



**Congressional
Research Service**

Informing the legislative debate since 1914

Nuclear Energy: Overview of Congressional Issues

Mark Holt

Specialist in Energy Policy

March 14, 2014

Congressional Research Service

7-5700

www.crs.gov

R42853

Summary

The policy debate over the role of nuclear power in the nation's energy mix is rooted in the technology's fundamental characteristics. Nuclear reactors can produce potentially vast amounts of energy with relatively low consumption of natural resources and emissions of greenhouse gases and other pollutants. However, facilities that produce nuclear fuel for civilian power reactors can also produce materials for nuclear weapons. The process of nuclear fission (splitting of atomic nuclei) to generate power also results in the production of radioactive material that must be contained and can remain hazardous for thousands of years. How to manage the weapons proliferation and safety risks of nuclear power, or whether the benefits of nuclear power are worth those risks, are issues that have long been debated in Congress.

The 100 licensed nuclear power reactors at 62 sites in the United States generate about 20% of the nation's electricity. Five new reactors are currently under construction. About a dozen more are planned, but whether they move forward will depend largely on their economic competitiveness with natural gas and coal plants. Throughout the world, 435 reactors are currently in service, and 71 more are under construction.

The March 2011 disaster at the Fukushima Dai-ichi nuclear power plant in Japan increased attention to nuclear safety throughout the world. The U.S. Nuclear Regulatory Commission (NRC), which issues and enforces nuclear safety requirements, established a task force to identify lessons from Fukushima applicable to U.S. reactors. The task force's report led to NRC's first Fukushima-related regulatory requirements on March 12, 2012. Several other countries, such as Germany and Japan, eliminated or reduced their planned future reliance on nuclear power after the accident.

Highly radioactive spent nuclear fuel that is regularly removed from nuclear power plants is currently stored at plant sites in the United States. Plans for a permanent underground repository at Yucca Mountain, NV, were abandoned by the Obama Administration, although that decision is being challenged in court. The Obama Administration appointed the Blue Ribbon Commission on America's Nuclear Future to recommend an alternative nuclear waste policy. In response to the Commission's recommendations, the Department of Energy (DOE) issued a new waste strategy in January 2013 that calls for the selection of new candidate sites for nuclear waste storage and disposal facilities through a "consent-based" process and for a surface storage pilot facility to open by 2021.

The level of security that must be provided at nuclear power plants has been a high-profile issue since the 9/11 terrorist attacks on the United States in 2001. Since those attacks, NRC issued a series of orders and regulations that substantially increased nuclear plant security requirements, although industry critics contend that those measures are still insufficient.

Encouraging exports of U.S. civilian nuclear products, services, and technology while making sure they are not used for foreign nuclear weapons programs has long been a fundamental goal of U.S. nuclear energy policy. Recent proposals to build nuclear power plants in several countries in the less developed world, including the Middle East, have prompted concerns that international controls may prove inadequate.

Contents

Synthesis of Key Issues	1
Basic Facts and Statistics	2
Major Nuclear Energy Issues.....	3
Safety.....	3
Recent Events.....	4
Selected Congressional Action.....	4
CRS Reports.....	5
Additional References.....	5
Radioactive Waste	5
Recent Events.....	5
Selected Congressional Action.....	6
CRS Reports.....	7
Additional References.....	7
Federal Support and Incentives	7
Recent Events.....	7
Selected Congressional Action.....	8
CRS Reports.....	8
Additional References.....	8
Security and Emergency Response.....	8
Recent Events.....	8
Selected Congressional Action.....	9
CRS Reports.....	9
Additional References.....	9
Nuclear Weapons Nonproliferation	9
Recent Events.....	10
Selected Congressional Action.....	10
CRS Reports.....	11
Other References.....	11

Contacts

Author Contact Information.....	11
---------------------------------	----

Synthesis of Key Issues

The long-running policy debate over the future of nuclear energy is rooted in the technology's inherent characteristics. Initially developed for its unprecedented destructive power during World War II, nuclear energy seemed to hold equal promise after the war as a way of providing limitless energy to all mankind. International diplomacy has focused ever since on finding institutional mechanisms for spreading the perceived benefits of nuclear energy throughout the world while preventing the technology from being used for the proliferation of nuclear weapons. Much of this international effort is focused on key nuclear fuel cycle facilities—plants for enriching uranium in the fissile isotope U-235 and for separating plutonium from irradiated nuclear fuel. Such plants can be used to produce civilian nuclear reactor fuel as well as fissile material for nuclear warheads.

