POWER AUTHORITY OF THE STATE OF NEW YORK
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August 17, 1979
IPN-79-60

Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Albert Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
I.E. Bulletin 79-07

Dear Sir:

Attached please find "Notes of Telephone Conversation" between Mr. K. Whitman and others of your staff and Mr. R. Rigamonti and others of United Engineers & Constructors held on Thursday and Friday, August 16th and 17th, 1979 concerning the subject item. This is in response to your verbal requirement that the notes be submitted formally by the Authority.

Very truly yours,

George T. Berry

George T. Berry
Executive Director

encs.
cc: Mr. Boyce H. Grier, Director
Office of Inspection and Enforcement
Region 1
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pa. 19406

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INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK
DOCKET NO. 50-286

NOTES OF TELEPHONE CONVERSATIONS

Summary of conversations between United Engineers & Constructors and Nuclear Regulatory Commission Personnel on the Subject of Modeling of Elbows and Associated Effects on the Results of the Analyses Performance in Response to NRC I.E. Bulletin 79-07.

This summary addresses the subjects discussed by Mr. K. Whitman and others (NRC) and Mr. G. Rigamonti and others (UE&C) during four (4) telephone conversations held on Thursday, August 16, 1979, approximately at 9:00 a.m., 10:30 a.m., and 3:00 p.m., and on Friday, August 17, 1979, approximately at 10:00 a.m.

BACKGROUND INFORMATION

In response to NRC IE Bulletin 79-07, the Authority was requested to submit a computer run of a representative line (reanalysed with the UE&C ADL-2 Program) for verification purposes.

The line submitted to NRC was:

Line 351 (Problem No. 401) (Accumulator line inside the containment)

In the process of duplicating the analytical model to generate input data compatible with the program selected by NRC for verification, it was identified that certain input data associated with the modeling of piping selections with elbows was incorrectly applied in the run performed by UE&C. The resulting discrepancies in the analytical model and the potential efforts on the analysis results were brought to the attention of UE&C management on Wednesday, August 15, 1979, approximately 3:30 p.m. An investigation of the problem was initiated immediately. On Thursday and Friday, August 16 and 17, 1979, a number of telephone calls were exchanged between NRC and UE&C personnel on the subject. Preliminary results of the investigation and an action program were discussed and agreed.

EVALUATION RESULTS

The evaluation revealed that two types of problems can be identified:

Problem No. 1 - In modeling standard elbows, the analyst identifies (in the program input data) the coordinates for points A,B,C,D,E and the radius R of the elbow. The program then proceeds to calculate the coordinates for the points B' and D'. Figure 1.A shows the resulting analytical model for the case R L_2 or L_3. Should the value for R erroneously be input larger than L_2 (or L_3), the location of the point B' (or D') would be as shown in Figure 1.B. This condition is not presently identified automatically by the UE&C

(Ref to Fig. 1.A and Fig. 1.B for terms and configurations.)

ADL-2 Program error message features. For projects subsequent to the Indian Point 3 project checkers addressed this problem by verifying the correct relationship L_2/R or L_3/R in the input data image printed out by the computer. For this project since original decks were used in the reanalysis checking was limited to the input data which was changed due to as-built or other current requirements.

Problem No. 2 (Refer to Fig. 2) - In modeling large radius piping sections, two techniques are used:

a. The section is divided into a number of subsections each modeled with elbow elements. Due to an application limitation in the UE&C ADL-2 Program, which does not accept elbow-to-elbow modeling, short straight sections of pipe are introduced between each curved section (i.e., GA, AB, DE, EF in Fig. 2). Elbows between these sections are included as in the standard elbow cases. This condition is therefore analogous to the one explained in the Problem No. 1 cases. Here, however, additional calculations are required to identify the coordinates of the short straight section point C and the chances for errors are increased.

b. The section is divided in a series of straight subsections. This technique requires only that the coordinates of both ends of each section be calculated. The algorithm used internally by the computer to fit an elbow of a given radius R is not used here and consequently the problems of the types discussed under (a) above do not exist.

Having recognized these two potential problems, an investigation directed to identify the extent of isometrics affected by these two problems and a series of computer analysis have been performed. The results of the preliminary investigation are summarized in Table 1.

Computer analyses were performed to address the Problem No. 1 case. Description and results of these analyses are summarized below:

Problem No. 1 (Description and results) - Problem 401 was reanalyzed with corrected input data. Pipe stresses, support loads, fundamental frequencies showed insignificant change in results.

A series of test problems consisting of a configuration similar to that presented in Fig. 1 were run with a) small error (i.e., BB' small vs. AB), b) large error (i.e., BB' large vs AB) and c) correct input data. Type a) run showed insignificant difference when compared to the results from type c) run. Results from type b) run showed erratic behavior. Due to the significantly altered configuration and the associated stiffeners of each section generalization of these results could not be made.

(Conclusion) - Based on the above evaluation, it has been concluded

that small error in the input data will not affect significantly the results.

Problem No. 2 - The elbow-to-elbow modeling technique for long radius sections was not used for IP-3 (See Table 1).

