UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC 20436

MEMORANDUM TO THE COMMITTEE ON WAYS AND MEANS OF THE UNITED STATES HOUSE OF REPRESENTATIVES ON PROPOSED TARIFF LEGISLATION [1]

[**Date approved**: June 28, 2000][2]

Bill No.: H.R. 3875; 106th Congress

Introduced by: Mr. COLLINS (for himself, Mr. TANNER, Mr. HAYWORTH, Mr. LEWIS of Georgia, Mrs. JOHNSON of Connecticut, and Mrs. THURMAN)

Similar and/or related[3] bills: S. 2158, 106th Congress

Summary of the bill:[4]

The bill would suspend the general rate of duty[5] on–

Watertube boilers with a steam production exceeding 45 t per hour, for use in nuclear facilities (provided for in subheading 8402.11.00)

Effective: The 15th day after the date of enactment.

Through: December 31, 2005.

Retroactive effect: On or after January 1, 2000.

[*The remainder of this memorandum is organized in five parts: (1) information about the bill's proponent(s) and the product which is the subject of this bill; (2) information about the bill's revenue effect; (3) contacts by Commission staff during preparation of this memorandum; (4) information about the domestic industry (if any); and (5) technical comments.*]

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[1] International trade analyst: Dennis Fravel (202-205-3404); Attorney: Jan Summers (202-205-2605).

[2] Access to an electronic copy of this memorandum is available at *http://www.usitc.gov/billrpts.htm* Access to a paper copy is available at the Commission's Law Library (202-205-3287) or at the Commission's Main Library (202-205-2630).

[3] "Similar bills" are bills in the other House, in the current Congress, which address, at least in part, the substance of this bill. "Related bills" are bills in the **same** House, in the current Congress, but which are either earlier (or later) in time than the bill which is the subject of this memorandum. The cited Senate bill calls for a permanent duty elimination.

[4] The product nomenclature is as set forth in the bill. See technical comments for suggested changes (if any).

[5] See appendix A for definitions of tariff and trade agreement terms.

– THE PROPONENT AND THE IMPORTED PRODUCT –

The proponent firm/organization(s)			
Name of firm	Location contacted (city/state)	Date contacted	Response (Y/N)[6]
Palo Verde Nuclear Generating Station[1]	Phoenix, AZ	April 19, 2000	N[2]
Arizona Public Service Company, a subsidiary of Pinnacle West Capital Corp.	Phoenix, AZ	April 20, 2000	N[2]
ABB Combustion Engineering Nuclear Power[3]	Windsor, CT	April 14, 2000	N
Alliant Energy Corporation	Washington, DC[4]	May 5, 2000	Y
Northern States Power Company	Washington, DC[4]	May 5, 2000	Y
Nuclear Management Company[5]	Washington, DC[4]	May 5, 2000	Y
Pinnacle West Energy Corporation	Washington, DC[4]	May 5, 2000	Y
The Southern Companies	Washington, DC[4]	May 5, 2000	Y
Westinghouse Electric Company[3]	Washington, DC[4]	May 5, 2000	Y
WPS Resources Corporation	Washington, DC[4]	May 5, 2000	Y
Pricewaterhouse Coopers LLP Washington National Tax Services	Washington, DC	April 13, 2000	Y

[1] Palo Verde Nuclear Generating Station is owned by Arizona Public Service Co. (29.1%), Salt River Project (15.5%), El Paso Electric (15.8%), Southern California Edison (15.8%), Public Service Company of New Mexico (10.2%), Southern California Public Power Authority (5.9%), and Los Angeles Dept. of Water & Power (5.7%).
[2]Pinnacle West Energy Corporation, owner of Arizona Public Service Co. (majority owner of Palo Verde Nuclear Generating Station), is a proponent and joined a statement prepared by PricewaterhouseCoopers LLP (app. C).
[3]Westinghouse Electric Co., a wholly owned subsidiary of British Nuclear Fuels plc (BNFL) of the U.K., completed acquisition of ABB's worldwide nuclear business, headquartered in Windsor, CT on May 2, 2000. BNFL acquired Westinghouse Electric Co. in early 1999. The Nuclear Regulatory Commission has only approved designs for steam generators for commercial nuclear power plants from Westinghouse, ABB-CE, and Babcock & Wilcox.
[4]These proponents were not initially identified to Commission staff, but were listed as proponents in the submission by PricewaterhouseCoopers LLP on their behalf. See appendix C for this submission.
[5]The Nuclear Management Company LLC was formed in 1999 by Northern States Power Co., Alliant Energy, Wisconsin Electric Power Co. and Wisconsin Public Service Co. to operate and manage their seven nuclear generating plants.

[6] Non-confidential written responses received prior to approval of this report by the Commission, if any, will be included in appendix C.

*Does the proponent plan **any** further processing or handling[7] of the subject product after importation to its facilities in the United States (Y/N)*: No.

If "Yes," provide location of this facility if different from above (city/state):

If "No," provide location of proponent's headquarters or other principal facility if different from above (city/state): n/a

Alliant Energy Corporation, Northern States Power Company, WPS Resources Corporation, and Nuclear Management Company (NMC) reportedly would import steam generators for use in pressurized water reactor (PWR) nuclear power generating plants managed by NMC at Northern States Power's two-unit Prairie Island Nuclear Plant near Red Wing, MN, and the Kewaunee Nuclear Power Plant near Kewaunee, WI, operated by Wisconsin Public Service (owned by WPS Resources Corporation, a holding company based in Green Bay, WI) and jointly owned with Alliant Energy and Madison Gas & Electric.

Pinnacle West Energy Corporation, Arizona Public Service Company, and the Palo Verde Nuclear Generating Plant reportedly would use steam generators at the Palo Verde 2 nuclear power plant, near Wintersburg, AZ.

The Southern Companies reportedly would use steam generators in its PWR nuclear power generating plants, Joseph Farley 1 and 2, located near Dothan, AL.

Westinghouse Electric Company or its customers reportedly will be importing steam generators for a number of U.S. nuclear power generating plants across the United States. Possible locations include:

Nuclear power plant	City	State
Arkansas Nuclear 2	Russellville	AK
Waterford 3	Taft	LA
Callaway 1	Fulton	MO
Salem 2	Salem	NJ
Sequoyah 1	Daisy	TN
South Texas 2	Bay City	TX

[7] The phrase "further processing or handling" can include repackaging, storage or warehousing for resale, etc.

The imported product	
Description and uses	Country(s) of origin
The only type of watertube boiler with steam production exceeding 45 tons per hour, for use in nuclear facilities, is a steam generator for use with a nuclear reactor in a pressurized water reactor (PWR) plant. In such a plant, reactor coolant (water) is pumped under pressure through the reactor core where heat is transferred from the nuclear fuel to piping carrying the reactor coolant. The water then continues on to a steam generator, a large heat exchanger. Inside the steam generator, steam is formed in another piping system and is transferred to the main steam turbine, where electricity is generated. The reactor coolant is returned to the reactor. Inside the steam generator, hot reactor coolant flows through many tubes. Heat from the reactor coolant--the primary coolant system--is transferred to a secondary coolant, or feedwater, that surrounds the tubes carrying the primary coolant. When sufficient heat is absorbed, the feedwater boils and forms steam. At this point in the process, differences in steam generator vendor designs exist. In the Westinghouse and ABB-Combustion Engineering[1] (ABB-CE) designs, the steam and water mixture is separated in two stages. In the first stage, the mixture is spun to cause most water to separate out. In the second stage, the remaining steam and water are separated by a forced rapid change in direction, with the drier steam leaving the water behind. In these designs, the primary coolant flows through U-shaped tubes. In the Babcock & Wilcox design, the steam is heated above the boiling point, or superheated, causing the steam to separate from any water. In this design, the primary coolant flows from the top of the generator to the bottom. Regardless of design, dry steam is required to avoid damage to the blades on the steam turbines. PWR nuclear plants using an ABB-CE or Babcock & Wilcox designs each use 2 steam generators, while those with Westinghouse designs use 2, 3, or 4 steam generators, depending upon the power output of the PWR system. Steam generators in nuclear power plants are being replaced because of corrosion of their tubes; there are 3,000 or more tubes per steam generator. These generators weigh from 400 to 900 tons each and may be 40 feet tall. The generators are classified in Harmonized Tariff Schedule of the United States (HTS) subheading 8402.11.00. See U.S. Customs Service Ruling Letter, NY D88567, Mar. 19, 1999.	Korea, South Italy Spain

[1]Combustion Engineering was purchased by ABB in 1990 and became known as ABB-CE. Westinghouse became a subsidiary of British Nuclear Fuels plc in 1999, as did ABB-CE in May 2000.

