



Action Report

Environmental Management

Entergy

April 12, 2013

Ticker	Exchange	Meeting Date	Record Date	Annual Meeting Location
ETR	NYSE	5-3-13	3-5-13	Little Rock, Arkansas

Agenda

Item	Proposal
1	MGT: Elect directors
2	MGT: Ratify selection of auditors
3	MGT: Shareholder advisory vote on executive compensation
4	MGT: Report on lobbying
5	SH: Report on nuclear plant safety risks

Si2 Briefing [Environmental Management](#)

Report Author [Peter DeSimone](#)

Links [Proxy Statement](#); [10-K Filing](#)

Resolved Clause **THEREFORE**, be it resolved that shareholders request that Entergy's Board of Directors adopt and implement a policy to better manage the dangers that might arise from an accident or sabotage by minimizing the storage of waste in spent fuel pools and transferring such waste at the earliest safe time into dry cask storage, and report to shareholders on progress quarterly, at reasonable expense and excluding proprietary or confidential information.

Lead Proponent New York State Common Retirement Fund

Vote History Entergy contested NYSCRF's proof of stock ownership at the SEC and also argued it related to ordinary business. The SEC initially sided with the company's ownership challenge but reversed itself after reconsideration and also [said](#) it did not concern ordinary business. In 2012, the SEC agreed a similar proposal was moot, and that a separate request to closure the Indian Point nuclear plant was ordinary business.

Summary The request comes in the wake from recommendations in two reports that nuclear plant operators transfer spent fuel to dry cask storage as soon as possible and take other steps to safeguard facilities and communities to avoid catastrophic events should accidents or terrorist attacks occur. Entergy says that given the extensive regulations governing its operations and its own, time-tested programs, management and the board are best left to make decisions surrounding spent fuel storage. It also says that the proponent's proposal is overly prescriptive and would bind it to operating procedures that might not be the most prudent for the company or its shareholders.

I. Entergy and Nuclear Plant Safety

Entergy operates mainly through two business segments:

- The **Utility** business segment includes the generation transmission, distribution, and sale of electric power in portions of Arkansas, Mississippi, Texas, and Louisiana, including the City of New Orleans, with five nuclear power units and a small natural gas distribution business. In December 2011, Entergy entered into an agreement to spin off its transmission business and merge it with a newly-formed subsidiary of ITC Holdings Corp.
- The **Entergy Wholesale Commodities** business segment includes the ownership and operation of six nuclear power plants in the northern United States and the sale of the electric power produced by those plants to wholesale customers. This business also provides services to other nuclear power plant owners. Entergy Wholesale Commodities also owns interests in non-nuclear power plants that sell the electric power produced by those plants to wholesale customers.

Financials			
(\$ millions)	2011	2012	% Change
Total Revenue	\$11,229.1	\$10,302.1	(8.3)%
Net Income	\$1,367.4	\$868.4	(36.5)%

Financial results: Several factors combined to hit Entergy’s revenues and net income in 2012. (See table above.) In August 2012, Hurricane Isaac caused extensive damage to portions of Entergy’s service area in Louisiana, and to a lesser extent in Mississippi and Arkansas. Entergy says in its [10-K filing](#), “The storm resulted in widespread power outages, significant damage primarily to distribution infrastructure, and the loss of sales during the power outages.” The company estimates that total costs for repair and replacement of its electric facilities damaged by the storm are \$370 million, including \$7 million at Entergy Arkansas, \$70 million at Entergy Gulf States Louisiana, \$220 million at Entergy Louisiana, \$22 million at Entergy Mississippi, and \$48 million at Entergy New Orleans. Entergy says it is working to recover costs for the restoration of its facilities damaged by the storm, including “accessing funded storm reserves; securitization or other alternative financing; and traditional retail recovery on an interim and permanent basis.”

In addition, Entergy’s results of operations for 2012 include a \$355.5 million (\$223.5 million after-tax) impairment charge to write down the carrying values of the Vermont Yankee nuclear power plant.

Also, Entergy says its net income in 2012 “was significantly affected by two settlements with the IRS; one of which related to the income tax treatment of the Louisiana Act 55 financing of the Hurricane Katrina and Hurricane Rita storm costs, and the other of which related to nuclear power plant decommissioning liabilities, both of which resulted in a reduction in income tax expense.” It says the “net income effect was partially offset by a regulatory charge, which reduced net revenue in 2012, associated with the storm costs settlement to reflect the obligation to customers with respect to the settlement.”

Finally, net revenue for Entergy Wholesale Commodities decreased by \$191 million, or 9 percent, in 2012 compared to 2011—partially because of “lower volume in its nuclear fleet resulting from more unplanned and refueling outage days in 2012 as compared to 2011,” offset by the sale of electricity to cover this from other company assets. Higher net revenue from the Rhode Island State Energy Center, which Entergy acquired in December 2011, also partially offset these declines: “The recent economic downturn and negative trends in the energy commodity markets have resulted in lower natural gas prices and lower market prices for electricity in the New York and New England power regions, which is where five of the six Entergy Wholesale Commodities nuclear power plants are located.”

