REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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FACIL:50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
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MANGAN,C.V. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Submits description of reactor water cleanup & feedwater sys described in FSAR & discussion of compliance w/SRP 3.6.2.Consideration given to postulating break feedwater to cleanup line junction.Environ & radiation effects evaluated.

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

December 12, 1984
(NMP2L 0289)

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

Re: Nine Mile Point Unit 2
Docket No: 50-410

On October 22, 1984, Niagara Mohawk Power Corporation Licensing staff discussed the Reactor Water Cleanup break exclusion zone for Nine Mile Point Unit 2 with the Nuclear Regulatory Commission staff. In that discussion, the NRC stated their opinion that the break exclusion zone for this line is not in accordance with the intent of Standard Review Plan 3.6.2. The NRC staff contended that there are too many fittings and it is too long of a run for a break excluded pipe. Following is a brief description of the system design and a discussion of Unit 2 compliance with Standard Review Plan 3.6.2.

The design of the Reactor Water Cleanup and Feedwater Systems is described in the Nine Mile Point Unit 2 FSAR (Section 6.2.4.3.2). The two feedwater lines penetrate the primary containment. The isolation system is achieved by Y-pattern check valves (2FWS*V12 A & B) inside and spring-assisted, air-testable check valves (2FWS*AOV 23 A & B) outside containment (see attached Figure 6.2-70). This configuration offers immediate containment isolation. Motor-operated gate valves (2FWS*MOV21 A & B) located outside containment and beyond the check valves assure long-term isolation capability for each of the penetrations. The Motor Operated Valve's do not receive an automatic isolation signal so that feedwater may remain available as coolant in the event of a Loss of Coolant Accident. The Motor Operated Valve's are remotely operated from the Control Room if feedwater makeup is either unavailable or unnecessary.

The Reactor Water Cleanup line connects to the Feedwater line outside the containment between the check valve and Motor Operated Valve. This location allows flow into containment through the check valve while isolation is maintained with the closed Motor Operated Valve. This mode is important for post-accident cleanup and during shutdowns.

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The Reactor Water Cleanup piping includes a motor-operated gate valve (2WCS*MOV200), which performs an identical isolation function as the Feedwater Motor Operated Valves. It is also remotely operated from the Control room.

The Reactor Water Cleanup and Feedwater lines were configured to provide the best operational flexibility while: 1) maintaining low cumulative usage factors/stress and 2) minimizing number of fittings and length of pipe to the least practically achievable and 3) meeting the requirements of the Standard Review Plan for break exclusion. Several studies were performed to demonstrate that the existing position of the Reactor Water Cleanup isolation valve was the closest practical location.

First, a Class 1 pipe stress analysis for a Reactor Water Cleanup valve location in the horizontal run close to the Feedwater line was evaluated (Figure A). Stresses were significantly higher than the existing design and break exclusion criteria was not met (see Figures C,D,E and F). An intermediate location gave similar (unacceptable) results. Analysis of the existing location, Figure B, shows that overall stress for break exclusion zones and the cumulative usage factors were below the Standard Review Plan criteria (see Figures C,D,E and F). Therefore, the current design is best considering stress and Cumulative Usage Factors, as well as practical considerations. Niagara Mohawk believes that this design meets the intent of the Standard Review Plan.

Second, two methods of removing the Reactor Water Cleanup line from the Feedwater isolation system (break exclusion zone) were considered. Moving the Reactor Water Cleanup line upstream of the Feedwater line Motor Operated Valve was first evaluated. This would require significant changes in both the feedwater and reactor water cleanup design. Standard Review Plan 5.4.8 requires Reactor Water Cleanup to continue cleaning the reactor water in the event of upset conditions. With the Reactor Water Cleanup connected upstream of the Feedwater motor operated valve, an additional isolation valve would be required in the main feedwater line to provide this cleanup function. Also, since Reactor Water Cleanup is a safety class 3 system, an additional motor operated valve would be required in the Reactor Water Cleanup system to effect the required separation with the safety class 4 Feedwater system. Also, a significant number of pipe supports and whip restraints would be needed to accommodate the revised piping arrangements.

These major modifications increase the number of active safety related valves, increase the length of high energy piping and add devices which impede inspections of equipment and piping. Niagara Mohawk believes that overall safety would be degraded by making such a modification. Additionally, the existing design is consistent with the WPPS-2, Fermi 2, Shoreham and River Bend plants and GESSAR.