– EFFECT ON CUSTOMS REVENUE –

[*Note: This section is divided in two parts. The first table addresses the effect on customs revenue based on the duty rate for the HTS number set out in the bill. The second table addresses the effect on customs revenue based on the duty rate for the HTS number recommended by the Commission (if a different number has been recommended). Five-year estimates are given based on Congressional Budget Office "scoring" guidelines. If the indicated duty rate is subject to "staging" during the duty suspension period, the rate for each period is stated separately.*]

HTS number *used in the bill*: 8402.11.00[8]					
	2001	2002	2003	2004	2005
General rate of duty[9] (AVE)[10]	5.2	5.2	5.2	5.2	5.2
Estimated value ***dutiable*** imports	$61,000,000[1]	$200,000,000	[2]-	$25,000,000	$190,000,000
Customs revenue loss	$3,172,000[1]	$10,400,000	[2]-	$1,300,000	$16,120,000

[1]This estimate includes data for 2000 and 2001because the bill is retroactive to importations on or after January 1, 2000. For 2000, U.S. dutiable imports are estimated at $86 million with a customs revenue loss of $4,472,000.
[2]Based on available information, it is unlikely that there will be any dutiable imports in 2003.

Note: Dutiable imports and customs revenue loss were estimated based upon the number of PWR nuclear plants likely to have steam generators replaced during 2000-2005. Information for this estimate was obtained from the U.S. Nuclear Regulatory Commission internet site, official statistics of the U.S. Department of Commerce, and submissions from interested parties, and other publicly available information.

[8] The HTS number is as set forth in the bill. See technical comments for suggested changes (if any).
[9] See appendix B for column 1-special and column 2 duty rates.
[10] AVE is ad valorem equivalent expressed as percent. Staged rates may be found at: *http://dataweb.usitc.gov*

HTS number *recommended by the Commission*: n/a [11]					
	2001	2002	2003	2004	2005
General rate of duty (AVE)					
Estimated value ***dutiable*** imports					
Customs revenue loss					

– CONTACTS WITH OTHER FIRMS/ORGANIZATIONS –

Contacts with firms or organizations *other than* the proponents			
Name of firm	Location contacted (city/state)	Date contacted	Response (Y/N)[12]
American Boiler Manufacturers Association	Arlington, VA	March 29, 2000	N
United States Nuclear Regulatory Commission	Rockville, MD	April 12, 2000	N
Babcock & Wilcox International	Cambridge, Ontario, Canada	April 17, 2000	Y[1]
U.S. Customs Service	New York, NY	April 20, 2000	N
General Electric Co.	Washington, DC	April 20, 2000	N

[1]See statement concerning current U.S. production by McDermott International, Inc., parent company of Babcock & Wilcox in appendix D.

[11] If a different HTS number is recommended, see technical comments.

[12] Non-confidential written responses received prior to approval of this report by the Commission, if any, will be included in appendix D. Only statements submitted in connection with **this** bill will be included in the appendix.

– THE DOMESTIC INDUSTRY –

[*Note: This section is divided in two parts. The first part lists non-confidential written submissions received by the Commission which assert that* ***the imported product itself*** *is produced in the United States and freely offered for sale under standard commercial terms. The second part lists non-confidential written submissions received by the Commission which assert either that (1) the imported product will be produced in the United States in the future; or (2) another product which* ***may compete*** *with the imported product is (or will be) produced in the United States and freely offered for sale under standard commercial terms. All submissions received by the Commission in connection with this bill prior to approval of the report will be included in appendix D. The Commission cannot, in the context of this memorandum, make any statement concerning the validity of these claims.*]

Statements concerning current U.S. production			
Name of product	Name of firm	Location of U.S. production facility	Date received
Steam generators for use in nuclear facilities	McDermott International, Inc.	Barberton, OH Mount Vernon, IN	May 3 and 26, 2000

Statements concerning "future" or "competitive" U.S. production			
Name of product	Name of firm	Location of U.S. production facility	Date received
Steam generators for use in nuclear facilities	McDermott International, Inc.	Barberton, OH Mount Vernon, IN	May 3 and 26, 2000

– TECHNICAL COMMENTS –

[The Commission notes that references to HTS numbers in temporary duty suspensions (i.e., proposed amendments to subchapter II of chapter 99 of the HTS) should be limited to ***eight*** *rather than ten digits. Ten-digit numbers are established by the Committee for Statistical Annotation of Tariff Schedules pursuant to 19 U.S.C. 1484(f) and are not generally referenced in statutory enactments.]*

Recommended changes to the nomenclature in the bill:

The article description of the new HTS heading should be amended by striking the existing wording and inserting the description "Steam generators for use in pressurized water nuclear reactors". This language would not only utilize the product name commonly employed in the industry but would also avoid covering other boilers that may be used at nuclear facilities. The phrase "in nuclear facilities" is broad and ambiguous, because such a facility may encompass areas outside the plant building.

Recommended changes to any C.A.S. numbers in the bill (if given):

None.

Recommended changes to any Color Index names in the bill (if given):

None.

Basis for recommended changes to the HTS number used in the bill:[13]

n/a

Other technical comments (if any):

None.

[13] The Commission may express an opinion concerning the HTS classification of a product to facilitate the Committee's consideration of the bill, but the Commission also notes that, by law, the U.S. Customs Service is the only agency authorized to issue a binding ruling on this question. The Commission believes that the U.S. Customs Service should be consulted prior to enactment of the bill.

APPENDIX A

TARIFF AND TRADE AGREEMENT TERMS

In the **Harmonized Tariff Schedule of the United States** (HTS), chapters 1 through 97 cover all goods in trade and incorporate in the tariff nomenclature the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description. Subordinate 8-digit product subdivisions, either enacted by Congress or proclaimed by the President, allow more narrowly applicable duty rates; 10-digit administrative statistical reporting numbers provide data of national interest. Chapters 98 and 99 contain special U.S. classifications and temporary rate provisions, respectively. The HTS replaced the Tariff Schedules of the United States (TSUS) effective January 1, 1989.

Duty rates in the **general** subcolumn of HTS column 1 are normal trade relations rates, many of which have been eliminated or are being reduced as concessions resulting from the Uruguay Round of Multilateral Trade Negotiations. Column 1-general duty rates apply to all countries except those listed in HTS general note 3(b) (Afghanistan, Cuba, Laos, North Korea, and Vietnam) plus Serbia and Montenegro, which are subject to the statutory rates set forth in **column 2**. Specified goods from designated general-rate countries may be eligible for reduced rates of duty or for duty-free entry under one or more preferential tariff programs. Such tariff treatment is set forth in the **special** subcolumn of HTS rate of duty column 1 or in the general notes. If eligibility for special tariff rates is not claimed or established, goods are dutiable at column 1-general rates. The HTS does not enumerate those countries as to which a total or partial embargo has been declared.

The **Generalized System of Preferences** (GSP) affords nonreciprocal tariff preferences to developing countries to aid their economic development and to diversify and expand their production and exports. The U.S. GSP, enacted in title V of the Trade Act of 1974 for 10 years and extended several times thereafter, applies to merchandise imported on or after January 1, 1976 and before the close of September 30, 2001. Indicated by the symbol "A", "A*", or "A+" in the special subcolumn, the GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing countries, as set forth in general note 4 to the HTS.

The **Caribbean Basin Economic Recovery Act** (CBERA) affords nonreciprocal tariff preferences to developing countries in the Caribbean Basin area to aid their economic development and to diversify and expand their production and exports. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984. Indicated by the symbol "E" or "E*" in the special subcolumn, the CBERA provides duty-free entry to eligible articles, and reduced-duty treatment to certain other articles, which are the product of and imported directly from designated countries, as set forth in general note 7 to the HTS.

Free rates of duty in the special subcolumn followed by the symbol "IL" are applicable to products of Israel under the **United States-Israel Free Trade Area Implementation Act** of 1985 (IFTA), as provided in general note 8 to the HTS.

Preferential nonreciprocal duty-free or reduced-duty treatment in the special subcolumn followed by the symbol "J" or "J*" in parentheses is afforded to eligible articles the product of designated beneficiary countries under the **Andean Trade Preference Act** (ATPA), enacted as title II of Public Law 102-182 and implemented by Presidential Proclamation 6455 of July 2, 1992 (effective July 22, 1992), as set forth in general note 11 to the HTS.

