NSIC

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555



AUG 8 1980

The Honorable James Weaver
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Weaver:

Thank you for your letter of July 14, 1980, which raised questions with respect to financing guarantees provided to certain NRC licensees. Enclosed are answers to these questions. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

(Signed) E. Kevin Cornell

William J. Dircks
Acting Executive Director
for Operations

Enclosure:
Response to Questions

Question 1: Do any other NRC licensees (OL or CP) benefit from similar financing guarantees by a federal government agency?

Answer:

We know of no other situation whereby a federal government agency provides a carte blanche guarantee to another entity regarding its nuclear plant construction costs, financing costs or operating costs. The Tennessee Valley Authority does guarantee its own debt obligations and the Rural Electrification Administration guarantees most long-term debt repayment of cooperatives. These latter arrangements are not analogous, however, to the BPA-WPPSS relationship.

Question 2: Do any other NRC licensees (OL or CP) benefit from similar financing guarantees by state or other government agency?

Answer

Approximately 80 percent of all U.S. nuclear units (reactors) in the design, construction or operating state are jointly owned by two or more utilities. In most, if not all of these cases, the minority applicant(s)/licensee(s) are contractually responsible to the lead applicant/licensee and to each other to pay their pro-rata shares of all design, construction and operation costs including all escalated costs due to inflation and plant delays. Most, if not all of these contracts also provide that all such costs shall be paid regardless of whether or not the plant is operable. In this respect the lead and minority applicants/licensees are in somewhat analogous positions to WPPSS/BPA. However, such minority applicants and licensees generally participate to some degree in decisions affecting the costs of design, construction and operation of the plant. Minority owners of U.S. nuclear units include investor-owned utilities, municipals, state agencies and rural electric cooperatives.

In addition to WPPSS, five publically-owned nuclear plant licensees guarantee repayment of principal and interest on their debt used to finance nuclear facilities primarily by pledging the revenues from their electric operations. Such debt is not a general obligation of the utility or the parent government, nor does the respective state or municipal government guarantee repayment of the debt. The five publically-owned licensees are South Carolina Public Service Authority which is 33% owner of Summer Unit 1; Sacramento Muncipal Utility District, sole owner of Rancho Seco Units 1 and 2; Nebraska Public Power District, sole owner of Cooper; Power Authority of the State of New York, sole owner of Fitzpatrick and Indian Point Unit 3; and Omaha Public Power District, sole owner of Fort Calhoun.

Question 3: Are any plants licensed by the NRC (OL or CP) a part of a multi-plant consortium that spreads the benefits and risks of the several plants among all utility members of the consortium, even though each utility-member may not directly own a part of each plant?

Answer:

Utility members of a consortium (e.g., the Yankee nuclear plants) or of other joint ownership arrangements share the risks and benefits of the plant in the same ratio as their ownership shares in the facility. The members also share in all costs of design, construction and operation in this same ownership ratio. We know of no deviations from this pattern among NRC applicants and licensees.

Question 4: What other institutional arrangements are utilized by NRC licensees that might have the same effect of guaranteeing the financing of a power plant as does the WPPSS-BPA arrangement?

Answer:

We know of no arrangement among NRC applicants and licensees similar to the WPPSS-BPA arrangement.

Question 5: Finally and most importantly, in each of the above categories, what has been the history of cost escalation and schedule delays?

Answer:

There are not many direct comparisons which can be made between the WPPSS/BPA arrangement and other nuclear power plants. The enclosed tables show the cost or expected cost, of early 1980, of all nuclear plants under construction and operating. Costs of the WPPSS plants are among the highest, although other plants particularly in the northeastern U.S. also are high cost. Schedule delays on nuclear power plant construction have been common in recent years regardless of the details of the particular plant's financial arrangements.

