

NUCLEAR POWER: IMPLICATIONS OF LOAN GUARANTEES FOR REACTORS WITH FOREIGN CONTROL AND FOREIGN JOBS

AN OVERVIEW BY THE NUCLEAR INFORMATION & RESOURCE SERVICE

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OVERVIEW

As Congress contemplates taxpayer-backed loan guarantees ranging from \$54 billion (Kerry-Lieberman draft climate bill¹) to unlimited levels (Senate American Clean Energy Leadership Act of 2009²), few lawmakers and even fewer members of the public are likely to know that:

- Two of the next three reactor projects in line to get loan guarantees have substantial foreign ownership/control – Calvert Cliffs, Unit 3 in Maryland and South Texas Project Units 3 & 4.
- Beyond front-end foreign ownership or control, a substantial portion of the benefits of the loan guarantees will flow to non-U.S. workers, since virtually all major reactor components are made outside of the United States by foreign companies. This issue was a major concern when similar concerns were expressed earlier in 2010 about the components for wind projects.³ Others have already raised the foreign worker issue in the context of nuclear subsidies.⁴
- The foreign companies that stand to be the biggest short-term beneficiaries of taxpayer-backed loan guarantees are both massive in size and profitable.

As such, the near-term bailout of the nuclear industry with taxpayer-backed financing of loan guarantees is in no way a triumph for U.S. energy independence. Instead, it is a huge publicly backed support mechanism for foreign-owned companies and non-U.S. workers.

FOREIGN CONTROL OF NUCLEAR REACTOR PROJECTS AND JOBS

The Nuclear Regulatory Commission has received 18 combined (construction and operating) license applications for new nuclear reactors. These applications—including those that have been suspended or withdrawn at the request of the applicant— were reviewed to determine in which cases the operator or the vendor of the reactor is foreign-owned or otherwise controlled, as well as the source of the components that would be used in the reactors.

The results are summarized in the following table:⁵

FOREIGN OWNERSHIP/CONTROL OF PROPOSED REACTOR PROJECTS

PROJECT	STATE	OPERATOR	FOREIGN?	REACTOR VENDOR	FOREIGN?
Bell Bend	PA	PPL	No	AREVA	Yes
Bellefonte, Units 3 & 4	AL	Tennessee Valley Authority	No	Westinghouse (Toshiba)	Yes
Callaway, Unit 2	MO	Ameren	No	AREVA	Yes
Calvert Cliffs, Unit 3	MD	UniStar Nuclear (Constellation Energy and EDF)	At least half	AREVA	Yes
Comanche Peak, Units 3 & 4	TX	Luminant (Energy Future Holdings)	No	Mitsubishi Heavy Industries	Yes
Fermi, Unit 3	MI	Detroit Edison	No	GE Hitachi	Partially
Grand Gulf, Unit 3	MS	Entergy	No	Originally GE Hitachi; now undetermined	
Levy County, Units 1 & 2	FL	Progress Energy	No	Westinghouse (Toshiba)	Yes
Nine Mile Point, Unit 3	NY	UniStar Nuclear (Constellation Energy and EDF)	At least half	AREVA	Yes
North Anna, Unit 3	VA	Dominion Resources	No	Mitsubishi Heavy Industries	Yes
River Bend, Unit 3	LA	Entergy	No	Originally GE Hitachi; now undetermined	
Shearon Harris, Units 2 & 3	NC	Progress Energy	No	Westinghouse (Toshiba)	Yes
South Texas Project, Units 3 & 4	TX	Nuclear Innovation North America (NRG, Toshiba, TEPCO)	Partially	Toshiba	Yes
Turkey Point, Units 6 & 7	FL	Florida Power & Light (NextEra Energy)	No	Westinghouse (Toshiba)	Yes
Victoria County, Units 1 & 2	TX	Exelon	No	Originally GE Hitachi; now undetermined	
Virgil C. Summer, Units 2 & 3	SC	SCANA Corp.	No	Westinghouse (Toshiba)	Yes
Vogtle, Units 3 & 4	GA	Southern Company	No	Westinghouse (Toshiba)	Yes
William States Lee III, Units 1 & 2	SC	Duke Energy	No	Westinghouse (Toshiba)	Yes

As the above chart indicates, two out of three of the next-in-line candidates for loan guarantees, have substantial foreign ownership/control issues. Further, *all* of the reactor vendors are foreign-owned or partially foreign-owned.

