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

March 9, 1989

Docket Nos. 50/390/391

APPLICANT: Tennessee Valley Authority (TVA)

FACILITY: Watts Bar Nuclear Plant, Units 1 and 2

SUBJECT: MEETING SUMMARY FOR THE FEBRUARY 7-8, 1989 MEETING REGARDING WATTS BAR CORRECTIVE ACTION PROGRAMS

On February 7-8, 1989, a meeting was held in Rockville, Maryland between the NRC staff and representatives of TVA. The purpose of the meeting was to discuss the Corrective Action Programs (CAPs) at the Watts Bar Nuclear Plant (WBNP) in the areas of Design Baseline Verification Program (DBVP), Welding, Quality Assurance (QA) Records, and the update in the Seismic Program since the January 18-19, 1989 meeting. Attachment 1 is the list of the attendees and Attachment 2 is a copy of the handouts provided by TVA at the meeting.

TVA opened the meeting with the presentation on the DBVP CAP. According to TVA, the DBVP assures that the WBNP licensing basis, design basis, essential calculations, and safety-related plant functional configuration for Unit 1 and common features are in agreement, and establishes the necessary systems and procedures to maintain this baseline. The DBVP also establishes test requirements for the WBNP Prestart Test Program. This CAP is Revision 1 of the DBVP submitted to NRC in July 1986. The program is consistent with the Sequoyah and Browns Ferry DBVPs but with the expanded scope of activities. The major DBVP activities are: licensing verification, design basis, calculations, configuration control, and test requirements.

The licensing verification activities includes verification of docketed WBNP commitments associated with design, construction, operations, maintenance and inspection items. TVA has identified 26,000 commitments to Unit 1 and common.

The design basis activity includes the development and consolidation of design basis engineering requirements and licensing commitments for the plant features that perform a primary or secondary safety function. TVA intends to analyze 39 design basis events for this activity.

The calculations activity assures existence, retrievability, and technical adequacy of essential calculations. TVA will identify the essential calculations. Watts Bar calculations have been transferred from diverse filing locations to a central location onsite. Existing essential calculations will be entered into a computerized data base using the calculations Cross Reference Information System (CCRIS) software program. This list will be compared to the list of required essential calculations to determine those that are missing. Missing calculations will be generated in accordance with the current calculation procedures.

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TVA stated that the configuration control activity includes the development and implementation of an improved design change control process which will be utilized for subsequent plant changes. The scope will include Unit 1 and common systems necessary to mitigate design basis events. CCSs will be developed for main control room drawings. The testing requirements activity assures test scoping documents are consistent with the design basis documents.

During the TVA presentation, NRC staff had specific questions regarding DBVP and some general concerns regarding TVA overall approach in using CAPs as a tool for resolving issues. The staff would like to see the periodic status reports on the implementation of each CAP, the role of each group in the implementation of CAPs and the implementation and the proposed audit schedule for the CAPs. NRC would also like to have man-hour estimates for the implementation of each CAP.

Specific comments regarding DBVP presentation are as follows:

1. How are commitments controlled with respect to revisions to referenced criteria (e.g., G-29) and how the plant features comply?

2. DBVP CAP referenced FSAR Section 17.2.1, but this section of the FSAR currently refers to QA Topical Report. Evaluate this apparent discrepancy and correct the DBVP CAP (as necessary) to refer to the current reference.

4. System logic diagrams (i.e., 611 series prints) are presently not within the scope of the configuration control activity of the DBVP. What is the rationale for their absence?

5. What will be included in the Preoperational Testing and Prestart Test Program? Current staff position is that no credit will be allowed for any system preoperation test. A preoperational test on a component level may be acceptable.

In the second part of the meeting, TVA presented additional information on the following six issues.

1. Comparison of the response spectra for set B&C as discussed in the meeting on January 18-19, 1989.

2. Commodity damping values for sets B&C.

3. Seismic analysis for the additional diesel generator building (ADGB).

4. Small bore piping evaluation.

5. Example of critical case evaluation for conduit.

6. Schedule for implementation of civil CAPs.

As a result of the NRC staff concerns raised during January 18-19, 1989 meeting, TVA handed out a draft revision of Section 4.3.5 and 4.3.6 of seismic analysis CAP and provided additional tables for comparison. Set A is the original seismic analysis criteria as stated in the FSAR and the staff SER. In Set B, the input ground motion is the site specific response spectra (SSRS). The criteria used in this set is consistent with the Standard Review Plan (SRP) criteria and Regulatory Guides. These criteria including ground motion will be used only for addressing CAQRs, reassessments, and critical case evaluations for conduit supports, cable tray, HVAC supports and small bore piping. TVA further explained that any new design or modification of structures, systems and components will continue to be based on the original licensing basis plus SRP modeling guidelines. For this purpose, Category I structures will be reanalyzed using the original criteria with modeling improvements, consistent with the current guidelines, to develop a new set of amplified response spectra (ARS), Set C. When the Set B and Set C criteria are applied, TVA proposed to use the computer code "SASSI" for the soil-structure interaction analysis.

Specific comments/action items resulted from the discussion were:

1. TVA is to submit a revision to the seismic CAP to reflect the "Set B" and "Set C" criteria and how TVA will use each criteria set.

2. TVA will provide a copy of the seismic design criteria when revised to reflect "Set B" and "Set C" criteria.

3. TVA and NRC are to assess the use of envelope of the ARS obtained from "Set B" and "Set C" analysis for use with ASME Code Case N-411.

4. Table 2 of the seismic CAP needs to be clarified in a number of areas to explicitly convey TVA's intent (e.g., explain what is meant by "same.")

5. TVA and NRC are to check on the previous NRC acceptance of use of SASSI computer code.

6. TVA will provide a comparison of the damping values for equipment (Table 8) against the Sequoyah values (use of RG 1.61 as basis for equipment damping values).

7. Provide a copy of the references justifying the use of damping values, for conduit, cable tray, and HVAC (i.e., ANCO testing).

8. Provide copies of the critical case walkthrough procedure when issued and keep NRC apprised of the progress.

9. TVA will submit a revision to the Hanger and Analysis Update Program (HAAUP) CAP to reflect the revised support evaluations for small bore ASME piping.

The third part of the meeting dealt with TVA's presentation of the welding CAP. TVA provided historical background dating back to the events during 1985 and formation of the welding project. The welding project is divided into three phases. Phase I is the assessment of written welding program, Phase II is the review of welding program implementation and Phase III is the recurrence control activities.

The scope of the welding CAP includes Unit 1 safety-related welding. As part of Phase I and II, an independent review of welding activities was performed by the Department of Energy Weld Evaluation Project (DOE/WEP). EG&G performed the independent evaluation. TVA is performing all work related to the Phase III effort.

TVA stated that nine areas of deficiencies were identified for which corrective actions have been initiated, either as a direct result of the DOE/WEP reinspection, by TVA concurrently with the reinspections, and/or as a result of EC evaluations. In addition, during the Phase II evaluation, other conditions were identified which required further evaluation and/or resolution. The listing of the nine corrective actions and the other added activities is provided in the handout provided at the meeting. The NRC staff need numerous questions regarding these activities. As a result of the discussions between the NRC staff and TVA, the following action items were agreed upon:

1. How many other areas were identified with similar weld deficiencies identified from the structural platform welds on elevation 741.0?

2. In order to inspect a sample of the elevation 741.0 welds that were evaluated to meet the code and were not repaired, provide references of these to NRC staff.

3. Has the ANI inspector reviewed the radiographs for ASME piping welds and provided a supplement to the N.5 reports?

4. Is the Level III inspection a 100% review or audit basis?

5. On piping shear lug welds, is N.318 applicable for TVA use for Class II and Class III welds?

6. Will the drawings be revised to reflect the adequacy of the wall-mounted instrument panel welds (as demonstrated by TVA tests)?

7. Has TVA performed a 100% QA/QC reinspection of the HVAC duct welds and duct support welds?

8. On vendor welds, what was the basis for the selection of 16 vendors? What was the number of total vendors? Will the sample be expanded?

9. An action from the October 1988 meeting was for Jim Roach to provide response to NRC questions on the basis for the sample of 560 misidentified radiographs and if a 100% review is warranted? (18 deficiences). Provide the status of the response.

10. Provide monthly periodic status reports to NRC resident inspector on the implementation of weld corrective actions.

The last part of the meeting dealt with the corrective action program for Quality Assurance (QA) Records. TVA stated that this program was initiated because some records (1) were not retrievable in a timely manner or were potentially missing, (2) were maintained in improper storage, or (3) had quality problems (e.g. were incomplete, technically/administratively deficient). According to TVA, about half the identified problems in this area are related to retrievability (missing or misfiled documents).

The scope of the program includes the storage, retrievability, and quality of essential construction and operations QA records generated or stored onsite. There are approximately 3 million unit 1 construction and operations records onsite. The essential records are defined as those that substantiate the characteristics of a component that are significant to its safety-related function.

TVA is qualifying one facility at the site as Lifetime Record Storage Facility (LRSF). It will store all essential records. The facility will be modified to meet 2-hour fire rating. TVA stated that a QA Records Team (QART) will be established to oversee and manage all activities required by this CAP. Storage, Retrievability and Quality issues were discussed and how they will be addressed by this CAP. Trend analysis will be performed on Quality Issues and will include a review of VSR - identified record issues.

As a result of discussions between the staff and TVA, the following action items were agreed upon:

1. TVA to clarify the "inspection" activity of the process for resolution of record quality issues. What requirements will be inspected to? If reinspection of hardware is deemed necessary, what inspection requirements will be used (i.e. current or original requirements)? If reinspection is not practical, how will this be handled?

2. Regarding TVA's use of NCIG-08 to evaluate known deficiencies in the area of QA/QC records, it is staff's position that the use of NCIG-08 combined with the other elements of the QA records CAP may be an acceptable approach in resolving known deficiencies in this area. However, a change to the R.G.1.88 commitment is necessary to apply NCIG-08. Additionally, any records found unacceptable in satisfying co-original construction code, standards, specification or regulatory requirements must be regenerated as allowed by ANSI N45.2.9 or an exemption must be requested.

Rajender Auluck

Rajender Auluck, Project Manager
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosures:

Distribution
Docket File
NRC PDR
Local PDR
Those on Attached List

OFC	:NRR:TVA/LA	:NRR:TVA/PM	:NRR:TVA/BC	:TVA:AD/P	:	:	:
NAME	:MSimms	:RAuluck:as	:DTerao	:SBlack	:	:	:
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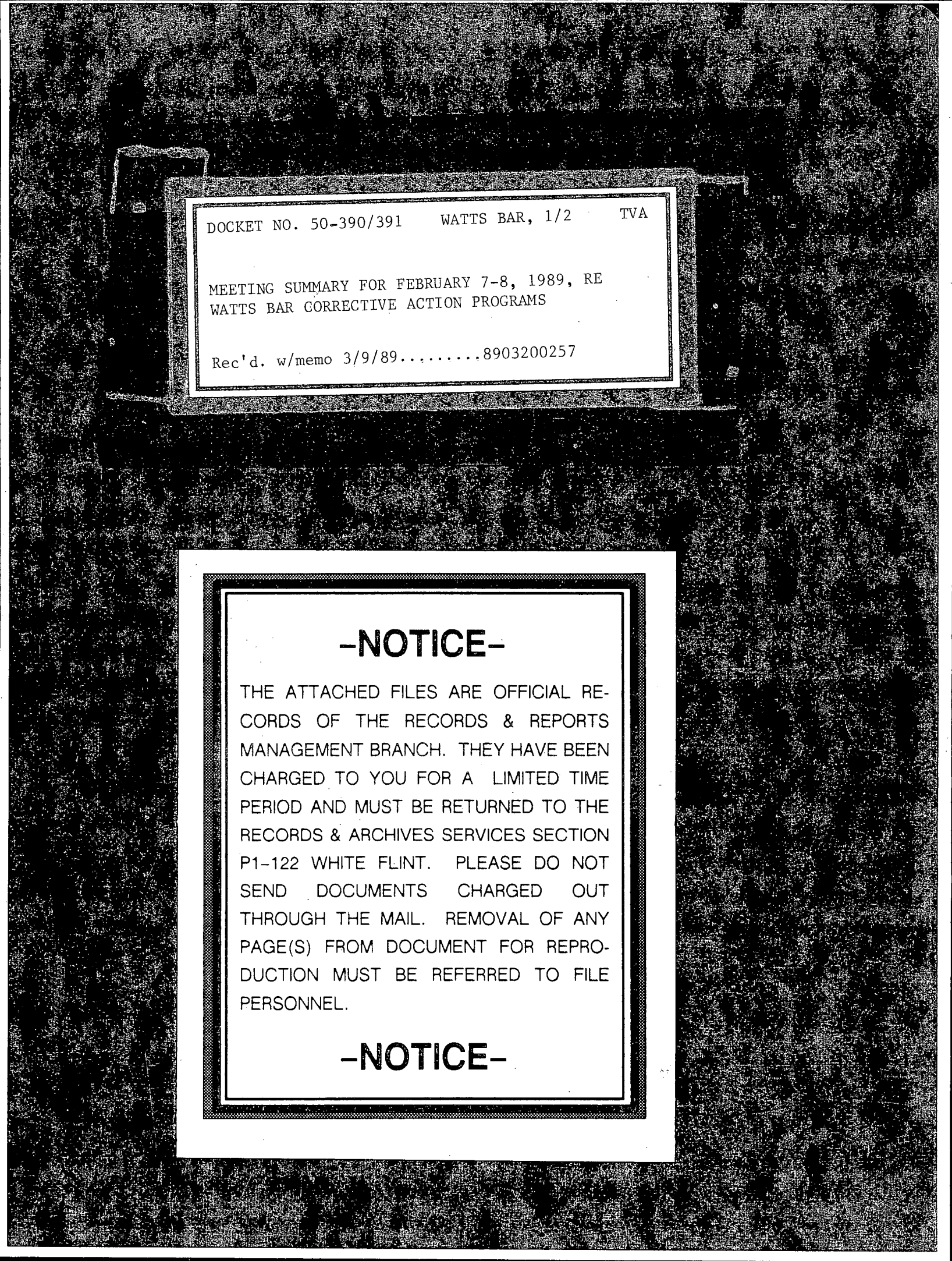

DOCKET NO. 50-390/391 WATTS BAR, 1/2 TVA

MEETING SUMMARY FOR FEBRUARY 7-8, 1989, RE WATTS BAR CORRECTIVE ACTION PROGRAMS

Rec'd. w/memo 3/9/89.....8903200257

TVA Meeting - Feb - 7, 1989

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David Terao	NRC	(301) 492-3317
B. D. Liaw	NRC / TVA/ID	(301) 492-3288
Angelo Marinos	"	(301) 492-3311
Suzanne Black	NRC/TVA	(301) 492-0796
Ken Barr	NRC	404-331-0342
Morris Brand	NRC	615 365-5487
Glen Walton	NRC	615 " "
George Hubbard	NRC	301-492-0706
Pete Hearn	NRC/TVA/ROB	301-492-0763
George Georgiev	NRC/TVA	301-492-0732
Jim Young	TVA	615-365-6761
STAN LOVE	TVA	615-365-1510
PR MANDAVA	TVA	615-365-1662
J.R. LYONS	TVA	615-365-1662
JOHN F. COX	TVA/WBPT	615-365-3307
Thomas M. Cheng	NRC	301-492-0710
[illegible]	NRC	[illegible]
RE SHEWMAKER	NRC	301-492-0719
T.A. Ippolito	TVA Advisor	301-770-6790

