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Nuclear Power: Renaissance or Relapse?

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*by J.C. Sylvan**

Thirty years of cost overruns,[1] power outages,[2] gaps in oversight,[3] security lapses,[4] a number of high-profile accidents, and unaddressed concerns about the temporary and permanent storage of radioactive waste,[5] make nuclear power the *bête noire* of the U.S. energy sector. But growing popular concern about the threats posed by global climate change and the emerging support for a carbon tax or a cap on greenhouse gas ("GHG") emissions is changing the cost-benefit analysis traditionally applied to nuclear power.[6] Proponents are heralding the return of nuclear power as a "new day for energy in America."[7]

The latest evidence of a nuclear renaissance comes with the recent license application by NRG Energy, Inc. ("NRG") to the Nuclear Regulatory Commission ("NRC") to build and operate two new reactors at its facility in Bay City, Texas—the first application filed with the NRC in thirty years, and the first of twenty-one such applications the NRC anticipates receiving over the next eighteen months.[8] One of the principal arguments for this expansion is that by replacing coal and gas-fired electricity generation capacity nuclear reactors could slow the overall growth of GHG emissions.[9] Nonetheless, nuclear power has financial and legal hurdles to clear before it can assume a role as a credible program to combat global warming.

Nuclear plants are economical to fuel and operate but prohibitively expensive to build. Thus, renewed investment in commercial nuclear power will only come when "the cost of producing electricity using nuclear apower will be lower than the risk-adjusted costs associated with alternative electric generation technologies."[10] Moderate reductions in construction cost, construction time, operation costs, and capital costs could, theoretically, make nuclear competitive with coal and natural gas.[11] Nuclear electricity generation could also become more competitive if the externalities associated with carbon-emitting fuels are internalized through either a carbon tax, a cap-and-trade system, or a tax credit for carbon-free electricity generation.[12] Also, the Energy Policy Act of 2005 provides for a clean-energy loan program that would guarantee up to eighty percent of total project cost of innovative technologies—including nuclear power—that avoid "anthropogenic emissions of greenhouse gases."[13] Leaving aside the question of health and human safety, the competitiveness of nuclear power may ultimately depend on whether the federal government imposes additional costs on coal and natural gas—a notion with considerable political momentum.

Moving forward, the salient issue will not be financing, but safety. Due to the magnitude of the harm presented by nuclear materials, the frequency with which that harm can occur, and the limited prospects for mitigating it, a dramatic expansion of the nuclear power industry would pose considerable risks to the health and human safety of the American public.[14] At its current level of operation, commercial U.S. reactors will discharge at least 105,000 metric tons of spent fuel by 2035.[15] So far only two countries have identified specific sites to deposit this waste—the United States (Yucca Mountain) and Finland (Olkiluoto). Neither facility will be ready to receive material for at least another decade.[16] Since 1998, utilities have brought dozens of breach-of-contract suits against the U.S. government because the NRC has failed to honor its Standard Contract commitments to remove waste from temporary on-site storage facilities pursuant to the Nuclear Waste Policy Act;[17] the NRC has argued that it cannot be obligated to remove waste before it has a place to store it permanently.[18] No doubt methods will be developed to reduce the volume of waste and to improve the overall safety of the nuclear fuel cycle. Alternative disposal techniques, such as deep bore geologic disposal, might also be viable. Until then, waste disposal will remain an open question and a potential hazard.

Primary responsibility for nuclear safety belongs to the NRC.[19] Unfortunately, the NRC's decisions to outsource security functions to private contractors, to rely on voluntary reporting standards, and to enforce its regulations selectively have shaken public confidence.[20] Nonetheless, when it comes to forcing higher safety standards, the states' hands are tied.[21] State authority to regulate the safety of radiological materials either under state or federal statutes is pre-empted by the Atomic Energy Act.[22] Private citizens can bring suits under the Price-Anderson Act, but such suits have little effect in forcing higher safety standards when operators are held to a federally determined standard of care (not strict liability) and citizens are barred from seeking punitive damages.[23] Moreover, new standing requirements for challenging plant licensing will make it more difficult for private citizens' groups to challenge the construction of new plants.[24] Absent changes in federal law, the effectiveness of safety standards for the operation of plants and the disposal of waste will depend primarily on the NRC's careful stewardship.

The nuclear industry is asking environmentalists to pick their poison—global warming or nuclear power—and some are cautiously opting for the latter.[25] Climate change has given nuclear power a second hearing. Rigorous safety standards, a plan for their robust enforcement, and a fail-safe scheme for permanent waste storage have the potential to create broad public support for nuclear power;[26] a single accident, on the other hand, could erase that support overnight.[27] By taking the lead and insisting on stricter safety standards and a plan for permanent storage of reactor waste materials, the industry could prevent a nuclear renaissance from becoming what the public will view pessimistically as a "relapse" for nuclear power in the United States.

Endnotes: Nuclear Power *continued on page 78*

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[1] *See* Daniel Cusick, *Bechtel Wins TVA Contract For $2.5B Watts Bar Reactor*, E&E News, Oct. 15, 2007, *available at* http://www.eenews.net/eenewspm/2007/10/15/4/#4 (last visited Oct. 15, 2007).

