Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

January 23, 1970

Regulatory File Cy

Dr. P. A. Morris, Director
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, DC 20545

Re: Docket 50-155
DPR-6 ZEK

Dear Dr. Morris: Attention: Mr. D. J Skovholt

In an informational letter to you dated January 14, 1969, we informed you of our intention to install a control rod drive support structure in the Big Rock Point Nuclear Plant. The design and procurement of materials for the structure have progressed to the point that we now are planning to install it during the forthcoming Big Rock Point Plant refueling outage, scheduled for February 1970. It is the purpose of this letter to apprise you of the upcoming scheduled installation of the structure, to inform you of a design change and to discuss a few points concerning testing and surveillance raised by your staff.

First, because of a design change involving the characteristics of the Belleville washers, the original load-deflection calculations were redone. This necessitated a change in our original letter. On Page 4, Line 11 of the first paragraph of Stress Analysis, starting with the word "Considering," the remainder of the paragraph should read, with changes underlined:

"Considering that the control rod drive housing will travel about 0.26 inches downward before encountering the resisting support assembly, and, also considering that the support assembly will offer a resistance at each corner column of 18,100 lbs. per inch of downward travel, calculations reveal that a downward travel of 2.84 inches at the corner column will result for the case where the failed assembly is nearest that corner column. With a corresponding dynamic load factor of 2.25, this will result in a maximum dynamic load of 88.2 kips and a total downward movement of 2.37 inches for the control rod at the location of the control rod. For the case where the failed assembly is near the center of the support grid, the deflection will be 1.30 inches under the failed assembly and at each corner column, and a total downward movement of 1.56 inches for the control rod. With

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a corresponding dynamic load factor of 2.41, this will result in a maximum dynamic load of 94.5 kips at the location of the control rod."

Attached is a load-deflection curve for the Belleville washer shock absorber assembly.

A question was raised by your staff concerning static load-deflection curves on the Belleville washer shock absorber assembly and the repeatability of such tests. The supplier of the Belleville washers informs us that in their experience, stacks of Belleville washers constitute a relatively simple system, readily amenable to calculation as to their static load-deflection characteristics. In their judgment, such a test is generally unnecessary. In this specific case where there is a "one-time" loading design criterion, it is felt to surely be unnecessary.

Another question was raised relative to our planned surveillance program on the control rod drive support structure. Bechtel Corporation is our architect-engineer-constructor on this project. Both their Quality Control Department and Consumers Power's responsible project engineer closely followed the fabrication of the support assembly to provide assurance that the assembly conformed to specifications. This surveillance will continue through the construction and final check-out phases. Before the initial plant start-up with this structure installed, cold and hot clearances between the control rod housing and the supporting piece will be checked to assure proper relationships of the components. Thereafter, whenever work is performed on control rod drives necessitating removal of the supporting piece, cold clearances will be checked before returning to power. At each refueling outage, a general visual inspection of the whole control rod support structure will be made. Special attention will be paid to the clearances.

All of these checks and inspections will be described in a written plant operating procedure. Since this structure is located in a high-radiation area, the inspections and checks will be designed to minimize personnel radiation exposure.

In conclusion, we believe that the control rod drive support structure is designed to prevent the ejection of a control rod drive in the unlikely event of a thimble failure. Consumers Power Company believes the addition of this structure will make Big Rock Point equivalent to BWR plants currently authorized for construction with respect to the potential excursion caused by a control rod ejection. In our opinion, the addition of the control rod drive support structure does not involve an unreviewed safety question or a change to the Technical

Specifications of License DPR-6, Docket No 50-155, issued to Consumers Power Company on May 1, 1964, for the Big Rock Point Nuclear Plant.