NRC Meeting with TVA (Seismic Issues) 2/7/89

R. Architzel	NRR/TVA	301-492-0759
D. Terao	NRC/TVAPD	301-492-3317
B. D. Liaw	NRC/TVAPD	301-492-3288
T. M. Cheng	NRC/TVAPD	301-492-0710
Suzanne Black	NRC/TVAPD	301 492-0796
Ken Baer	NRC	404-331-0342
Morris Brandi	NRC	615-365 5487
Glen Walton	"	" " "
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John Cox	TVA/WBPT	615-365-3307
P R. MANDAVA	TVA	615-365-1662
RO HERNANDEZ	TVA-CEB	615-632 3868
O. GURBUZ	TVA/BECHTEL	213-807-4008
Don LANDERS	TELEDYNE/WBPT SUPPORT	617-890-3350
WALT HORN	TVA/WBPT	615-365-3516
Jim Young	TVA/WBN L.C	615-365-8761
Syed A. Bokhari	TVA/WBEP	615-365-1158
P.K. Agrawal	TVA/WBPT	615-365-3403
Donald L. Beck	TVA/Bechtel	615-365-1348
R.E. Shewmaker	NRR/TVA	301-492-0917
S. B. KIM	[illegible]	[illegible]
TA Ippolito	TVA Advisor	301-770-6790
Rod Carle	TVA	615-365-1488

NRC Meeting with TVA - <u>QA Records</u> 2/8/89

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G. T. Hubbard	NRC/TVA/PEB	301-492-07[illegible]
K P Barr	NRC	404-331-0342
M. Branch	NRC	615 - 365 5487
G. Walton	"	" "
R.E. LEWIS	WBPT/QA	615-365-3374
JOHN F. COX	TVA/WBPT	615-365-3307
JOHN A. McDONALD	TVA	615-365-8627
WALT HORN	TVA/WBPT	615-365-3516
Jim Young	TVA	615-365-8761
JIM BRYJA	SARGENT & LUNDY	615-365-1220
P. K. [illegible]	TVA/[illegible]	615-3[illegible] 34[illegible]
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NRC Meeting with TVA - WELDING 2/8/89

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D. Terao	NRC / TVAPD	301 - 492 - 3317
K. Barr	NRC	404 - 331 - 0342
S. C. Black	NRC/TVAPD	301 492 - 0796
D. Brandt	NRC	615 365 5487
G. Walton	NRC	" " "
D. E. Smith	NRC	301 492 - 0711
John F. Cox	TVA / WBPT	615-365-3307
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EJ Vigluicci	TVA	615 - 632 - 6050
WE Cooper	TES	617 - 890 - 3750
WALT HORN	TVA	615-365-3516
Jim Young	TVA	615 - 365 - 8761
TERRY R WOODS	TVA/LEAD MAT ENG	615-365 - 1741
P.K. AGRAWAL	TVA / WBPT	615- 365 3403

CAP IMPLEMENTATION SCHEDULE

	UPDATE CRITERIA*	IMPLEMENT WALKDOWNS AND WALK THROUGHS	IMPLEMENT EVALUATIONS	IDENTIFY MODIFICATIONS
. HANGER & ANALYSIS UPDATE PROGRAM				
A. Rigorous Analysis	Complete	90% Complete	Ongoing (15% Complete)	Ongoing
B. Other	2nd Qtr. '89	2nd Qtr. '89	3rd Qtr. '89	3rd Qtr. '89
. CONDUIT SUPPORTS	1st Qtr. '89	1st Qtr. '89	1st Qtr. '89	2nd Qtr. '89
. CABLE TRAY SUPPORTS	2nd Qtr. '89	2nd Qtr. '89	2nd Qtr. '89	3rd Qtr. '89
. HVAC	2nd Qtr. '89	3rd Qtr. '89	3rd Qtr. '89	3rd Qtr. '89

Pending Seismic Evaluation

TVA MEETING WITH NRC ON FEBRUARY 7 & 8, 1989

AGENDA FOR PRESENTATION OF CORRECTIVE ACTION PROGRAMS

2/7/89 8:30	I.	INTRODUCTION	J. F. COX
2/7/89 8:45	II.	DESIGN BASELINE AND VERIFICATION PROGRAM	J. R. LYONS
2/7/89 10:00	III.	CIVIL ISSUES	J. K. McCALL R. J. HUNT S. A. BOKHARI J. G. ADAIR
2/8/89 8:30	IV.	WELDING	J. A. ROACH J. G. ADAIR
2/8/89 12:30	V.	QA RECORDS	J. A. McDONALD

CIVIL CAP AGENDA FOR MEETING ON 2/7

1. COMPARISON OF RESPONSE SPECTRA FOR SETS B & C

2. COMMODITY DAMPING VALUES FOR SETS B & C

3. SEISMIC ANALYSIS FOR ADDITIONAL DIESEL GENERATOR BUILDING

4. SMALL BORE PIPING EVALUATION

5. EXAMPLE OF CRITICAL CASE EVALUATION FOR CONDUIT

6. SCHEDULE FOR IMPLEMENTATION OF CIVIL CAPS

WATTS BAR NUCLEAR PLANT (WBNP)

SMALL BORE PIPING PROGRAM

- BACKGROUND
- REASONS FOR REEVALUATION
- PROGRAM PLAN
- SCOPE

BACKGROUND

- SMALL BORE PIPING AT WBNP WAS DESIGNED BY ALTERNATE ANALYSIS METHODS (COOKBOOK)
- VARIOUS NCRs IDENTIFIED DESIGN AND INSTALLATION DEFICIENCIES
- 100 PERCENT VERIFICATION PROGRAM (NCR 8252) INITIATED FOR ALL PIPING INSTALLED BASED ON ALTERNATE ANALYSIS METHODS
  - CEB 76-5 (COOKBOOK) AND APPLICABLE PROCEDURES UPDATED/REVISED
  - APPROXIMATELY 1500 PROCESS PIPING ISOMETRICS AND ASSOCIATED SUPPORTS WERE EVALUATED
  - APPROXIMATELY 240 NEW SUPPORTS WERE INSTALLED
  - APPROXIMATELY 1560 MODIFICATIONS WERE MADE TO EXISTING SUPPORTS
    - 700 WASHER CHANGES
    - 860 MODIFICATIONS
  - ALL CALCULATIONS WERE UPDATED
  - ALL HANGER ENGINEERING UNIT (HEU) ISOMETRICS WERE UPDATED TO REFLECT AS-BUILT CONDITIONS
- DEFICIENCIES AND CORRECTIVE ACTIONS TAKEN BY THIS PROGRAM WERE FORWARDED TO THE NRC IN A 50.55(e) REPORT (10-14-83)
- CLOSURE OF NCR 8252 WAS DOCUMENTED

REASONS FOR REEVALUATION

- REVISIONS TO PIPING AND PIPE SUPPORT DESIGN CRITERIA
- CAQs ISSUED SINCE 1985 NEED TO BE ADDRESSED

WBNP SMALL BORE PIPING PROGRAM PLAN

- REVIEW ALL OPEN CAQs, CATDs, ETC.
- UPDATE EXISTING TYPICAL SUPPORTS TO CURRENT CRITERIA
  - 47A053 - PROCESS PIPING
- DEVELOP ACCEPTANCE STANDARD (COOKBOOK) IN ACCORDANCE WITH CURRENT CRITERIA
- EVALUATE PIPING AND SUPPORTS AGAINST ACCEPTANCE STANDARD
- PERFORM ADDITIONAL EVALUATIONS AS REQUIRED FOR CONFIGURATIONS THAT DO NOT MEET ACCEPTANCE STANDARD
- REVISE EXISTING STRESS AND SUPPORT CALCULATIONS TO DOCUMENT EVALUATIONS
- ISSUE MODIFICATIONS AS REQUIRED
- CLOSE ALL OPEN ITEMS (CAQs, CATDs, ETC)
- ISSUE FINAL REPORT

SCOPE

	STRESS CALCS	PIPE SUPTS
CATEGORY I ASME III CLASS 2/3 SMALL BORE PIPING	500	6200

THIS DRAFT WRITE-UP REPLACES SECTIONS 4.3.5 AND 4.3.6 OF SEISMIC ANALYSIS CAPS AND PROVIDES ADDITIONAL TABLES

4.3.5 Summary of Seismic Analysis Review for Category I Structures

4.3.5.1 Original Analyses

The original analyses of Category I structures were performed consistent with the FSAR requirements and using methodologies that were prevalent at that time. These criteria and analyses results were reviewed by the NRC prior to issuance of the SER. The seismic analysis results, in the form of structural loads and floor or amplified response spectra (ARS) were used in the design of structures, systems and components. The Additional Diesel Generator Building (ADGB) was designed at a later date using a different criteria, added to the FSAR in Amendment 57, which has not been reviewed by the NRC.

The criteria used in the original analyses and the significant analysis parameters, called Set A, are shown in Table 3. As can be seen from this table, the original analyses (except for the Additional Diesel Generator Building) utilized four different time-history records. The average of the response spectra of the four time-history records enveloped the Modified Newmark spectrum which was the design basis. The same four records were used in three directions, independently. The vertical input was taken as two-thirds of the horizontal. The structural models used in analyses were essentially one-dimensional models but included the torsional effects in the direction of excitation.

4.3.5.2 Analyses Using Site Specific Response Spectra

As a result of the issues discussed in Sections 4.3.1 through 4.3.4, it is concluded that reanalysis of some structures is necessary. The intent of the reanalysis is to demonstrate the adequacy of structures, systems, and components in the seismic environment, considering the effects of the issues identified through the calculation review, employee concern, and CAQR programs. In order to determine the significance of these issues, i.e., whether the existing hardware meets the current design requirements or whether modifications would be required, the evaluations will be based on criteria compatible with current practices. This will include the Site Specific Response Spectra (SSRS) developed for WBN which were reviewed and concurred by the NRC in the SER.

The criteria for SSRS analysis and the significant parameters related to the criteria, called Set B, are shown in Table 4. The structural loads and the ARS resulting from the SSRS analyses will be used to evaluate the structures, systems, and components.

4.3.5.3 Reanalysis Using the Original Criteria and Current Modeling Techniques

Any new design or modification of structures, systems and components will continue to be based on the original licensing basis. For this purpose, Category I structures will be reanalyzed using the original criteria with modeling improvements, consistent with the current techniques, to develop a new set of response spectra, called Set C. The new analyses will also include soil-structure interaction analysis methods that are consistent with the Standard Review Plan.

The criteria for this reanalysis and the significant analysis parameters are shown in Table 5. Comparison of Tables 3 and 5 indicates that the two sets of criteria are identical except in the area of modeling where current practices differ from those used during the original analysis.

4.3.5.4 Criteria for Evaluation and New Design/Modification of Structures, Systems, and Components

The various structural analyses discussed above and their use are summarized in Table 6 for each structure housing Category I systems and components. The criteria used for original analysis of the Additional Diesel Generator Building will be eliminated and Set C analysis results will be used for both evaluation and new design\modification.

Both Set B and Set C analyses will use the same 3D models, consistent with the SRP. Coupling effects between horizontal and vertical directions will be included. The integration time step will be 0.005 seconds. The spectra will be calculated by enveloping the responses at extreme points at each floor level.

The Young's and shear moduli of the concrete have been re-evaluated for use in the reanalyses. The evaluation concluded that lower moduli values should be used for Interior Concrete Structure, Additional Diesel Generator Building, and North Steam Valve Room. The revised moduli will be incorporated into both Set B and Set C analysis.

As shown in Table 6, evaluation of structures and the systems and components contained in these structures will be based on Set B, except for rigorously analyzed piping. In the HAAUP program, Set C response spectra will be used for rigorously analyzed piping. The scope of evaluations for systems and components are discussed in the other CAPs (Cable tray, Conduit, HVAC, Instrument lines, HAAUP, and Equipment Seismic Qualification) in detail. Any new design or modification of structures, systems, and components will be based on Set C.

The criteria and methodology to be used in the evaluations and new design/modifications of systems and components are shown in Table 7. As shown in the table, damping values based on Regulatory Guide 1.61, Code Case N411, and applicable test data will be used. Damping values for each commodity are shown in Table 8. Use of higher damping is justified since the evaluation criteria are consistent with the SRP provisions. It will also be shown that the modification/new design criteria results (Set C) will be comparable to the SRP-compatible criteria (Set B).

The analysis techniques to be used for system and component analysis in the new work are also consistent with the SRP provisions. Equivalent static and the response spectrum analysis will be the main methods used. The time-history analysis may be used on occasion if the system input time-history records are demonstrated to contain sufficient energy over the entire frequency range by an analysis of its power spectral density. Uncertainties in T-H analysis will be addressed through the use of peak shifting technique.

In the area of spatial combination the 2D absolute sum method will continue to be used for structures and commodities except piping. This is consistent with the FSAR requirements. Studies show that the difference resulting from the use of 2D absolute sum and 3D square-root-of-sum-of-squares is small and therefore use of the 2D absolute sum method for maintaining the licensing basis and continuity is acceptable. For piping analysis, the 3D SRSS approach will be utilized, as indicated in Table 7 in order to be able to use N411 damping values.

In summary, the seismic criteria for systems and components as shown in Tables 7 and 8, when used in conjunction with ARS from the new analyses, will provide assurance that WBN plant will have been designed to be consistent with the current SRP provisions.

Table 3. Original Seismic Analysis Criteria – Set A

Attributes	Criteria
Design Spectra	Modified Newmark
Peak Ground Accel.	
SSE	0.18 G Hor. 0.12 G Vert.
OBE	0.09 G Hor. 0.06 G Vert.
Artifical Time–History Records	Four artificial T–H records – Use average of four responses. Same four used in each direction independently. T–H spectra envelop both modified Newmark and SSRS
Structural Models	As described in the FSAR
Peak Broadening	±10%

Damping	OBE	SSE
Steel Containment Vessel (SCV)	1	1
Shield Build. and Interior Conc. Struct.	2	5
Other Concrete Structures	5	5

Table 4. Site Specific Response Spectra (SSRS) Analysis Criteria–Set B

Attributes	Criteria
Design Spectra	SSRS
Peak Ground Accel.	
SSE	0.215 G Hor. 0.15 G Vert.
OBE	0.09 G Hor. 0.06 G Vert.
Artifical Time–History Records (1)	Three statistically independent records – one for each direction. T–H spectra envelop SSRS
Structural Models	3D – Coupling effects included
Peak Broadening	±15%

Damping	OBE	SSE
Steel Containment Vessel (SCV)	2	4
Concrete Structures (2)	4	7

(1) In performing T–H analysis with single set of T–Hs, adequacy of energy content shall be demonstrated.