COMMITMENTS

During the subject telephone conversations, the following was discussed and agreed upon:

a. By Friday, August 17, 1979, approximately 10:00 a.m., the complete number of lines affected by Problem No. 2 if any, will be telephoned to NRC.

b. By Friday, August 17, 1979, approximately 4:30 p.m., a telex summarizing the subject telephone conversations will be transmitted to NRC.

c. By Monday, August 20, 1979, approximately 10:00 a.m., the complete list of lines and elbows contained in these lines affected by Problem No. 1 will be identified and telephoned to NRC. In addition, an assessment of the impact of this problem will be provided.

e. Lines effected by Problem No. 1 will be reevaluated in accordance with the priority delineated in the response to the NRC I.E. Bulletin 79-07.

f. Criteria to report NRC cases found in excess of the original allowables will comply with that used for the response to NRC I.E. Bulletin 79-07.

(1)

TABLE 1

		Indian Point 3
	Total No. of ISO's	200
	No. of ISO's Reviewed	5
PROBLEM 1	No. of Elbows in the above ISO's with Problems	3 (2)
	No. of Elbows in the above ISO's without Problems	66
	No. of ISO's Reviewed	ALL
PROBLEM 2	No. of ISO's Analyzed with Elbow-to-Elbow Technique	NONE (3)

NOTES

(1) Data reported include information available as of 8/16/79, approximately 3:00 p.m.

(2) Two of the problem elbows are included in the line submitted to NRC.

(3) All the ISO's with large radius section were analyzed with the straight section technique.

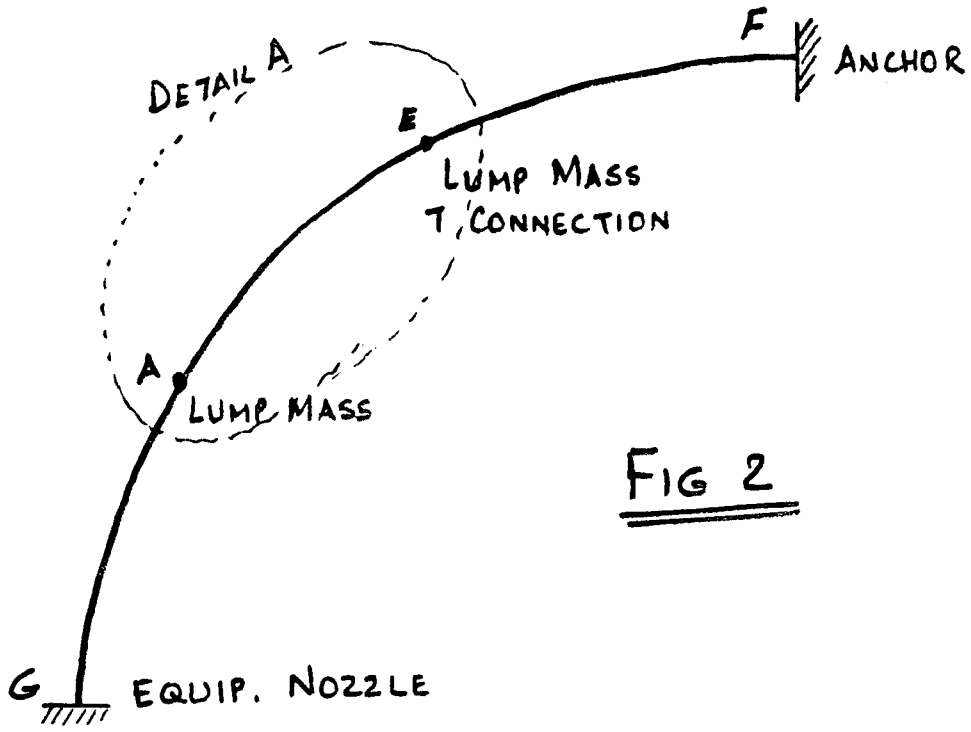
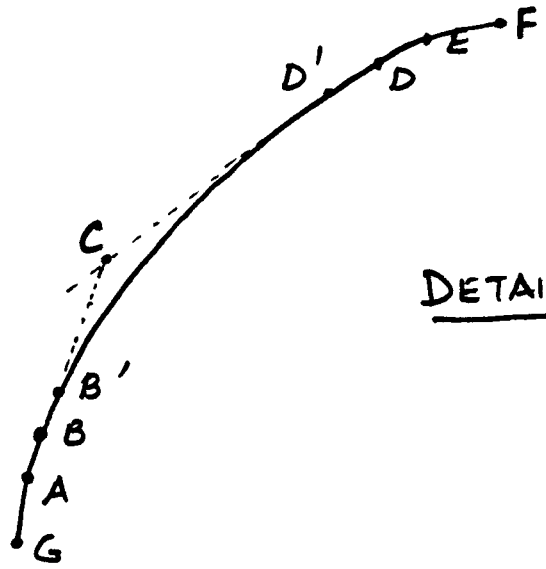