Preferential free rates of duty in the special subcolumn followed by the symbol "CA" are applicable to eligible goods of Canada, and rates followed by the symbol "MX" are applicable to eligible goods of Mexico, under the **North American Free Trade Agreement**, as provided in general note 12 to the HTS and implemented effective January 1, 1994 by Presidential Proclamation 6641 of December 15, 1993. Goods must originate in the NAFTA region under rules set forth in general note 12(t) and meet other requirements of the note and applicable regulations.

Other special tariff treatment applies to particular **products of insular possessions** (general note 3(a)(iv)), **products of the West Bank and Gaza Strip** (general note 3(a)(v)), goods covered by the **Automotive Products Trade Act** (APTA) (general note 5) and the **Agreement on Trade in Civil Aircraft** (ATCA) (general note 6), **articles imported from freely associated states** (general note 10), **pharmaceutical products** (general note 13), and **intermediate chemicals for dyes** (general note 14).

The **General Agreement on Tariffs and Trade 1994** (GATT 1994), pursuant to the Agreement Establishing the World Trade Organization, is based upon the earlier GATT 1947 (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) as the primary multilateral system of disciplines and principles governing international trade. Signatories' obligations under both the 1994 and 1947 agreements focus upon most-favored-nation treatment, the maintenance of scheduled concession rates of duty, and national treatment for imported products; the GATT also provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, antidumping and countervailing duties, dispute settlement, and other measures. The results of the Uruguay Round of multilateral tariff negotiations are set forth by way of separate schedules of concessions for each participating contracting party, with the U.S. schedule designated as Schedule XX. Pursuant to the **Agreement on Textiles and Clothing** (ATC) of the GATT 1994, member countries are phasing out restrictions on imports under the prior "Arrangement Regarding International Trade in Textiles" (known as the **Multifiber Arrangement** (MFA)). Under the MFA, which was a departure from GATT 1947 provisions, importing and exporting countries negotiated bilateral agreements limiting textile and apparel shipments, and importing countries could take unilateral action in the absence or violation of an agreement. Quantitative limits had been established on imported textiles and apparel of cotton, other vegetable fibers, wool, man-made fibers or silk blends in an effort to prevent or limit market disruption in the importing countries. The ATC establishes notification and safeguard procedures, along with other rules concerning the customs treatment of textile and apparel shipments, and calls for the eventual complete integration of this sector into the GATT 1994 over a ten-year period, or by Jan. 1, 2005.

Rev. 1/4/00

APPENDIX B

SELECTED PORTIONS OF THE
HARMONIZED TARIFF SCHEDULE OF THE UNITED STATES

[*Note: Appendix may not be included in the electronic version of this memorandum.*]

APPENDIX C

STATEMENTS SUBMITTED BY THE PROPONENTS

[*Note: Appendix C may not be included in the electronic version of this memorandum posted on the Commission's web site if an electronic copy of the statement was not received by the Commission.*]

Mr. Dennis Fravel
International Trade Analyst
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20002

Re: H.R. 3875: Legislation to suspend temporarily the duty on certain steam and other vapor-generating boiler used in nuclear facilities.

S. 2158: Legislation to amend the Harmonized Tariff Schedule of the United States to eliminate the duty on certain steam or other vapor-generating boilers used in nuclear facilities.

Dear Mr. Fravel:

Please accept these comments in support of H.R. 3875 and S. 2158. These comments and the enclosed report on the *U.S. Market for Nuclear Steam Generators* are submitted on behalf of several domestic proponents of H.R. 3875 and S. 2158. These comments are filed on behalf the following organizations and are in lieu of individual comments from each organization.

Alliant Energy Corporation
Northern States Power Company
Pinnacle West Energy Corporation
The Southern Companies
Westinghouse Electric Company
WPS Resources Corporation

A description of each organization is provided as Attachment 1 to this letter.

The proponents strongly urge the Administration to work with Congress to repeal the tariff on steam generators imported for use in nuclear power facilities. The 5.2% duty imposed by 8402.11 of the 2000 U.S. Harmonized Tariff Schedule (USHTS) is a burden on domestic residential, industrial, and commercial users of electricity. There is no current domestic

production of these specialized steam generators. Further, there is no domestic capability to initiate production of nuclear steam generators and no feasible likelihood that domestic production capability will be developed.

H.R. 3875

Representative Collins (GA) introduced H.R. 3875 in the House of Representatives to suspend for five years the tariff imposed by 2000 USHTS 8402.11 on the importation of steam generators for use in nuclear power facilities.

The legislation was introduced with five original cosponsors: Representatives Tanner (TN), J.D. Hayworth (AZ), J. Lewis (GA), N. Johnson (CT), and Thurman (FL). Following introduction of the bill, Representatives Matsui (CA) and Barr (GA) cosponsored the bill.

S. 2158

Senator Murkowski (AK) introduced S. 2158 to eliminate the duty on the importation steam generators for use in nuclear power facilities. Senator Murkowski introduced his legislation with two original cosponsors, Senators Grams (MN) and Thompson (TN). Senators Coverdell (GA), Kyl (AZ), Mack (FL) and Nickles (OK) have also cosponsored the bill.

Proponents Prefer Repeal (S. 2158)

The proponents support both S. 2168 and H.R. 3875. We urge Congress and the Administration to repeal the duty. Other than a limited amount of revenue derived from this hidden tax, the tariff on nuclear steam generators provides no apparent public benefit. Because of the limited market for these specialized generators and the many difficult barriers to entry into production, it is highly unlikely that there will be any domestic production capability in the future.

Locations Where Proponents Will Use the Product

Of the 104 operational nuclear power plants in the United States in 1998, 70 have pressurized water reactors. These plants are owned by 34 different utilities and are located in 27 different States. There are committed orders for 30 nuclear steam generators. The following table identifies the country of origin, estimated year of delivery, and power plant where these steam generators will be installed.

Committed Orders For Steam Generators by U.S. Power Plants

Power Plant Name	Country of Manufacture	Year of Delivery	Power Plant State	Number of Units Purchased
Ano 2	Spain	2000	Arkansas	2
Farley 1	Spain	2000	Alabama	3
Kewaunee	Italy	2000	Wisconsin	2
Shearon Harris		2000	North Carolina	2
South Texas Project 1	Spain	2000	Texas	4
Cook 1	Canada	2001	Michigan	4
Farley 2	Spain	2001	Alabama	3
Calvert Cliffs 1	Canada	2002	Maryland	2
Calvert Cliffs 2	Canada	2003	Maryland	2
Palo Verde 2	Italy	2002	Arizona	2

Attachment 2 lists the U.S. plants with pressurized water reactors in 1998 and their owners. Attachment 3 depicts their locations.

Description of the Product and Its Uses

Nuclear steam generators are essential components in the process of turning nuclear energy into electricity in a pressurized water reactor. Water is pumped through the reactor's core and is heated by the fission process. This water is maintained under pressure to prevent it from boiling and turning into steam. The pressurized water is passed through the tubing within the nuclear steam generator, a large heat exchanger that transfers heat from a primary coolant system (tube side) to a secondary coolant system (shell side). The primary coolant system contains pressurized water; the secondary coolant system contains water that is turned into steam by the heat exchanged. The steam drives the power plant turbines, creating electricity.

Attachment 4 shows how nuclear steam generators fit into the generation of electricity. Attachment 5 diagrams the reactor coolant system arrangement.

Specialized use: Nuclear steam generators are specialized pieces of equipment that weigh 500 to 900 tons each. They are used only in pressurized water reactors. They are not used in boiling water reactors, non-nuclear power plants, or other industrial facilities.

The design of a nuclear steam generator is unlike the design of a fossil fuel steam generator. The equipment required to operate the two types of generators is different. The material for the tubing in the nuclear steam generator is different from the tubing material in a non-nuclear plant. The nuclear steam generator tubing must be compatible with the unique primary and secondary side water chemistry conditions to minimize corrosion degradation. Historically the transfer tubes in nuclear steam generators used in the United States were made of alloy 600, a

nickel/chrome/iron alloy. Newer steam generators primarily use alloy 690, which is more resistant to corrosion.

Countries of Origin of the Product

Only six companies produce nuclear steam generators. All of them are outside the United States. The companies are listed below.

- Ensa (Spain)
- Anasaldo (Italy)
- Babcock & Wilcox (Canada)
- Framatome (France)
- HANJUNG (Korea)
- Mitsubishi (Japan).

Revenue Effect

We estimate the revenue loss to federal Treasury will be approximately $10 to $11 million over five years. We arrive at this figure by applying the tariff rate of 5.2% to the average price of a nuclear steam generator ($12.6 million) and multiplying the result by the number of committed nuclear steam generators ordered and expected to be imported between 2000 and 2005.