(2) Includes Interior Concrete Structure, Shield, Auxiliary Control, Diesel and Additional Diesel Generator buildings, North Steam Valve Room, and Intake Pumping Station.

Table 5. Seismic Reanalysis Using Original Criteria and Modeling Techniques – Set C

Attributes	Criteria
Design Spectra	Modified Newmark
Peak Ground Accel.	
SSE	0.18 G Hor. 0.12 G Vert.
OBE	0.09 G Hor. 0.06 G Vert.
Artifical Time–History Records	Four artificial T–H records– Use average of four responses. Same four used in each direction independently. T–H spectra envelop both modified Newmark and SSRS
Structural Models	3D – Coupling effects included
Peak Broadening	±10%

Damping	OBE	SSE
Steel Containment Vessel (SCV)	1	1
Shield Build. and Interior Conc. Struct.	2	5
Other Concrete Structures	5	5

Table 6. Seismic Analysis Matrix

Structure	Set A (1)	Set B (2)	Set C (3)	Eval	Design/ Modif
Interior Concrete Structure	E	Y	Y	B	C
Steel Containment Vessel	E	Y	Y	B	C
Shield Building	E	Y	Y	B	C
Diesel Generator Building	E	Y	Y	B	C
Additional Diesel Generator Building	*	Y	Y	C	C
North Steam Valve Room	E	Y	Y	B	C
Refueling Water Storage Tank	E	Y	Y	B	C
Intake Pumping Station	E	Y	Y	B	C

E = existing analysis
* = original analysis criteria established subsequent to SER
Y = yes, analysis is needed

Notes:

1. Set A refers to original analysis
2. Set B refers to SRP – compatible analysis using SSRS
3. Set C refers to reanalysis using original criteria and current modeling

Table 7. Seismic Criteria / Methodology for System and Components

Attributes	Criteria / Methodology
Damping for Sets B and C (See Table 9 for values)	Use damping values based on • RG 1.61 • N411 • Test Results
Analysis techniques	Use SRP – Compatible approaches • Equivalent Static • Response Spectrum Analysis (RSA) • T–H Analysis (THA)
Accounting for Uncertainties	Peak broadening (RSA) Peak shifting (THA)
Spatial Combinations	2D Absolute sum for structures and Commodities except piping 3D Square–root–of–sum–of–squares for piping

Notes:

1. The above criteria are to be used both for Set B and Set C analyses
2. In performing T–H analysis with single set of T–Hs, adequacy of energy content shall be demonstrated.

Table 8. Seismic Criteria for System and Component Damping

Item	Proposed For Evaluation and Modification / New Design		Justification / Source For Proposed Values
	OBE	SSE	
Piping			
12'' or Larger	2	3	RG 1.61
Less Than 12''	1	2	RG 1.61
Optional (Code Case)	N411	N411	RG 1.84
Cable Tray System	7	7	Test Results (1)
Conduit System	7	7	Test Results
HVAC Systems			Nuclear Air
– Companion Angle	5	7	Cleaning
– Pocket Lock	7	7	Handbook and Test
– Welded Duct	2	5	Results
Equipment	2	3	RG 1.61

(1) Higher Damping may be used in specific applications if supported by test data and approved by NRC