The Fukushima Daiichi Disaster

As widely reported, a 9.0 magnitude earthquake on the Richter scale—the fifth largest earthquake in recorded history and the largest to ever hit Japan—struck on March 11, 2011, approximately 40 miles off the coast of Tohoku in Japan, near Sendai, and created a massive tsunami in its wake.¹ The Fukushima Daiichi nuclear plant complex sits along the nearby coastline and received some of the peak waves from the tsunami—in excess of nine meters, as well as extensive damage from the earthquake.

Reactor designs: The complex is owned by the Tokyo Electric Power Company (TEPCO), a Japanese utility, and is comprised of six separate boiling water reactors designed by **General Electric**. They are the predecessors of the Advance Boiler Water Reactors (ABWR) GE Hitachi sells today. Five of the six, and the ones under scrutiny as a result of the crisis, are referred to as the first generation MARK I series. Reactor six is a second generation, MARK II series model. The reactors were designed during the 1960s and installed during the 1970s. Reactors one, two and six—the single MARK II—were supplied by General Electric, while Toshiba installed units three and five; Hitachi supplied unit four.² (The Hitachi operation is now part of GE Hitachi.)

Entergy continues to operate several of the MARK series reactors in its U.S. nuclear fleet today.

Dissecting the incident: At the time of the quake, reactor number four had been de-fueled, while reactors five and six were in cold shutdown for planned maintenance; the remaining reactors one, two and three were in operation. The three in operation automatically began to shut down after the earthquake and their emergency generators came online to control their coolant systems and the shutdown process. However, the ensuing tsunami flooded the rooms containing the emergency generators rendering them inoperable, and it also severed the complex's ties to the electric grid and other sources of power. In the ensuing hours and days, the three reactors began to experience full meltdowns, as workers struggled to cool and shut down the reactors manually, while keeping excess fuel rods cool in pools in storage areas above the reactors. Hydrogen explosions occurred, and eventually the government ordered the reactors to be flooded with seawater to cool them down, ending their useful lives. High radiation levels in and around the site have cut off areas near the complex for years to come for local residents, wrecking a local economy that was dependent on agriculture and fishing; the long-term impacts on cancers in both workers and residents will be closely monitored for years to come.

Public mistrust: Throughout the crisis, because of previous controversies over misinformation surrounding safety records of nuclear plants, residents and local officials evinced general mistrust of the Japanese government and TEPCO. In fact, TEPCO and the Fukushima Daiichi nuclear power complex was part of a falsified records scandal during the 1970s that led to the departure of several senior TEPCO executives, as well as disclosures to the public of previously unreported problems at the plant.³ Confidence in the company and government was not helped when Japanese officials originally classified the Fukushima Daiichi crisis as a Level Four, an accident with only local consequences, on the International Nuclear Event Scale (INES), despite widely held views by international scientists that it should be higher.⁴ The classification for the crisis eventually was made a five and then a seven, a major accident and the highest rating on the scale.⁵ These events have opened up questions about the safety of other nuclear

¹ See <http://earthquake.usgs.gov/earthquakes/eqinthenews/2011/usc0001xgp/>.

² See http://nuctrans.org/Nuc_Trans/locations/daiichi/daiichi.htm.

³ Norihiko Shirouzu and Rebecca Smith for *The Wall Street Journal*. (March 16, 2011). "Plant's design, safety record are under scrutiny." Retrieved from <http://online.wsj.com/article/SB10001424052748704396504576204461929992144.html>.

⁴ See <http://www.iaea.org/Publications/Factsheets/English/ines.pdf>.

⁵ Mackey, Robert for *The New York Times*. (April 12, 2011). "A Look at the Nuclear Accident Scale." Retrieved from <http://thelede.blogs.nytimes.com/2011/04/12/a-look-at-the-nuclear-accident-scale/>.

power plants like the MARK I and II reactors at Fukushima, and of the safety of nuclear energy in general in Japan and elsewhere in the world.

Background on Spent Fuel Storage and other Safety Issues

The proponent is asking Entergy to minimize risks to catastrophic releases of radioactive materials related to accidents or incidents of sabotage by reviewing the way it stores spent nuclear fuel in pools and seeing if it is transferring this waste to dry cask storage—deemed as a safer method of storage although only useful for older spent fuel—as soon as possible. The proponent cites two reports in making recommendations to Entergy on the storage of spent fuel.

National Academy of Sciences: The first is a 2006 report from the National Academy of Sciences, National Research Council, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, titled *Safety and Security of Commercial Spent Nuclear Fuel Storage*. It offers recommendations to Congress on the best methods of spent fuel storage to guard against terrorist attacks. It notes that spent fuel pools are necessary at all nuclear facilities to store discharged fuel in the short term immediately after use, even though this type of storage exposes nuclear facilities to additional risks related to terrorist attacks.

