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July 25, 1985

Mr. John Stolz, Chief
Operating Reactors Branch No. 4
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Peach Bottom Atomic Power Station, Units 2 & 3
Docket Nos. 50-277 and 50-278
Energy Absorbers as Replacement of Snubbers
for Seismic Support of Nuclear Piping Systems

Dear Mr. Stolz:

To support nuclear piping systems for the effects of earthquake and other dynamic-type loads, hydraulic or mechanical snubbers are used at locations where thermal expansion considerations preclude the use of rigid-type supports. Because of the complex nature of snubber mechanisms, Inservice inspection and functional testing requirements, and extensive preventative maintenance programs are necessary to assure reliable snubber performance and satisfy technical specification operability requirements. Because these requirements typically result in personnel radiation exposure and increased unit outage time for testing and maintenance, Philadelphia Electric Company has evaluated the use of energy absorbers, a recently developed support concept, to reduce the use of snubbers at Peach Bottom Units 2 and 3. Energy absorbers may also be used to reduce loads on piping support and equipment nozzles.

A presentation of the development work done on energy absorbers was made by Bechtel Power Corporation and Bechtel International Corporation (Bechtel) to members of your staff on April 3, 1984. Another presentation on the proposed application of energy absorbers at Peach Bottom was made on May 30, 1985, and was attended by R. Bosnak, H. Shaw, F. Cherny, D. Terao and G. Gears of the NRC. At the May 30 meeting, the NRC technical staff requested submittal of certain technical information for their review. This information is contained in Enclosures 1 and 2.

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4 Non Prop Encl 1 & 2

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Enclosure 2 entitled "Technical Basis for Energy Absorbers as Supports of Nuclear Power Plant Piping Systems" contains information pertinent to the development and application aspects of Bechtel's energy absorbers. We have been advised that Enclosure 2 contains information which Bechtel considers to include trade secrets or privileged information. Accordingly, it is hereby requested that Enclosure 2 be withheld from public disclosure in accordance with Section 2.790 of the Commission's regulations. The affidavit of Alan M. Dachs, Vice President, Bechtel International Corporation, which sets forth the grounds in support of this request for non-disclosure is attached hereto. A non-proprietary version consisting of Sections 1-3, and Section 9 of Enclosure 2 is also enclosed.

Philadelphia Electric Company (PECo) proposes to install energy absorbers in place of certain snubbers at the Peach Bottom Atomic Power Station Units 2 & 3. Enclosure 1 describes the results of an analysis of a sample application of energy absorbers on a portion of Residual Heat Removal (RHR) system piping, designated "RHR line P-10-3".

Energy absorbers are simple, flexible supports made of ductile steel plates which are shaped to attain desired energy absorption characteristics. They contain no activation or trigger mechanisms. Use of energy absorbers as supports of piping systems for earthquakes or other dynamic loads introduces significant additional damping. Energy absorbers act as flexible-type supports with a finite stiffness under thermal expansion and control dynamic displacement by imparting large amounts of damping to the piping system as the energy absorbing plates undergo controlled yielding. The specific shape of the plates results in a well defined yielding action and hysteresis characteristics. These well-defined characteristics stem from established, proven, fundamental physical laws. ASME Section III Code Case N-420 provides Construction Rules for energy absorbers. The performance of energy absorbers can be accurately predicted and is repeatable. Their utilization is, therefore expected to result in increased piping system reliability and flexibility when compared to a system with snubbers installed.

Experimental testing of basic energy absorber concepts, including results from shaker table tests is summarized in Enclosure 2. These tests were performed at the Richmond Earthquake Engineering Research Facility of the University of California, Berkeley, under various DOE and EPRI programs with participation and consultation by Bechtel. These experimental tests have demonstrated the feasibility of energy absorbers for piping systems for dynamic conditions. Based on the initial success of these experiments, Bechtel has undertaken an extensive energy absorber development program, which includes theoretical and analytical studies, energy absorber design, fatigue testing, and application evaluations. The results to date are also summarized in Enclosure 2.

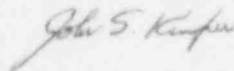
Philadelphia electric Company proposes to eliminate snubbers and use energy absorbers at Peach Bottom Units 2 & 3 at locations where the piping configuration and analysis indicate that such replacement is acceptable. The energy absorbers may also be installed to reduce pipe support or equipment nozzle loads. As discussed in the meeting on May 30, 1985, installation of energy absorbers will involve the following:

1. Analysis of the piping containing the energy absorber using the Bechtel ME101 computer program which has been modified and verified for energy absorbers (See Section 7 of Enclosure 2). Unique modal damping values will be calculated and used in the piping analysis. The analytical basis of these damping ratios and their correlations to test results are provided in Enclosure 2. These damping ratios will in some cases exceed the generic system damping ratios used in the original design of the plant.
2. Installation will be accomplished using procedures and quality control/assurance surveillance similar to those in effect for installation of safety related pipe supports.
3. Inservice inspection of the energy absorbers will be conducted in accordance with existing the ISI Program Plan for pipe support components such as spring hangers and rigid supports.