Yet even the use of nuclear power solely for peaceful energy production has proven intrinsically controversial. The harnessing of nuclear fission in a reactor creates highly radioactive materials that must be kept from overheating and escaping from the reactor building, as occurred during the disasters at Fukushima and Chernobyl. Spent nuclear fuel that is regularly removed from reactors during refueling must be isolated from the environment for up to a million years. Potential technologies to reduce nuclear waste through recycling usually involve separating plutonium that could be used for nuclear weapons and would still leave substantial amounts of radioactive waste to be stored and disposed of. Long-term storage and disposal sites for nuclear waste have proven difficult to develop throughout the world, as illustrated by the Obama Administration's cancellation of the proposed U.S. waste repository at Yucca Mountain, NV.

The March 2011 disaster at Japan's Fukushima Dai-ichi nuclear power plant, which forced the evacuation of areas as far as 30 miles away, has slowed nuclear power expansion plans around the world, particularly in Japan and Western Europe. However, dozens of new reactors are still being planned and built in China, India, Eastern Europe, and elsewhere.¹ In these areas, nuclear power's initial promise of generating large amounts of electricity without the need for often-imported fossil fuels, along with the more recent desire to reduce greenhouse gas emissions, remains a compelling motivation.

With 100 licensed reactors, the United States has the largest nuclear power industry in the world. But U.S. nuclear power growth has been largely stagnant for the past two decades, as natural gas has captured most of the market for new electric generating capacity.² Congress enacted incentives for new nuclear plants in the Energy Policy Act of 2005 (P.L. 109-58), including production tax credits, loan guarantees, and insurance against regulatory delays. Those incentives, combined with rising natural gas prices and concerns about federal restrictions on carbon dioxide emissions, prompted industry plans by late 2009 for up to 30 new nuclear power reactors in the United States.³ However, falling natural gas prices and the defeat of greenhouse gas legislation in the 111th Congress have put many of those projects on hold. Currently, four new reactors, in Georgia and South Carolina, are under construction, and an older reactor on which construction

¹ World Nuclear Association, "World Nuclear Power Reactors & Uranium Requirements," February 1, 2014, <http://www.world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements>.

² Energy Information Administration, "Most Electric Generating Capacity Additions in the Last Decade Were Natural Gas-Fired," July 5, 2011, <http://www.eia.gov/todayinenergy/detail.cfm?id=2070>.

³ Nuclear Regulatory Commission, "Expected New Nuclear Power Plant Applications," updated September 28, 2009. Available from the author.

had been suspended for two decades is now being completed in Tennessee. A variety of incentives to renew the growth of nuclear power have been proposed, including a plan by President Obama to include nuclear power, along with natural gas and advanced coal technologies, in a federal mandate for the production of “clean energy.”

Existing U.S. nuclear power plants are facing difficult competition from natural gas and renewable energy. Four U.S. reactors were permanently closed in 2013, and the shutdown of a fifth unit was announced for late 2014. Three of those units closed because of the need for expensive repairs, while the other two were operating well but could not compete in their local wholesale electricity markets. All five units had substantial time remaining on their initial 40-year operating licenses or had received or applied for 20-year license extensions from the Nuclear Regulatory Commission (NRC). The shutdowns prompted widespread discussion about the future of other aging U.S. reactors. The extent to which the growth of nuclear power should be encouraged in the United States and around the world will continue to be a major component of the U.S. energy policy debate. Questions for Congress will include the implementation of policies to encourage or discourage nuclear power, post-Fukushima safety standards, development of new nuclear power and fuel cycle technologies, and nuclear waste management strategies.