TABLE XII

GENERATING COST FOR NUCLEAR PLANTS

Plants which are under construction, which have not applied for an operating license.

| Plant | Applicant | Net Electrical Capacity (MWe) | Estimated Commercial Operation | SUMMARY - GENERATING COST* mills/kWh Capital Cost ($/kW) | Fixed Cost | O&M | Fuel | Total |
|---|---|---|---|---|---|---|---|---|
| Palo Verde 1, 2 & 3 | Arizona Public Service Company | 3810 | 83, 84 & 86 | 644 | 19.2 | 2.3 | 11.0 | 32.5 |
| Perry 1 & 2 | Cleveland Electric Illuminating | 2[illegible] | 83 & 84 | 1052 | 31.4 | 2.2 | 10.8 | 44.4 |
| Harris 1, 2, 3 & 4 | Carolina Power & Light Company | 3060 | 84, 86, 90 & 88 | 1150 | 34.3 | 2.3 | 11.6 | 48.2 |
| Cherokee 1, 2 & 3 | Duke Power Company | 3840 | 85, 87 & 89 | 943 | 28.1 | 2.6 | 12.8 | 43.5 |
| Catawba 1 & 2 | Duke Power Company | 2290 | 83 & 84 | 659 | 19.7 | 2.2 | 10.9 | 32.8 |
| Beaver Valley 2 | Duquesne Light Company | 833 | 84 | 1698 | 50.7 | 2.3 | 11.0 | 64.0 |
| St. Lucie 2 | Florida Power & Light Company | 810 | 83 | 1135 | 33.8 | 2.2 | 10.5 | 46.5 |
| Vogtle 1 & 2 | Georgia Power Company | 2220 | 84 & 85 | 1299 | 38.7 | 2.5 | 11.0 | 52.2 |
| River Bend 1 & 2 | Gulf States Utilities | 1868 | 86 & 88 | 1092 | 32.6 | 2.6 | 12.6 | 47.8 |
| Clinton 1 & 2 | Illinois Power Company | 1866 | 82 & 88 | 1262 | 37.7 | 2.4 | 11.6 | 51.7 |
| Forked River 1 | Jersey Central Power & Light Company | 1070 | 83 | 1075 | 32.1 | 2.2 | 10.5 | 44.8 |
| Wolf Creek | Kansas City Power & Light | 1150 | 83 | 895 | 26.7 | 2.2 | 10.5 | 39.4 |
| Callaway 1 & 2 | Union Electric | 2240 | 82 & 87 | 1083 | 32.3 | 2.3 | 11.3 | 45.9 |
| Marble Hill 1 & 2 | Public Service of Indiana | 2260 | 82 & 84 | 800 | 23.9 | 2.2 | 10.5 | 36.5 |
| Nine Mile Point 2 | Niagara Mohawk Power Company | 1099 | 84 | 1776 | 53.0 | 2.3 | 11.0 | 66.3 |
| Millstone 3 | Northeast Nuclear Energy Company | 1156 | 86 | 1712 | 51.1 | 2.5 | 12.1 | 65.7 |
| Bailly Station | Northern Indiana Public Service Co. | 660 | 84 | 1320 | 39.4 | 2.3 | 11.0 | 52.6 |
| Phipps Bend 1 & 2 | Tennessee Valley Authority | 2466 | 84 & 85 | 1168 | 34.9 | 2.3 | 11.3 | 48.5 |
| Limerick 1 & 2 | Philadelphia Electric Company | 2110 | 83 & 85 | 1234 | 36.9 | 2.3 | 11.0 | 50.2 |
| Seabrook 1 & 2 | Public Service Co. of N. H. | 2400 | 83 & 85 | 1075 | 32.0 | 2.4 | 11.0 | 45.4 |
| Hope Creek 1 & 2 | Public Service Electric & Gas Co. | 2134 | 84 & 86 | 1680 | 50.2 | 2.4 | 11.6 | 64.2 |
| Sterling 1 | Rochester Gas & Electric Corporation | 1150 | 88 | 1496 | 44.5 | 2.7 | 13.1 | 60.3 |
| WPPSS-1 | Washington Public Power Supply System | 1218 | 83 | 1736 | 51.8 | 2.2 | 10.5 | 64.5 |
| WPPSS-3 | Washington Public Power Supply System | 1240 | 85 | 1758 | 52.5 | 2.5 | 11.5 | 66.5 |
| WPPSS-4 | Washington Public Power Supply System | 1218 | 85 | 1890 | 56.4 | 2.5 | 11.5 | 70.4 |
| WPPSS-5 | Washington Public Power Supply System | 1240 | 86 | 2010 | 60.0 | 2.5 | 12.1 | 74.6 |
| Yellow Creek 1 & 2 | Tennessee Valley Authority | 2570 | 85 & 88 | 1125 | 33.5 | 2.7 | 13.1 | 49.3 |
| Hartsville 1, 2, 3 & 4 | Tennessee Valley Authority | 4932 | 86, 87, 89 & 90 | 1150 | 34.3 | 2.7 | 12.6 | 49.6 |
| North Anna 3 & 4 | Virginia Electric & Power Co. | 1814 | 86 & 87 | 1315 | 39.3 | 2.5 | 12.1 | 53.9 |