FIG 2



DETAIL A

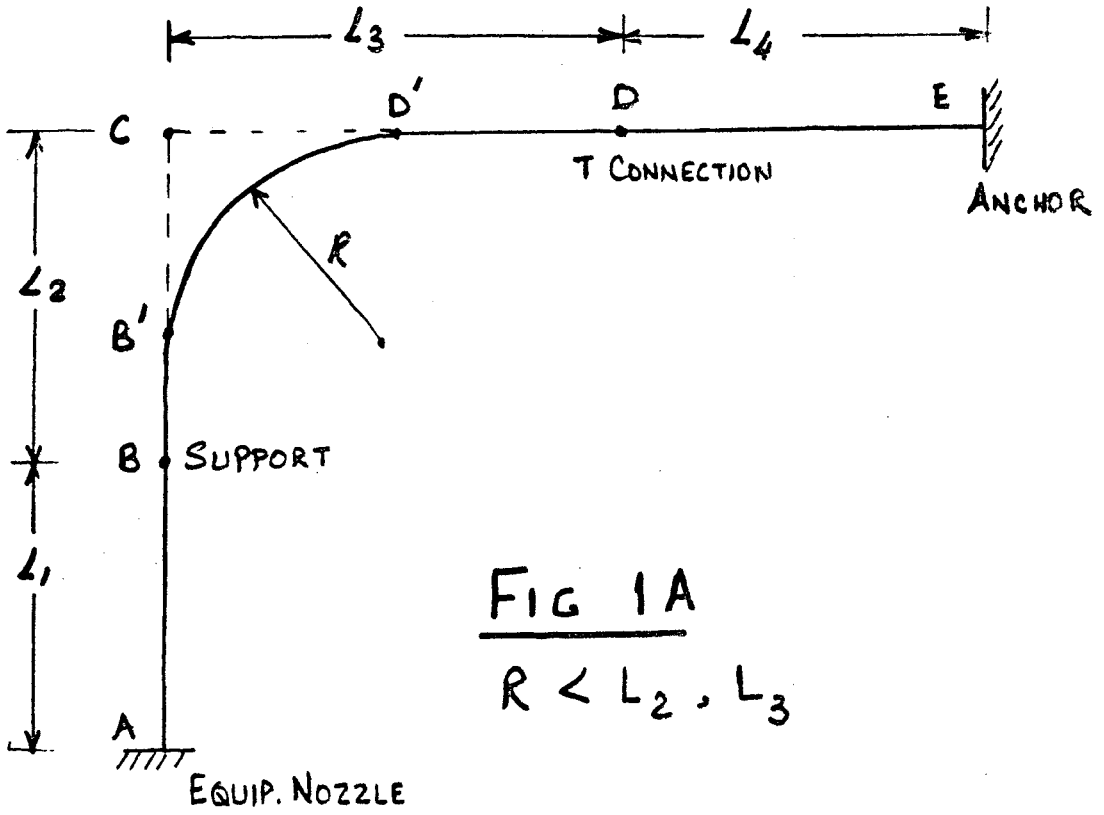


FIG 1A

$R < L_2, L_3$

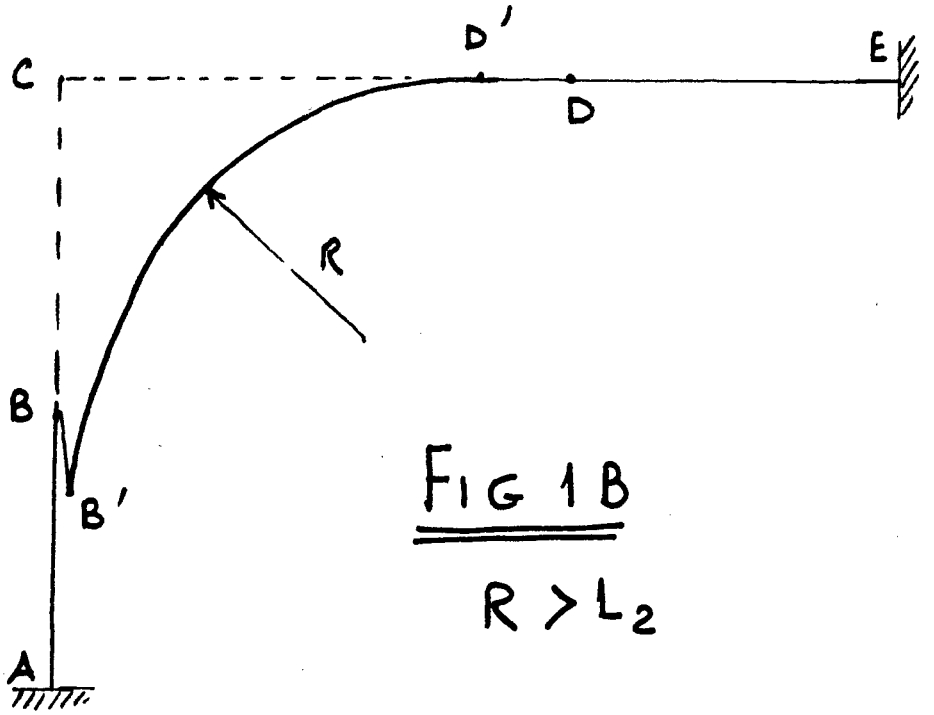


FIG 1B

$R > L_2$