Duties paid by U.S. taxpayers are deductible expenses for purposes of computing income tax liability. Therefore, increased federal revenue derived from duties paid by U.S. taxpayers is partially offset by lower income tax payments to the federal government. It is our understanding the Congressional Budget Office's scoring conventions assume that the income tax offset lowers the revenue loss of a duty suspension or repeal by 25%.

Replacement cost and price: The average *replacement cost* of a nuclear steam generator during 1994-1997 (the latest available year of full price data) was $38.4 million. Replacement cost includes many costs in addition to the price or fabrication cost of the steam generator itself. Replacement cost may include licensing, engineering, installation, storage, and transport, as well as the price of the steam generator. Recently, the *price* of a nuclear steam generator has been approximately 33% of total replacement cost, with some variation.

Tariff to the United States: A buyer may be required to pay an import duty to the United States on nuclear steam generators that are manufactured abroad. In general, the tariff rate for 2000 is 5.2%, although imports from certain countries are exempt by treaties (including Canada, by virtue of the North American Free Trade Agreement).

Duty is computed by reference to the price of the steam generator and not to the replacement cost discussed above (which includes substantial, *domestically* incurred costs such as transportation, installation, and engineering). A 5.2% duty on the price or fabrication cost of a nuclear steam generator ($12.67 million,

or 33% of average total replacement cost) is about $660,000. Of the 30 steam generators under committed orders and listed in Attachment 6, all will be imported and, excepting eight Canadian-made steam generators, 22 apparently will be subject to the 5.2% duty.

No Current U.S. Production of the Product

Nuclear steam generators are no longer manufactured in the United States. When nuclear plants were being constructed in the United States, the original steam generators were being manufactured by the reactor suppliers. Combustion Engineering manufactured in Chattanooga, Tennessee; Westinghouse, in Pensacola, Florida; and Babcock & Wilcox in Barberton, Ohio. Combustion Engineering no longer uses its Chattanooga facility for that purpose and has disposed of the manufacturing equipment. Babcock & Wilcox moved its manufacturing operation to Canada.

Westinghouse was the last company to manufacture this product in the United States. Its plant in Pensacola, Florida was closed after shipping its last order in November 1999 to the South Texas Project. The plant equipment has already been sold and moved, including highly specialized equipment purchased by competitors. The plant structure is for sale and could be converted to many uses other than its former use.

The Pensacola plant had been used to make power generation and electric generation systems in addition to nuclear steam generators. Westinghouse had planned to close the plant when it sold its power generation division to Siemens AG and its nuclear division to BNFL LTD. Siemens transferred activities relating to power generation out of the plant. Westinghouse/BNFL found the nuclear steam generator business insufficient to sustain the plant and transferred its production overseas to Ensa.

Future U.S. Production is Unlikely

U.S. market entry—the delivery of a new nuclear steam generator that has been produced in the United States—seems highly unlikely during the next five years. There are several factors:

- The time required to select, design, and construct a manufacturing facility. Preferred sites are large (a facility of about 200,000 square feet is needed to house production and output prior to shipping) and close to water (steam generators, at 500 to 900 tons, are too large to transport by rail and are transported by water). The estimated cost of a new manufacturing facility is $60 million to $80 million.

- The time required for regulatory authorizations. For example, the Nuclear Regulatory Commission requires manufacturers of nuclear power plant components to be certified (the N-Certificate of Authorization) by the American Society of Mechanical Engineers before a plant may operate in the United States. To acquire a new certification takes about one year.

- The time required to produce a nuclear steam generator. Even after a manufacturing facility is ready to produce, the construction of all component subassemblies and final fabrication would take 32 to 48 months in the typical case.

- The evident assessment of former U.S. suppliers that production of nuclear steam generators in the United States is not competitive with production elsewhere.

Attachment 6 illustrates the timetable for the 6-year nuclear steam generator replacement project at Unit 2 of the Palo Verde Nuclear Generating Station located 60 miles west of Phoenix, Arizona.

Conclusion

The proponents conclude by again urging the Administration to recommend that Congress repeal the tariff on nuclear steam generators. If we can provide any additional information, please do not hesitate to call us.

Sincerely,

Patrick J. Raffaniello *Kirt C. Johnson*

Patrick J. Raffaniello Kirt C. Johnson

Attachment 1 - Proponents

Alliant Energy is a major energy-services corporation headquartered in Madison, Wisconsin. It is a utility holding company employing more than 6000 employees, providing electric, natural gas, water and steam energy to more than 1.3 million customers in service territories in Iowa, Wisconsin, Illinois and Minnesota. Alliant Energy is putting its energy services expertise to use in developing markets internationally. Roughly 12% of the energy is generates as a utility comes from nuclear sources, and it purchases additional nuclear-generated electricity for its customers on the wholesale market.

Northern States Power Company is an investor-owned utility serving the Upper Mid-West. Headquartered in Minneapolis, Minnesota, NSP serves electricity consumers in Minnesota, Michigan, North Dakota, South Dakota, and Wisconsin.

Pinnacle West Energy Corporation is an investor-owned utility serving the Southwest. Headquartered in Phoenix, Arizona, Pinnacle serves electricity consumers in Arizona, California, Nevada, New Mexico, and Texas.

The Southern Companies is an investor-owned utility serving the Southeast. Headquartered in Atlanta, Georgia, The Southern Companies serve electricity consumers in Alabama, Florida, Georgia, and Mississippi.

Westinghouse Electric Company is engineering and technology company headquartered in Pittsburgh, Pennsylvania.

WPS Resources Corporation is a holding company headquartered in Green Bay, Wisconsin providing products and services in both regulated and non-regulated energy markets. Through its subsidiaries, **Wisconsin Public Service Corporation** and **Upper Peninsula Power Company**, WPS serves electric consumers in Michigan and Wisconsin.

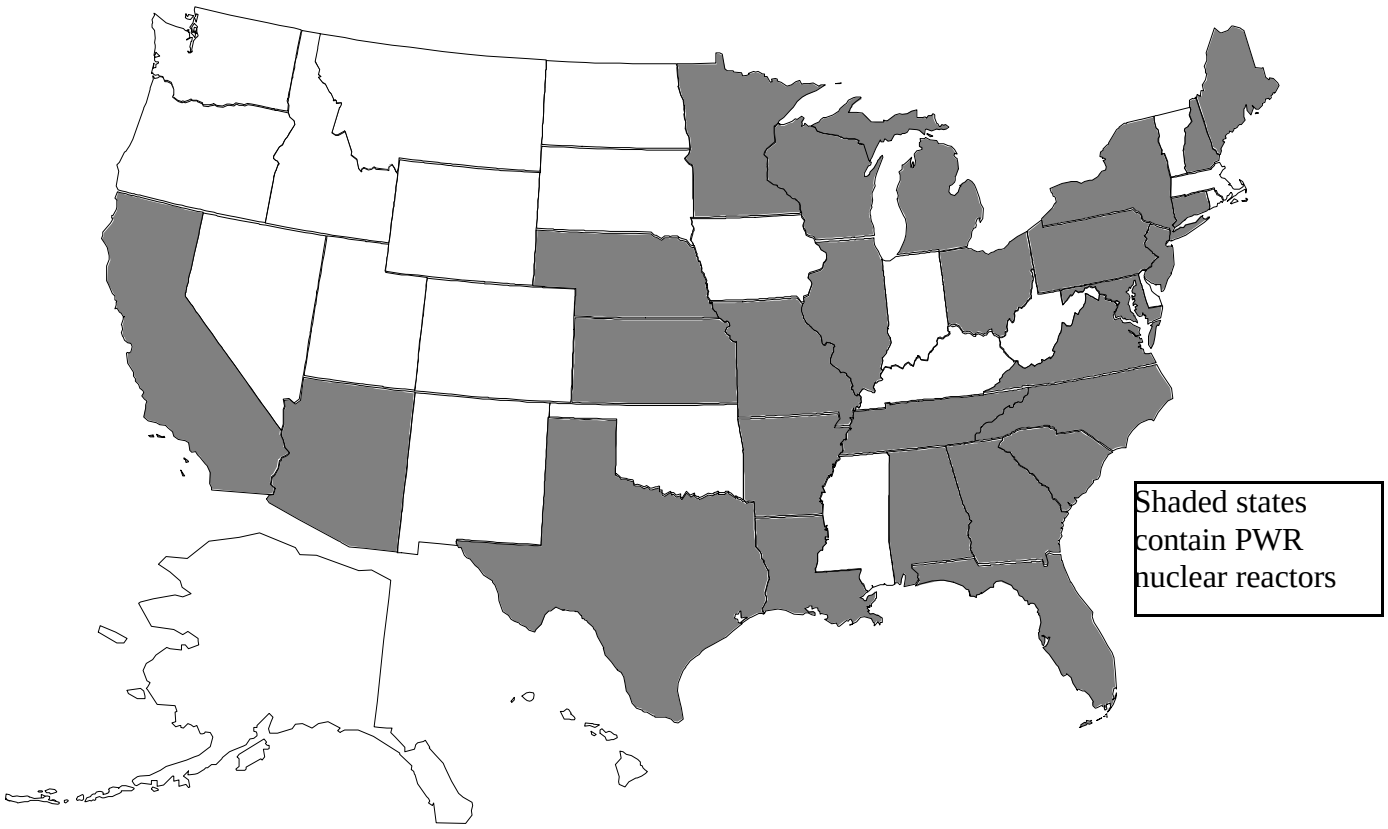
Attachment 2 – U.S. Pressurized Water Reactor Power Plants In 1998