Here are details on the foreign reactor project leaders and vendors:

FOREIGN-REACTOR PROJECT LEADERS

Nuclear Innovation North America

Nuclear Innovation North America LLC (NINA) is a joint venture formed in 2008 by NRG Energy (88 percent ownership) and Toshiba (12 percent) to develop new “advanced design” nuclear projects in North America, including the South Texas Project (STP) Units 3 & 4.⁶ Japan’s Toshiba, the parent company of leading reactor supplier Westinghouse Electric, is involved not only as an investor but also as the prime contractor on the projects. The Advanced Boiling Water Reactors (ABWR) is based on technology developed by Toshiba, General Electric, and Hitachi.

In May 2010, it was announced that the Tokyo Electric Power Company (TEPCO) would invest \$155 million for a 10 percent share in the South Texas project.⁷

As a limited liability company, NINA does not disclose financial results, but NRG Energy, Toshiba and TEPCO are publicly traded.

NRG Energy (traded on New York Stock Exchange; ticker symbol NRG) is a wholesale power generation company based in Princeton, New Jersey. It operates more than 40 generating plants, mostly using coal, natural gas and oil. Last year, it acquired Reliant Electric, a retail electricity supplier in Texas. It is also has limited involvement in wind and solar power and has some operations in Australia and Germany. For the year ending December 31, 2009, NRG had revenues of \$8.95 billion and net income of \$941 million (\$3.70 per share).

Toshiba Corporation is one of the largest diversified industrial corporations in the world. It divides its operations into four segments⁸: digital products (mobile phones, LCD televisions, DVD players, computers, retail checkout systems, etc.), electronic devices and components (semiconductors, flat-panel displays, etc.), social infrastructure systems (power plants, transmission equipment, air and highway traffic control systems, elevators, etc.) and home appliances (refrigerators, washing machines, microwave ovens, lighting, etc.) The company trades primarily on the Tokyo Stock Exchange.

In the fiscal year ending March 31, 2010, Toshiba reported total revenues of 6,381.6 billion yen (about US\$68.6 billion) and an operating profit of 117.2 billion yen (US\$1.26 billion).⁹ The social infrastructure segment accounted for virtually all the operating profit (digital products accounted for a tenth as much operating profit, and the electronic devices and home appliances segments experienced operating losses).

In addition to being the power supplier for Tokyo and surrounding areas, TEPCO is involved in power generation and various other businesses. Traded on the Tokyo Stock Exchange, the

company reported revenues of 5,016 billion yen (about \$54 billion) and net income of 133.7 billion yen (about \$1.4 billion) for the fiscal year ending March 31, 2010.¹⁰

UniStar Nuclear Energy

UniStar Nuclear Energy, LLC is a 50/50 joint venture formed in 2007 by Constellation Energy and the EDF Group as a replacement for UniStar Nuclear, which had been formed two years earlier by Constellation and the French company AREVA to promote AREVA's nuclear reactors in the United States.¹¹ UniStar would own the Calvert Cliffs-3 nuclear project in Maryland and the Nine Mile Point-3 project in New York. AREVA remains a partner (along with Bechtel, Alstom and others¹²). UniStar is also involved as a reactor vendor at the Bell Bend project in Pennsylvania and the Callaway project in Missouri. Both EDF and AREVA are 85 percent or more owned by the French government.¹³

As a limited liability company, UniStar Nuclear Energy does not disclose financial results, but to date has no assets other than initial seed funding provided by its parent companies. Both Constellation Energy and EDF are publicly traded.