The committee recommends transferring spent fuel to dry cask storage, which it says “has inherent security advantages over spent fuel pool storage,” as soon as possible, although it acknowledges that dry cask storage only can be used to store older spent fuel. The committee judged that “successful terrorist attacks on spent fuel pools, though difficult, are possible.” It noted that if an attack propagated a zirconium cladding fire, the incident “could result in the release of large amounts of radioactive material.” To minimize the possibility of a zirconium cladding fire, the committee recommended “rearranging spent fuel assemblies in the pool and making provision for water-spray systems that would be able to cool the fuel, even if the pool or overlying building were severely damaged.”

The committee said that there appeared to be no inherent advantages of different storage-cask designs, although further study was needed into these and best practices for storage. At the same time, it noted that it “would be difficult for terrorists to steal enough spent fuel from storage facilities for use in significant radiological dispersal devices (dirty bombs).”

Union of Concerned Scientists: The second report was published in 2011 by the Union of Concerned Scientists, *U.S. Nuclear Power after Fukushima: Common Sense Recommendations for Safety and Security*. It offers several recommendations to the nuclear power industry, the Nuclear Regulatory Commission (NRC), Congress and the President on nuclear power safety and security in the wake of the Fukushima Daichi disaster:

- **Extend regulations to cover severe accidents**—The group believes the NRC should expand the scope of its regulations to include “the prevention and mitigation of severe accidents,” defined as “those more serious than the so-called ‘design-basis’ accidents that U.S. reactors are designed to withstand.” While severe accidents such as the one at Fukushima are unlikely, the group says, they “can cause substantial damage to the reactor core and failure of the containment building, leading to large releases of radiation.” Focusing exclusively on regulations to prevent accidents stemming from faults in a plant’s design, the group says, has created a system not prepared to cope with severe accidents. For example, it says, the NRC “does not evaluate or test the severe accident management guidelines that reactor owners have voluntarily developed, so neither the NRC nor the public can be confident these guidelines would be effective.”
- **Strengthen emergency planning requirements**—The Union of Concerned Scientists says that the NRC “should ensure that everyone at significant risk from a severe accident—not just people

within the arbitrary 10-mile zone currently used for emergency planning—is protected.” The group notes that present emergency planning requirements only address evacuation and other emergency planning for communities within a 10-mile radius of a nuclear plant. However, in the Fukushima Daichi incident, residents 50 miles from the facility were affected.

- **Move spent fuel to dry casks**—The group says that the “NRC should require plant owners to transfer fuel from storage pools to dry casks when the fuel has cooled enough to do so.” It points again to the Fukushima Daichi incident, which illustrated the dangers of storage pools for spent fuel. It was the fuel stored in these pools that when left without adequate cooling fluids released massive amounts of radiation in to the surrounding communities and caused further damages to the nuclear reactors themselves. The fact that they were located directly above the reactors was widely cited as a design flaw that worsened the situation. The Union of Concerned Scientists says that a disaster in the United States related to similar equipment, however, could be far worse, as spent fuel in similar pools at U.S. reactors is “far more densely packed than those at Fukushima and poses even greater hazards.”

Therefore, the group recommends that U.S. plants move spent fuel from pools as soon as possible—about five years on average after removal from the reactor core—to dry cask storage and to pack less densely storage pools with spent fuel. It warns, “Spent nuclear fuel stored in pools is more vulnerable to accidents, natural disasters, and attack than fuel in the reactor core, and more likely to release radiation into the atmosphere.” The group explains that dry casks are easier to keep cool if power is lost, would release far less radiation in the event of an accident or terrorist attack and are viable storage options for at least 50 years. However, it notes that reactor owners have been reluctant to implement dry cask storage solutions because of the higher expenses associated with them, instead opting to fill storage pools to maximum capacity in a move to boost operational efficiency and cut costs. However, the group says, this has been at the expense of public safety, and the NRC has done nothing about it, offering no regulations on the transfer of spent fuel to dry cask storage.

- **Enforce fire protection regulations**—The group also says the NRC “should compel the owners of more than three dozen reactors to comply with fire protection regulations they currently violate.” It notes that the NRC issued regulations in 1980, later amended in 2004, regarding fire hazards following a fire in 1975 at the Browns Ferry nuclear plant in Alabama, but the NRC hasn’t been enforcing these rules.
- **Set timeliness goals for safety issues**—The Union for Concerned Scientists points out that the NRC sets timeliness goals for the nuclear industry in completing business dealings, but it does not do the same for resolving outstanding safety issues, although it should.
- **Terrorist attacks**—The group also recommends that the NRC “should make more realistic assumptions about the capabilities of terrorists who might attack a nuclear power plant, and these assumptions should be reviewed by U.S. intelligence agencies.” It says present assumptions are modest and “do not reflect real-world threats.” For example, it points out, contingencies ignore the possibility of a terrorist group using rocket-propelled grenades, although insurgent groups widely use such equipment around the world.
- **Strengthen safety standards for new reactor designs**—The group also says the NRC should require all new reactor designs to be safer than existing models. At present, the NRC only requires designs to meet the same standards.
- **Assign an appropriate value to human life in cost-benefit analyses**—Finally, the Union for Concerned Scientists says that the NRC “should increase the value of human life in its analyses so it

is consistent with other government agencies.” At present, the group says, the NRC only values life at one-half to one-third the amount of other government agencies. However, it notes that the present calculations are skewing assessments and undervaluing the merits of instituting new safety regulations and requiring the installation of related equipment.