Another method of removing the Reactor Water Cleanup line from the Feedwater isolation system (break exclusion zone) is replacing the check valve with a Motor Operated Valve automatically closed on containment

isolation signals. With this arrangement, feedwater flow could not be maintained during periods of isolation. This would result in an overall reduction of the safe operation of the plant. Furthermore, there is no advantage to having a Motor Operated Valve in place of a check valve from the viewpoint of break exclusion zone definition. The break exclusion zone would still extend to the first zero gap restraint; in this case, the jet impingement wall.

In summary, based on the above discussion, it is Niagara Mohawk's position that the current design is the best from practical design and safety considerations, and satisfies the requirements of the Standard Review Plan.

In response to a further NRC request, consideration has been given to postulating a break at the feedwater to cleanup line junction. We have evaluated the environmental and radiation effects and found them to be minimal in comparison to other analyzed events such as a mainsteam line rupture, however, we do not believe that postulating a break at this location is appropriate considering the low stress and cumulative Usage Factor.

Very truly yours,

C. V. Mangan
Vice President
Nuclear Engineering & Licensing

NLR:ja

cc: Project File (2)

R. A. Gramm, NRC Resident Inspector

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Niagara Mohawk Power Corporation	)	Docket No. 50-410
	)	
(Nine Mile Point Unit 2)	)	

AFFIDAVIT

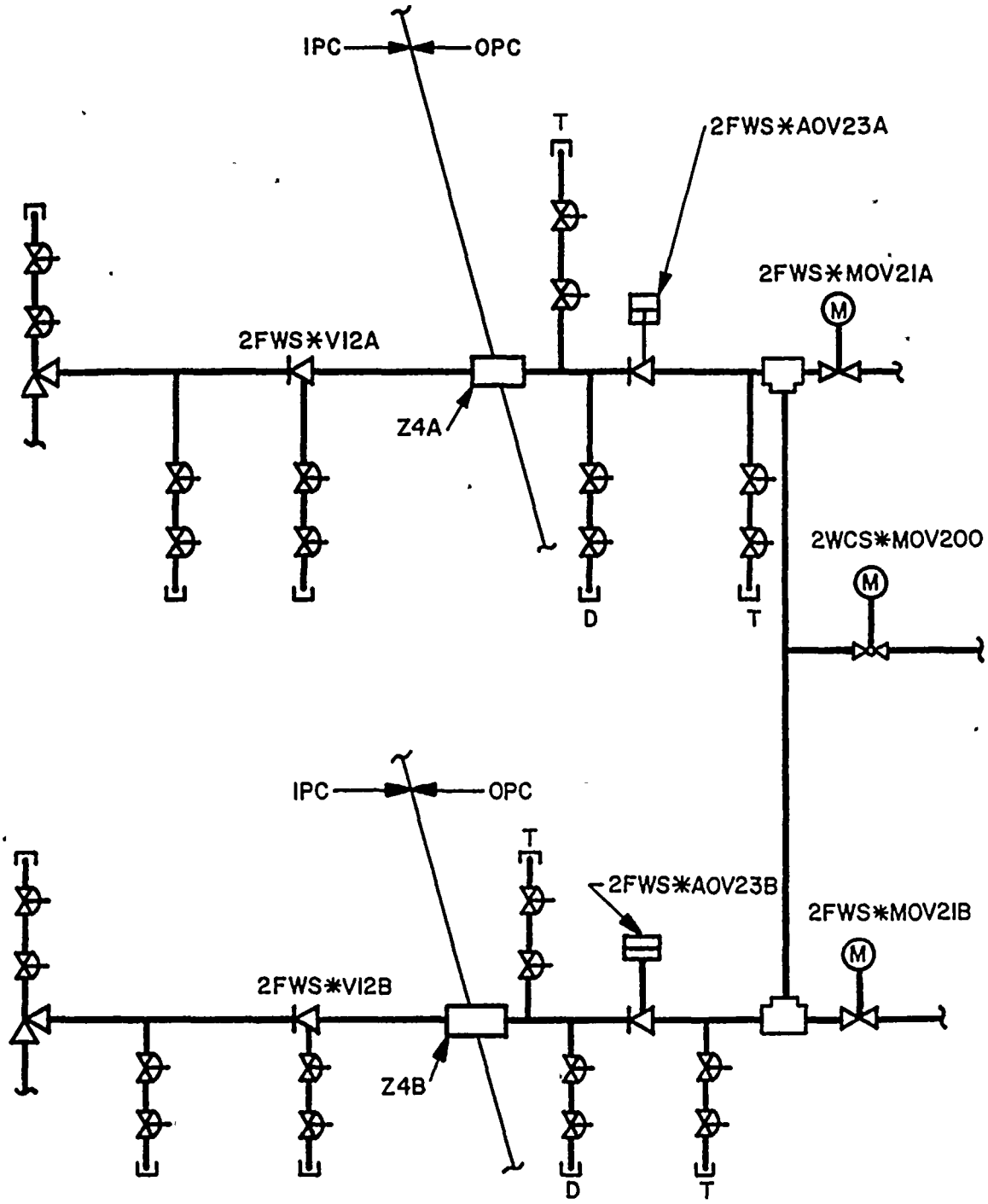
C. V. Mangan, being duly sworn, states that he is Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C V Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 12th day of December, 1984.