Utility Owner	Power Plant	Location
Alabama Power	Farley 1	Alabama
	Farley 2	Alabama
Arizona PSC	Palo Verde 1	Arizona
	Palo Verde 2	Arizona
	Palo Verde 3	Arizona
Baltimore G&E	Calvert Cliffs 1	Maryland
	Calvert Cliffs 2	Maryland
Carolina Power	Robinson	S. Carolina
	Shearon Harris	N. Carolina
Commonwealth Edison	Braidwood 1	Illinois
	Braidwood 2	Illinois

	Byron 1	**Illinois**
	Byron 2	**Illinois**
Consolidated Edison	**Indian Point 2**	**New York**
Consumers Energy	**Palisades**	**Michigan**
Duke Power	**Catawba 1**	**Piedmont Carolinas**
	Catawba 2	**Piedmont Carolinas**
	McGuire 1	**Piedmont Carolinas**
	McGuire 2	**Piedmont Carolinas**
	Oconee 1	**S. Carolina**
	Oconee 2	**S. Carolina**
	Oconee 3	**S. Carolina**
Duquense	**Beaver Valley 1**	**Pennsylvania**
	Beaver Valley 2	**Pennsylvania**
Entergy	**Ano 2**	**Arkansas**
	Ano1	**Arkansas**
	Waterford 3	**Louisiana**
Florida P&L	**St Lucie 1**	**Florida**
	St Lucie 2	**Florida**
	Turkey Point 3	**Florida**
	Turkey Point 4	**Florida**
Florida Power Corp	**Crystal River 3**	**Florida**
General Public Utilities	**TMI 1**	**Pennsylvania**
Georgia Power Co.	Vogtle 1	Georgia
	Vogtle 2	Georgia
Houston Light and Power	South Texas Proj 1	Texas
	South Texas Proj 2	Texas
Indiana Michigan Power Company	Cook 1	Michigan
	Cook 2	Michigan
Maine Yankee AP	Maine Yankee	Maine
New York Power Authority	Indian Point 3	New York
Northeast Utilities	Millstone 2	Connecticut
	Millstone 3	Connecticut
Northern States	Prairie Island 1	Minnesota
	Prairie Island 2	Minnesota
Omaha PPD	Fort Calhoun	Nebraska
PG&E	Diablo Canyon 1	California
	Diablo Canyon 2	California
Public Service Electric	Salem 1	New Jersey
	Salem 2	New Jersey
Public Service of New Hampshire	Seabrook	New Hampshire

Rochester G&E	Ginna	New York
South Carolina E&G	Summer	S. Carolina
Southern California Edison	San Onofre 2	California
	San Onofre 3	California
Texas Utilities Electric	Comanche Peak 1	Texas
	Comanche Peak 2	Texas
Toledo Edison	Davis Besse	Ohio
Tennessee Valley Authority	Sequoyah 1	Tennessee
	Sequoyah 2	Tennessee
	Watts Bar 1	Tennessee
Union Electric	Callaway	Missouri
Virginia Power	North Anna 1	Virginia
	North Anna 2	Virginia
	Surry 1	Virginia
	Surry 2	Virginia
Wisconsin Electric Power	Point Beach 1	Wisconsin
	Point Beach 2	Wisconsin
Wisconsin Public Service	Kewaunee	Wisconsin
Wolf Creek NOC	Wolf Creek	Kansas

Attachment 3 - Location of U.S. Pressurized Water



THE U.S. MARKET FOR NUCLEAR STEAM GENERATORS:

SUMMARY

Product

Nuclear steam generators are essential components in the process of turning nuclear energy into electricity in a pressurized water reactor. They enable the transfer of heat from pressurized water that has been in the nuclear core to water that has not, thus isolating the steam supply to the power plant turbines from radioactivity.[14]

The generators are used only in pressurized water reactors. They are not used in boiling water reactors or non-nuclear power plants because those other types of plants require steam generators that differ in design and materials. Of the 104 operational nuclear power plants in the United States in 1998, 70 are pressurized water reactors. These plants are located in 27 different States.[15]

Market Demand

Replacement demand.--The market for new nuclear steam generators in the United States is circumscribed and static. There have been no new orders for nuclear power plants in the United States since the late 1970s, and no additions are expected in the foreseable future. Therefore, the demand for nuclear steam generators is, and will be, confined to replacing degraded nuclear steam generators at existing plants. The average age of a nuclear steam generator in the United States at the time of replacement has been about 15 years.[16]

Of the 70 U.S. nuclear facilities with pressurized water reactors in 1998, 48 facilities (69 percent) still operate with their original steam generators and 22 facilities (31 percent) have already replaced the generators.[17] However, 11 of the plants that use original nuclear steam generators have scheduled replacement of 30 generators during 2000-2003 (each plant uses two to four steam generators). These plants are located in Alabama, Arizona, Arkansas, Maryland, Michigan, North Carolina, Tennessee, Texas, and Wisconsin.[18]

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[14] EPRI Steam Generator Reference Book, pages 2.2-2.3
[15] EPRI Steam Generator Reference Book, Appendix B – Plant Design Characteristics
[16] EPRI Steam Generator Progress Report, Revision 14, Table 2-1; PwC calculations
[17] EPRI Steam Generator Progress Report, Revision 14, Table 9-1
[18] EPRI Steam Generator Progress Report, Revision 14, Table 9-2, and supplemental information

Replacement cost and price.--The average *replacement cost* of a nuclear steam generator from 1994 through 1997 was $38.4 million. Replacement cost includes many costs in addition to the price (fabrication cost) of the steam generator itself. As reported to EPRI, replacement cost may include licensing, engineering, installation, storage, and transport. Recently, the *price* of the steam generator has been approximately 33 percent of total replacement cost, with some variation above and below. [19]

When nuclear steam generators are replaced at a plant, the utility usually purchases between two and four steam generators, one for each steam generation loop. Thus, the total cost of replacing nuclear steam generators averaged between $76 million and $152 million per plant during 1994-97.[20] Replacement cost has increased very little in nominal dollars through the years, with some ups and downs in between.

The buyer may be required to pay an import duty to the United States on generators that are manufactured abroad. The applicable year 2000 Harmonized Tariff Organization schedule subheading for nuclear replacement steam generators is 8402.11.00, with an associated duty rate of 5.2 percent. Imports from Canada are exempt from this tariff under the North American Free Trade Agreement.[21] It appears that 22 of the 30 nuclear steam generators that are scheduled for replacement during 2000-2003 will be dutiable and that the other eight will come from Canada.[22] Duty is computed by reference to the price of the steam generator and not to the replacement cost discussed above (which includes substantial, *domestically* incurred costs such as installation and engineering). A 5.2-percent duty on the price of a nuclear steam generator ($12.67 million, or 33 percent of average total replacement cost) is about $660,000.

