to the table. This is especially critical at the community level where nongovernmental partners in the private and nonprofit sectors play a critical role in meeting local needs.²⁰¹

This guidance document specifically recognizes the central importance of post-disaster financial considerations by adding a new Economic Recovery Support Function as part of the framework's coordinating structure.²⁰² This function emphasizes the need for pre-disaster planning to facilitate post-disaster economic recovery,²⁰³ which should be tested and evaluated "through seminars, workshops and exercises."²⁰⁴

Amplifying this guidance on February 12, 2013, the President issued Presidential Policy Directive 21 on critical infrastructure security and resilience. This document states that:

It is the policy of the United States to strengthen the security and resilience of its critical infrastructure against both physical and cyber threats. The Federal Government shall work with critical infrastructure owners and operators and SLTT entities to take proactive steps to manage risk and strengthen the security and resilience of the Nation's critical infrastructure, considering all hazards that could have a debilitating impact on national security, *economic stability*, public health and safety, or any combination thereof. These efforts shall seek to reduce vulnerabilities, minimize consequences, identify and disrupt threats, and *hasten response and recovery efforts* related to critical infrastructure U.S. efforts shall address the security and resilience of critical infrastructure in an integrated, holistic manner to reflect this infrastructure's interconnectedness and interdependency. This directive also identifies energy and communications systems as uniquely critical due to the enabling functions they provide across all critical infrastructure sectors.²⁰⁵

Both the U.S. Department of Homeland Security (FEMA's parent agency) and the NRC have specific responsibilities for carrying out this directive. In recognition of changes during the preceding decade,

201. *Id.* at 10.

202. *Id.* at 37.

203. *Id.* at 49–50.

204. *Id.* at 64.

205. Presidential Policy Directive 21: Critical Infrastructure Security and Resilience, 2013 DAILY COMP. PRES. DOC. 1 (Feb. 12, 2013) (emphasis added). Nuclear reactors are designated specifically among the Nation's critical infrastructure sectors. *Id.* The term "SLTT" refers to "state, local, tribal, and territorial entities." *Id.*

three “strategic imperatives” are identified. Among these is the following:

Refine and Clarify Functional Relationships across the Federal Government to Advance the National Unity of Effort to Strengthen Critical Infrastructure Security and Resilience

. . . [F]ederal functions related to critical infrastructure security and resilience shall be clarified and refined to establish baseline capabilities that will reflect this evolution of knowledge, to define relevant Federal program functions, and *to facilitate collaboration and information exchange between and among the Federal Government, critical infrastructure owners and operators, and SLTT entities.*²⁰⁶

C. Preparedness for Compensation

Considering current REP standards and guidance, and in light of the events at Fukushima and recent developments in recovery planning doctrine, to what extent is planning for the compensation process that would follow a nuclear incident well-integrated into the REP program?

In the REP standards, the logical place to start is Planning Standard M.1, which is the only planning standard for recovery and reentry that includes the licensee, state, and local governments. Planning Standard M.1 states:

Each organization, as appropriate, shall develop general plans and procedures for reentry and recovery and describe the means by which decisions to relax protective measures (e.g., allow reentry into an evacuated area) are reached. This process should consider both existing and potential conditions.²⁰⁷

However, neither Planning Standard M.1 nor any other part of the REP Program guidance specifically discusses post-incident compensation.²⁰⁸

The absence of explicit reference to compensation planning in REP standards and guidance may reflect the fact that the emergency planning regulations historically had a different basis than the PAA. The two laws were adopted at different times for different purposes,

206. *Id.* (emphasis added).

207. 1980 CRITERIA FOR PREPARATION, *supra* note 182, at 70.

208. For many years, FEMA has maintained a document known as the “REP Manual,” which “serves as the principal source of policy and guidance for the FEMA REP.” FED. EMERGENCY MGMT. AGENCY, PROGRAM MANUAL: RADIOLOGICAL EMERGENCY PREPAREDNESS I-1 (2013). The REP Manual does not address victim compensation.

and involved different organizations. Under the PAA, a separate organization (ANI) is responsible for the compensation function. In addition, when the emergency planning standards were adopted in 1980, recovery was not recognized as the major emergency planning challenge that more recent experiences have shown it to be.

National recovery guidance, the interim staff task force report on the Fukushima accident, and Presidential Policy Directive 21 all suggest strongly that post-incident recovery planning and exercises should encompass integrated mechanisms for compensation under the PAA, Stafford Act assistance, and other funding and investment sources. The apparent disconnect between the REP program and the PAA compensation process raises two potential issues, one practical and one legal. The practical issue is simply that planning for recovery from a nuclear facility incident is not as well-integrated as it might be, and is somewhat out of step with current guidance on recovery planning. While no one would expect the sort of confusion or delay that has attended the Fukushima compensation process, it appears that the federal, state, local, and private-sector processes are not explicitly coordinated. Indeed, the NRC interim staff task force report observed that:

[L]icensees and States are required to have plans for recovery and reentry; however, these plans remain largely conceptual and are rarely practiced. Since recovery and reentry have proven to present challenges at Fukushima, the NRC should continue work in this area to forward the U.S. Government approach.²⁰⁹