Christine Austin
Notary Public in and for
Onondaga County, New York

My Commission expires:
CHRISTINE AUSTIN
Notary Public in the State of New York
Qualified in Onondaga Co. No. 4707687
My Commission Expires March 30, 1985



Z-4A, B FEEDWATER TO REACTOR PRESSURE VESSEL

FIGURE 6.2-70

ISOLATION VALVE ARRANGEMENT
FOR PENETRATION Z-4A, B
SHEET 3 OF 43

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

WCS LINE BREAK EXCLUSION AREA
THERMAL EXPANSION STRESS (EQ.12-NB CODE)

MODEL A

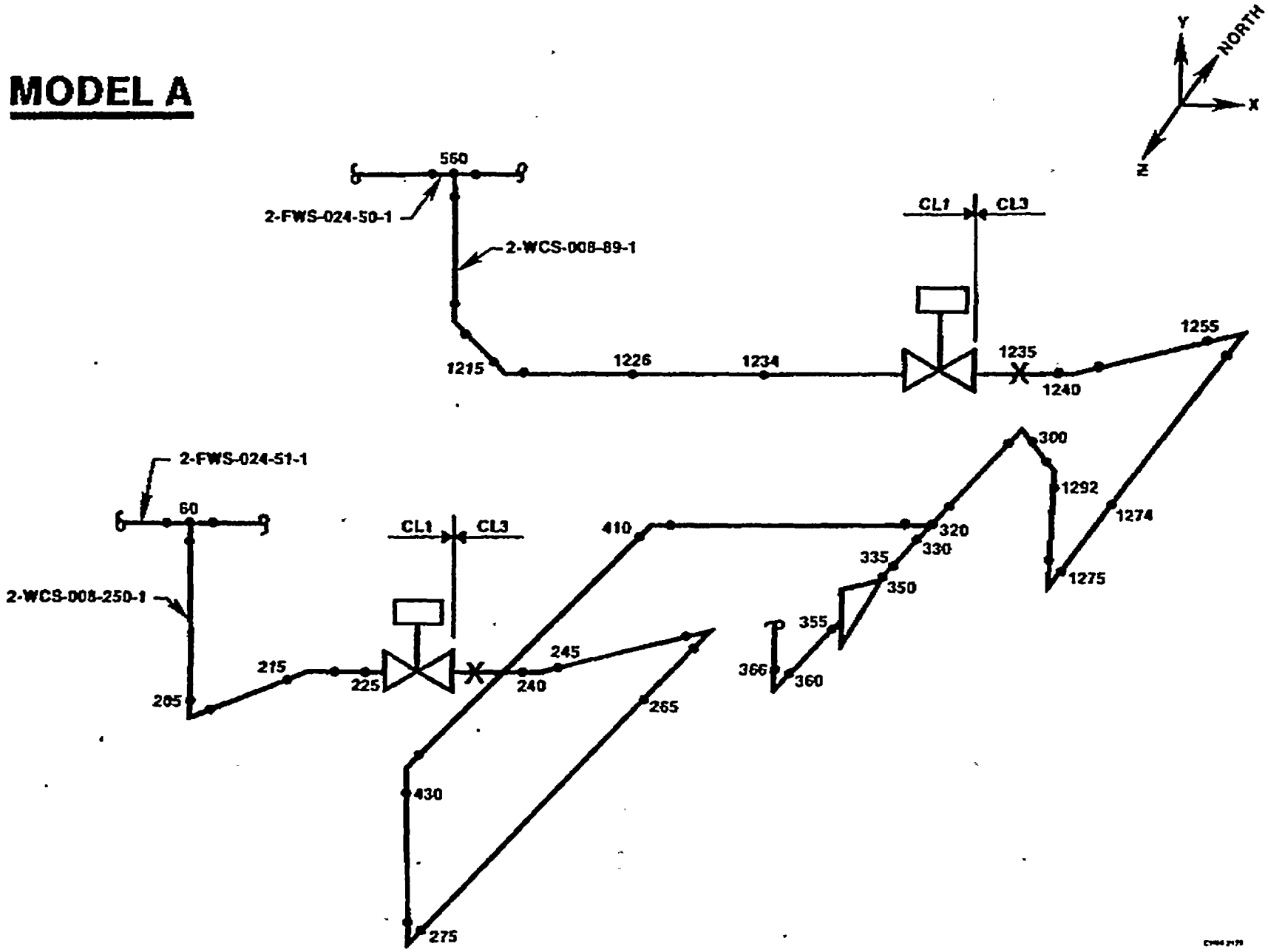


FIGURE A

WCS LINE BREAK EXCLUSION AREA
THERMAL EXPANSION STRESS (EQ.12-NB CODE)

MODEL B (EXISTING DESIGN)