COMPARISON OF SET B AND SET C SPECTRA

SET B - SSRS - SOLID CURVES

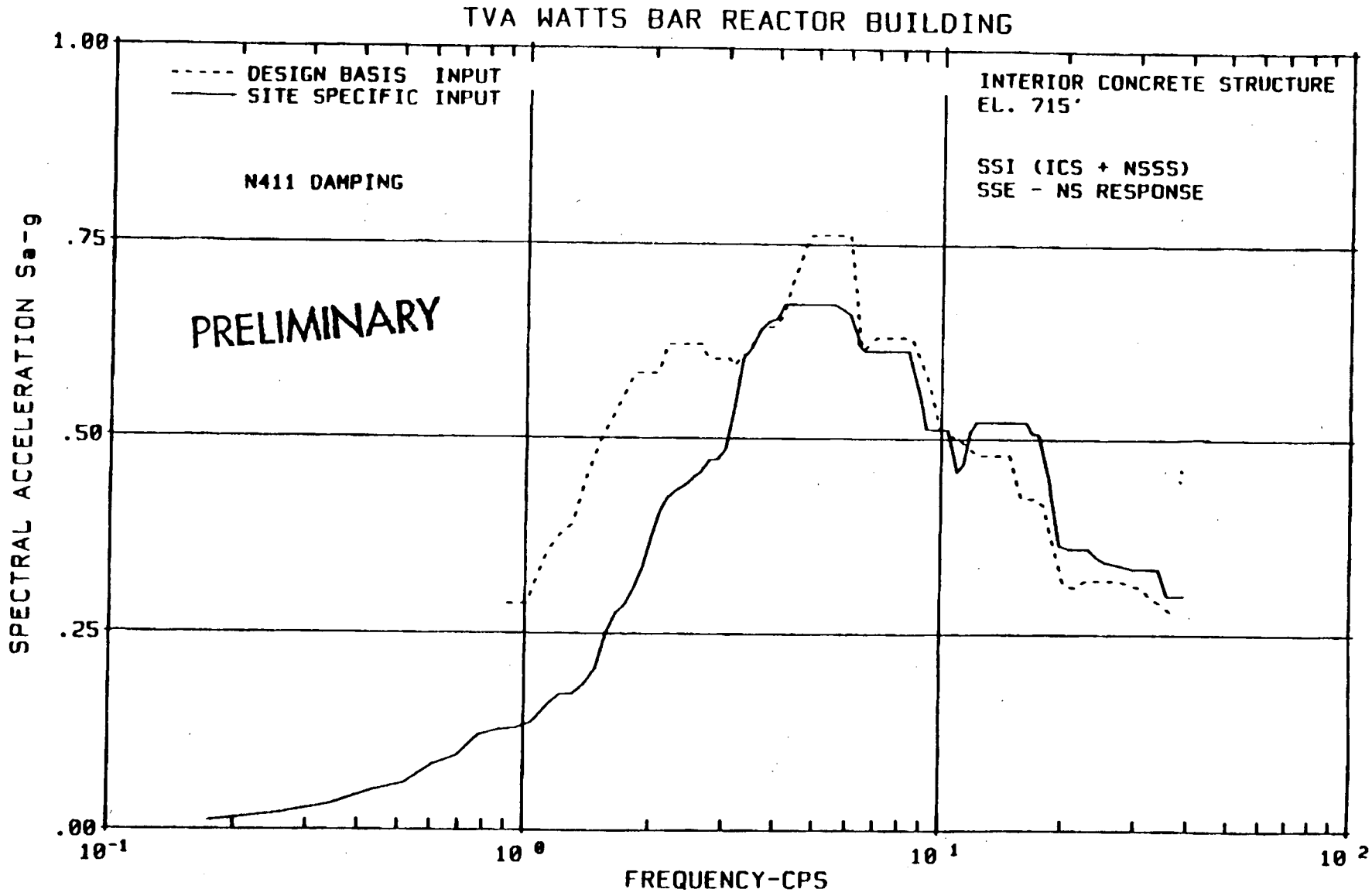
SET C - DESIGN BASIS INPUT WITH IMPROVED MODELING - DASHED LINES

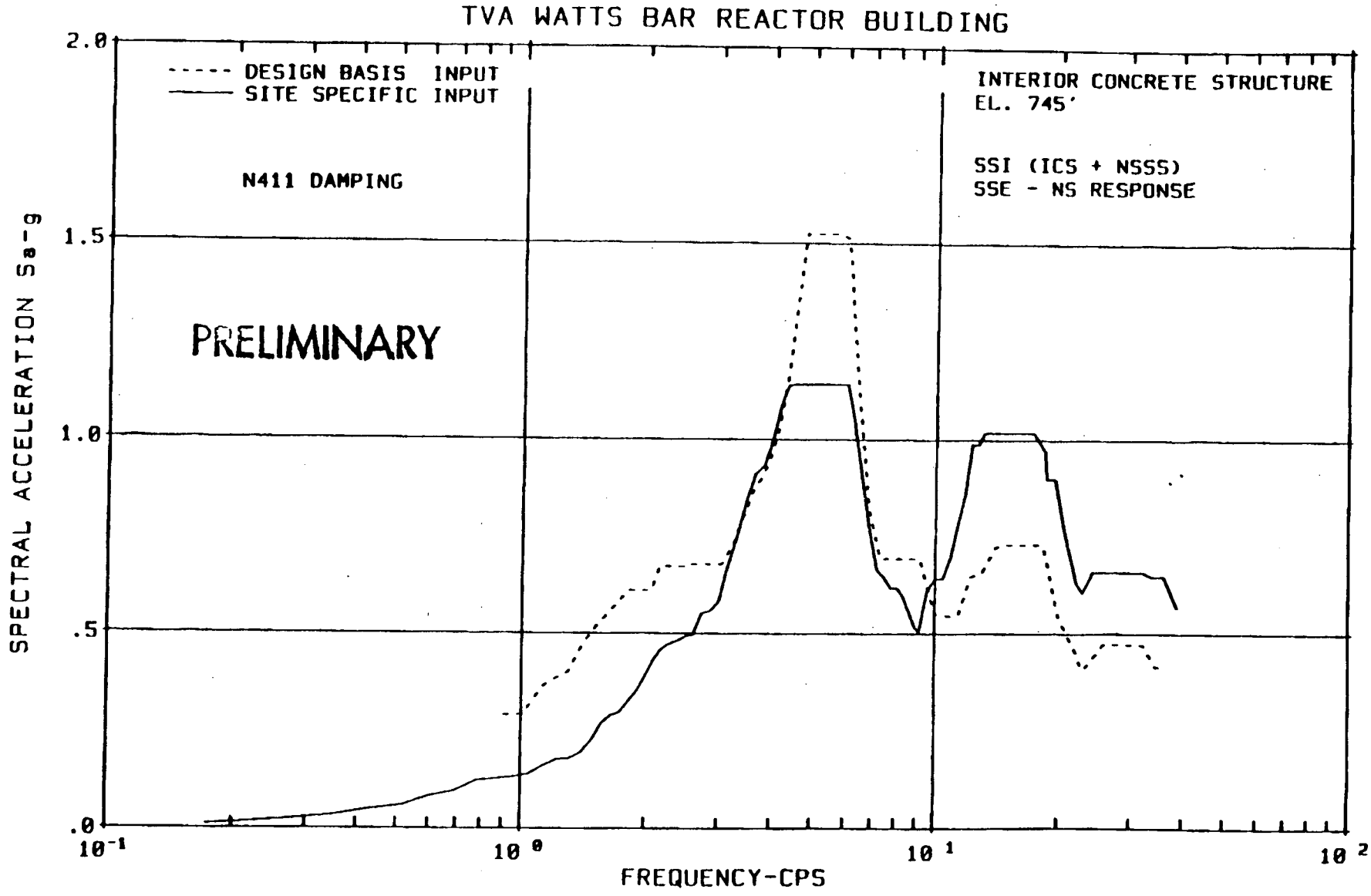
INTERIOR CONCRETE STRUCTURE

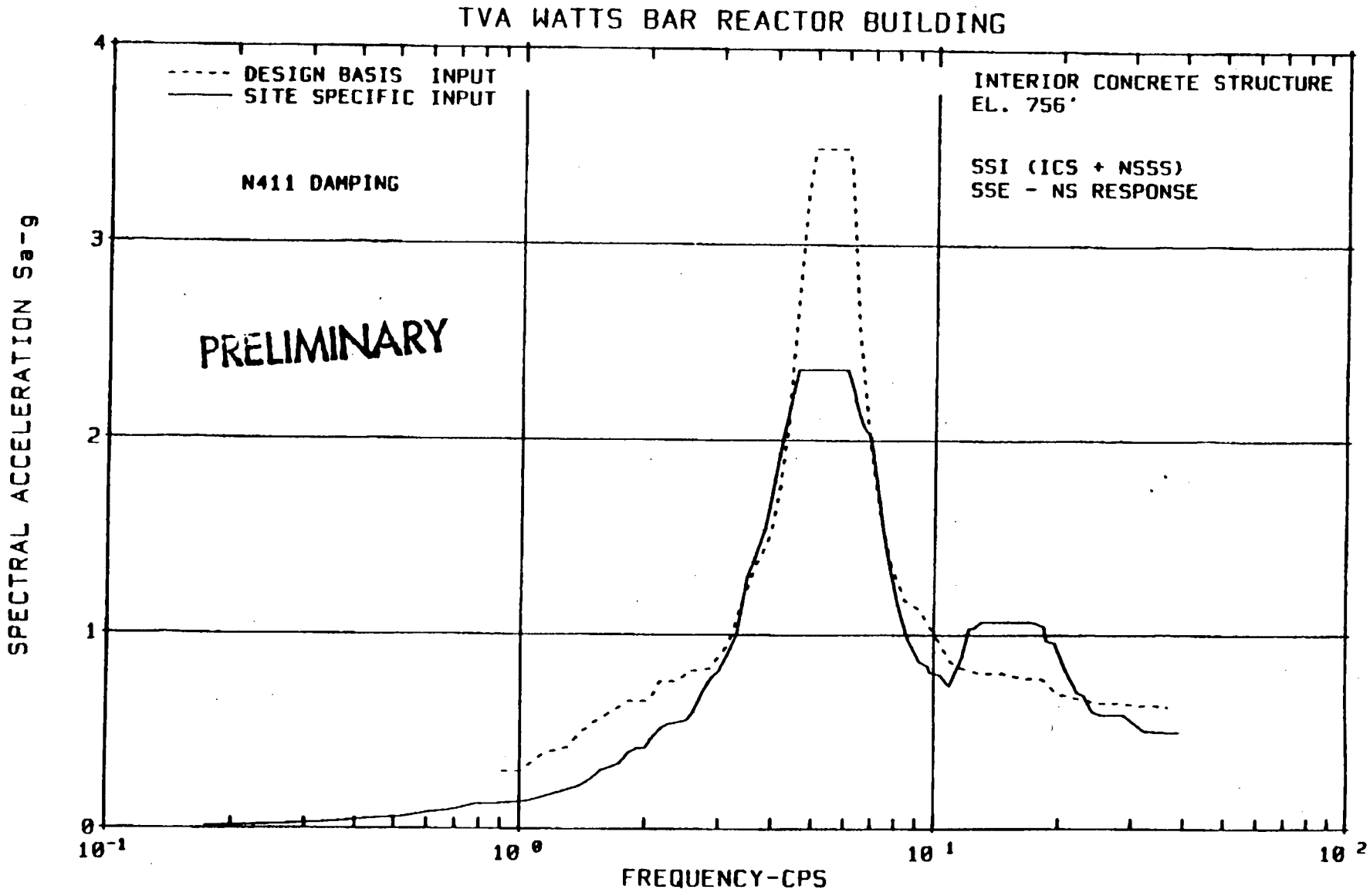
EL. 715
EL. 745
EL. 756
EL. 783

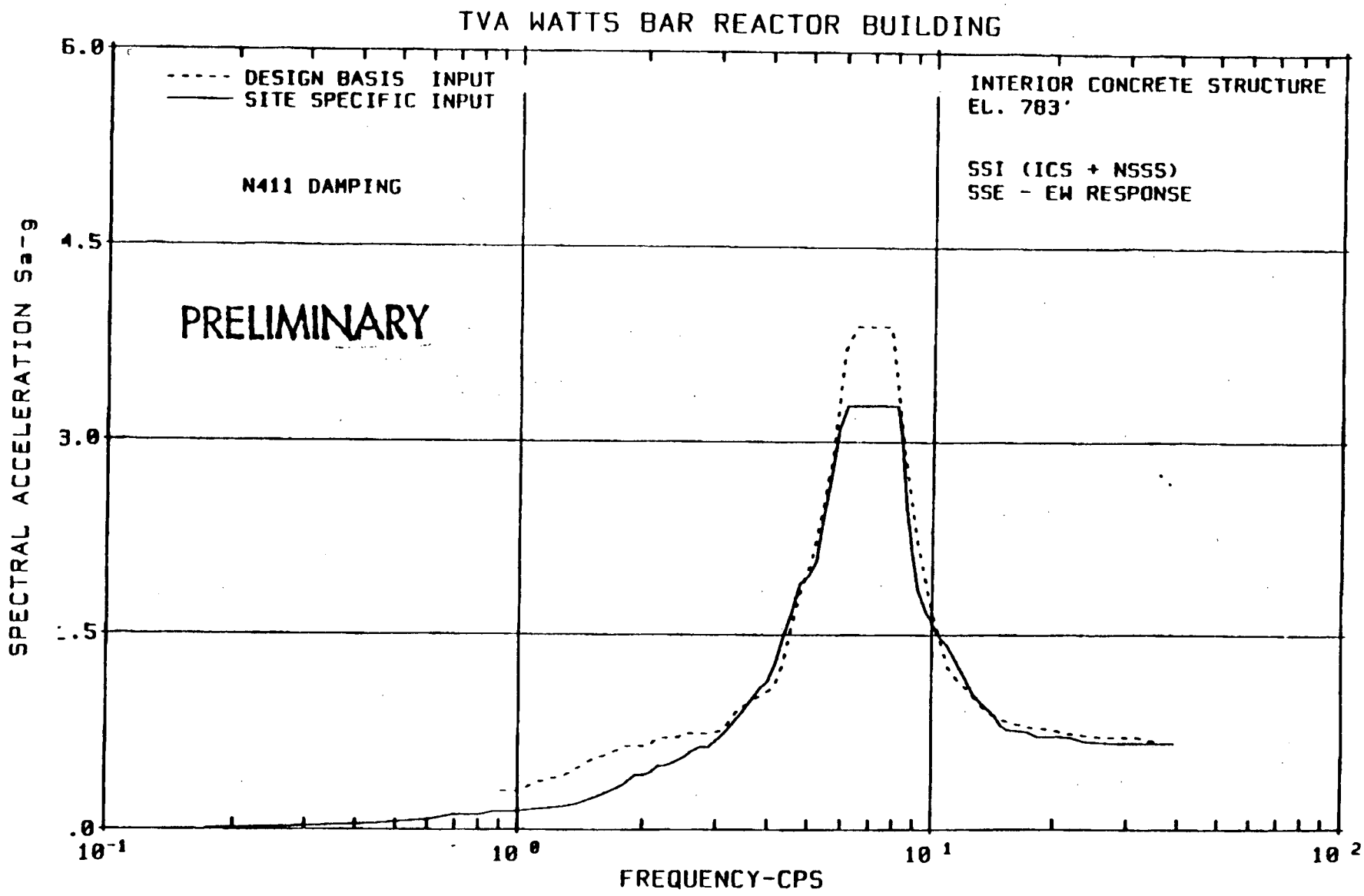
SSE: N411 DAMPING

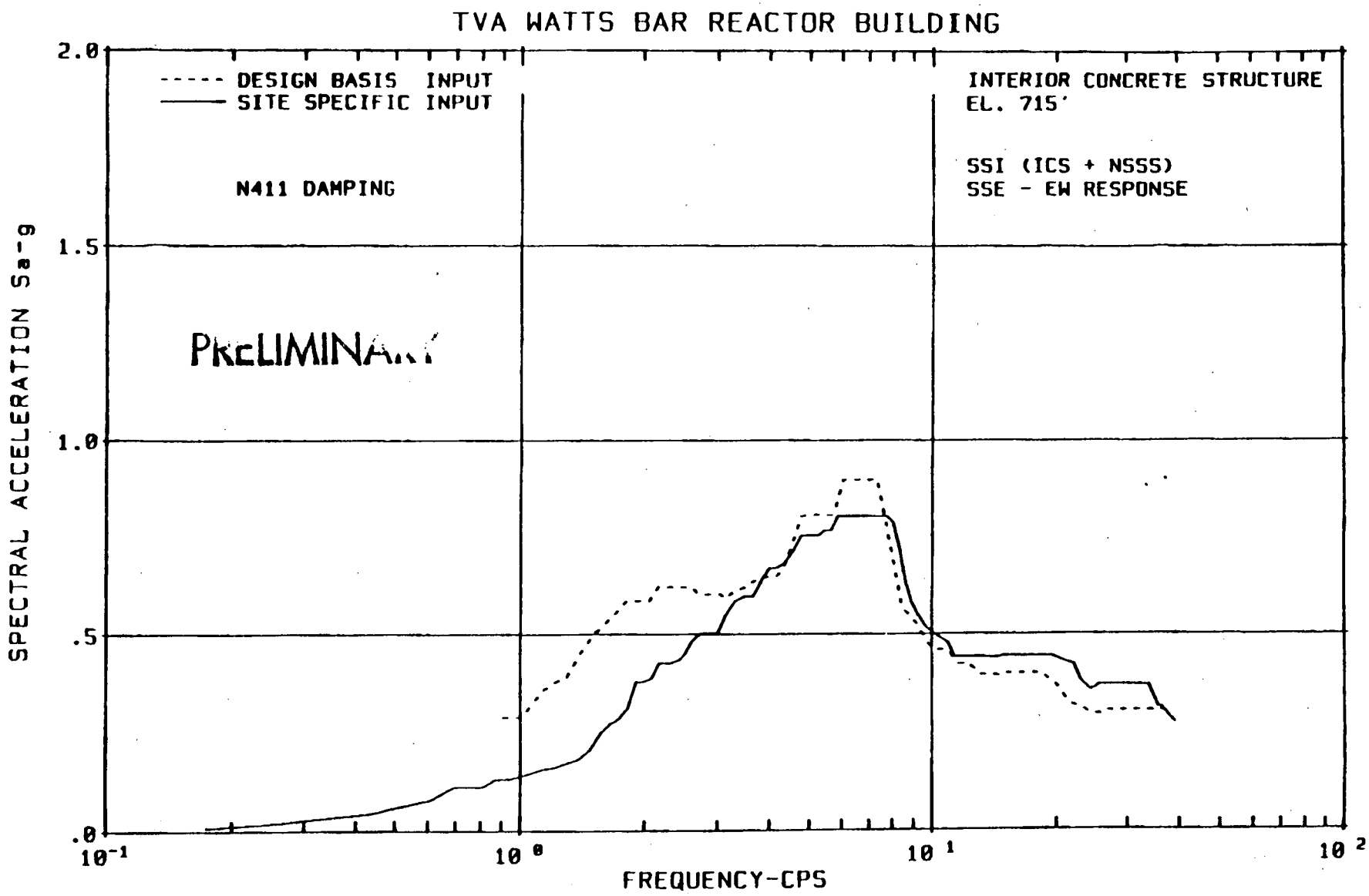
NS
EW
V

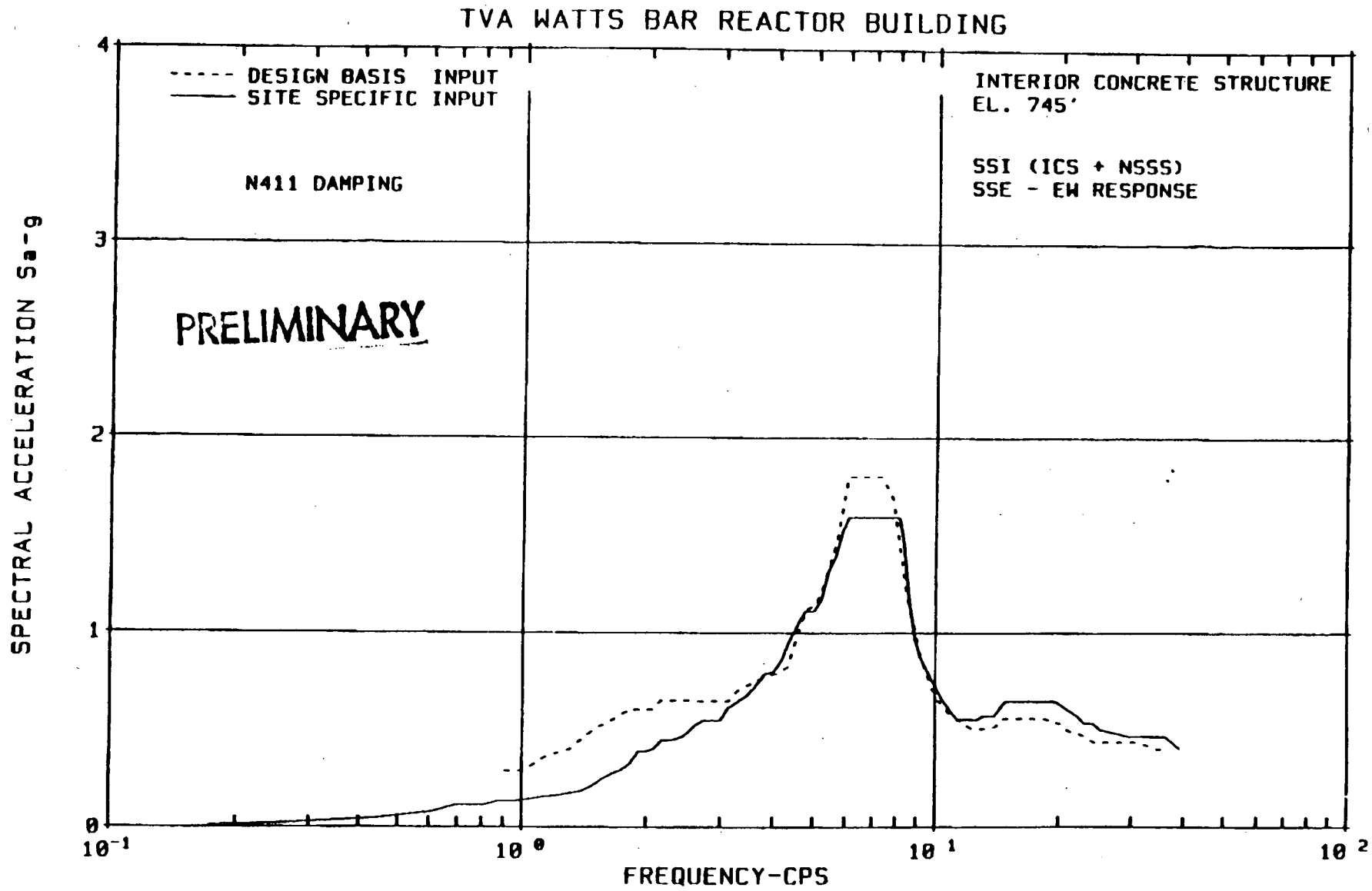

TVA WATTS BAR REACTOR BUILDING
DESIGN BASIS INPUT
SITE SPECIFIC INPUT
N411 DAMPING
PRELIMINARY
INTERIOR CONCRETE STRUCTURE
EL. 715'
SSI (ICS + NSSS)
SSE - NS RESPONSE
SPECTRAL ACCELERATION Sa-g
1.00
.75
.50
.25
.00
10 -1
10 0
10 1
10 2
FREQUENCY-CPS