It is intended to install the energy absorbers under the provisions of 10CFR50.59(a). We are in the process of investigating specific applications which will be given the necessary review and evaluations to determine if an unreviewed safety question exists. Based upon our review of the information provided by Bechtel, we do not anticipate that any of these installations will involve an unreviewed safety question. We will keep you advised of our plans to install the initial energy absorber(s) and any resulting FSAR changes will be submitted as part of the annual FSAR update.

Should you or the staff require additional information, please do not hesitate to contact us.

Sincerely,



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Enclosure (4 copies proprietary reports and 4 copies non-proprietary reports).

AFFIDAVIT

STATE OF CALIFORNIA

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CITY AND COUNTY OF SAN FRANCISCO

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ss.

Alan M. Dachs, being first duly sworn, says:

1. I am a Vice President of Bechtel International Corporation. Bechtel International Corporation is the owner of information contained in a document entitled "Technical Bases for Energy Absorbers as Supports of Nuclear Power Plant Piping Systems" dated January 1985, prepared by M. Z. Khlafallah and Hong Ming Lee, hereinafter referred to as "Technical Bases for Energy Absorbers", which Bechtel International Corporation seeks to have withheld from public disclosure.

2. I am making this Affidavit pursuant to the provisions of the Nuclear Regulatory Commission's rules and regulations, including 10 CFR 2.790, and in conjunction with Bechtel Power Corporation's application for withholding.

3. I have personal knowledge of the criteria and procedures utilized by Bechtel International Corporation in determining and designating information as a trade secret or privileged or confidential commercial or financial information.

Under that system, information is customarily designated confidential and held in confidence if the release of that information might result in the loss of an existing or potential competitive advantage. Information which falls in one or more of the following categories is designated confidential:

- a. Information which reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by a competitor without license from Bechtel International Corporation constitutes a competitive economic advantage over other companies.
- b. Information in the form of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- c. Information which, if available to a competitor would reduce his expenditure of resources or

improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

- d. Information concerning cost or price, production capacities, budget levels, or commercial strategies of Bechtel International Corporation, its customers or suppliers.
- e. Information which reveals aspects of past, present, or future Bechtel International Corporation or customer funded development plans and programs of potential commercial value to Bechtel International Corporation.
- f. Information which contains patentable ideas or for which patent protection may be desirable.
- g. Information relating to an invention.

4. The document "Technical Bases for Energy Absorbers" is marked "TRADE SECRET - CONFIDENTIAL COMMERCIAL INFORMATION" and is transmitted to the Nuclear Regulatory Commission in confidence.

5. The document "Technical Bases for Energy Absorbers" contains confidential commercial information relating to an invention conceived and developed by Bechtel International Corporation through the expenditure of substantial amounts of effort and money.

6. The document "Technical Bases for Energy Absorbers", as well as the invention which it describes, has been held in confidence by Bechtel International Corporation and has been disclosed only after each proposed recipient of the information has executed an appropriate agreement.

7. The information contained in the document "Technical Bases for Energy Absorbers" is not available in public sources and, assuming Bechtel International Corporation's application for a patent is granted by the U.S. Patent Office, that information could not be properly acquired or duplicated by others without a license from Bechtel International Corporation. Even if a patent is not granted, the information could not be properly acquired from Bechtel International Corporation without a license from Bechtel International Corporation and the information could not be otherwise duplicated by others without a substantial investment of effort and money by them.

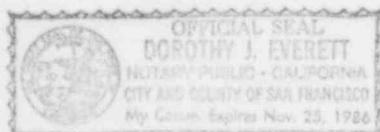
8. Because of both the substantial investment of effort and money by Bechtel International Corporation in conceiving and developing the invention described in the document "Technical

Bases for Energy Absorbers" and Bechtel International Corporation's expectation that this invention will substantially enhance its competitive position in the nuclear industry, Bechtel International Corporation has a rational basis for holding this information in confidence.

Alan M. Dachs

Alan M. Dachs

Subscribed and sworn to before me this 21st day of January, 1985.



Dorothy J. Everett

Dorothy J. Everett

Notary Public

My Commissions expires: 11/25/86