Basic Facts and Statistics

The 100 licensed nuclear power reactors at 62 sites in the United States generate about 20% of the nation’s electricity. The oldest of today’s operating reactors were licensed in 1969, and the most recent was in 1996. The reactors were initially licensed to operate for 40 years, but 80% have received or applied for 20-year license renewals by NRC. Under the current mixture of 40- and 60-year licenses, 33 reactors would have to shut down by 2030 and the rest by 2049.⁴

Whether new reactors will be constructed to replace the existing fleet or even to expand nuclear power’s market share will depend largely on costs. The cost of building and operating a new nuclear power plant in the United States is generally estimated to be significantly higher than natural gas combined-cycle plants (which use both combustion and steam turbines) and somewhat above conventional coal-fired plants. For example, the Energy Information Administration (EIA) estimates that electricity generation from a nuclear power plant coming on line in 2018 would cost 10.8 cents per kilowatt-hour (kwh), while advanced combined-cycle gas would cost 6.6 cents/kwh, and conventional coal would cost 10.0 cents/kwh. EIA estimates that onshore wind would cost 8.7 cents/kwh, offshore wind 22.2 cents/kwh, and solar photovoltaic 14.4 cents/kwh.⁵ Such estimates depend on a wide range of variables, however, such as future fuel costs and environmental regulations. Targeted tax credits and other incentives for specific technologies, which are not included in the EIA estimates, would also affect nuclear power’s economic competitiveness.

⁴ Nuclear Regulatory Commission, *Information Digest, 2032-2014*, NUREG-1350, Vol. 25, October 2013, Section 3: Nuclear Reactors, <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350>.

⁵ Energy Information Administration, “Levelized Cost of New Generation Resources in the Annual Energy Outlook 2013,” January 2013, http://www.eia.gov/forecasts/aeo/pdf/electricity_generation.pdf. Levelized costs include capital costs averaged over the life of the plant, plus fuel and maintenance costs.

As noted above, the United States currently has five reactors under construction. They are scheduled to begin operating in 2015 through 2018.⁶ Licenses to build and operate 12 additional reactors are currently pending at NRC, although some of their review schedules are uncertain.⁷ If those additional U.S. reactors are licensed and built, they could begin coming on line in the early 2020s.

Throughout the world, 435 reactors are currently in service or operable, and 71 more are under construction. France is the most heavily nuclear-reliant country in the world, with 58 reactors generating 75% of the country's electricity in 2012. Thirty countries in 2012 generated at least some of their electricity from nuclear power. After the Fukushima accident, Germany, which had previously generated about 30% of its electricity with nuclear power, closed eight of the country's 17 power reactors and decided to shut the remainder by 2022.⁸ Japan, which had also generated about 30% of its electricity with nuclear power and had planned to raise that level to 50%, is reconsidering its energy policy. None of Japan's 48 operable reactors is currently running. Safety improvements in response to the tsunami are currently being implemented, and 17 reactors are undergoing regulatory reviews for possible restart. It is not clear how many of the operable reactors will ultimately seek restart approval.

Major Nuclear Energy Issues

Safety

The Fukushima Dai-ichi disaster, triggered by a huge earthquake and tsunami, greatly increased concerns about safety in the nuclear policy debate. The accident clearly demonstrated the potential consequences of a total loss of power (or "station blackout") at today's commercial nuclear plants. Even when a reactor shuts down, as the Fukushima plant did after the initial earthquake, residual radioactivity in the reactor core continues to generate heat that must be removed, typically by electrically driven or controlled cooling systems. When the tsunami knocked out power at three of the Fukushima reactors, the buildup of heat and pressure became so great that it melted the reactors' nuclear fuel and exceeded the limits of their containment structures. Cooling was also lost in Fukushima's spent fuel storage pools, causing concern that they could overheat, although later examination indicated that they did not.

Safety requirements for nuclear power plants are established and enforced in the United States by NRC, an independent regulatory commission. NRC safety regulations address the effects of external events such as earthquakes and floods, equipment failure such as breaks in coolant pipes, and other problems that could lead to radioactive releases into the environment. Critics of nuclear power contend that NRC is often reluctant to impose necessary safety requirements that would be costly or disruptive to the nuclear industry. However, the industry has frequently contended that

⁶ Tennessee Valley Authority, "Watts Bar Unit 2 Project Construction Update," October 26, 2012, http://www.tva.com/power/nuclear/wattsbar_unit2.htm; South Carolina Electric and Gas, "Project Schedule," <http://www.sceg.com/en/about-sceg/power-plants/new-nuclear-development/schedule/default.htm>; Southern Company, "Milestones," <http://www.southerncompany.com/nuclearenergy/milestones.aspx>.

⁷ Nuclear Regulatory Commission, "New Reactor Licensing Applications," September 10, 2012, <http://www.nrc.gov/reactors/new-reactors.html>.

⁸ World Nuclear Association, "Public Information Service," <http://www.world-nuclear.org>.

costly safety proposals are unnecessary and would not significantly increase large existing safety margins.