Long-Term Storage for Spent Fuel

The nuclear industry had thought for years that the answer to a long-term storage solution for spent nuclear fuel was going to be the Yucca Mountain Nuclear Waste Depository, a deep geological repository storage facility for spent nuclear reactor fuel and other radioactive waste. The facility is located on federal land adjacent to the Nevada Test Site in Nye County, Nevada, about 80 miles northwest of Las Vegas. However, the location was highly contested by both environmentalists and residents in Las Vegas. While it was approved in 2002 by the U.S. Congress, it was later cancelled in 2009 when Congress decided to not go forward with its licensing in the face of stiff public opposition.

Now that Yucca Mountain is off the table, at least for now, the waste question still looms for the U.S. nuclear industry. The Obama Administration has taken specific steps to discontinue the Yucca Mountain project, including filing a motion for the NRC to withdraw the license application and establish a commission to develop recommendations for alternative spent fuel storage solutions. The Department of Energy’s *Blue Ribbon Commission on America’s Nuclear Future* issued a report in January, but the Administration has yet to take action on it. As a result, the industry is left to develop its own interim solutions, a tenable position that has left a large amount of uncertainty for nuclear plant operators.

Disputed funds: At the same time, under authority from the *Nuclear Waste Policy Act of 1982*, the Department of Energy (DOE) has been collecting fees from generators and owners of spent nuclear fuel and utilities using nuclear power to fund the Nuclear Waste Fund. The report from the Department of Energy’s *Blue Ribbon Commission on America’s Nuclear Future* estimates that the fund has been accumulating around \$750 million a year and is holding \$25 billion. It was these funds that were to be used to turn Yucca Mountain into a viable long-term storage facility.

In exchange for the fees they were paying, generators of spent nuclear fuel were supposed to get a solution for storage from the federal government by 1998. They did not. As a result, several operators, including Entergy (*see 10-K disclosure below*) contributing to the fund have sued DOE successfully for breaking its statutory obligation to provide a long-term, spent fuel storage facility and have recouped some of these funds to apply to interim storage facilities for nuclear waste. However, how the remainder of the money is to be used is in question, and the doubt surrounding a long-term solution has left operators of nuclear plants in a difficult position.

Entergy’s Nuclear Power Generating Assets

The table on the next page offers information on Entergy’s 11 nuclear power generating units, including capacity, reactor type, turbine manufacturer, architect, opening date, license expiration and location for each. The total generating capacity of the 11 units is 9,991 megawatts (MW). The units include several reactors similar to the MARK-generation equipment manufactured by **General Electric** that were at the center of the accident at the Fukushima Daichi complex.

Environmental footprint: Entergy says on its [website](#) that “emission-free nuclear generation” is part of its strategy to reduce its greenhouse gas emissions and overall environmental footprint. It notes, “Nuclear energy preserves the environment with perhaps the lowest impact—including air, land, water and wildlife—of any energy source, because it does not emit harmful gases, isolates its waste from the environment and requires less area to produce the same amount of electricity as other sources.” It points out that the 103 nuclear plants in the United States provide 69 percent of the country’s emission-free

power, making nuclear power the single largest contributor to reducing carbon emissions and accounting for half of the voluntary carbon reductions achieved so far by all industries in the United States. With energy demand projected to increase 32 percent over the next two decades, Entergy says, nuclear is uniquely positioned “to meet this large-scale need in an environmentally friendly way.”

Entergy’s Nuclear Power Plants									
Entergy Utility									
Plant	Unit	Capacity (MW)	Reactor Type	Reactor	Turbine Generator	Architect/Engineer	Opening	License Expiration	Location
Arkansas Nuclear One	1	836	Pressurized Water	Babcock & Wilcox	Westinghouse	Bechtel Power	1974	2034	Russellville, Arkansas
	2	987	Pressurized Water	Combustion Engineering	General Electric	Bechtel Power	1980	2038	Russellville, Arkansas
Grand Gulf*	1	1,071	Boiling Water	General Electric	Kraftwerk Union	Bechtel Power	1985	2024	Port Gibson, Mississippi
River Bend	1	974	Boiling Water	General Electric	General Electric	Stone & Webster	1986	2025	St. Francisville, Louisiana
Waterford 3	1	1,159	Pressurized Water	Combustion Engineering	Westinghouse	Ebasco	1985	2024	Killona, Louisiana
Entergy Wholesale Commodities									
Plant	Unit	Capacity (MW)	Reactor Type	Reactor	Turbine Generator	Architect/Engineer	Opening	License Expiration	Location
Indian Point	2	992	Pressurized Water	Westinghouse	General Electric	United Engineers & Constructors	1974	2013**	Buchanan, New York
	3	1,030	Pressurized Water	Westinghouse	General Electric	United Engineers & Constructors	1976	2015	Buchanan, New York
James A. Fitzpatrick	1	838	Boiling Water	General Electric	General Electric	Stone & Webster	1975	2034	Scriba, New York
Palisades	1	811	Pressurized Water	Combustion Engineering	Westinghouse	Combustion Engineering	1971	2031	Covert Township, Michigan
Pilgrim	1	688	Boiling Water	General Electric	General Electric	Bechtel Power	1972	2032	Plymouth, Massachusetts
Vermont Yankee	1	605	Boiling Water	General Electric	General Electric	Ebasco	1972	2032	Vernon, Vermont