In addition to an apparent gap in preparedness, this anomaly also could result in vulnerability to legal challenges alleging inadequate offsite preparedness. Courts traditionally have given deference to FEMA and the NRC, and to the standards established in NRC regulations. For example, the Court in *Massachusetts v. NRC*²¹⁰ rejected an intervenor's attempt to introduce evidence that an emergency plan for the Seabrook Nuclear Station in New Hampshire would not protect the public from excessive radiation doses.²¹¹ The Court disagreed that the regulation "was intended to achieve a measurable level of effective protection in specific cases."²¹² Instead, it approved the NRC's decision "that the minimization of harm to the public in each case may be inferred from satisfaction of the sixteen planning standards, regardless

209. MILLER ET AL., *supra* note 16, at 61.

210. 924 F.2d 311 (D.C. Cir. 1991).

211. Please note that co-author Edward Tanzman was an expert witness on behalf of FEMA in this case.

212. 924 F.2d at 327.

of whether the plan will actually protect the entire EPZ under all conditions.”²¹³ It is a bit like saying that an auto manufacturer has to prove both that its car has the necessary components—an engine, a transmission, brakes, an owners’ manual, etc.—and that it performs well on a test track, but not that the vehicle is guaranteed to get a driver to work on time during the morning rush.

In *Massachusetts v. NRC*, the Court’s deference to the NRC’s determination²¹⁴ that the emergency plans were sufficient was based on their compliance with the sixteen emergency planning standards. However, if these planning standards do not cover all essential components of offsite preparedness as defined in national doctrine developed by FEMA—the expert agency in offsite emergency preparedness—then interveners might argue that satisfaction of the planning standards is not sufficient to show adequate preparedness.

VII.

ANALYSIS AND RECOMMENDATIONS

The United States and Japan have faced differing challenges in responding to the events at TMI and Fukushima. The Fukushima reactor incident resulted in a widespread release of radioactive material, displacing tens of thousands of people and affecting thousands of businesses. Almost three years later, more than 50,000 people remain displaced, hundreds of square miles of territory are not reoccupied, and it may be many years before people can return to some areas. In contrast, the accident at TMI resulted in only a short, partial evacuation recommendation for a five-mile radius around the plant, and no lasting contamination beyond the site boundary. Comparing the situations and the respective responses led to the following analysis and recommendations.

A. Analysis

1. Compensation Law and Policy

The Japanese system for nuclear accident compensation at the time of the Fukushima accident bore at least some resemblance to the U.S. system. Nuclear licensees were required to show financial responsibility of a certain amount, and this was (and continues to be) met through a private insurance pool. The Japanese system provided

213. *Id.* at 328.

214. 878 F.2d 1516, 1523 (1st Cir. 1989); *see also* William C. Ostendorff & Kimberly A. Sexton, *Adequate Protection After the Fukushima Daiichi Accident: A Constant in a World of Change*, 91 NUCLEAR L. BULL. 23, 26 (2013).

considerably more than the U.S. system in primary coverage—\$1.2 billion as opposed to \$375 million. The Japanese system, however, had significant loopholes—exceptions for earthquake and tsunami damage—that defeated insurance coverage for this event. The Japanese government has had to take up the slack. Also, the Japanese system did not have a secondary tier, as the U.S. system does, providing for contributions from all nuclear operators if claims go beyond the first tier of coverage. That second tier was essentially developed after the fact by the Japanese Diet when it created the Nuclear Damage Compensation Facilitation Corp., funded by contributions from nuclear operators.

2. *Adequacy of Funding*

About \$34 billion has already either been spent or requested for Fukushima compensation costs.²¹⁵ This total far exceeds the capacity of the compensation system that was planned in advance.²¹⁶ Additional mechanisms and sources of funds for compensation had to be established and implemented after the fact.

After TMI, the pre-established mechanisms were implemented to provide compensation to victims. The total cost was about \$70 million, within the primary coverage limit for the plant. In terms of adequacy of funding, the U.S. system is much more robust, with coverage currently standing at up to \$12.6 billion.²¹⁷

Unfortunately, this robust coverage does not safeguard the United States against all of the consequences of a Fukushima-like event. The United States thankfully has not faced a challenge of the same magnitude as Fukushima, but if the estimates of upcoming costs there are correct, a Fukushima-like event evidently would overwhelm the resources currently available under the U.S. system.

3. *Operation of the Compensation Process*

Compensation to the Fukushima victims has been a source of stress and controversy. A funding mechanism (the Nuclear Damage Compensation Facilitation Corp.) and a policy-making body (the Dispute Reconciliation Committee for Nuclear Damage Compensation) had to be created on the fly. Implementation of the claims system was carried out by the operating company (TEPCO) and the Japanese gov-

215. See Press Release, *supra* note 38.

216. See *supra* Part I.C.

217. See *supra* Part II.C.

ernment. The initial efforts were not user-friendly, and drew criticism from the public.²¹⁸

At TMI, a preplanned system operated by insurance professionals was implemented to provide immediate relief for displaced persons. Initial efforts began quickly, and settled a fairly large number of claims for initial evacuation costs in a timely manner. Resolution of remaining claims became a more drawn-out process due to litigation, ultimately taking 24 years.