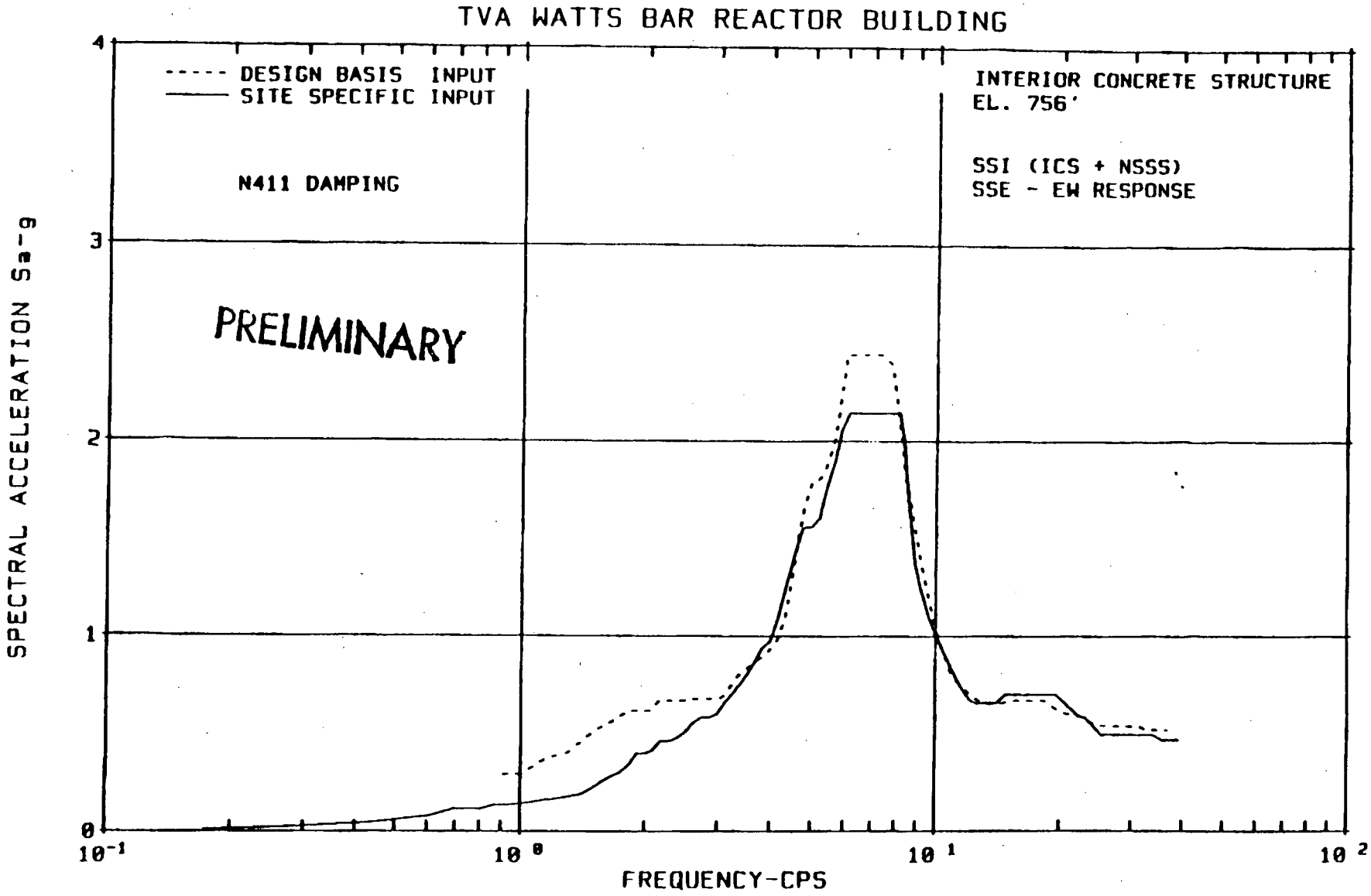


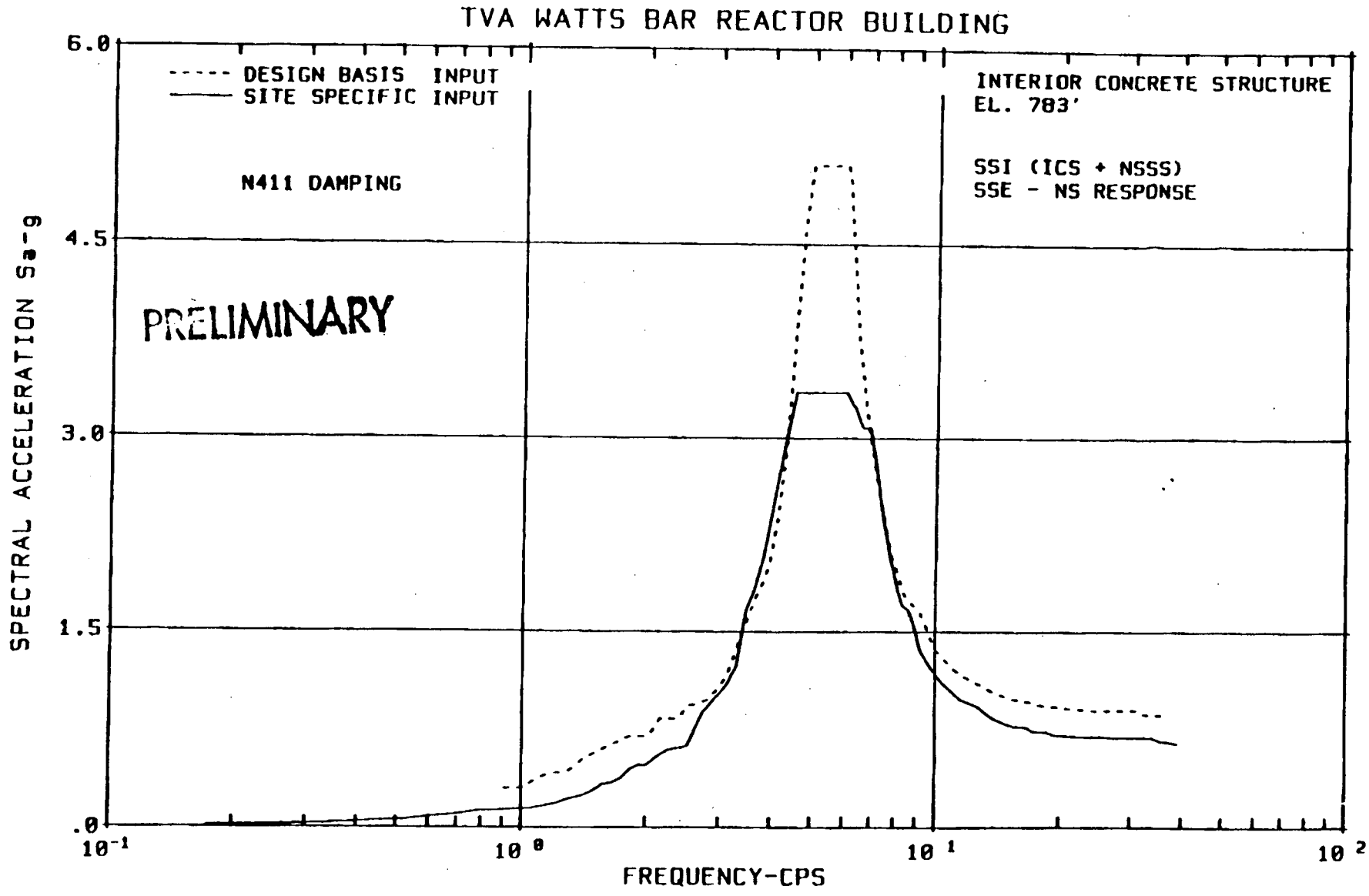


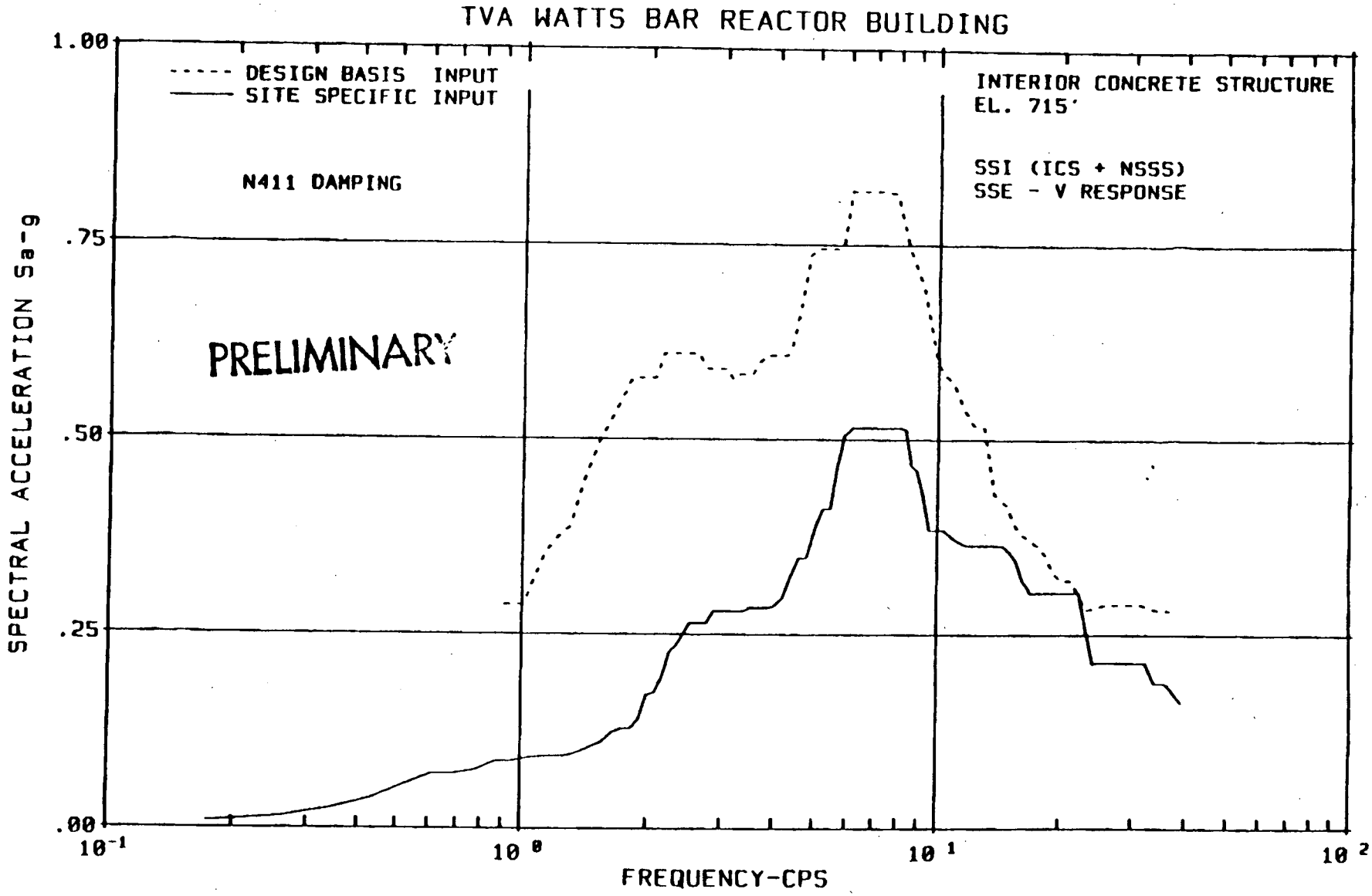

TVA WATTS BAR REACTOR BUILDING
DESIGN BASIS INPUT
SITE SPECIFIC INPUT
N411 DAMPING
PRELIMINARY
INTERIOR CONCRETE STRUCTURE
EL. 783'
SSI (ICS + NSSS)
SSE - EW RESPONSE
SPECTRAL ACCELERATION Sa-g
6.0
4.5
3.0
.5
.0
10 -1
10 0
10 1
10 2
FREQUENCY-CPS

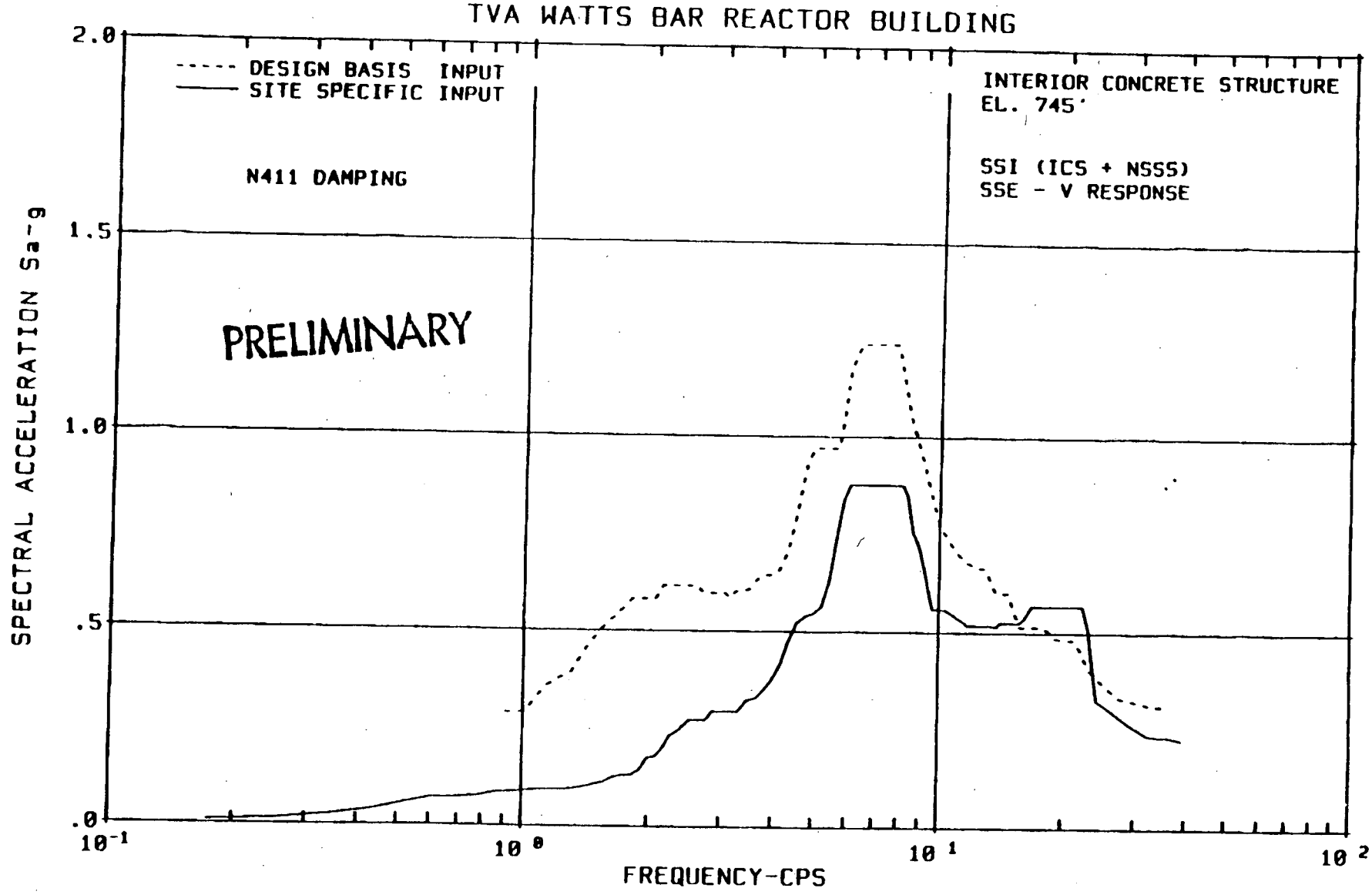

TVA WATTS BAR REACTOR BUILDING
----- DESIGN BASIS INPUT
——— SITE SPECIFIC INPUT
N411 DAMPING
INTERIOR CONCRETE STRUCTURE
EL. 715'
SSI (ICS + NSSS)
SSE - EW RESPONSE
PRELIMINARY
SPECTRAL ACCELERATION Sa-g
2.0
1.5
1.0
.5
.0
10-1
10 0
10 1
10 2
FREQUENCY-CPS