* Mississippi Electric Power Association owns 10 percent of this facility, while Entergy owns 90 percent.

** Recently renewed to 2032.

Source: <http://www.entergy-nuclear.com/>

Entergy and Nuclear Plant Safety

Entergy says on its [website](#) that it “is committed to the highest safety standards, recognizing that a safe plant runs reliably and efficiently, and that high safety performance engenders public, regulatory and employee confidence.” It notes that its “nuclear plants have low environmental impacts and risks. Extensive government regulations over nuclear plant construction, operation and maintenance, coupled with multiple redundant safety systems, work together to ensure our plants’ safety and security.”

Board oversight: In its proxy statement, Entergy notes that its board established a standing nuclear committee several years ago to oversee and review Entergy’s nuclear business activities, “including in-

dustry-wide nuclear safety concerns, regulatory issues, and the safety conditions of specific nuclear plants,” as well as “industry-wide issues relating to regulation, nuclear waste disposal, radiation health concerns, and advances in nuclear power and research.” It says the committee is briefed regularly by management and outside experts on each of Entergy’s nuclear plants, including each facility’s “power history, performance indicators, efforts to improve safe operations, and oversight of spent fuel management processes” and other performance indicators and reactor oversight process criteria “created by the Institute of Nuclear Power Operations and the NRC...” The committee does not have a charter posted on the company’s website.

Regulation: The U.S. Nuclear Regulatory Commission (NRC) is responsible for assuring that nuclear power plants operate safely and meet federal regulations. Entergy notes that NRC inspectors work full-time at its nuclear plants and review day-to-day operations, and additional inspectors perform regular on-site reviews each year.

Entergy’s responses to Fukushima: Entergy dedicates a portion of its [website](#) to reviewing the steps it has taken to improve safety in the wake of the Fukushima Daiichi disaster. The company says it “has worked closely with governmental regulators, the U.S. electric industry and world nuclear organizations to offer our expertise while also sharing best practices across the industry,” following the accident. It says these efforts have ensured that the industry “has been made even safer.”

In the days following the crisis, Entergy said it:

- Staffed its “nuclear corporate emergency center” and assigned dedicated staff to interact with regulators and the press on the issue.
- Had its technical experts review the safety capabilities of the Mark I boiling water reactor, which were the reactors that had problems at Fukushima, and share the results with industry and government officials. Entergy operates several of these units.
- Conducted “extensive walk-downs and procedure reviews” of all of its nuclear power plants, which “validated our plants’ abilities to respond appropriately during a disaster.” Entergy says the reviews led to enhancements at several facilities, including better equipment staging areas and minor equipment repairs, to further ensure safety. For example, at two of its sites where it has multiple reactors, regulatory authorities allowed it to have a single set of portable pumps to cool fuel and other equipment to cover both reactors in an emergency. It has since purchased duplicative equipment as a precaution.
- Reviewed risks related to earthquakes, floods and other natural disasters at its nuclear plants and found risks to be minimal.

Entergy said that its plants adjacent to the Mississippi river proved the safety of their designs and ability to handle adverse conditions, when they confronted a 100-year flood this past spring. In addition, Entergy says, “an earthquake along the eastern seaboard demonstrated our country’s domestic design basis against seismic threats.” *(For more on that earthquake and the response at a nuclear plant close to its epicenter, please see Si2’s [Action Report on Dominion Resources](#), where this proposal also is pending.)*

Entergy notes that the NRC and Environmental Protection Agency (EPA) recently released a new seismic model that will be used to test the safety of U.S. nuclear plants, which is the result of four years of extensive work by the agencies with help from industry experts and the broader scientific community. Entergy says it is reviewing the model with its internal teams to review the assumptions it has held for its own plants.

Spent fuel storage: Entergy says that each of its nuclear plants “has an aggressive waste minimization program designed to achieve the lowest category of hazardous waste production.” At the same time, it

points out, “most nuclear fuel loses about 50 percent of its radioactivity within three months and about 80 percent after one year.” It cites estimates from the NRC that hazardous spent fuel “could be stored at plant sites for 100 years without adverse health or safety consequences.” Nonetheless, Entergy says it is in favor of the U.S. government establishing a permanent disposal site.