4. *Context of Other Assistance and Compensation Models*

The problem of compensation for a nuclear disaster in the United States should be viewed in the context of other possible sources of assistance to victims and other models for compensation after disasters. The United States has a number of mechanisms for providing federal assistance to victims. They are deployed regularly by FEMA after natural disasters such as floods, hurricanes, wildfires, and tornadoes. FEMA and other federal agencies have capabilities and mechanisms in place to provide both material and financial services. It is an open question whether these programs would or should be available after a nuclear power plant incident. Issues include legal availability of resources, potential duplication of efforts, and practical issues of efficiency in delivering services.

Recent events, in particular the Deepwater Horizon oil spill in the Gulf of Mexico, may offer valuable lessons regarding practical issues in administering a widespread and voluminous claims process. Within two years after the event, the claims process initiated by BP paid billions of dollars to hundreds of thousands of claimants, covering a diverse range of claims for property damage, business losses, cleanup costs, and unemployment, among others. There has also been some controversy over operation of the facility and some claimants have not been satisfied.²¹⁹ Civil litigation is continuing as of publication.

5. *Requirements and Guidance*

Planning for post-disaster recovery has recently received greater emphasis in federal emergency preparedness doctrine, including the compensation and assistance necessary to restore local economies and allow communities to heal. In the NRC's nuclear emergency prepared-

218. See *supra* notes 42–47 and accompanying text.

219. See, e.g., Ramona H. Baker, Empty Nets: Finding Compensation for Commercial Fishermen after the Deepwater Horizon Disaster (Feb. 11, 2012), available at http://studentorgs.law.unc.edu/documents/elp/2012/baker_final.pdf (unpublished manuscript prepared for the 2012 Univ. of North Carolina Env'tl. Law Symposium).

ness regulations and NRC/FEMA guidance, recovery is considered in a general way, but the issue of compensation is not addressed directly.

B. Recommendations

The NRC has devoted considerable effort to reviewing nuclear emergency preparedness in the aftermath of Fukushima. Preparedness for the function of compensating victims, however, has not been a primary focus. The compensation process under the PAA is defined by federal law and private insurance practice. While it appears robust in some ways, this mechanism has been insufficiently connected to other aspects of REP. Elevated U.S. public concern about nuclear energy suggests that this gap will not go unchallenged. Therefore, we recommend the following:

- The Fukushima Daiichi experience demonstrates that damage claims from a nuclear power plant accident may exceed the amount that would be available under the American nuclear insurance system. The adequacy of PAA coverage should be reviewed. A risk analysis approach could be taken to review whether the PAA coverage limits require adjustment.
- Advance planning could be conducted now for the possibility of nuclear incident claims exceeding the established coverage limits. Lessons learned from Fukushima, Cerro Grande, and Deepwater Horizon could be applied in shaping legislation to allow a compensation system to be stood up quickly and efficiently.
- Review the relationship between the PAA and the Stafford Act as response authorities. As in Fukushima, a severe natural disaster may be associated with an incident at a U.S. nuclear reactor. Response efforts under both statutes might occur simultaneously; how would they be coordinated and where would the boundary between them lie?
- Review preparedness for victim compensation. This function is currently in the hands of private insurers, which have experience and a (short) track record of success in responding to an emergency. However, their plans and capabilities are not subjected to the formal REP Program planning and review processes, and they are not particularly well known in the REP community. Additional coordination, planning, and exercising are needed to integrate compensation systems into other aspects of REP recovery.
- Consider use of modeling to analyze the compensation process. Modeling tools can help to assess the benefits and costs of dif-

ferent approaches, especially in situations where experience is limited, like nuclear reactor accident victim compensation in the United States.

- Study the evolution of the compensation system in Japan since the Fukushima Daiichi accident, to identify potential lessons learned for the U.S. compensation system. Surely the lessons learned during this difficult period in Japan can inform efforts in the United States to develop a better system.
- Consider whether a terrorism-related nuclear reactor incident could change response and compensation procedures, or raise additional issues. In particular, the greater role that law enforcement and national security personnel necessarily would play during both response and recovery might create difficulties that have not been studied, such as in proving the extent of damages.

CONCLUSION

If nuclear power is to be a component of efforts to reduce carbon emissions and mitigate climate change, it will have to be accompanied by the readiness to respond to accidents. Robust response capabilities, including mechanisms to compensate victims, are part of the social contract with communities hosting nuclear power plants.

Nuclear power plant accidents that affect surrounding areas thankfully are rare, but they do happen. When they do, it is important to extract whatever lessons can be learned, and review the state of our preparedness. Just as engineers are studying the wreckage and the data from Fukushima Daiichi to be better prepared against future disasters, the legal and emergency management communities should be reviewing the aftermath to be better prepared against the social consequences of another power plant incident. A sophisticated state of preparedness, integrating the lessons of TMI, Cerro Grande, Deepwater Horizon, and Fukushima, will be the best protection to mitigate the effects of any future disasters.