*Single-unit costs are in year of initial commercial operation, multi-unit costs are averaged. Capital cost data are from U. S. Department of Energy form HQ-254, October 1979, other costs are based on NUREG-0480.

Plants which are under construction and have an operating license pending.

| Plant | Applicant | Net Electrical Capacity (MWe) | Estimated Commercial Operation | SUMMARY - GENERATING COST* mills/kWh Capital Cost ($/kW) | Fixed Cost | O&M | Fuel | Total |
|---|---|---|---|---|---|---|---|---|
| Farley 2 | Alabama Power Company | 829 | 80 | 825 | 24.5 | 1.9 | 9.1 | 35.6 |
| Comanche Peak 1 & 2 | Texas Utilities Generating Co. | 2222 | 81, 83 | 765 | 22.8 | 2.0 | 10.0 | 34.9 |
| Zimmer 1 | Cincinnati Gas & Electric Co. | 810 | 80 | 1049 | 31.4 | 1.9 | 9.1 | 42.4 |
| Bellefonte 1 & 2 | Tennessee Valley Authority | 2426 | 83 & 84 | 825 | 24.6 | 2.2 | 10.5 | 37.3 |
| LaSalle 1 & 2 | Commonwealth Edison Co. | 2156 | 80 & 81 | 764 | 22.8 | 1.9 | 9.1 | 33.8 |
| Midland 1 & 2 | Consumers Power Co.[1] | 1310 | 82 & 82 | 1314 | 39.2 | 2.1 | 10.0 | 51.2 |
| Fermi 2 | Detroit Edison Co. | 1093 | 82 | 890 | 26.6 | 2.1 | 10.0 | 29.7 |
| McGuire 1 & 2 | Duke Power Company | 2360 | 80 & 82 | 538 | 16.1 | 2.0 | 9.5 | 25.1 |
| South Texas 1 & 2 | Houston Power & Light Company | 2500 | 82 & 83 | 967 | 28.8 | 2.1 | 10.3 | 41.2 |
| Susquehanna 1 & 2 | Pennsylvania Power Company | 2100 | 81 & 82 | 1280 | 38.3 | 2.0 | 9.8 | 50.1 |
| Grand Gulf 1 & 2 | Mississippi Power & Light Co. | 2500 | 81 & 84 | 832 | 25.4 | 2.1 | 10.3 | 37.8 |
| Byron 1 & 2 | Commonwealth Edison Company | 2240 | 81 & 82 | 812 | 24.2 | 2.0 | 9.8 | 36.0 |
| Braidwood 1 & 2 | Commonwealth Edison Company | 2240 | 81 & 82 | 746 | 22.3 | 2.0 | 9.8 | 34.0 |
| Waterford 3 | Louisiana Power & Light Company | 1113 | 81 | 1104 | 33.0 | 2.0 | 9.5 | 44.5 |
| Diablo Canyon 1 & 2 | Pacific Gas & Electric Company[2] | 2190 | 80 & 81 | 731 | 21.8 | 2.0 | 9.1 | 32.9 |
| Salem Station 2 | Public Service Electric & Gas Co. | 1115 | 80 | 1517 | 45.2 | 1.9 | 9.1 | 56.3 |
| San Onofre 2 | Southern California Edison | 1110 | 81 | 1200 | 35.8 | 2.0 | 9.5 | 47.3 |
| San Onofre 3 | Southern California Edison | 1110 | 83 | 981 | 29.3 | 2.2 | 10.5 | 41.9 |
| Summer 1 | South Carolina Electric & Gas Co. | 900 | 80 | 840 | 25.0 | 1.9 | 9.1 | 36.0 |
| Shoreham | Long Island Lighting Company | 819 | 80 | 1930 | 57.6 | 1.9 | 9.1 | 68.7 |
| Sequoyah 1 & 2 | Tennessee Valley Authority | 2296 | 80 & 82 | 621 | 18.6 | 2.0 | 9.8 | 30.4 |
| Watts Bar 1 & 2 | Tennessee Valley Authority | 2354 | 81, 82 | 611 | 18.2 | 2.0 | 9.1 | 29.3 |
| North Anna 2 | Virginia Electric & Power Company | 907 | 80 | 513 | 15.4 | 1.9 | 9.1 | 26.4 |
| WPPSS-2 | Washington Public Power Supply System | 1093 | 82 | 1608 | 48.0 | 1.9 | 9.1 | 59.0 |