10-K disclosure: In its [10-K filing](#), Entergy notes that the *Nuclear Waste Policy Act of 1982* requires the DOE to provide for the permanent storage of spent nuclear fuel, and legislation has been passed by Congress to develop a repository at Yucca Mountain, Nevada. However, hearings on the repository’s NRC license, Entergy notes, have been suspended indefinitely. Therefore, the DOE is unable to accept spent nuclear fuel and is in non-compliance with federal law, as discussed above in this report. Entergy adds, “The DOE continues to delay meeting its obligation, and Entergy is continuing to pursue damages claims against the DOE for its failure to provide timely spent fuel storage.” Until a solution is found, Entergy says, it must manage interim solutions for spent fuel storage on the nuclear plant site, “which can require the construction and maintenance of dry cask storage sites or other facilities.” It notes that the “costs of developing and maintaining these facilities during the decommissioning period can have a significant effect,” as much as an average of 20 to 30 percent of total estimated decommissioning costs.

Judgments against DOE—With regard to its contracts with DOE for storage of spent nuclear fuel and the fees it has already paid, Entergy says several of its subsidiaries entered into contracts with the DOE, “whereby the DOE is to furnish disposal services at a cost of one mill per net kWh generated and sold after April 7, 1983, plus a one-time fee for generation prior to that date.” Entergy Arkansas, it says, was the only one of its utilities that generated electric power with nuclear fuel before that date and has a recorded liability as of December 31, 2012, of \$181.2 million for the one-time fee. It says its total spent fuel fees to date, including the one-time fee liability of Entergy Arkansas, “have surpassed \$1.5 billion,” excluding amounts relating to Entergy plants that were paid or are owed by prior owners of those plants. For now, Entergy considers these costs to be expenses it might be able to recover at a future date.

Entergy notes that the “Obama Administration has taken specific steps to discontinue the Yucca Mountain project and study a new spent fuel strategy,” as described above. Entergy points out these actions are the subject of litigation. At the same time, it notes, “the government has taken no effective action to date related to the recommendations of the appointed spent fuel study commission.” Therefore, it concludes, “large uncertainty remains regarding the time frame under which the DOE will begin to accept spent fuel from Entergy’s facilities for storage or disposal.” Accordingly, it notes, “continuing future expenditures will be required to increase spent fuel storage capacity at Entergy’s nuclear sites.”

Because of “the DOE’s failure to begin disposal of spent nuclear fuel in 1998 pursuant to the *Nuclear Waste Policy Act of 1982* and the spent fuel disposal contracts,” Entergy says its owner and licensee subsidiaries of nuclear facilities “have incurred and will continue to incur damages.” The subsidiaries, except for the owner of the Palisades nuclear plant, filed lawsuits beginning in 2003, it says, to recover the damages caused by the DOE’s delay. As a result:

- In October 2007, the U.S. Court of Federal Claims “awarded \$48.7 million jointly to System Fuels and Entergy Arkansas in damages related to the DOEs breach of its obligations...”
- In March 2010, the court revised its decision and “awarded \$9.7 million jointly to System Fuels, System Energy, and SMEPA.”
- Also in March 2010, in two separate decisions the court “awarded \$106.1 million to Entergy Nuclear Indian Point 2, and \$4.2 million to Entergy Nuclear Generation Company (the owner of Pilgrim).”
- In September 2010, the court “awarded \$46.6 million to Entergy Nuclear Vermont Yankee.

The DOE appealed all of the decisions to the U.S. Court of Appeals for the Federal Circuit, but the Federal Circuit affirmed most of them in September 2011, although it asked certain lower courts to recalculate certain damages. The \$106 million award to Entergy Nuclear Indian Point 2 was reduced to \$103 million, and Entergy received payment of that amount from the U.S. Treasury in August 2012. Similarly, the courts reduced the award to Vermont Yankee from almost \$47 million to \$41 million. The adjustments bring the total awards to date to \$206 million. Since the initial cases, Entergy notes, its Palisades facility also has filed suit against the DOE and is awaiting a judgment.

Interim storage solutions—Until DOE begins accepting and disposing of spent nuclear fuel, Entergy says its nuclear plants are providing their own storage. It says it has made storage capability additions using dry casks at its Palisades plant in 1993, at Arkansas Nuclear 1 in 1996, at FitzPatrick in 2002, at River Bend in 2005, at Grand Gulf in 2006, at Indian Point and Vermont Yankee in 2008, and at Waterford 3 in 2011. Entergy says it will expand its dry cask storage facilities “as needed.” It notes that its present, “on-site spent fuel storage capacity at Pilgrim is estimated to be sufficient until approximately 2014, by which time dry cask storage facilities are planned to be placed into service at that unit.”