Recent Events

Following the Fukushima disaster, NRC established a task force to identify lessons applicable to U.S. reactors and recommend safety improvements. The task force's report led to NRC's first Fukushima-related regulatory requirements, on March 12, 2012. NRC ordered all reactors to develop strategies to maintain cooling and containment integrity during external events, such as floods and earthquakes, that were more severe than anticipated by the plants' designs ("beyond design basis"). In addition, NRC required that U.S. reactors of similar design to the Fukushima reactors have "reliable hardened vents" to remove excess pressure from their primary containments, and that better instrumentation be installed to monitor the condition of spent fuel pools during accidents.⁹ The NRC commissioners on March 19, 2013, required NRC staff to study whether to require the newly mandated containment vents to include filters or other means to reduce the release of radioactive material if the vents have to be used. The idea of requiring filters had drawn praise from nuclear critics but opposition from the industry on cost grounds.¹⁰

Selected Congressional Action

Nuclear Regulatory Commission Reorganization Plan Codification and Complements Act (H.R. 3132, Terry, S. 1519, Vitter)

Specifies functions and authorities of the Chairman and Commissioners of NRC. Specifies that any commissioner may request a vote on whether a particular issue should be reserved for the Chairman or handled by the full Commission. House bill introduced September 18, 2013; referred to Committee on Energy and Commerce. Senate bill introduced September 18, 2013; referred to Committee on Environment and Public Works. Hearing held by House Committee on Energy and Commerce, Subcommittees on Energy and Power and Environment and the Economy, December 12, 2013.

Oversight Hearing: NRC's Implementation of the Fukushima Near-Term Task Force Recommendations and Other Actions to Enhance and Maintain Nuclear Safety

Joint hearing before the Senate Committee on Environment and Public Works and Subcommittee on Clean Air and Nuclear Safety. January 30, 2014. Witnesses: NRC Chairman Allison M. Macfarlane and NRC commissioners.

⁹ Nuclear Regulatory Commission, "Actions in Response to the Japan Nuclear Accident: March 12, 2012," updated May 30, 2012, <http://www.nrc.gov/reactors/operating/ops-experience/japan/timeline/03122012.html>.

¹⁰ NRC, "Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments," staff requirements memorandum, SECY-12-0157, March 19, 2013, <http://www.nrc.gov/reading-rm/doc-collections/commission/srm/2012/2012-0157srm.pdf>; Freebairn, William, "NRC Staff Recommends Ordering Filtered Vents for 31 Power Reactors," *Inside NRC*, November 5, 2012, p. 1.

CRS Reports

CRS Report RL33558, *Nuclear Energy Policy*, by Mark Holt

CRS Report R41805, *Nuclear Power Plant Design and Seismic Safety Considerations*, by Anthony Andrews and Peter Folger

CRS Report R41694, *Fukushima Nuclear Disaster*, by Mark Holt, Richard J. Campbell, and Mary Beth D. Nikitin

Additional References

Nuclear Safety: Countries' Regulatory Bodies Have Made Changes in Response to the Fukushima Daiichi Accident, Report to the Chairman, Subcommittee on Transportation and Infrastructure, Committee on Environment and Public Works, U.S. Senate, Government Accountability Office, GAO-14-109, March 2014, <http://www.gao.gov/products/GAO-14-109>.

Recommendations for Enhancing Reactor Safety in the 21st Century, Nuclear Regulatory Commission, Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, July 12, 2011, <http://pbadupws.nrc.gov/docs/ML1118/ML111861807.pdf>.

State-of-the-Art Reactor Consequence Analyses (SOARCA) Report: Draft Report for Comment, Nuclear Regulatory Commission, NUREG-1935, January 2012, <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1935>.