*Single-unit costs are in year of initial commercial operation, multi-unit costs are averaged. Capital cost data are from U. S. Department of Energy form HQ-254, October 1979, other costs are based on NUREG-0480.

[1]Unit 1 (1084), Unit 2 (1106)

[2]Unit 1 (492), Unit 2 (818)

Plants with applications for CP pending.

SUMMARY - GENERATING COST*
mills/kWh

| Plant | Applicant | Net Electrical Capacity (MWe) | Estimated Commercial Operation | Capital Cost ($/kW) | Fixed Cost | O&M | Fuel | Total |
|---|---|---|---|---|---|---|---|---|
| Pilgrim 2 | Boston Edison Company | 1150 | 85 | 1648 | 49.2 | 2.4 | 11.6 | 63.1 |
| Perkins 1, 2 & 3 | Duke Power Company | 3840 | 88, 91 & 93 | 1253 | 37.3 | 3.2 | 15.4 | 55.9 |
| Allens Creek 1 | Houston Lighting & Power Company | 1150 | 85 | 1015 | 30.8 | 2.4 | 11.6 | 44.7 |
| Jamesport 1 | Long Island Lighting Company | 1150 | 89 | 1622 | 48.5 | 2.8 | 13.9 | 65.0 |
| Jamesport 2 | Long Island Lighting Company | 1150 | 91 | 1622 | 48.5 | 3.0 | 15.2 | 66.7 |
| Erie 1 & 2 | Ohio Edison Company | 2534 | 86 & 88 | 1169 | 35.1 | 2.6 | 12.8 | 50.5 |
| Pebble Springs 1 | Portland General Electric Company | 1260 | 87 | 1034 | 30.8 | 2.6 | 12.8 | 46.2 |
| Pebble Springs 2 | Portland General Electric Company | 1260 | 89 | 982 | 29.3 | 2.4 | 14.0 | 45.7 |
| Black Fox 1 & 2 | Public Service Co. of Oklahoma | 2300 | 84 & 86 | 1038 | 30.9 | 2.4 | 11.6 | 44.9 |
| Skagit 1 & 3 | Puget Sound Power & Light Co. | 2554 | 86 & 88 | 1498 | 44.8 | 2.6 | 12.8 | 60.1 |
| Davis-Besse 2 & 3 | Toledo Edison Company | 1812 | 85 & 87 | 1363 | 40.7 | 2.5 | 12.1 | 55.3 |

*Single-unit costs are in year of initial commercial operation, multi-unit costs are averaged. Capital cost data are from U. S. Department of Energy form HQ-254, October 1979, other costs are based on NUREG-0480.

(Tables completed 1st quarter 1980)

Plants which have an operating license.