Constellation Energy, based in Baltimore and traded on the New York Stock Exchange (ticker: CEG), is the parent company of Baltimore Gas & Electric as well as a leading wholesale power marketer. In November 2009 Constellation Energy completed the sale of a 49.99 percent stake in its nuclear operations to EDF Group for about \$4.7 billion, a measure taken to avoid Constellation being bought by Warren Buffett's MidAmerican Energy, which rescued Constellation from bankruptcy in 2008. EDF also owns an additional 9% of Constellation Energy. Constellation's existing nuclear facilities are now operated with EDF in a joint venture called Constellation Energy Nuclear Group LLC.¹⁴ In 2009 Constellation took in revenues of \$15.6 billion and had net income of \$4.5 billion.

EDF Group is the global name for Electricité de France, a state-controlled utility that was partially privatized through a stock offering in 2005 (its shares trade on the Euronext Paris exchange).¹⁵ Apart from its investment in Constellation, the company has substantial foreign operations in countries such as the United Kingdom, Germany and Italy. In 2009 EDF had consolidated revenues of 66.3 billion euros (about \$95 billion) and net income of 3.9 billion euros (about \$5.6 billion).

Intervenors in the Calvert Cliffs-3 licensing proceeding succeeded in getting a contention admitted for hearing before an Atomic Safety and Licensing Board (ASLB) charging that the level of foreign ownership of that reactor is a violation of the Atomic Energy Act, which prohibits "foreign ownership, control or domination" of a U.S. nuclear reactor project.¹⁶ The ASLB has not yet been scheduled a hearing date on this issue.

Note: Nine U.S.-based operators — Detroit Edison, Duke Energy, Entergy, Exelon, Florida Power & Light, Progress Energy, SCANA, Southern and the Tennessee Valley Authority — participate in the NuStart Energy consortium, whose membership also includes France's EDF.¹⁷ The Westinghouse Electric unit of Japan's Toshiba and GE Energy also participate in NuStart as reactor designers and manufacturers.

FOREIGN REACTOR SUPPLIERS

AREVA

Paris-based AREVA has become one of the world's leading suppliers of nuclear power technology, including the new Evolutionary Pressurized Reactor. The company, which trades on the Euronext Paris Exchange, has manufacturing operations in 43 countries.¹⁸ In 2009 AREVA had consolidated revenue of 8.5 billion euros (about \$12.1 billion) and net income of 537 million euros (about \$769 million).

Recently, however, AREVA has found itself in financial trouble, partially due to escalating costs for a reactor it is building in Finland on a fixed-price contract. Costs on that project have risen 80 percent above the contract price,¹⁹ and AREVA has been forced to take substantial charges. *Standard & Poor's* lowered AREVA's credit rating in response in June.²⁰

GE Hitachi Nuclear Energy

GE Hitachi is an alliance of the nuclear power operations of U.S.-based General Electric and Japan's Hitachi. It is a provider of boiling water reactors, nuclear fuel and nuclear power plant services.²¹ GE Hitachi does not report financial results, but both companies involved are publicly traded.

General Electric, one of the premier industrial companies in the United States, trades on the New York Stock Exchange (ticker: GE). In 2009 it had total revenues of \$156.8 billion and net income of \$11.4 billion.

Hitachi Ltd., which trades on the Tokyo Stock Exchange, is one of Japan's diversified industrial powerhouses. Its businesses include information and telecommunications systems, power systems, industrial systems and consumer electronics. In the fiscal year ending March 31, 2010, it had consolidated revenues of 8,968,546 million yen (about \$97 billion) and operating income of about 202,159 million yen (about \$2.2 billion), of which power systems contributed about 22,075 million yen (about \$238 million).²²

Mitsubishi Heavy Industries

Japan's Mitsubishi Heavy Industries, which trades on the Tokyo Stock Exchange, is involved in shipbuilding and ocean development; power systems; machinery and steel structures; aerospace; and manufactured machinery. In the fiscal year ending March 31, 2010 it had consolidated revenues of 2,941 billion yen (about \$32 billion) and net income of 14.1 billion yen (about \$153 million).

Westinghouse/Toshiba

Since 2006 Westinghouse Electric, one of the key players in the nuclear reactor business, has been owned by Toshiba Corporation. As noted above, publicly traded Toshiba had revenues of about

\$68 billion in its most recent fiscal year. It had operating profits of about \$1.3 billion but an overall net loss of about \$212 million.