Radioactive Waste

Highly radioactive spent nuclear fuel must regularly be removed from operating reactors and stored in adjacent pools of water. After several years of cooling, the spent fuel can be placed in dry casks for storage elsewhere on the plant site. When existing U.S. reactors were built, spent fuel had been expected to be taken away for reprocessing (separation of plutonium and uranium to make new fuel) or permanent disposal. However, reprocessing has not become commercialized in the United States, for economic and nonproliferation reasons, and central waste storage and disposal facilities have proven difficult to site. As a result, the vast majority of U.S. commercial spent fuel remains at the nuclear plants where it was generated—totaling 71,775 metric tons in 2013 and rising at the rate of about 2,000 metric tons per year.¹¹

Recent Events

The Nuclear Waste Policy Act (P.L. 97-425, NWPA), as amended in 1987, named Yucca Mountain, NV, as the nation's sole candidate site for a permanent high-level nuclear waste repository. However, the Obama Administration decided to halt the Yucca Mountain project and appointed the Blue Ribbon Commission on America's Nuclear Future to recommend an alternative policy. The Commission issued its final report in January 2012, and the Department of Energy (DOE) responded in January 2013 with a new waste strategy that calls for a "consent-based" process to select nuclear waste storage and disposal sites and for a surface storage pilot

¹¹ Gutherman Technical Services, "2013 Used Fuel Data," Report to Nuclear Energy Institute, January 20, 2014.

facility to open by 2021.¹² A federal appeals court on August 13, 2013, ordered NRC to continue the Yucca Mountain licensing process with previously appropriated funds.¹³ NRC responded November 18, 2013, by directing the agency's staff to complete the Yucca Mountain safety evaluation report, a key document that would provide the staff's conclusions about whether the proposed repository could be licensed.

Selected Congressional Action

No More Excuses Energy Act of 2013 (H.R. 2081, Thornberry)

Includes provisions to prohibit NRC from considering nuclear waste storage when licensing new nuclear facilities, and to establish a tax credit for obtaining nuclear component manufacturing certification. Introduced May 21, 2013; referred to multiple committees.

Dry Cask Storage Act (H.R. 3354, Engel)

Requires spent fuel at nuclear power plants to be moved from spent fuel pools to dry casks after it has sufficiently cooled. Costs of the fuel transfers would be offset by a reduction in nuclear waste fees owed to the federal government. Introduced October 28, 2013; referred to Committee on Energy and Commerce.

Nuclear Waste Administration Act of 2013 (S. 1240, Wyden)

Establishes an independent Nuclear Waste Administration to develop nuclear waste storage and disposal facilities. Siting of such facilities would require the consent of the affected state, local, and tribal governments. The Nuclear Waste Administration could spend nuclear waste fees collected after the bill's enactment without the need for further appropriation. Fee collection would halt after 2025 if a waste facility had not been opened. Introduced June 27, 2013; referred to Committee on Energy and Natural Resources. Committee hearing held July 30, 2013.

Oversight Hearing: Nuclear Waste Programs and Strategies

Oversight hearing by the House Appropriations Committee Energy and Water Development and Related Agencies Subcommittee, Thursday, April 11, 2013. Lead witnesses: Peter B. Lyons, Assistant Secretary for Nuclear Energy, Department of Energy, and Michael Weber, Deputy Executive Director, Nuclear Regulatory Commission.

¹² DOE, *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*, January 2013, http://energy.gov/sites/prod/files/2013%201-15%20Nuclear_Waste_Report.pdf.

¹³ U.S. Court of Appeals for the District of Columbia Circuit, In re: Aiken County et al., No. 11-1271, writ of mandamus, August 13, 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/\\$file/11-1271-1451347.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/$file/11-1271-1451347.pdf).

CRS Reports

CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by Mark Holt

CRS Report R42513, *U.S. Spent Nuclear Fuel Storage*, by James D. Werner

CRS Report R40996, *Contract Liability Arising from the Nuclear Waste Policy Act (NWPA) of 1982*, by Todd Garvey

Additional References

Report to the Secretary of Energy, Blue Ribbon Commission on America's Nuclear Future, January 2012, <http://cybercemetery.unt.edu/archive/brc/20120620211605/http://brc.gov>.

Managing Spent Nuclear Fuel: Strategy Alternatives and Policy Implications, RAND Corporation, 2010, <http://www.rand.org/pubs/monographs/MG970.html>.

Federal Support and Incentives

Congress has long debated the role that nuclear power should play in meeting national energy and environmental goals. Nuclear power supporters generally point to the technology as crucial for providing a secure, domestic source of energy with low greenhouse gas and other emissions. Opponents generally counter that safety and proliferation risks, nuclear waste hazards, and high costs outweigh those benefits. The debate over nuclear power's role often focuses on the level of federal support that should be provided to encourage the construction of new nuclear plants, through such mechanisms as loan guarantees, tax credits, clean energy mandates, and liability limits under the Price-Anderson Act. Because of the relatively high cost of new nuclear reactors, especially compared with natural gas plants, the level of federal support is expected to be a key determinant of the future growth or decline of nuclear power in the United States. Federal funding for nuclear energy research and development, along with related infrastructure and security, is debated annually in Congress as part of the Energy and Water Development appropriations bill. DOE nuclear energy funding totals \$888.4 million for FY2014, while for FY2015 the President is requesting a reduction to \$863.4 million.