II. Proponent Position

The proponent, New York State Common Retirement Fund, points out that Entergy has 11 nuclear power plants in the United States, all of which store spent fuel on site. It cites research from the National Academy of Sciences, which found that “dry cask storage has several potential safety and security advantages over pool storage.” Furthermore, it notes the Union of Concerned Scientists “recommends that companies operating nuclear plants transfer spent nuclear fuel from storage pools into dry casks once it has cooled.” (The reports from the National Academy of Sciences and the Union of Concerned Scientists are reviewed earlier in this report.)

Therefore, it is asking Entergy to “adopt and implement a policy to better manage the dangers that might arise from an accident or sabotage by minimizing the storage of waste in spent fuel pools and transferring such waste at the earliest safe time into dry cask storage, and report to shareholders on progress quarterly, at reasonable expense and excluding proprietary or confidential information.”

III. Management Position

Entergy says it opposes the resolution because it has existing practices and policies addressing the very concerns raised by the proponent’s proposal. Furthermore, it says, “approval of the proposal would unduly interfere with and limit the Company’s flexibility in addressing the ever-changing and complex universe of scientific, engineering and regulatory standards related to nuclear plant operations.” It underscores that it “takes very seriously its responsibility to operate every phase of its nuclear facilities safely” and “has developed a strong record in this regard.”

Entergy notes that it is subject to “extensive” NRC “regulations addressing the monitoring safety, security, radiological, and environmental aspects of handling of spent nuclear fuel at commercial nuclear plants.” For example, it says, the NRC already requires nuclear power plants to take precautionary measures to protect the public from acts of sabotage and to safeguard spent fuel on site, and Entergy’s present practices “relating to the storage of spent fuel are designed to protect against the very concerns raised in the proposal.” In fact, Entergy says, its practices relating to spent fuel storage go beyond the underlying concerns raised by the proponent to evaluate and fine tune approaches in reaction to ongoing scientific, engineering and regulatory developments.

Entergy also points out that its board established a standing nuclear committee several years ago to oversee and review Entergy’s nuclear business activities, “including industry-wide nuclear safety con-

cerns, regulatory issues, and the safety conditions of specific nuclear plants,” as well as “industry-wide issues relating to regulation, nuclear waste disposal, radiation health concerns, and advances in nuclear power and research.” It says the committee is briefed regularly by management and outside experts on each of Entergy’s nuclear plants, including each facility’s “power history, performance indicators, efforts to improve safe operations, and oversight of spent fuel management processes” and other performance indicators and reactor oversight process criteria “created by the Institute of Nuclear Power Operations and the NRC...”

Furthermore, Entergy says that the proponent’s proposal does “not accurately reflect the substantial, ongoing analyses...conducted by the NRC and the Company to address nuclear plant risks and potential safety improvements.” Therefore, Entergy says it is of the view that, given the extensive regulatory oversight of the NRC and the steps it has already taken to ensure safety, that its “management, scientists and engineers should determine the most appropriate means, whether Company-wide or on a plant-by-plant basis, for safely managing spent fuel.” After all, Entergy says, it “engages these experts for the purpose of applying their professional judgment in assuring compliance with all regulatory requirements, conducting sophisticated risk assessments, and engineering safe methods for each aspect of plant operations, including spent fuel storage.”

Entergy is critical of the proponent’s approach, as it recommends a specific course of action without regard to the findings of its experts. It cautions that “decisions about plant operations are subject to complex scientific and engineering principles and are made within a technical regulatory framework governed by the NRC, which provides additional assurance that spent nuclear fuel is handled appropriately and with due regard to public health and safety.” Moreover, it says, “The scientific, engineering and regulatory standards related to nuclear plant operations are constantly evolving, as is the underlying nuclear energy technology, which provides further reason for the Company to remain flexible in its approach and continue to look to its management, scientists and engineers, subject to Board oversight through the Nuclear Committee, to determine the best way to manage the Company’s spent nuclear fuel.”

IV. Analysis

Key Points at Issue

- Is Entergy doing enough to ensure its spent fuel is stored properly and in a way that mitigates risks of catastrophic events related to accidents and terrorist attacks?
- Would Entergy and its shareholders benefit from the steps the proponent recommends?

Entergy points to extensive regulations and oversight from the Nuclear Regulatory Commission (NRC) and its own efforts to address safety at its nuclear plants as evidence that it takes nuclear plant safety seriously and already is addressing the proponent’s concerns surrounding the storage of its spent fuel. It notes that nuclear plant safety is a complex issue, and it needs the flexibility to readjust to emerging technologies, regulations and other industry developments to best serve shareholders and the communities where it operates.

However, the company in its statement of opposition to the proposal in its proxy statement, on its website and its related sustainability reporting never fully addresses the points raised by the proponent, although some details are available in its [10-K filing](#), as discussed earlier.

The two reports cited by the New York State Common Retirement Fund from the National Academy of Sciences and the Union of Concerned Scientists share two common threads when it comes to the storage of spent nuclear fuel:

- A terrorist attack on storage pools is unlikely, but possible nonetheless, and could be catastrophic if it occurred.
- Spent fuel should be shifted from storage pools to dry-cask storage as soon as it is safe to do so, as dry-cask storage is safer and a better long-term solution.