The largest components that go into the reactors are pressure vessels. Toshiba recently announced that it was contracting with Japan's IHI Corporation to provide the pressure vessel for the first new reactor at the South Texas Project.²³ Reactor vendors do not have many choices in this regard as the international pressure vessel business is dominated by a handful of companies. These companies are almost all based outside the United States.

According to the World Nuclear Association (WNA), the reactors being built today usually require pressure vessels that are built with very heavy forging presses, and that capacity is currently located only in Japan (Japan Steel Works), China (China First Heavy Industries and China Erzhong) and Russia (OMZ Izhora).²⁴ WNA notes that new capacity is being built by Japan Steel Works and JCFC in Japan; Shanghai Electric Group in China; and in South Korea, France, the Czech Republic and Russia. In France, the work is being done by Creusot Forge, a subsidiary of AREVA.

WNA notes that the other significant pressure vessel producers are in Japan (IHI, Mitsubishi Heavy Industries, Babcock-Hitachi KK, and Japan Casting & Forging); South Korea (Doosan Heavy Industries); China (China Dongfang); India (Larsen & Toubro); Britain (Sheffield Forgemasters); and Spain (Equipos Nucleares SA).

The only current U.S. player in the nuclear pressure vessel business is Babcock & Wilcox Nuclear Power Generation Group, a subsidiary of McDermott International.²⁵

It should be noted that in 2008 AREVA created a \$360 million joint venture with Northrop Grumman Shipbuilding to open a facility in Virginia that will take major nuclear components forged elsewhere and finish them for installation.²⁶

A CLOSER LOOK AT THE NEXT LOAN GUARANTEE CANDIDATES

In February 2010 President Obama announced that the first federal loan guarantees for new nuclear reactors would be offered to the Vogtle Units 3 and 4 that the Southern Company is planning to build in Georgia.²⁷ The company announced on June 18 that it had reached agreement with the Department of Energy on the terms of the guarantees.²⁸

The units are slated to use reactors supplied by Westinghouse Electric, a subsidiary of Japan's Toshiba Corp. Southern Company, based in Atlanta, trades on the New York Stock Exchange (ticker: SO). It is the parent of Georgia Power, Alabama Power, Mississippi Power, Gulf Power and Southern Power. In 2009 it had revenues of \$15.7 billion and net income of \$1.6 billion.²⁹

In May 2010 the Energy Department announced a \$2 billion loan guarantee for a uranium enrichment facility in Idaho proposed by the French company AREVA.³⁰

DOE has not formally announced which other reactor projects might be granted loan guarantees, but the signs are that they would be the following:³¹

- UniStar Nuclear's Calvert Cliffs project;
- Nuclear Innovation North America's South Texas project; and
- SCANA Corporation's Virgil C. Summer project.

As noted above, the operators of both Calvert Cliffs and South Texas include foreign interests, while the operator of the V.C. Summer project is a U.S. company.

Also as noted above, the companies involved in Calvert Cliffs—Constellation Energy and EDF Group—are both profitable.

SCANA Corporation, based in South Carolina and traded on the New York Stock Exchange (ticker: SCG), is the parent of South Carolina Electric & Gas, Public Service Company of North Carolina, and SCANA Energy (which operates in Georgia). In 2009 it had revenues of \$4.2 billion and net income of \$348 million.

Calvert Cliffs is slated to use a reactor supplied by France's AREVA, South Texas will be supplied by Japan's Toshiba, and V.C. Summer will be supplied by the Westinghouse Electric unit of Toshiba.

ENDNOTES

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² http://www.ucsusa.org/nuclear_power/solutions/unlimited-taxpayer-liability-CEDA.html

³ <http://cleantechnica.com/2010/03/04/four-democratic-senators-tilt-at-foreign-windmills/>

⁴ http://assets.usw.org/Releases/Misc/us-nrc_gerard-nrc-letter-southern-co_usw021610.pdf

⁵ Links to application documents can be found at <http://www.nrc.gov/reactors/new-reactors/col.html>.

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⁷ <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDUzMTR8Q2hpbGRJRDR0tMXxUeXBIPtM=&t=1>

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- ²⁹ <http://www.southerncompany.com/aboutus/figures.aspx>
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