Market Supply

No current U.S. production—Six companies are currently producing nuclear steam generators outside the United States. They are Ensa (Spain), Ansaldo (Italy), Babcock and Wilcox (Canada), Framatome (France), Korea Heavy Industries & Construction Company (HANJUNG) (Korea), and Mitsubishi (Japan).[23]

Nuclear steam generators are no longer manufactured in the United States. Westinghouse was the last company to manufacture this product in the United States. Upon closing its plant in Pensacola, Florida after shipping its last order in November 1999, Westinghouse surrendered its American Society of Mechanical

[19] In conversations with industry experts
[20] EPRI Steam Generator Progress Report, Revision 14, Table 9-1
[21] U.S. Harmonized Tariff Code Schedule, Chapter 84, Year 2000 revision
[22] EPRI Steam Generator Progress Report, Revision 14, Table 9-2; In conversation with industry experts
[23] In conversation with industry experts

Engineers certification which the Nuclear Regulatory Commission requires of manufacturers of nuclear steam generators. The plant equipment has already been sold and the plant structure is for sale.[24]

U.S. market entry highly unlikely in next five years—Production and delivery of nuclear steam generators made in the United States is highly unlikely for at least the next five years.[25] In addition to the evident conclusion of former U.S. suppliers that production overseas is more competitive and the limited economic incentives for expanding production in a country where domestic demand is confined to replacing the existing stock of generators, there are time factors to consider as well. They include time to--

- Select, design, and construct a manufacturing facility. Preferred sites are large, close to water, and cost between $60 million and $80 million to construct.[26]
- Obtain necessary authorizations. For example, the Nuclear Regulatory Commission requires manufacturers of nuclear power plant components to be certified by the American Society of Mechanical Engineers.[27]
- Produce a generator. If a new nuclear steam generator were ordered today, it would take, in the typical case, about 32 to 48 months to complete.[28]

About This Report

This report was prepared by the National Economic Consulting group of PricewaterhouseCoopers. Information for the report was obtained from publications of the Electric Power Research Institute (EPRI), discussions with government and industry experts, and other sources, as recorded in footnotes. Exhibits that elaborate or depict certain points made in the report are collected at the back, beginning at page 12.

[24] In conversation with industry experts
[25] In conversation with industry experts
[26] In conversation with government experts
[27] In conversation with industry experts
[28] EPRI Steam Generator Reference Book, pages 2.1-2.4

THE U.S. MARKET FOR NUCLEAR STEAM GENERATORS:

PRODUCT

Function

Nuclear steam generators are essential components in the process of turning nuclear energy into electricity in a pressurized water reactor. Water is pumped through the reactor's core and is heated by the fission process. This water is maintained under pressure to prevent it from boiling and turning into steam. The pressurized water is passed through the tubing within the nuclear steam generator, a large heat exchanger that transfers heat from a primary coolant system (tube side) to a secondary coolant system (shell side). The primary coolant system contains pressurized water; the secondary coolant system contains water that is turned into steam by the heat exchanged. The steam powers the power plant turbines, creating electricity.[29]

Exhibit 1 shows how nuclear steam generators fit into the generation of electricity. **Exhibit 2** diagrams the reactor coolant system arrangement.

Used Only in Pressurized Water Reactors

Specialized use.—Nuclear steam generators are specialized pieces of equipment that weigh 500 to 900 tons each.[30] They are used only in pressurized water reactors. They are not used in boiling water reactors, non-nuclear power plants, or other industrial facilities.[31]

The design of a nuclear steam generator is unlike the design of a fossil fuel steam generator. The equipment required to operate the two types of generators is different. The material for the tubing in the nuclear steam generator is different from the tubing material in a non-nuclear plant. The nuclear steam generator tubing must be compatible with the unique primary and secondary side water chemistry conditions to minimize corrosion degradation. Historically the transfer tubes in nuclear steam generators used in the United States were made of alloy 600, a nickel/chrome/iron alloy. Newer steam generators primarily use alloy 690, which is more resistant to corrosion.[32]

[29] In conversation with industry experts
[30] In conversation with industry experts
[31] In conversation with industry experts; EPRI Steam Generator Reference Book, pages 2.3-2.4
[32] EPRI Steam Generator Reference Book, pages 2.4-2.5

***Number in use*—**Of the 104 operational nuclear power plants in the United States in 1998, 70 have pressurized water reactors. These plants are owned by 34 different utilities and are located in 27 different States.[33]

Exhibit 3 lists the U.S. plants with pressurized water reactors in 1998 and their owners.
Exhibit 4 depicts their locations.

[33] EPRI Steam Generator Reference Book, Appendix B – Plant Design Characteristics

THE U.S. MARKET FOR NUCLEAR STEAM GENERATORS:

MARKET DEMAND

Replacement Demand

***No demand from new power plant construction*--**No new nuclear power plants are currently planned for construction in the United States.[34] However, existing plants will eventually replace their deteriorating nuclear steam generators.[35] Thus, the market for nuclear steam generators in the United States is limited to replacements at existing plants.

***Repairs*—**The tubes in a nuclear steam generator (approximately 4,000 to 12,000, depending on size[36]) are susceptible to denting, fatigue, wall thinning, corrosion, and other degradation mechanisms requiring repair. A sleeve can be inserted into the tube and welded to bridge the problem area, allowing continued use of the tube.[37] Alternatively, the tube can be plugged with a corrosion resistant alloy, effectively removing it from service.[38]

***Replacement*—**As more tubes are plugged or sleeved performance is diminished and it may become necessary to replace the steam generator with a new, more corrosion resistant one. The average age of a nuclear steam generator in the United States at the time of replacement has been 14.6 years.[39]

Of the 70 operational nuclear facilities in the United States in 1998 with pressurized water reactors, 22 (or 31 percent) have replaced their original generators. The replacements are concentrated in the older plants. Nearly half of the plants that are now 21 years or older have replaced their nuclear steam generators, while none that are now 10 years or younger have replaced them.[40]

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[34] EIA, 1996 Nuclear Capacity Status and Projections, DOE Document
[35] EPRI Steam Generator Reference Book, pages 1.6–1.7
[36] In conversation with industry experts
[37] Lockyer Elizabeth M., "Laser Welding Technology to Put Kewaunee River Plant Back On Line," Technology News, December 1996.
[38] NEI, Long Term Nuclear Power Maintenance, September 1999 Revision
[39] EPRI Steam Generator Progress Report, Revision 14, Table 2-1,PwC Calculations
[40] EPRI Steam Generator Progress Report, Revision 14, Table 9-1

The majority of pressurized water reactors (69 percent) still operate with their original nuclear steam generators.[41] However, 11 of that group have scheduled replacement of 30 generators during 2000-2003.[42] Each plant uses two to four steam generators.

Exhibit 5 gives a frequency distribution of replacements of nuclear steam generators, keyed to the age of the nuclear facility.
Exhibit 6 lists the committed orders for steam generators by U.S. power plants and includes the country of manufacture, year of delivery, power plant site, and number of steam generators.

Price

Replacement cost and price.--The average *replacement cost* of a nuclear steam generator during 1994-1997 (the latest year of full price data, as collected by Electric Power Research Institute) was $38.4 million. Replacement cost includes many costs in addition to the price or fabrication cost of the steam generator itself. As reported to EPRI, replacement cost may include licensing, engineering, installation, storage, and transport, as well as the price of the steam generator. Recently, the *price* of a nuclear steam generator has been approximately 33 percent of total replacement cost, with some variation.[43]

The average replacement cost of a nuclear steam generator has increased only slightly in nominal value between 1980 ($31.3 million) and 1997 ($35.5 million), with some larger ups and downs in between. Data for part of 1998 suggest that the 1998 average nominal replacement cost might be above the trend line.[44] As prices for capital equipment have generally increased by more than 60 percent since 1980, the replacement cost of nuclear steam generators in 1980 dollars has declined greatly.

Exhibit 7 charts average replacement cost of one nuclear steam generator, in current dollars, from 1980 through 1997.

Tariff to United States--A buyer may be required to pay an import duty to the United States on nuclear steam generators that are manufactured abroad. In general, the tariff rate for 2000 is 5.2 percent, although imports from certain countries are exempt by treaties (including Canada, by virtue of the North American Free Trade Agreement).[45]

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[41] EPRI Steam Generator Progress Report, Revision 14, Table 9-1
[42] EPRI Steam Generator Progress Report, Revision 14, Table 9-2, and conversations with industry experts
[43] In conversation with industry experts
[44] EPRI Steam Generator Progress Report, Revision 14, Table 9-1
[45] U.S. Harmonized Tariff Code Schedule, Chapter 84, Year 2000 revision

Duty is computed by reference to the price of the steam generator and not to the replacement cost discussed above (which includes substantial, *domestically* incurred costs such as installation and engineering). A 5.2-percent duty on the price or fabrication cost of a nuclear steam generator ($12.67 million, or 33 percent of average total replacement cost) is about $660,000. Of the 30 steam generators under committed orders and listed in **Exhibit 6**, all will be imported and, excepting eight Canadian-made steam generators, 22 apparently will be subject to the 5.2-percent duty.[46]

Fee to designer—Each pressurized water reactor power plant has steam generators that were designed specifically for it. When a utility decides to replace the nuclear steam generators, the replacements must match the original design specifications.[47]

The designs used at the 70 pressurized water reactor power plants in the United States belong to three companies: Westinghouse, ABB Combustion Engineering, and Babcock & Wilcox.[48]

Because a manufacturer has licenses only for certain designs, a customer may have to pay a design royalty fee. For example, the Ansaldo plant in Italy is licensed to build ABB CE System 80 model steam generators but not Babcock & Wilcox models.[49] A utility buying a Babcock & Wilcox model may have to pay a design royalty to Babcock & Wilcox for construction to occur at Ansaldo.