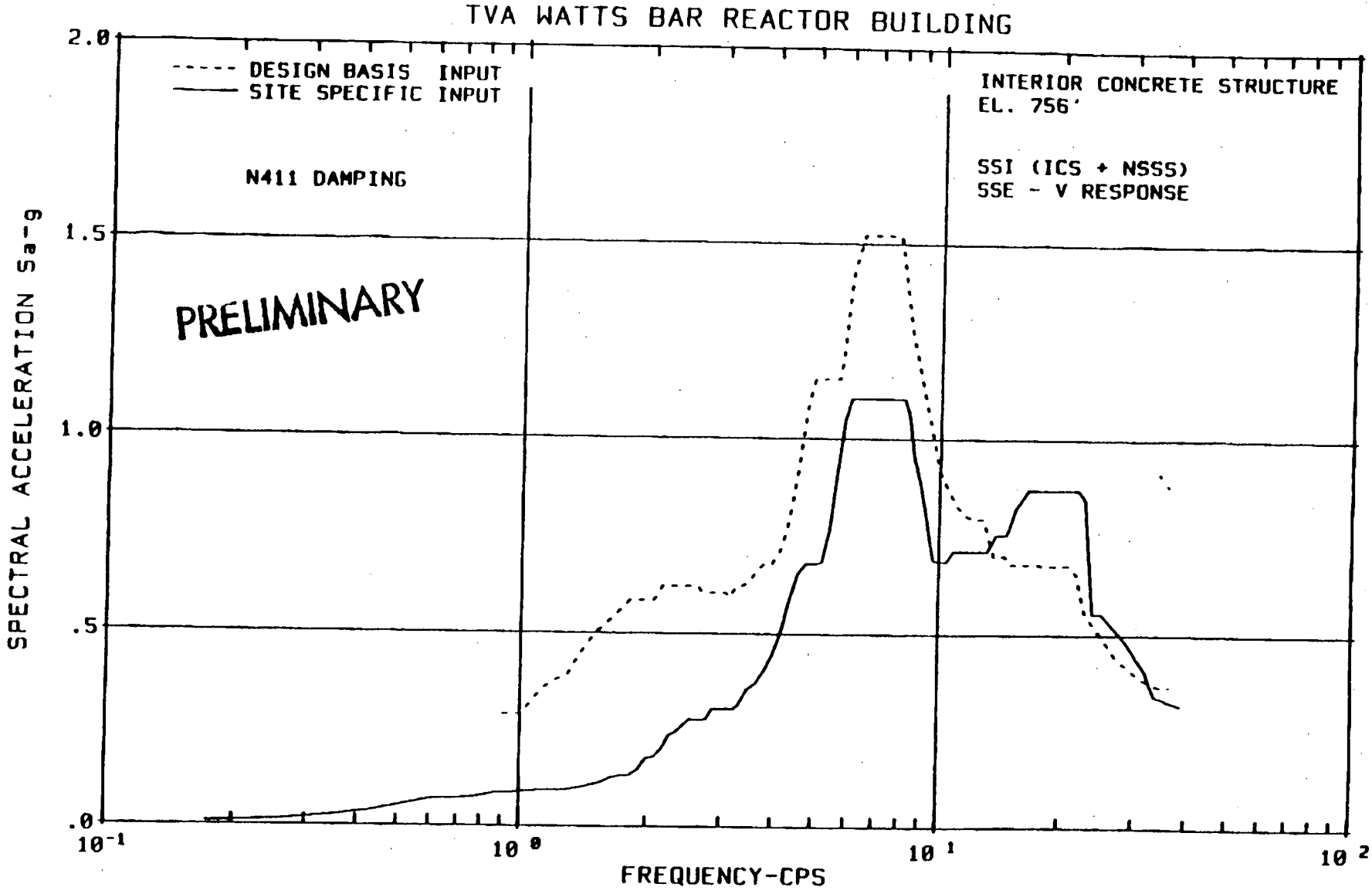


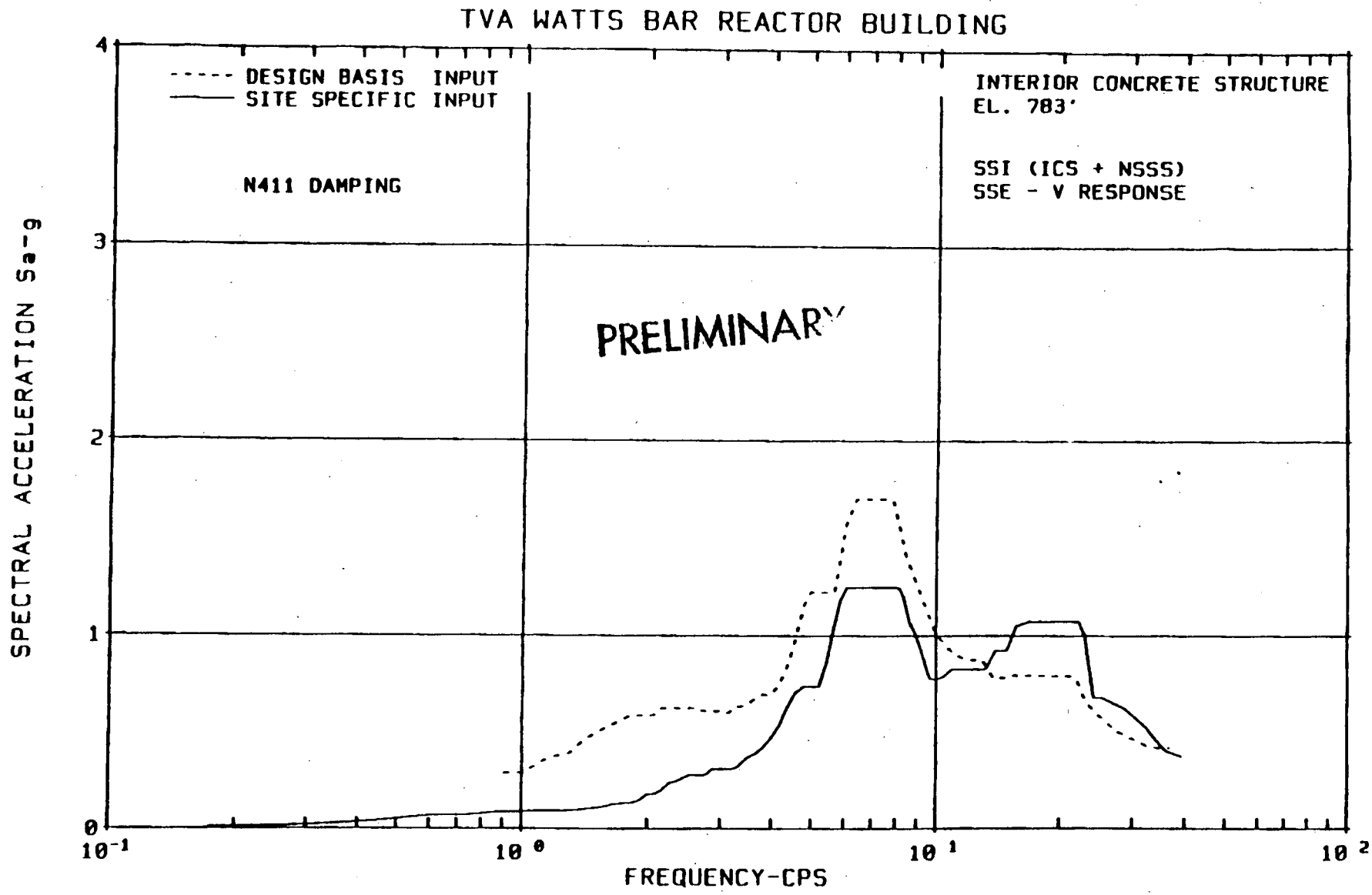

TVA WATTS BAR REACTOR BUILDING
----- DESIGN BASIS INPUT
——— SITE SPECIFIC INPUT
N411 DAMPING
PRELIMINARY
INTERIOR CONCRETE STRUCTURE
EL. 756'
SSI (ICS + NSSS)
SSE - EW RESPONSE
SPECTRAL ACCELERATION Sa-g
FREQUENCY-CPS
0
1
2
3
4
10⁻¹
10⁰
10¹
10²


TVA WATTS BAR REACTOR BUILDING
DESIGN BASIS INPUT
SITE SPECIFIC INPUT
N411 DAMPING
PRELIMINARY
INTERIOR CONCRETE STRUCTURE
EL. 783'
SSI (ICS + NSSS)
SSE - NS RESPONSE
SPECTRAL ACCELERATION Sa-g
6.0
4.5
3.0
1.5
.0
10-1
10 0
10 1
10 2
FREQUENCY-CPS









AUXILIARY/CONTROL BUILDING

EL. 755.5

EL. 814.2

OBE: 2% DAMPING

NS

EW

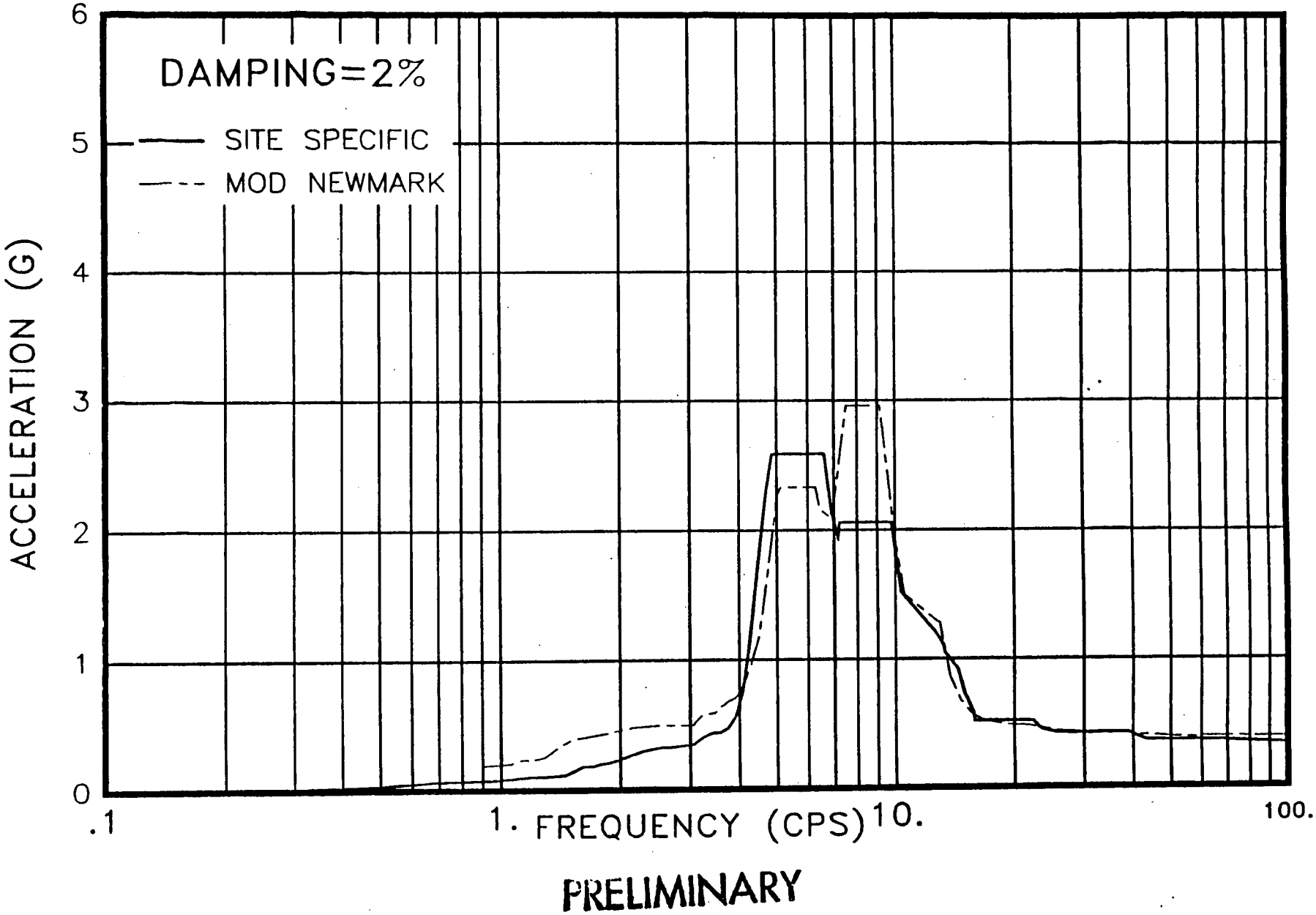
SSE: 5% DAMPING

NS

EW

PRELIMINARY

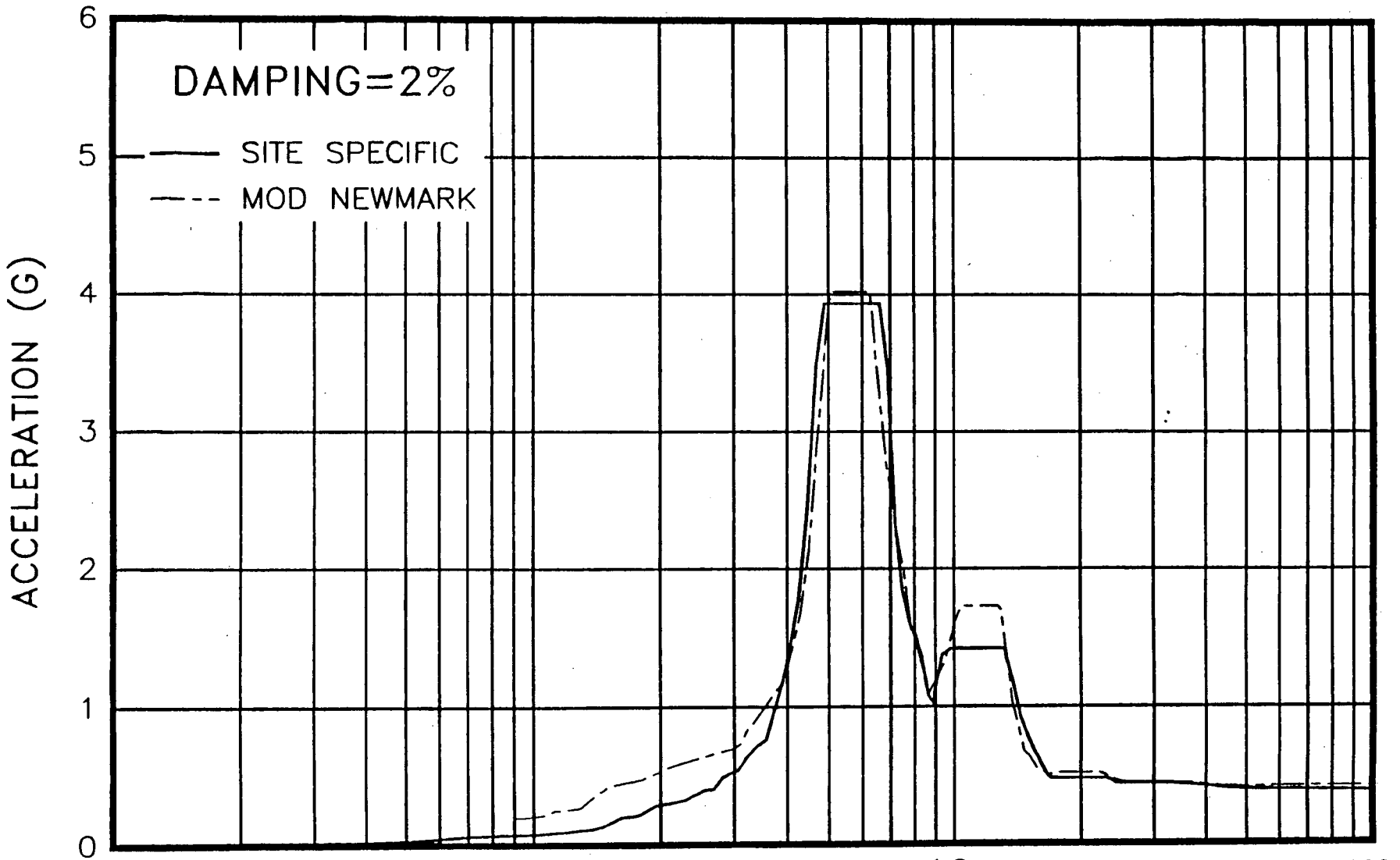
ENVELOPED SPECTRA FOR WBN ACB EL755.5 NS OBE