SUMMARY - GENERATING COSTS
mills/kWh 1978

| | Licensee | Year Commercial Operation | Capital* Cost ($/kW) | Fuel** | Total |
|---|---|---|---|---|---|
| Farley 1 | Alabama Power | 77 | 643 | 4 | 20[2] |
| Arkansas 1 & 2 | Arkansas Power & Light Company | 74 & 78 | 296, 570 | 3 | 15 |
| Calvert Cliffs 1 & 2 | Baltimore Gas & Electric Company | 74 & 76 | 356 | 4 | 14[2] |
| Pilgrim 1 | Boston Edison Company | 72 | 384 | 3 | 19 |
| Brunswick 1 & 2 and H. B. Robinson 2 | Carolina Power and Light | 76, 74, 70 | 436, 493<br>128 | 4 | 19 |
| Dresden 2 & 3, Quad Cities 1 & 2 and Zion 1 & 2 | Commonwealth Edison Company | 69, 71, 72, 73 | 142, 142, 157<br>157, 278<br>278 | 3 | 13 |
| Connecticut Yankee | Connecticut Yankee Atomic Power Co. | 61 | 204 | 3 | 14 |
| Indian Point 2 | Consolidated Edison Company | 73 | 243 | 5 | 24 |
| Palisades | Consumer Power Company | 72 | 249 | 4 | 19[2] |
| Oconee 1, 2 & 3 | Duke Power Company | 73, 73, 74 | 190 | 4 | 12 |
| Beaver Valley 1 | Duquesne | 76 | | 4 | 36[2] |
| Crystal River 3 | Florida Power Corporation | 77 | 509 | 6 | 26[2] |
| St. Lucie 1 and Turkey Point 3 & 4 | Florida Power and Light Company | 76, 73 | 617, 192 | 2 | 12[2] |
| Edwin I. Hatch 1 & 2 | Georgia Power Company | 74, 78 | 467, 692 | 3[1] | 20[2] |
| D. C. Cook 1 & 2 | Indiana and Michigan Electric Co. | 74, 78 | 519, 453 | 3[1] | 18[2] |
| Duane Arnold | Iowa Electric Light and Power | 74 | 559 | 3[1] | 25[2] |
| Oyster Creek 1 | Jersey Central Power & Light Co. | 69 | 173 | 3 | 19 |
| Maine Yankee | Maine Yankee Atomic Power Company | 73 | 308 | 3 | 13 |
| Three Mile Island 1 & 2 | Metropolitan Edison Company | 74, 78 | 488, 691 | 2 | 19 |
| Cooper Station | Nebraska Public Power District | 74 | 352 | 2 | 11 |
| Nine Mile Point 1 | Niagara Mohawk Power Corporation | 74 | 308 | 6 | 17 |
| Millstone 1 & 2 | Northeast Nuclear Energy Company | 70, 75 | 193, 564 | 3 | 16 |

Plants which have an operating license (cont'd)

SUMMARY - GENERATING COSTS
mills/kWh 1978

| | Licensee | Year Commercial Operation | Capital* Cost ($/kW) | Fuel** | Total |
|---|---|---|---|---|---|
| Monticello, Prairie Island 1 & 2 | Northern States Power Company | 71, 74 | 223, 405 | 3 | 12 |
| Ft. Calhoun | Omaha Public Power District | 73 | 404 | 2 | 9 |
| Peach Bottom 2 & 3 | Philadelphia Electric Company | 74 | 380 | 3 | 21 |
| Trojan | Portland General Electric Company | 75 | 427 | 3 | 16 |
| FitzPatrick, Indian Point 3 | Power Authority of the State of NY | 74 | 367, 408 | 3 | 16[2] |
| Fort St. Vrain | Public Service Co. of Colorado | 73 | 694[3] | 3[1] | --[3] |
| Salem 1 | Public Service Electric & Gas Company | 76 | 626 | 3[1] | 29[2] |
| R. E. Ginna 1 | Rochester Gas & Electric Co. | 69 | 243 | 5 | 15 |
| Rancho Seco | Sacramento Municipal Utility District | 74 | 366 | 3 | 11 |
| San Onofre 1 | Southern California Edison Company | 67 | 373 | 4 | 15[2] |
| Browns Ferry 1, 2 & 3 | Tennessee Valley Authority | 73, 74, 76 | 259, 259, 279 | 3 | 13[2] |
| Davis-Besse 1 | Toledo Edison Company | 77 | 588 | 3 | 35[2] |
| Vermont Yankee | Vermont Yankee Nuclear Power Corp. | 73 | 359 | 4 | 19 |
| Surry 1 & 2, North Anna 1 & 2 | Virginia Electric & Power Co. | 72, 73, 77, 78 | 266, 266, 865, 865 | 5 | 19 |
| Point Beach 1 & 2 | Wisconsin Michigan Electric Co. | 70, 73 | 171 | 4 | 8 |
| Kewaunee | Wisconsin Public Service Corp. | 73 | 385 | 4 | 17 |