[46] In conversation with industry experts; EPRI Steam Generator Progress Report, Revision 14, Table 9-2; U.S. Harmonized Tariff Code Schedule, Chapter 84, Year 2000 revision
[47] In conversation with industry experts
[48] EPRI Steam Generator Progress Report, Revision 14, Table 2-1
[49] In conversation with industry experts

THE U.S. MARKET FOR NUCLEAR STEAM GENERATORS:

MARKET SUPPLY

Overview of Production

A nuclear steam generator has over 18 subassemblies that need to be planned, specified, and built according to certification standards of the American Society of Mechanical Engineers (ASME). Paperwork documenting that the material usage, design plans, and construction facilities meet AMSE certification must be filed before construction begins.[50] The Nuclear Regulatory Commission also requires specific quality assurance standards that are unique to the nuclear industry.

Assembly at a nuclear steam generator production plant can occur at the rate of four to six items per year. However, the actual rate of output can be as low as two items per year due to backlogs in acquiring components. For example, alloy 690 tubing, a key component in a nuclear steam generator, is produced in only three locations worldwide—Sumutomu (Japan), Valinox (France), and Sandvik (Sweden)—and lead times may be as much as eighteen months. Or again, integrally forged primary channel head lead times may be in excess of 12 months.[51]

Accounting for all factors, the typical turnaround time from ordering a nuclear steam generator to delivering it is about 32 to 48 months.[52]

Foreign Suppliers

Six companies produce nuclear steam generators outside the United States. They are[53]—

- Ensa (Spain)
- Anasaldo (Italy)
- Babcock & Wilcox (Canada)
- Framatome (France)
- HANJUNG (Korea)
- Mitsubishi (Japan).

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[50] In conversation with industry experts
[51] In conversation with industry experts
[52] In conversation with industry experts
[53] In conversation with industry experts

In some cases, international consortia own these companies. For example, Ensa is jointly owned by Westinghouse/BNFL and Equipe Nucleares S.A.[54]

No Current U.S. Production

Nuclear steam generators are no longer manufactured in the United States.[55] When nuclear plants were being constructed in the United States, the original steam generators were being manufactured by the reactor suppliers. Combustion Engineering manufactured in Chattanooga, Tennessee; Westinghouse, in Pensacola, Florida; and Babcock & Wilcox in Barberton, Ohio. Combustion Engineering no longer uses its Chattanooga facility for that purpose and has disposed of the manufacturing equipment. Babcock & Wilcox moved its manufacturing operation to Canada.

Westinghouse was the last company to manufacture this product in the United States.[56] Its plant in Pensacola, Florida was closed after shipping its last order in November 1999 to the South Texas Project. The plant equipment has already been sold and moved, including highly specialized equipment purchased by competitors. The plant structure is for sale and could be converted to many uses other than its former use.[57]

The Pensacola plant had been used to make power generation and electric generation systems in addition to nuclear steam generators. Westinghouse had planned to close the plant when it sold its power generation division to Siemens AG and its nuclear division to BNFL LTD. Siemens transferred activities relating to power generation out of the plant. Westinghouse/BNFL found the nuclear steam generator business insufficient to sustain the plant and transferred its production overseas to Ensa.[58]

U.S. Market Entry Highly Unlikely

U.S. market entry—the delivery of a new nuclear steam generator that has been produced in the United States—seems highly unlikely during the next five years. There are several factors:

- The time required to select, design, and construct a manufacturing facility. Preferred sites are large (a facility of about 200,000 square feet is needed to house production and output prior to shipping) and close

[54] Westinghouse Electric Company, "Steam Generators Shipped to Quinshan II Nuclear Station," Press Release of 3/24/99
[55] In conversation with industry experts
[56] In conversation with industry experts
[57] In conversation with industry experts
[58] In conversation with industry experts

to water (steam generators, at 500 to 900 tons, are too large to transport by rail and are transported by water). The estimated cost of a new manufacturing facility is $60 million to $80 million.[59]

- The time required for regulatory authorizations. For example, the Nuclear Regulatory Commission requires manufacturers of nuclear power plant components to be certified (the N-Certificate of Authorization) by the American Society of Mechanical Engineers before a plant may operate in the United States.[60] To acquire a new certification takes about one year.[61]

- The time required to produce a nuclear steam generator. Even after a manufacturing facility is ready to produce, the construction of all component subassemblies and final fabrication would take 32 to 48 months in the typical case.[62]

- The evident assessment of former U.S. suppliers that production of nuclear steam generators in the United States is not competitive with production elsewhere.[63]

Exhibit 8 illustrates the timetable for the 6-year nuclear steam generator replacement project at Unit 2 of the Palo Verde Nuclear Generating Station located 60 miles west of Phoenix, Arizona.

[59] In conversation with industry experts
[60] In conversation with government experts
[61] In conversation with industry experts
[62] In conversation with industry experts
[63] In conversation with industry experts

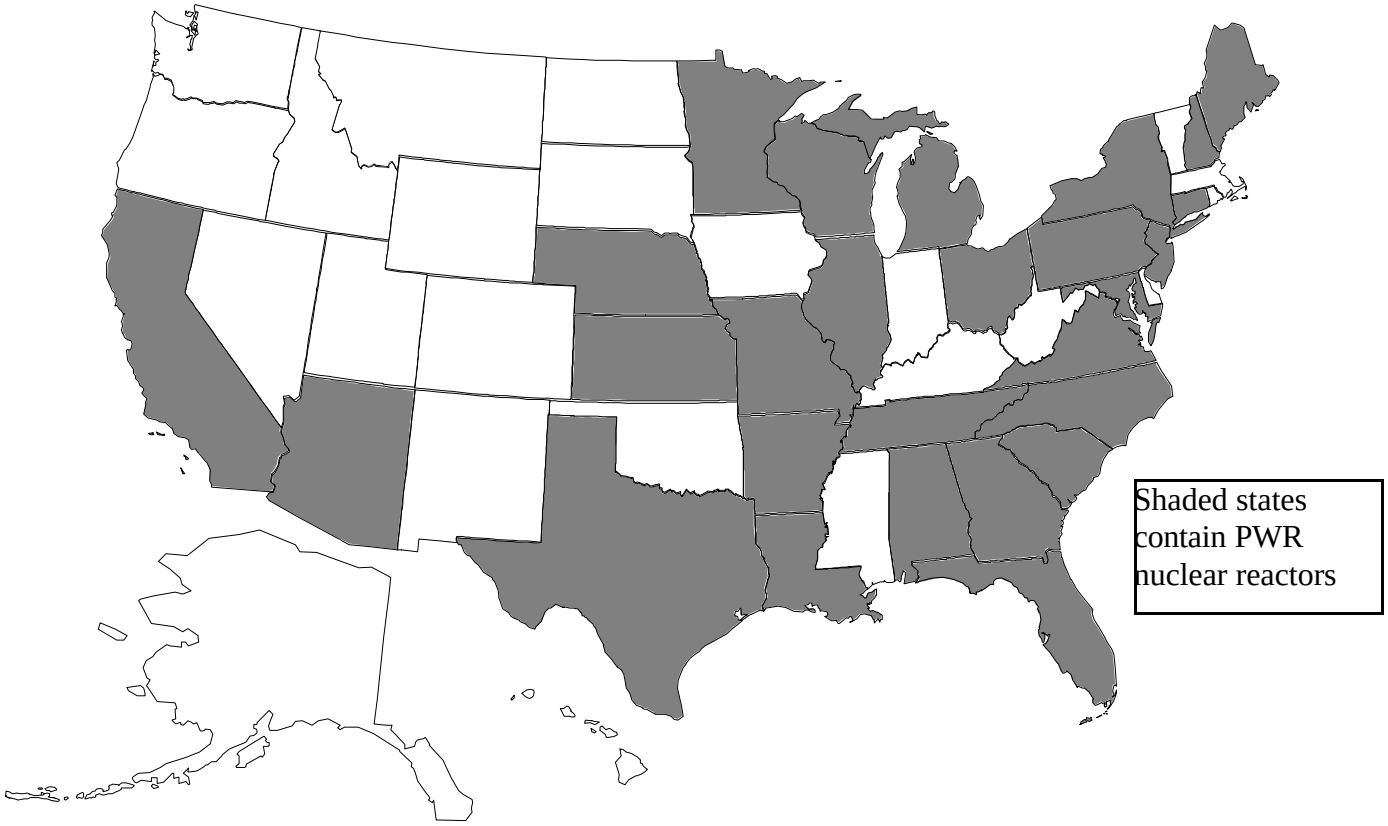
Exhibit 3 – U.S. Pressurized Water Reactor Power Plants in 1998		
Utility Owner	**Power Plant**	**Location**
Alabama Power	**Farley 1**	**Alabama**
	Farley 2	**Alabama**
Arizona PSC	**Palo Verde 1**	**Arizona**
	Palo Verde 2	**Arizona**
	Palo Verde 3	**Arizona**
Baltimore G&E	**Calvert Cliffs 1**	**Maryland**
	Calvert Cliffs 2	**Maryland**
Carolina Power	**Robinson**	**S. Carolina**
	Shearon Harris	**N. Carolina**
Commonwealth Edison	**Braidwood 1**	**Illinois**
	Braidwood 2	**Illinois**
	Byron 1	**Illinois**
	Byron 2	**Illinois**
Consolidated Edison	**Indian Point 2**	**New York**
Consumers Energy	**Palisades**	**Michigan**
Duke Power	**Catawba 1**	**Piedmont Carolinas**
	Catawba 2	**Piedmont Carolinas**
	McGuire 1	**Piedmont Carolinas**
	McGuire 2	**Piedmont Carolinas**
	Oconee 1	**S. Carolina**
	Oconee 2	**S. Carolina**
	Oconee 3	**S. Carolina**
Duquense	**Beaver Valley 1**	**Pennsylvania**
	Beaver Valley 2	**Pennsylvania**
Entergy	**Ano 2**	**Arkansas**
	Ano1	**Arkansas**
	Waterford 3	**Louisiana**
Florida P&L	**St Lucie 1**	**Florida**
	St Lucie 2	**Florida**