PRELIMINARY

PRELIMINARY

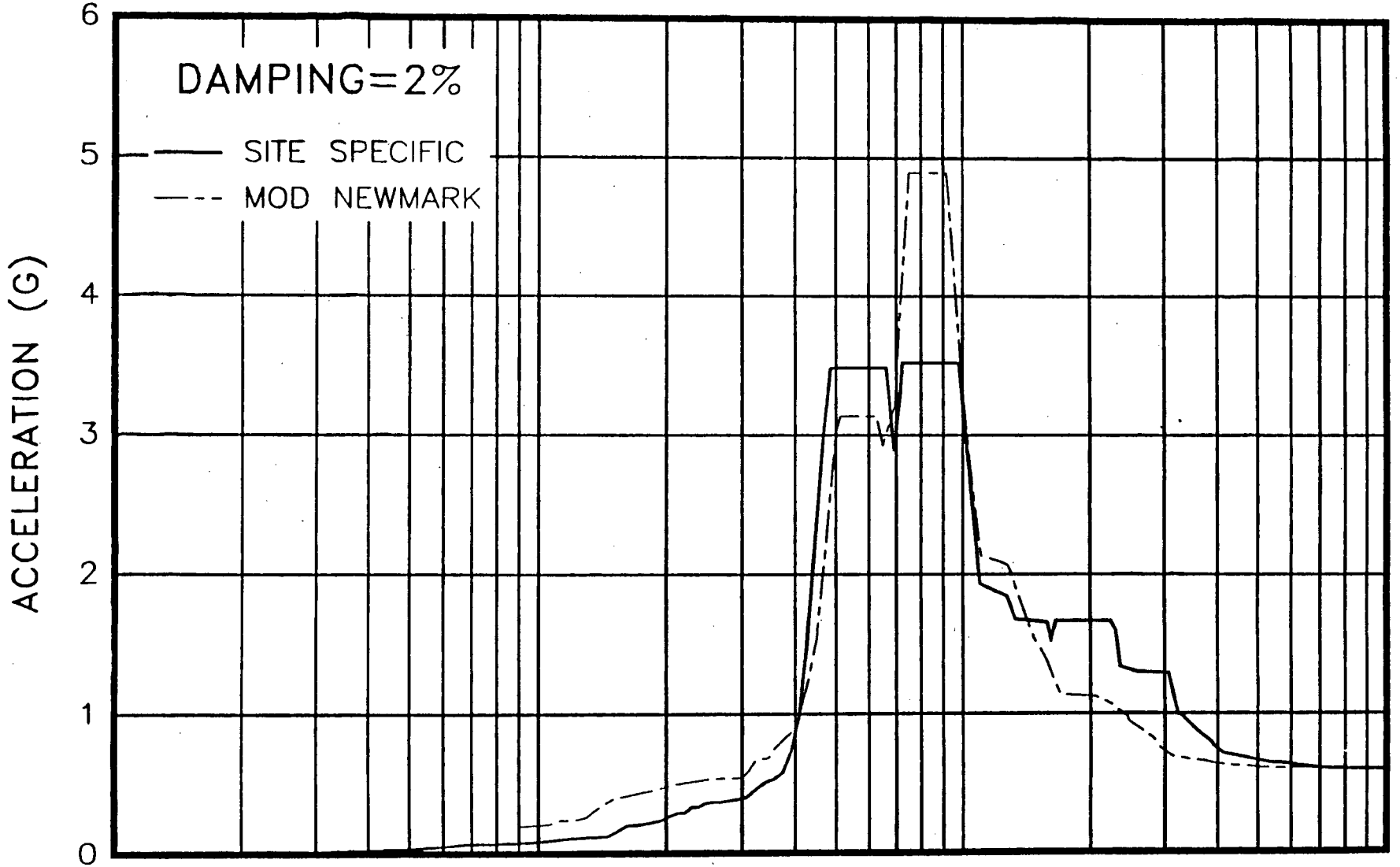
ENVELOPED SPECTRA FOR WBN ACB EL755.5 EW OBE



PRELIMINARY

PRELIMINARY

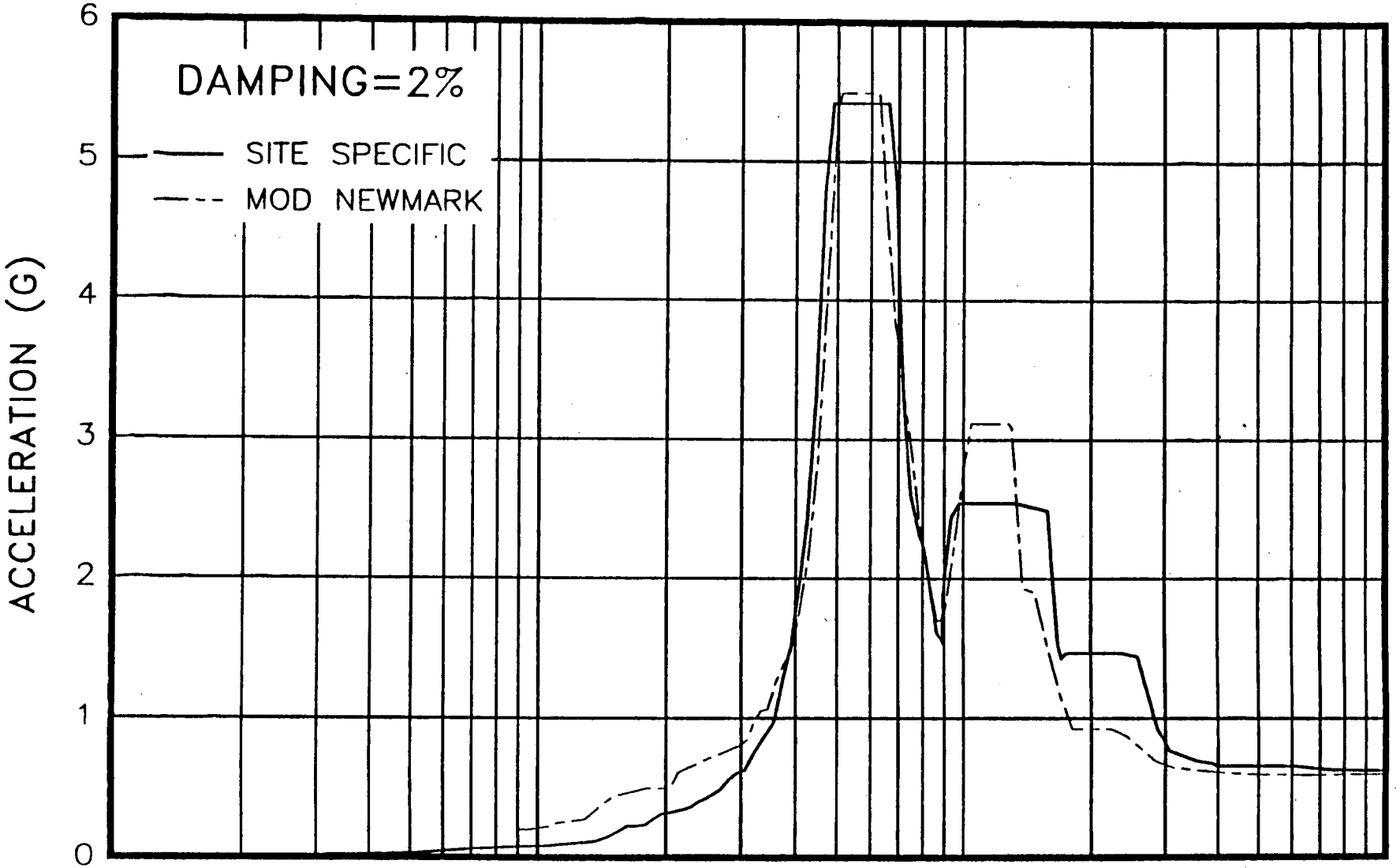
ENVELOPED SPECTRA FOR WBN ACB EL814.25 NS OBE



PRELIMINARY

PRELIMINARY

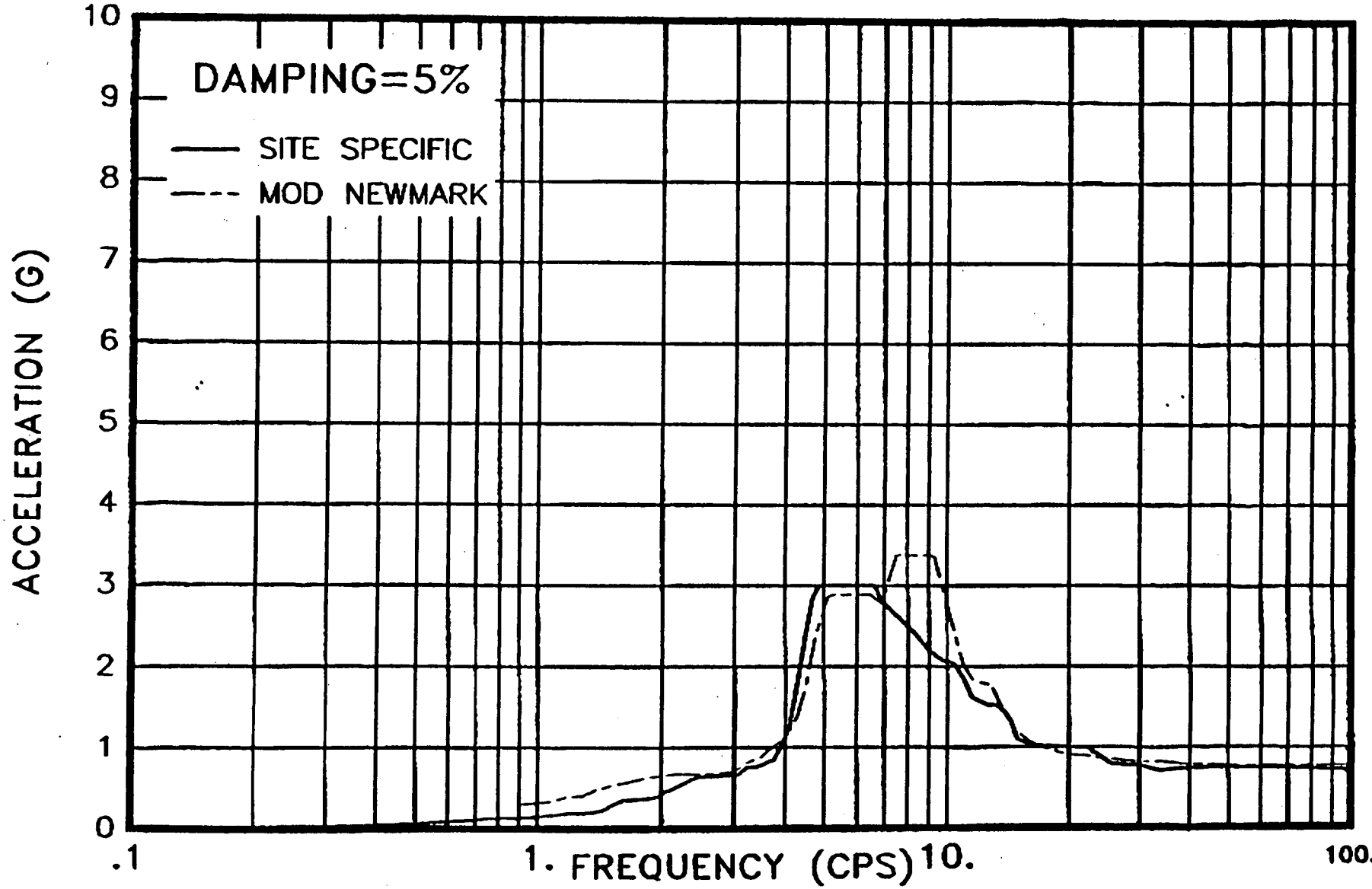
ENVELOPED SPECTRA FOR WBN ACB EL814.25 EW OBE