Recent Events

One nuclear power project, consisting of two new reactors at the Vogtle plant in Georgia, received a conditional commitment from DOE for an \$8.33 billion loan guarantee in February 2010, as authorized by Section 1703 of the Energy Policy Act of 2005 (P.L. 109-58). Energy Secretary Ernest Moniz announced the issuance of \$6.5 billion in loan guarantees on February 19, 2014, to two of the three utility partners in the project, Georgia Power and Oglethorpe Power. An additional \$1.8 billion loan guarantee for another partner, Municipal Electric Authority of Georgia, is still pending. No other planned nuclear plants have received conditional commitments for DOE loan guarantees.

Selected Congressional Action

Energy Freedom and Economic Prosperity Act (H.R. 259, Pompeo)

Terminates nuclear energy production tax credit, among other provisions. Introduced January 15, 2013; referred to Committee on Ways and Means.

CRS Reports

CRS Report RL33558, *Nuclear Energy Policy*, by Mark Holt

Additional References

Maintaining U.S. Leadership in Global Nuclear Energy Markets, Bipartisan Policy Center, September 2012, <http://bipartisanpolicy.org/sites/default/files/Nuclear%20Report.PDF>.

World Nuclear Industry Status Report 2013, Mycle Scheider Consulting, July 30, 2013, <http://www.worldnuclearreport.org/-2013-.html>.

Security and Emergency Response

The level of security that must be provided at nuclear power plants has been a high-profile issue since the 9/11 terrorist attacks on the United States in 2001. Since those attacks, NRC issued a series of orders and regulations that substantially increased nuclear plant security requirements, although industry critics contend that those measures are still insufficient. Key measures include an increase in the level of attacks that nuclear plant security forces must be able to repel, requirements for mitigating the effects of large fires and explosions, and a requirement that new reactors be capable of withstanding aircraft crashes without releasing radioactive material. NRC also modified its planning requirements for evacuations and other emergency responses after the 9/11 attacks, and the Fukushima disaster illustrated the importance of emergency response to radioactive releases from any cause.

Recent Events

NRC issued wide-ranging revisions to its emergency preparedness regulations on November 1, 2011, dealing with duties of emergency personnel and the inclusion of hostile actions in emergency planning drills.¹⁴ In response to Fukushima, NRC staff recommended that nuclear emergency plans be required to address events affecting multiple reactors and prolonged station blackout. NRC told nuclear power plants on March 12, 2012, to provide specific information and analysis on those issues.¹⁵

¹⁴ NRC, “Enhancements to Emergency Preparedness Regulations,” final rule, *Federal Register*, November 23, 2011, p. 72560.

¹⁵ NRC, “Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” March 12, 2012, <http://pbadupws.nrc.gov/docs/ML1205/ML12053A340.pdf>.

Selected Congressional Action

Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (P.L. 113-5, H.R. 307)

Reauthorizes public health security programs, including those related to nuclear and radiological hazards. Introduced January 18, 2013, by Representative Mike Rogers of Michigan; passed House January 22, 2013, by vote of 395-29. Passed Senate by unanimous consent with an amendment February 27, 2013. House suspended rules and agreed to Senate amendment 370-28 on March 4, 2013. President signed March 13, 2013.

Nuclear Disaster Preparedness Act (H.R. 1700, Engel)

Requires the President to issue guidance for federal response to nuclear disasters, covering specific topics listed in the bill. Introduced April 24, 2013; referred to Committee on Transportation and Infrastructure.

CRS Reports

CRS Report RL34331, *Nuclear Power Plant Security and Vulnerabilities*, by Mark Holt and Anthony Andrews

Additional References

Protecting Our Nation, Nuclear Regulatory Commission, NUREG/BR-0314, Rev. 3, October 2013, <http://pbadupws.nrc.gov/docs/ML1327/ML13270A213.pdf>.