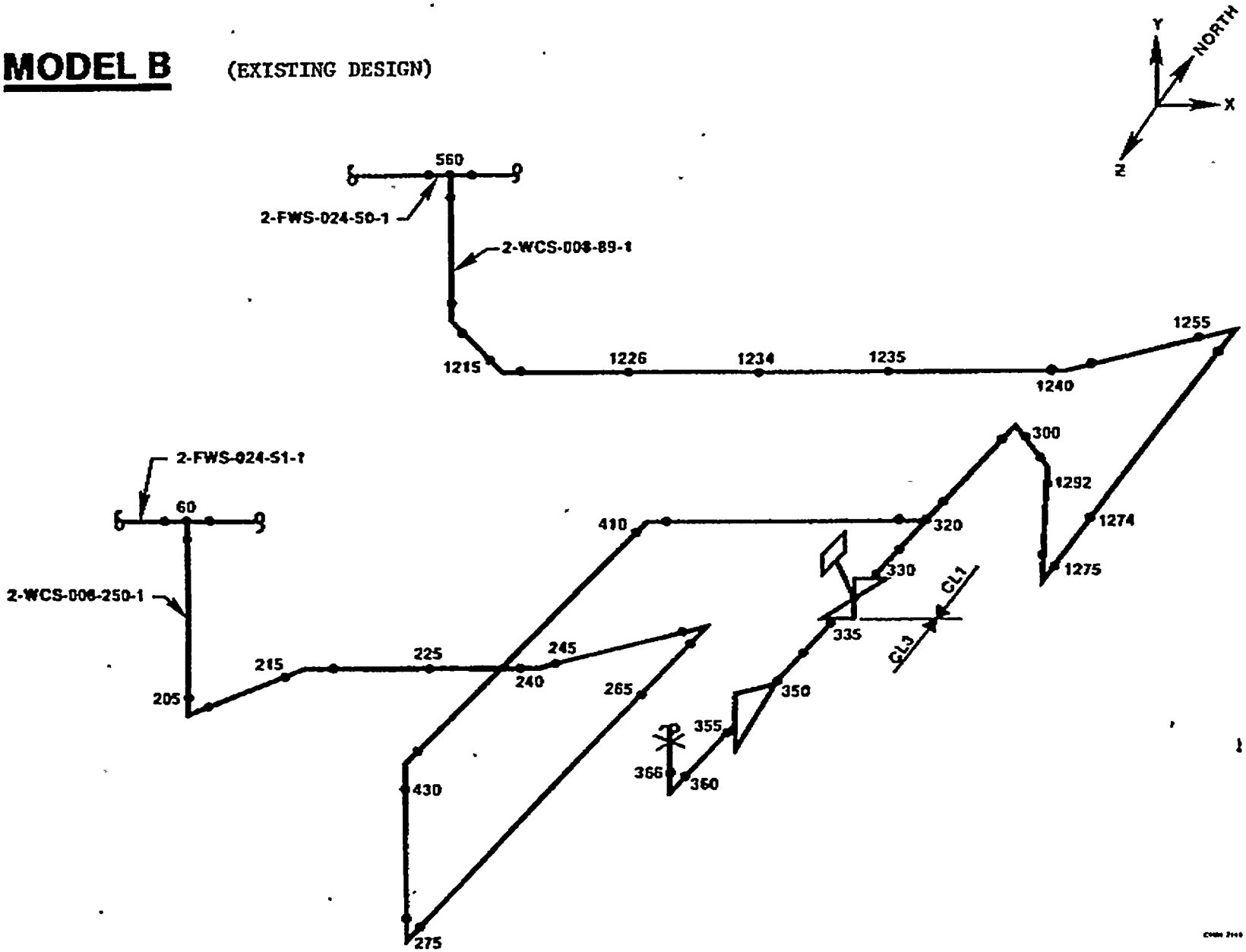


FIGURE B

WCS LINE BREAK EXCLUSION AREA
THERMAL EXPANSION STRESS (EQ.12-NB CODE)