	Turkey Point 3	**Florida**
	Turkey Point 4	**Florida**
Florida Power Corp	**Crystal River 3**	**Florida**
General Public Utilities	**TMI 1**	**Pennsylvania**
Georgia Power Co.	Vogtle 1	Georgia
	Vogtle 2	Georgia
Houston Light and Power	South Texas Proj 1	Texas
	South Texas Proj 2	Texas
Indiana Michigan Power Company	Cook 1	Michigan
	Cook 2	Michigan
Maine Yankee AP	Maine Yankee	Maine
New York Power Authority	Indian Point 3	New York
Northeast Utilities	Millstone 2	Connecticut
	Millstone 3	Connecticut
Northern States	Prairie Island 1	Minnesota
	Prairie Island 2	Minnesota
Omaha PPD	Fort Calhoun	Nebraska
PG&E	Diablo Canyon 1	California
	Diablo Canyon 2	California
Public Service Electric	Salem 1	New Jersey
	Salem 2	New Jersey
Public Service of New Hampshire	Seabrook	New Hampshire
Rochester G&E	Ginna	New York
South Carolina E&G	Summer	S. Carolina
Southern California Edison	San Onofre 2	California
	San Onofre 3	California
Texas Utilities Electric	Comanche Peak 1	Texas
	Comanche Peak 2	Texas
Toledo Edison	Davis Besse	Ohio
Tennessee Valley Authority	Sequoyah 1	Tennessee
	Sequoyah 2	Tennessee
	Watts Bar 1	Tennessee
Union Electric	Callaway	Missouri
Virginia Power	North Anna 1	Virginia
	North Anna 2	Virginia
	Surry 1	Virginia
	Surry 2	Virginia

Wisconsin Electric Power	Point Beach 1	Wisconsin
	Point Beach 2	Wisconsin
Wisconsin Public Service	Kewaunee	Wisconsin
Wolf Creek NOC	Wolf Creek	Kansas
Source: EPRI Steam Generator Progress Report Table 2-1; EPRI Steam Generator Reference Book, Appendix B – Plant Design Characteristics		

Note: Maine Yankee has since shut down.

Exhibit 4 - Location of U.S. Pressurized Water Reactors



Source: EPRI Steam Generator Reference Book, Appendix B – Plant Design

Exhibit 5 - Replacement of Nuclear Steam Generators

Age Category	Number of Power Plants	Number of Plants with Replaced Steam Generators	Percentage with Replacements
5-	**1**	**0**	**0.0%**
6 to 10	**3**	**0**	**0.0%**
11 to 15	**21**	**3**	**14.3%**
16-20	**12**	**4**	**33.3%**
21-25	**13**	**6**	**46.2%**
26+	**20**	**9**	**45.0%**
Total	**70**	**22**	**31.4%**
Source: EPRI Steam Generator Progress Report, Tables 2-1 and 9-1			

Exhibit 6 – Committed Orders For Steam Generators by U.S. Power Plants

Power Plant Name	Country of Manufacture	Year of Delivery	Power Plant State	Number of Generators Purchased
Ano 2	Spain	2000	Arkansas	2
Farley 1	Spain	2000	Alabama	3
Kewaunee	Italy	2000	Wisconsin	2
Shearon Harris		2000	North Carolina	2
South Texas Project 1	Spain	2000	Texas	4
Cook 1	Canada	2001	Michigan	4
Farley 2	Spain	2001	Alabama	3
Sequoyah 1	South Korea	2002	Tennessee	4
Calvert Cliffs 1	Canada	2002	Maryland	2
Calvert Cliffs 2	Canada	2003	Maryland	2
Palo Verde 2	Italy	2002	Arizona	2

Source: EPRI, Steam Generator Progress Report, Revision 14, and conversations with industry experts

Exhibit 7 - Average Replacement Cost of a Nuclear Steam Generator

Note: Replacement cost includes the price of a steam generator (about 33 percent of replacement cost) plus installation costs, engineering, licensing, and other costs related to replacement.

Source: EPRI Steam Generator Progress Report, Table 9-1.

APPENDIX D

STATEMENTS SUBMITTED BY OTHER FIRMS/ORGANIZATIONS

[*Note: Appendix D may not be included in the electronic version of this memorandum posted on the Commission's web site if an electronic copy of the statement was not received by the Commission.*]

I

106TH CONGRESS
2D SESSION

H. R. 3875

To suspend temporarily the duty on certain steam or other vapor generating boilers used in nuclear facilities.

IN THE HOUSE OF REPRESENTATIVES

MARCH 9, 2000

Mr. COLLINS (for himself, Mr. TANNER, Mr. HAYWORTH, Mr. LEWIS of Georgia, Mrs. JOHNSON of Connecticut, and Mrs. THURMAN) introduced the following bill; which was referred to the Committee on Ways and Means

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A BILL

To suspend temporarily the duty on certain steam or other vapor generating boilers used in nuclear facilities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SUSPENSION OF DUTY ON CERTAIN STEAM OR OTHER VAPOR GENERATING BOILERS USED IN NUCLEAR FACILITIES.

(a) IN GENERAL.—Subchapter II of chapter 99 of the Harmonized Tariff Schedule of the United States is amended by inserting in numerical sequence the following new subheading:

"	9902.84.02	Watertube boilers with a steam production exceeding 45 t per hour, for use in nuclear facilities (provided for in subheading 8402.11.00)	Free	No change	No change	On or before 12/31/2005	".

(b) EFFECTIVE DATE.—

(1) IN GENERAL.—The amendment made by subsection (a) applies with respect to goods entered, or withdrawn from warehouse for consumption, on or after the 15th day after the date of the enactment of this Act.

(2) APPLICATION TO LIQUIDATIONS OR RELIQUIDATIONS.—Notwithstanding section 514 of the Tariff Act of 1930 or any other provision of law and subject to paragraph (3), any article described in heading 9902.84.02 of the Harmonized Tariff Schedule of the United States (as added by subsection (a)) that was entered, or withdrawn from warehouse for consumption—

(A) on or after January 1, 2000, and

(B) before the date that is 15 days after the date of the enactment of this Act,

shall be liquidated or reliquidated as if such heading 9902.84.02 applied to such entry or withdrawal, and the Secretary of the Treasury shall refund any excess duty paid with respect to such entry.

(3) REQUESTS.—Liquidation or reliquidation may be made under paragraph (2) with respect to any entry only if a request therefor is filed with the Customs Service, within 180 days after the date of the enactment of this Act, that contains sufficient information to enable the Customs Service—

(A) to locate the entry; or

(B) to reconstruct the entry if it cannot be located.

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