[1]Fuel costs not given, average of all reported costs used.

[2]Calculated by staff using cumulative capacity factors from "Grey Book," 15% fixed charge rate, and O&M costs of 2 mills/kWh.

[3]HTGR is in R&D stage.

*U.S. Department of Energy, Energy Information Administration, Steam-Electric Plant Construction Cost and Annual Production Expenses, August 1978.

**Atomic Industrial Forum, April 20, 1978.

4TH DISTRICT, OREGON

COMMITTEES:
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# Congress of the United States

## House of Representatives

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July 14, 1980

Mr. John Ahern, Chairman
Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D. C. 20006

Dear Mr. Chairman:

As you know, the Commission on June 17, 1980 issued an Escalated Enforcement Act in the form of a $61,000 penalty to the Washington Public Power Supply System (WPPSS) for its WNP-2 project. In addition to specific items of non-compliance regarding the sacrificial shield wall and pipe width restraints, the Notice of Violation sited other shortcomings on the part of WPPSS relating to quality assurance and inspection procedures.

The WPPSS enjoys a most unusual financing arrangement for WNP-2 (and WNP 1 and 3). The Bonneville Power Administration (of the U. S. Department of Energy) has "purchased the total capability of the Project...from the supply system. Bonneville is obligated to pay...the total annual costs of the Project, including debt service on the Bond, whether or not the Project is completed, operable or operating and notwithstanding the suspension, reduction or curtailment of the Project output (Bond Statement for WPPSS Nuclear Project #2, 11-1-79)." In other words, WPPSS has no financial liability for the project's costs or schedule. This BPA-WPPSS relationship has been examined by several management consultants. Some have criticized the arrangement as exacerbating the management problems at WPPSS; Mr. Eugene Akridge of Theodore Barry and Associates said in congressional testimony (2/79) that "(t)here is no question but that (the financing guarantee) removes certain management tensions that typically build up in an organization." Thus, the management problems at WPPSS that the NRC is concerned with may be linked to this arrangement.

While I would be very interested in your thoughts on that question, I would like instead to ask a similar series of questions. The schedule delays and cost overruns at WPPSS have been unusually high, even for an industry plagued with such problems. I am curious as to the correlation between such problems in the rest of the nuclear industry and any financial arrangements similar to those of WPPSS.

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1) Do any other NRC licensees (OL or CP) benefit from similar financing guarantees by a federal government agency?

2) Do any other NRC licensees (OL or CP) benefit from similar financing guarantees by state or other government agency?

3) Are any plants licensed by the NRC (OL or CP) a part of a multi-plant consortium that spreads the benefits and risks of the several plants among all utility members of the consortium, even though each utility-member may not directly own a part of each plant?

4) What other institutional arrangements are utilized by NRC licensees that might have the same effect of guaranteeing the financing of a power plant as does the WPPSS-BPA arrangement?

5) Finally and most importantly. in each of the above categories, what has been the history of cc t escalation and schedule delays?

Because the House of Representatives is now considering legislation that would extend the BPA-WPPSS type of relationship to new thermal facilities, a prompt reply to this request would be greatly appreciated. If you need clarification of this request, please contact Mark Reis of my staff at 225-6416.

Sincerely,

Jim Weaver

JIM WEAVER
Member of Congress

JW/mro