Yours very truly,

Gerald J. Walke

GJW/dmb

Gerald J. Walke
Nuclear Fuel Management
Administrator

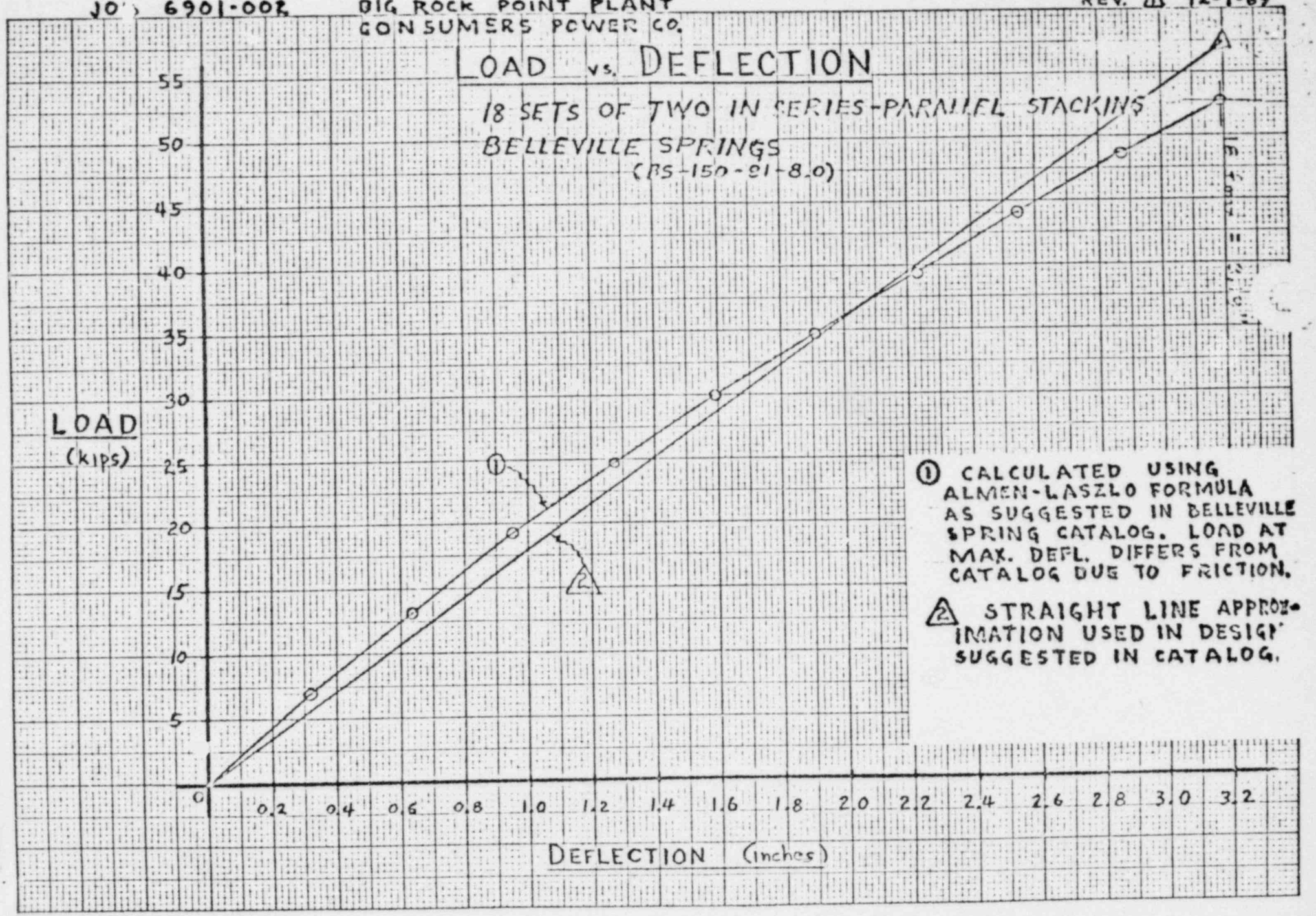
CC: GFiorelli, Div of
Compliance, USAEC
EBrunner, Div of
Compliance, USAEC

JO's 6901-002 BIG ROCK POINT PLANT
CONSUMERS POWER CO.

REV. ⚠ 12-1-69

LOAD vs. DEFLECTION

18 SETS OF TWO IN SERIES-PARALLEL STACKING
BELLEVILLE SPRINGS
(B5-150-91-8.0)



① CALCULATED USING ALMEN-LASZLO FORMULA AS SUGGESTED IN BELLEVILLE SPRING CATALOG. LOAD AT MAX. DEFL. DIFFERS FROM CATALOG DUE TO FRICTION.

② STRAIGHT LINE APPROXIMATION USED IN DESIGN SUGGESTED IN CATALOG.

FROM: Consumers Power Company
Jackson, Michigan 49201
Gerald J. Walke

DATE OF DOCUMENT: 1-23-70
DATE RECEIVED: 1-26-70
NO.: 236
LTR. X MEMO: REF: OTHER:

TO: Dr Peter A. Morris

ORIG.: 1 CC: 4 OTHER:

ACTION NECESSARY ☐ CONCURRENCE ☐ DATE ANSWERED
NO ACTION NECESSARY ☐ COMMENT ☐ BY:

CLASSIF: U POST OFFICE REG. NO:

FILE CODE: 50-155

DESCRIPTION: (Must Be Unclassified)
Ltr in re to their 1-14-69 ltr regarding installing of a control rod drive support structure.....advising of pland to install it during refueling outrage..

ENCLOSURES: ....change in design & trans:

Load-deflection curve for the Belleville washer shock absorber assembly.

(5 cys rec'd)

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Ziemann w/9 cys for action	1-26-70		
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DO NOT REMOVE
ACKNOWLEDGED
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U.S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (8-60)

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