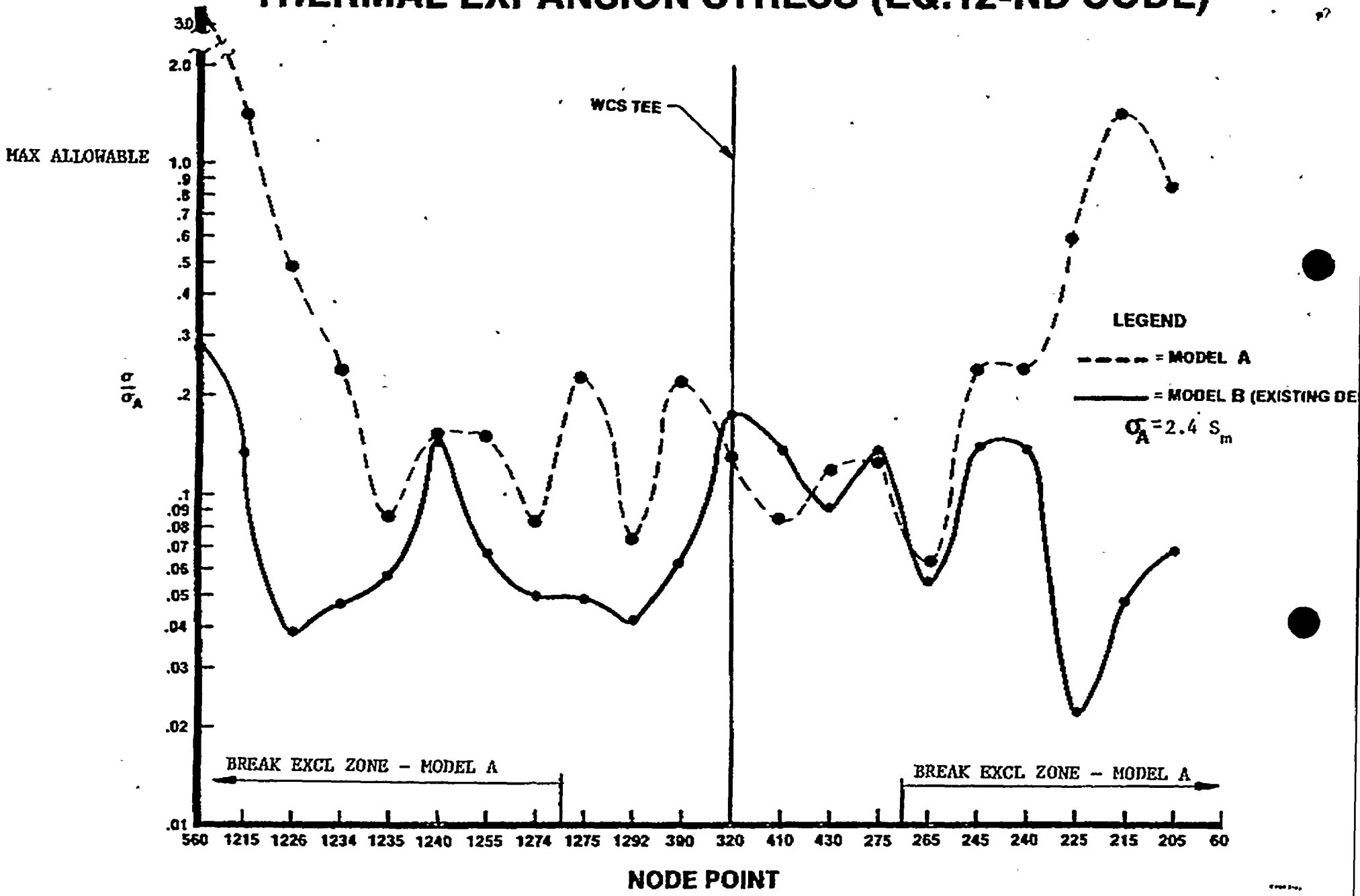


FIGURE C

WCS LINE BREAK EXCLUSION AREA
THERMAL EXPANSION STRESS (EQ.12-NB CODE)