Nuclear Weapons Nonproliferation

Encouraging exports of U.S. civilian nuclear products, services, and technology while making sure they are not used for foreign nuclear weapons programs has long been a fundamental goal of U.S. nuclear energy policy. International controls and inspections are intended to ensure the peaceful use of civilian nuclear facilities and prevent the proliferation of nuclear weapons. However, recent proposals to build nuclear power plants in as many as 18 countries¹⁶ that have not previously used nuclear energy, including several in the Middle East and elsewhere in the less developed world, have prompted concerns that international controls may prove inadequate. Numerous recommendations have been made in the United States and elsewhere to create new incentives for nations to forgo the development of uranium enrichment and spent nuclear fuel reprocessing facilities that could produce weapons materials as well as civilian nuclear fuel.

¹⁶ World Nuclear Association, "World Nuclear Power Reactors & Uranium Requirements," February 1, 2014, <http://www.world-nuclear.org/info/reactors.html>.

Recent Events

Iran is currently the prime example of the tension between peaceful and weapons uses of nuclear technology. Of particular concern is a growing Iranian uranium enrichment program, which Iran contends is solely for peaceful purposes but which the United States and other countries suspect is for producing weapons material. The U.N. Security Council has imposed sanctions and passed several resolutions calling on Iran to suspend its enrichment program and other sensitive nuclear activities. Nevertheless, Iran continues to advance its nuclear program.

Extension of the U.S.-South Korea nuclear cooperation agreement, running through March 19, 2014, has also been affected by nonproliferation issues. South Korea would like to include advance U.S. consent for spent fuel reprocessing and uranium enrichment, but the United States is concerned about the precedent that such an agreement might set and how it would affect other ongoing issues on the Korean peninsula. Legislation authorizing the President to extend the existing nuclear cooperation agreement by two years was signed into law on February 12, 2014 (P.L. 113-81), allowing more time to negotiate a new, long-term agreement.

Selected Congressional Action

Iran, North Korea, and Syria Nonproliferation Accountability Act of 2013 (H.R. 893, Ros-Lehtinen)

Imposes penalties for nuclear technology trade with Iran, North Korea, and Syria, restricts U.S. cooperation with countries aiding nuclear weapons proliferation in Iran, North Korea, and Syria, and establishes related sanctions. Introduced February 28, 2013; referred to multiple committees.

To amend the Atomic Energy Act of 1954 to require congressional approval of agreements for peaceful nuclear cooperation with foreign countries, and for other purposes (H.R. 3766, Ros-Lehtinen)

Requires congressional approval of U.S. peaceful nuclear cooperation agreements with countries that do not agree to forgo enrichment and reprocessing. Introduced December 12, 2013; referred to Committees on Foreign Affairs and Rules.

Hearing: Civilian Nuclear Cooperation Agreements

Hearing by the Senate Committee on Foreign Relations, January 30, 2014. Examined whether U.S. nuclear cooperation agreements should require cooperating countries to forgo uranium enrichment and reprocessing and the potential impact of a declining U.S. role in global nuclear trade. Lead witnesses: Thomas M. Countryman, Assistant Secretary of State, Bureau of International Security and Nonproliferation, and Daniel B. Poneman, Deputy Secretary of Energy.

CRS Reports

CRS Report RL34234, *Managing the Nuclear Fuel Cycle: Policy Implications of Expanding Global Access to Nuclear Power*, coordinated by Mary Beth D. Nikitin

CRS Report R41910, *Nuclear Energy Cooperation with Foreign Countries: Issues for Congress*, by Paul K. Kerr, Mark Holt, and Mary Beth D. Nikitin

CRS Report RL31559, *Proliferation Control Regimes: Background and Status*, coordinated by Mary Beth D. Nikitin

CRS Report R41032, *U.S. and South Korean Cooperation in the World Nuclear Energy Market: Major Policy Considerations*, by Mark Holt

Other References

Nuclear Nonproliferation: IAEA Has Made Progress in Implementing Critical Programs but Continues to Face Challenges, Government Accountability Office, GAO-13-139, May 16, 2013, <http://www.gao.gov/products/GAO-13-139>.

U.S. Nuclear Cooperation as Nonproliferation: Reforms, or the Devil You Know? Nuclear Threat Initiative, November 27, 2012, <http://www.nti.org/analysis/articles/us-nuclear-cooperation-nonproliferation-reforms-or-devil-you-know>.

Author Contact Information

Mark Holt
Specialist in Energy Policy
mholt@crs.loc.gov, 7-1704