[2] *See* Nuclear Regulatory Commission's Reactor Oversight Process: Hearing Before the S. Subcomm. on Clean Air and Nuclear Safety of the S. Comm. on Env't and Pub. Works, 110th Cong. (2007) (statement of David A. Lochbaum, Director, Nuclear Safety Project, Union of Concerned Scientists) [hereinafter UCS Testimony] (finding that "since 1966, there have been fifty-one (51) outages lasting one year or longer at U.S. nuclear power reactors").

[3] *E.g.*, *id.* (noting that the NRC intentionally ignored a breach of federal regulations prohibiting the unmonitored and uncontrolled release of radioactive air or liquid to the environment at Braidwood nuclear plant in Illinois from 1996 to 2005).

[4] *See*, *e.g.*, Examiner.com, *Sleeping Guards At Peach Bottom Prompt Investigation*, (Oct. 5, 2007), *available at* http://www.examiner.com/a-972905~Sleeping_guards_at_Peach_Bottom_prompt_investigation.html (last visited Nov. 13, 2007).

[5] *See* Massachusetts Institute of Technology, The Future of Nuclear Power 10, 53, 157 (2003), *available at* http://web.mit.edu/nuclearpower/ (last visited Oct. 14, 2007) [hereinafter MIT Report].

[6] *See* Steven Mufson, *Nuclear Power Primed for Comeback: Demand, Subsidies Spur U.S. Utilities*, Wash. Post, Oct. 8, 2007 at A1.

[7] *See* Press Release, NRG Energy, Inc., First Nuclear Plant License Application In 29 Years; Plant Will Produce No Greenhouse Gas Emissions (Sept. 24, 2007) *available at* http://www.snl.com/irweblinkx/file.aspx?IID=4057436&FID=4916766 (last visited Oct. 14, 2007).

[8] *See* U.S. Nuclear Regulatory Commission, Expected New Nuclear Power Plant Applications, *available at* http://www.nrc.gov/reactors/new-licensing/new-licensing-files/expected-new-rx-applications.pdf (last visited Nov. 16, 2007).

[9] *See* MIT Report, *supra* note 5, at 26 (stating 1000 gigawatt nuclear program could displace fifteen to twenty-five percent of the anticipated growth in anthropogenic carbon emissions).

[10] MIT Report, *supra* note 5, at 37.

[11] *See* MIT Report, *supra* note 5, at 7.

[12] *See* Wes Miller, *NRG Energy First In Nuclear Revival*, Sustainable Industries, Oct. 4, 2007, *available at* http://www.sustainableindustries.com/breakingnews/10234836.html (last visited Oct. 14, 2007).

[13] 42 U.S.C. § 16513 (2007).

[14] It takes 150,000 years for spent fuel to decay to the point where it is no more hazardous than the parent ore. *See* MIT Report *supra* note 5, at 161; *see also* Katherine Ling, Nuclear Power: Senate Panel Takes Hard Look At NRC Oversight, E&E Daily il Reporter (Oct. 4, 2007).

[15] *See* MIT Report, *supra* note 5, at 63 n.12.

[16] *See* David Whitford, *America's Nuclear Revival*, Fortune, Aug. 6, 2007 at 52.

[17] 42 U.S.C. § 10222 (2007).

[18] *See*, *e.g.*, Indiana Michigan Power Co. v. United States, 60 Fed. Cl. 639, 664-65 (2004).

[19] 42 U.S.C. § 2021(c) (2007); *see also* 10 C.F.R. § 8.4; Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 211-12 (1983).

[20] *See* UCS Testimony, *supra* note 2 (arguing that NRC's performance indicators are "useless measures that allow genuine safety problems to be undetected until they surface via other means" and noting that the majority of the recommendations made by an NRC investigation into a structural defect at the Davis-Besse plant in Ohio called for more effective enforcement of the existing regulations).

[21] *See*, *e.g.*, United States v. Kentucky, 252 F.3d 816 (6th Cir. 2001) (ruling that federal law preempts a state's waste permitting functions when they relate to the disposal of radioactive waste in a landfill operated by the U.S. Department of Energy).

[22] 42 U.S.C. §§ 2011-2297g-4 (2007); *see*, *e.g.*, Missouri v. Westinghouse, LLC, 487 F. Supp. 2d 1076 (E.D. Mo. 2007).

[23] *See* 42 U.S.C. § 2210(s) (2007) ("[n]o court may award punitive damages in any action with respect to a nuclear incident"); *see also* El Paso Natural Gas Co. v. Neztsosie, 526 U.S. 473, 484 n.6 (1999).

[24] *See* Neal H. Lewis, *Interpreting the Oracle: Licensing Modifications, Economics, Safety, Politics, and the Future of Nuclear Power in the United States*, 16 Alb. L.J. Sci. & Tech. 27, 33 (2006).

[25] *See* Patrick Moore, *Nuclear Energy's Role in the Fight Against Global Climate Change*, Kiplinger's Business Resource Center, Sept. 2007, *available at* http://www.kiplinger.com/businessresource/summary/archive/2007/Moore_Nuclear_Case.html (last visited Oct. 14, 2007).

[26] *See* MIT Report, *supra* note 5, at 6, 71.

[27] Nuclear Regulatory Commission's Reactor Oversight Process: Hearing Before the S. Subcomm. on Clean Air and Nuclear Safety of the S. Comm. on Env't and Pub. Works, 110th Cong. (2007) (statement of Senator Thomas R. Carper, S. Comm. Chairman).