The Union of Concerned Scientists goes a step further to warn U.S. facilities to stop storing spent nuclear fuel in storage pools at levels denser than those practiced by TECO at Fukushima Daichi. The group also points out that owners of nuclear plants have been reluctant to invest heavily in dry-cask storage solutions, because they are expensive, opting instead to rely on storage pools as much as possible, and densely packing them as much as feasible, to save on costs. The group believes these decisions are shortsighted.

Long-term storage solutions: Part of the problem for years has been uncertainty in the industry as to what the long-term storage solution for spent fuel would be in the United States. As noted earlier, most thought Yucca Mountain would be the answer, but it has been taken off the table because of opposition from Las Vegas residents and environmental groups, leaving the industry to devise its own interim solutions. At the same time, under authority from the [Nuclear Waste Policy Act of 1982](#), the Department of Energy (DOE) has been collecting \$750 million in fees annually from utilities using nuclear power to fund the Nuclear Waste Fund, which now holds \$25 billion. It was these funds that were to be used to turn Yucca Mountain into a viable long-term storage facility. How this money is to be used now is in question, although some companies have recouped some of their contributions to the fund by suing the DOE for reneging on its obligation on the law to create a long-term storage solution by 1998. Nonetheless, uncertainty in this area weighs on nuclear plant operators.

Entergy notes in its [10-K filing](#) that it has won more than \$206 million in judgments from DOE to date for breaking its statutory and contractual obligations to provide long-term storage for spent fuel. It also says that it has developed dry cask storage facilities for all of its nuclear facilities as an interim solution to a longer-term DOE answer. However, Entergy's regulatory filings also do not fully answer the proponent's questions regarding policies for transferring spent fuel from storage pools to dry cask facilities. In addition, the Union of Concerned Scientists also raised a red flag in its report over the practices of many U.S. operators to store spent more spent fuel in pools than Fukushima Daichi did, to cut costs. It is impossible to tell how Entergy compares to its competitors in this regard or how its facilities measure up to conditions at Fukushima Daichi at the time of the accident.

Costs and benefits: Given the risks, the proponent is asking the company to investigate options to manage the dangers that might arise from an accident or sabotage on its spent fuel pools by looking into transferring waste as soon as possible to dry casks storage. It also is asking the company to adopt a policy based on its findings and to report to shareholders on the policy and its efforts to implement it regularly. It sets no timetable for transferring waste or prescribes any particular type of dry cask storage solution. Again, the proponent's recommendations are based on reports from the National Academy of Sciences and the Union of Concerned Scientists, both credible sources.

At question is the cost. It seems, although it is difficult to tell, that Entergy is hedging its bets, trying to minimize costs while the government develops a final solution for the long-term storage needs for nuclear plant operators' spent fuel. Shareholders will have to weigh if they believe management and the board should be left to decide the best course of action or if they should report to shareholders on the matter. Entergy complains that the proponent's proposal is too prescriptive. However, it leaves Entergy the flexibility to report back to shareholders on alternative solutions for long-term storage with a rationale on the merits of costs and safety, and it doesn't pigeonhole Entergy into any one solution or timeline, even though it suggests early transfer to dry cask facilities as the optimal solution.

Voting Considerations

Voting in favor: Shareholders concerned about the risks posed by storage pools for spent nuclear fuel, including their vulnerability to terrorist attacks and accidents, will likely vote for this proposal. Entergy leaves many questions unanswered regarding its policies and procedures for how densely it packs spent fuel in its storage pools and how soon it transfers spent fuel to dry cask storage, which is a much safer form of long-term storage.

Voting against: Given the complexities of nuclear plant operations and safety and the uncertainties surrounding regulations and long-term storage solutions for spent fuel, shareholder may believe that decisions regarding the points raised by the proponent are best left to management and the board. These shareholders will vote against this proposal.

Resources

- Entergy's 10-K filing:
<http://investor.shareholder.com/entergy/secfiling.cfm?filingID=65984-13-50>
- National Academy of Sciences report, *Safety and Security of Commercial Spent Nuclear Fuel Storage*:
http://www.nap.edu/catalog.php?record_id=11263
- Union of Concerned Scientists report, *U.S. Nuclear Power after Fukushima: Common Sense Recommendations for Safety and Security*:
http://www.ucsusa.org/assets/documents/nuclear_power/ucs-fs-nuclear-safety-recs.pdf
- Background on Entergy's nuclear power plants and policies, as well as responses to the Fukushima disaster:
<http://www.entergy-nuclear.com/>
- The *Nuclear Waste Policy Act of 1982*:
<http://www.epw.senate.gov/nwpa82.pdf>
- Report from the Department of Energy's *Blue Ribbon Commission on America's Nuclear Future*:
<http://energy.gov/sites/prod/files/Strategy%20for%20the%20Management%20and%20Disposal%20of%20Used%20Nuclear%20Fuel%20and%20High%20Level%20Radioactive%20Waste.pdf>