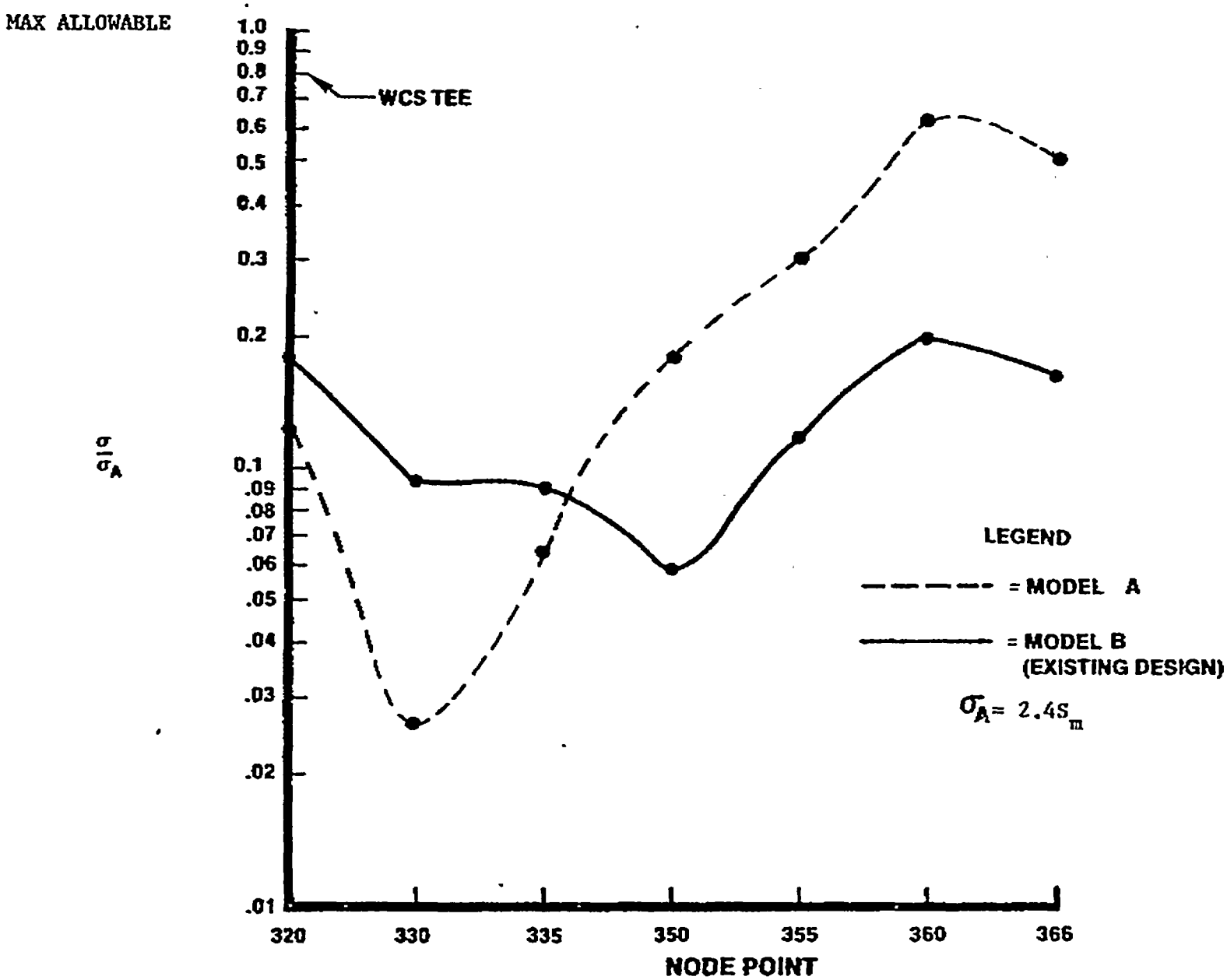


FIGURE D

WCS LINE BREAK EXCLUSION AREA FATIGUE EVALUATION CURVES

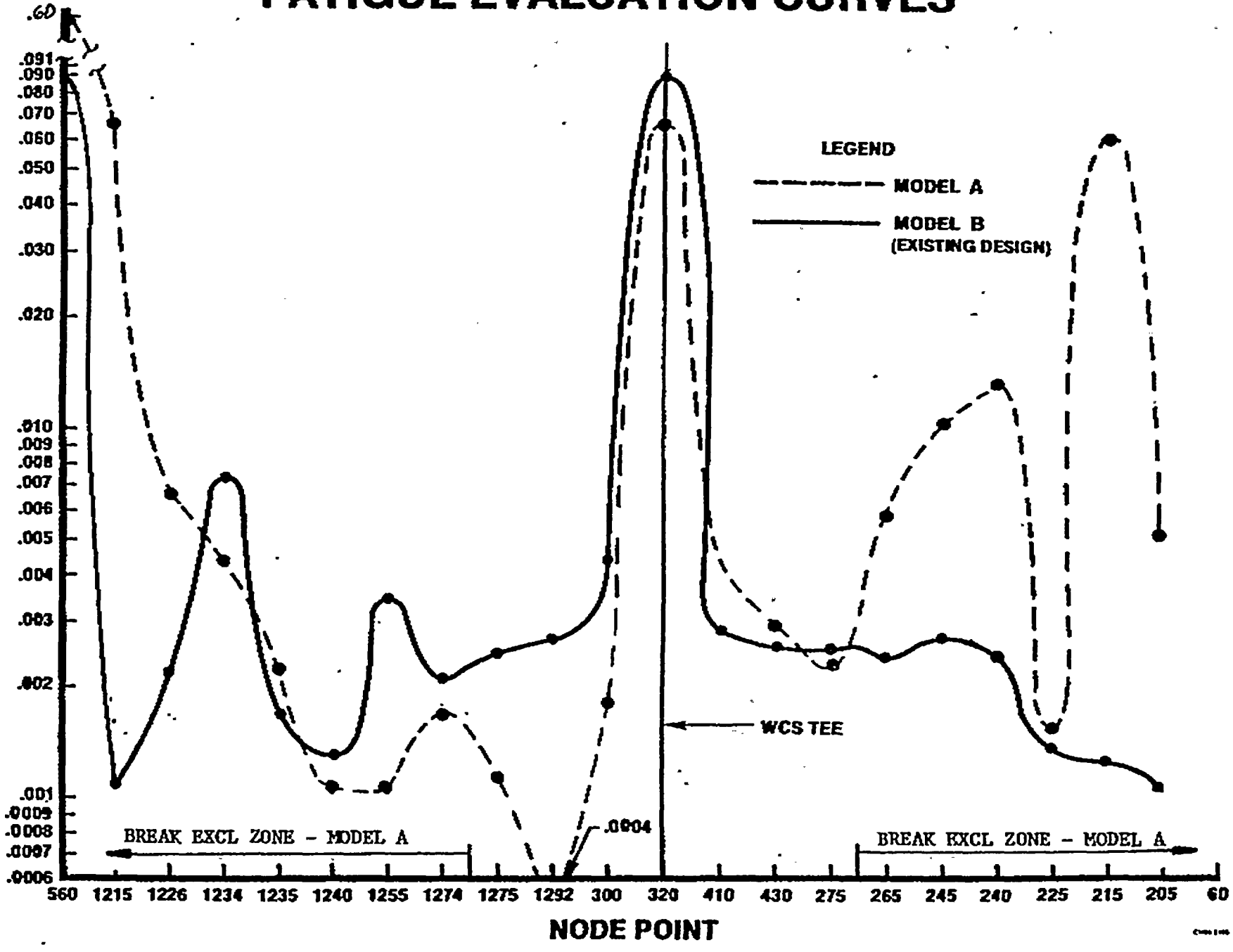


FIGURE E

WCS LINE BREAK EXCLUSION AREA FATIGUE EVALUATION CURVES

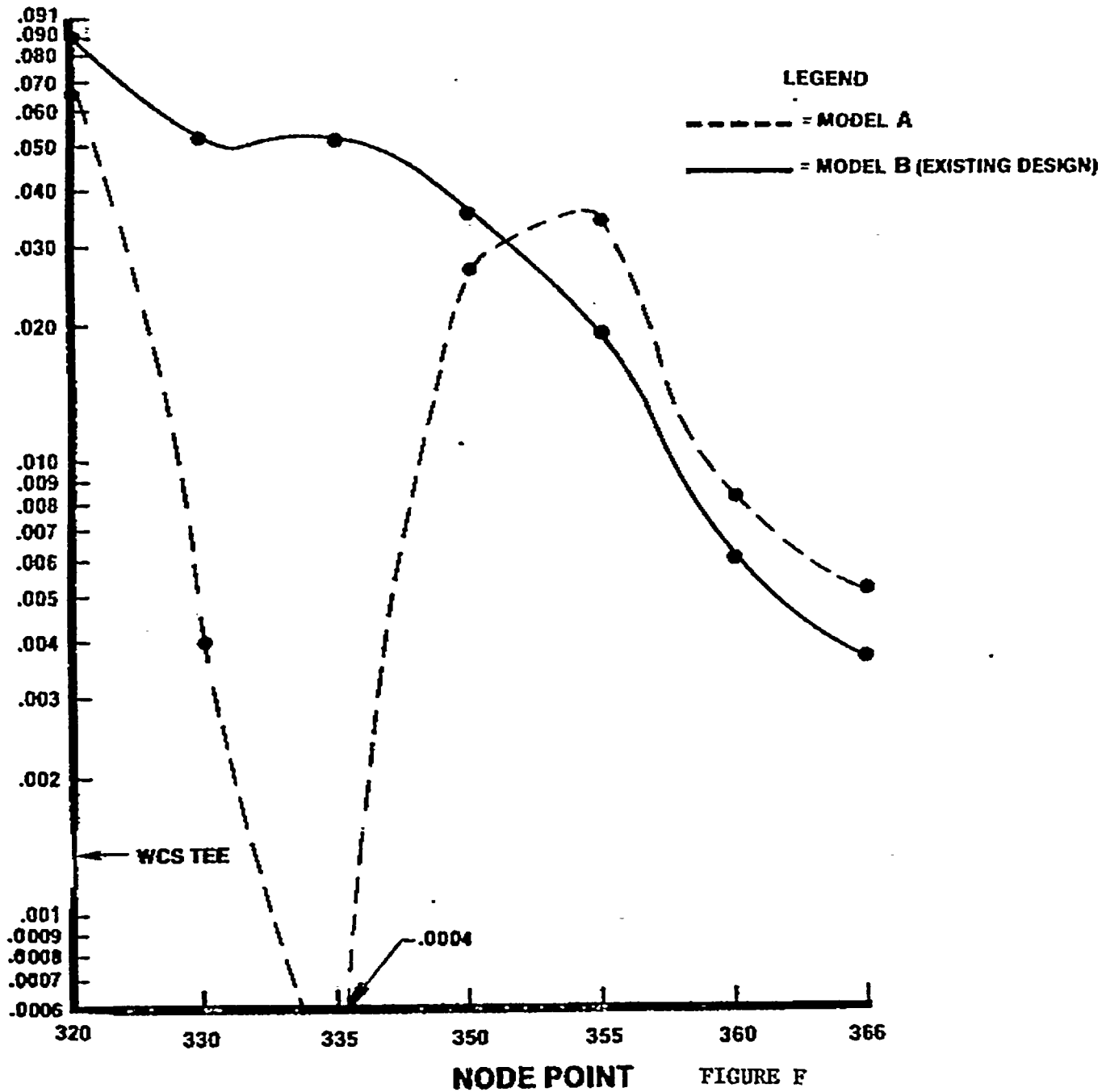


FIGURE F