PRELIMINARY

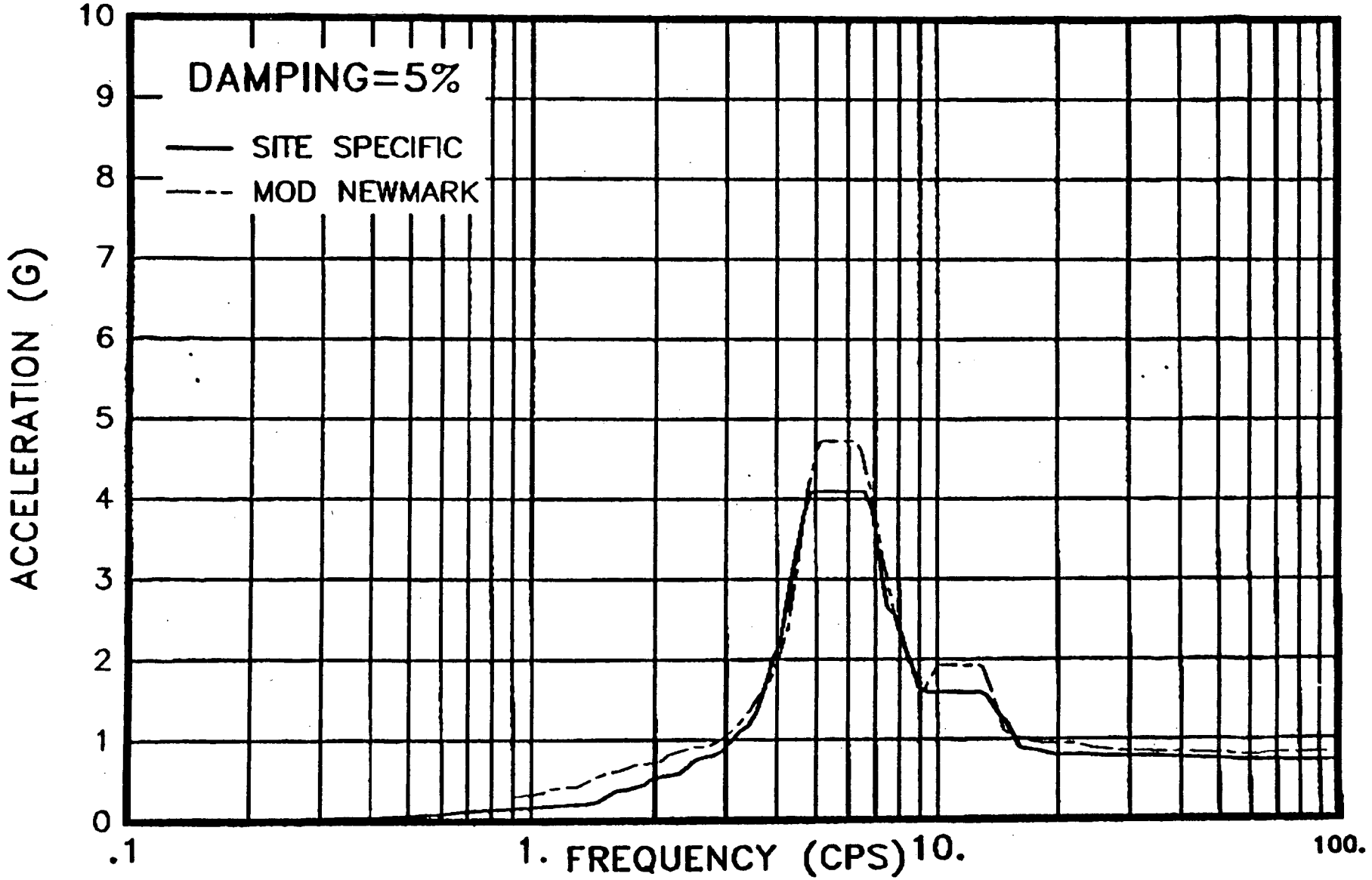
PRELIMINARY

ENVELOPED SPECTRA FOR WBN ACB EL755.5 NS SSE

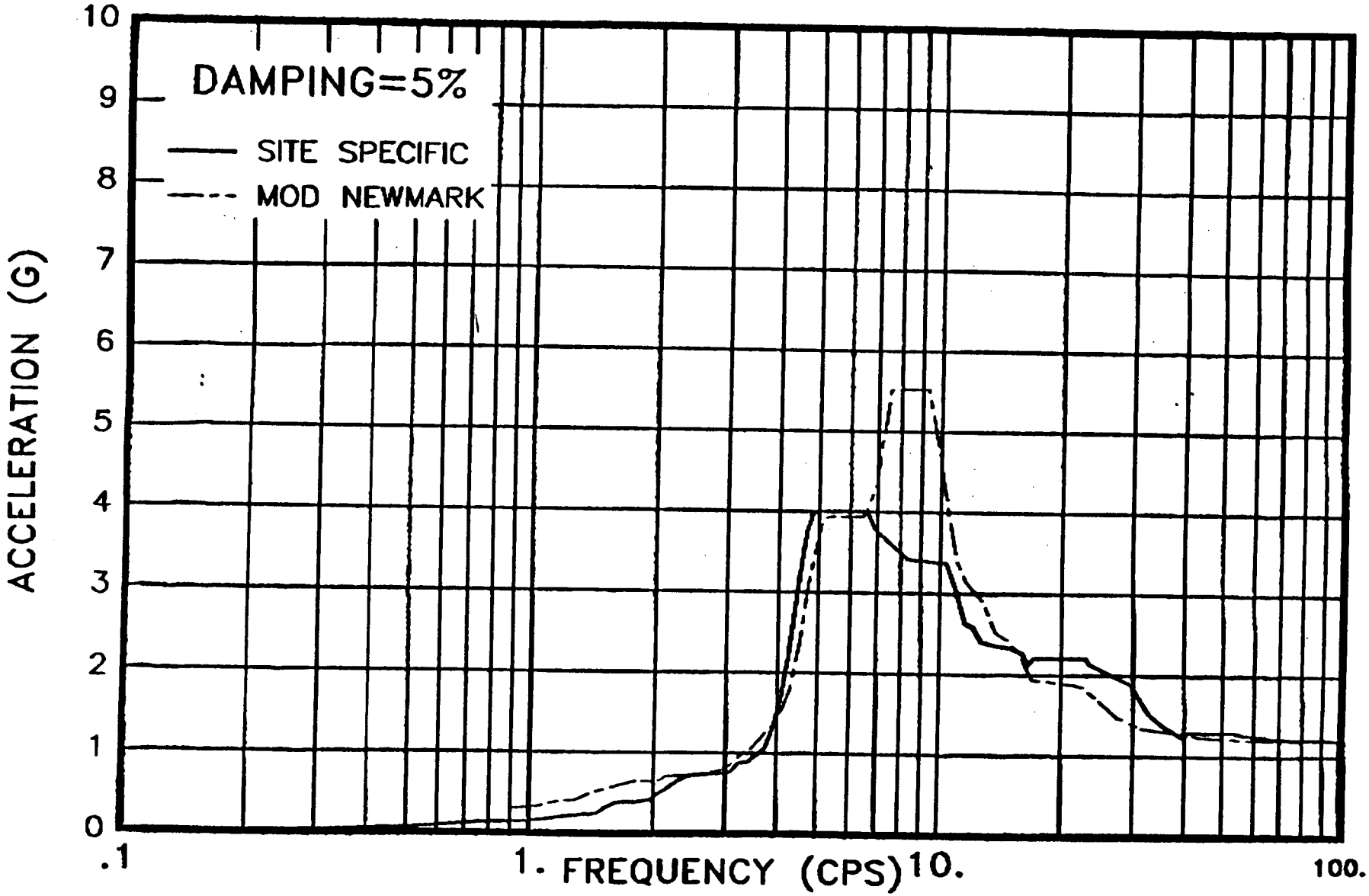


PRELIMINARY

ENVELOPED SPECTRA FOR WBN ACB EL755.5 EW SSE

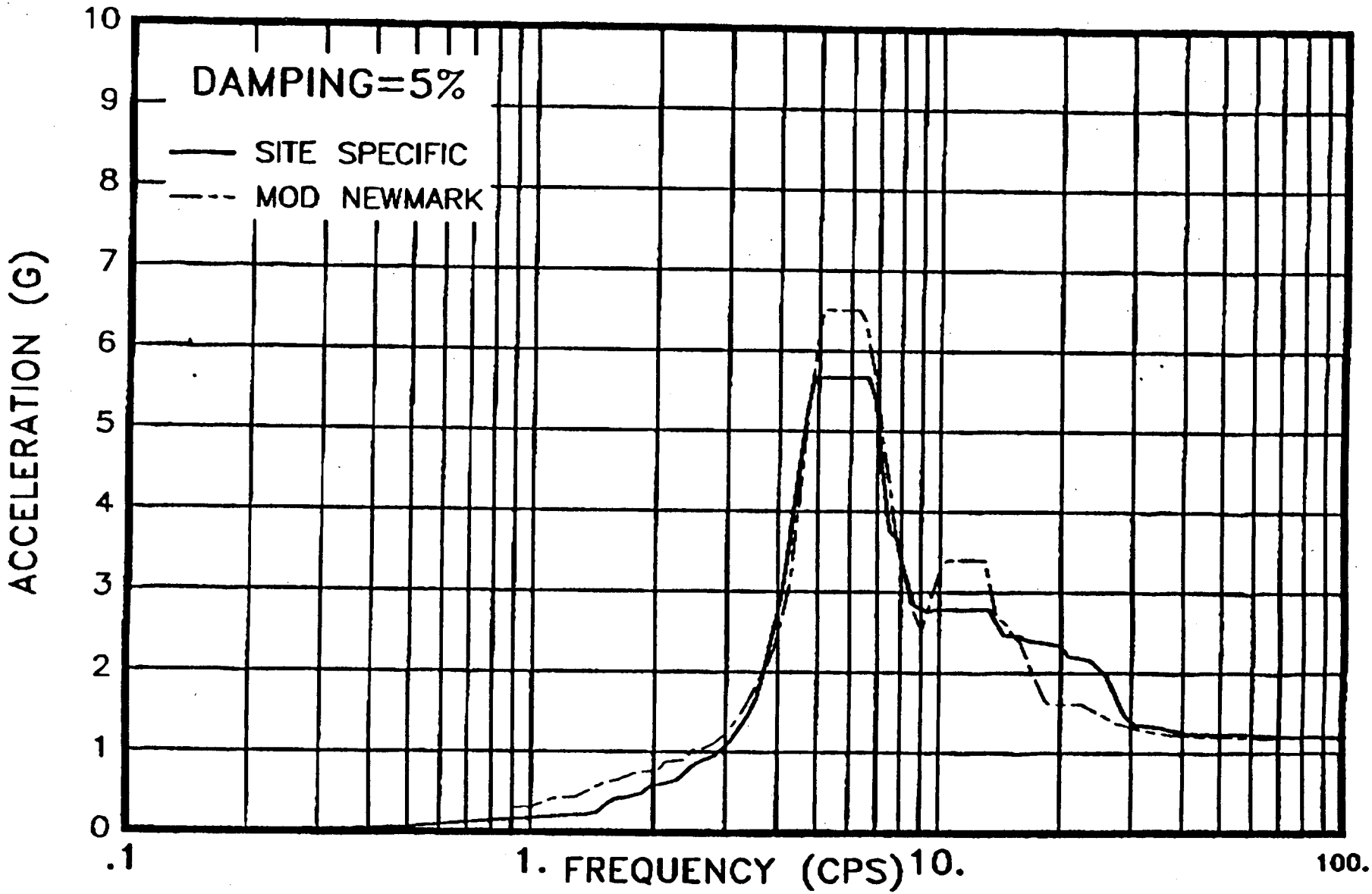


ENVELOPED SPECTRA FOR WBN ACB EL814.25 NS SSE



PRELIMINARY

ENVELOPED SPECTRA FOR WBN ACB EL814.25 EW SSE



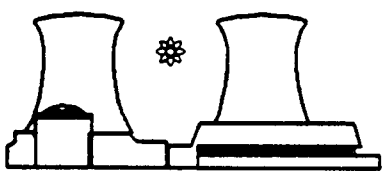
WATTS BAR NUCLEAR PLANT

PRESENTATION OF
CORRECTIVE ACTION PROGRAM
TO THE NUCLEAR REGULATORY COMMISSION

ROCKVILLE, MARYLAND

FEBRUARY 7, 1989

DESIGN BASELINE
AND
VERIFICATION PROGRAM



INTRODUCTION

- PURPOSE OF PROGRAM
- CHANGES FROM REVISION 0
- COMPARISON TO SQN AND BFN DBVP

MAJOR DBVP ACTIVITIES

- LICENSING VERIFICATION
- DESIGN BASIS
- CALCULATIONS
- CONFIGURATION CONTROL
- TESTING REQUIREMENTS

LICENSING VERIFICATION

- OBJECTIVES
  - VERIFICATION OF COMMITMENTS
  - MAINTENANCE OF CONSISTENCY
- SCOPE
  - UNIT 1 AND COMMON
  - DOCKETED COMMITMENT SOURCES
- ACTIVITIES
  - IDENTIFY CORRESPONDENCE
  - IDENTIFY COMMITMENT
  - VERIFY COMMITMENT
  - ESTABLISH LICENSING DOCUMENT COMMITMENT MATRIX (LDCM)
- RECURRENCE CONTROL
  - LDCM
  - SITE ADMINISTRATIVE INSTRUCTION
- STATUS

DESIGN BASIS

- OBJECTIVES
  - ESTABLISH DESIGN BASIS DOCUMENT (DBD)
  - MAINTAIN DBD
- SCOPE
  - PRIMARY OR SECONDARY SAFETY FUNCTION
- ACTIVITIES
  - IDENTIFY COMMITMENTS AND REQUREMENTS (C/Rs)
  - DEVELOP C/R DATA BASE
  - INCORPORATE C/Rs INTO DESIGN CRITERIA/SYSTEM DESCRIPTIONS
  - DEVELOP DESIGN BASIS EVENTS CRITERIA DOCUMENT
- RECURRENCE CONTROL
  - PROJECT PROCEDURE
- STATUS

CALCULATIONS

- OBJECTIVES
  - ASSURE EXISTENCE, RETRIEVABILITY, AND TECHNICAL ADEQUACY OF ESSENTIAL CALCULATIONS
  - MAINTENANCE OF CONSISTENCY WITH PLANT DESIGN
- SCOPE
  - PRIMARY OR SECONDARY SAFETY FUNCTION
- ACTIVITIES
  - IDENTIFY ESSENTIAL CALULATIONS
  - VERIFY EXISTENCE AND RETRIEVABILITY
  - GENERATE MISSING CALCULATIONS
  - ASSURE TECHNICAL ADEQUACY
  - ASSURE CONSISTENCY WITH PLANT DESIGN
- RECURRENCE CONTROL
  - CALCULATION CROSS-REFERENCE INFORMATION SYSTEM (CCRIS)
  - PROCEDURE UPGRADES
- STATUS

CONFIGURATION CONTROL

- OBJECTIVES
  - IMPLEMENT IMPROVED DESIGN CHANGE PROCESS
  - DEVELOP CONFIGURATION CONTROL DRAWINGS (CCDs)
  - CONFIRM SYSTEM FUNCTIONAL DESIGN
- SCOPE
  - UNIT 1 AND COMMON SYSTEMS NECESSARY TO MITIGATE DESIGN BASIS EVENTS
- ACTIVITIES
  - IMPLEMENT NEW DESIGN CHANGE PROCESS
  - PREPARE SYSTEM BOUNDARY CALCULATION
  - DEVELOP CCDs FOR MAIN CONTROL ROOM DRAWINGS
  - WALKDOWN FLOWS, CONTROLS, SINGLE-LINES
  - EVALUATE TEST RESULTS FOR SCHEMATICS
  - PERFORM SYSTEM EVALUATIONS
- RECURRENCE CONTROL
  - IMPROVED DESIGN CHANGE PROCESS
- STATUS

TESTING REQUIREMENTS

- OBJECTIVE
  - ASSURE TEST SCOPING DOCUMENT CONSISTENCY WITH THE DBD
- SCOPE
  - FSAR TABLE 14.2-1 TESTS
- ACTIVITIES
  - REVIEW SCOPING DOCUMENTS AGAINST DBD
  - REVISE SCOPING DOCUMENTS
  - REVIEW TEST RESULTS AGAINST SCOPING DOCUMENT
  - REVIEW REVISED SCOPING DOCUMENT AGAINST TEST INSTRUCTION FOR INCOMPLETE TESTS
- RECURRENCE CONTROL
  - PROCEDURE UPGRADE
- STATUS

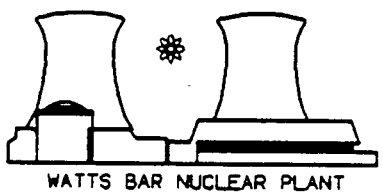
WATTS BAR NUCLEAR PLANT

PRESENTATION OF
CORRECTIVE ACTION PROGRAM
TO THE NUCLEAR REGULATORY COMMISSION

ROCKVILLE, MARYLAND

FEBRUARY 8, 1989

WELDING



TVA WELDING PROJECT

- BACKGROUND
- DESCRIPTION OF PROGRAM
- WBN WELD EVALUATION ACTIVITIES
- STATUS
- RESULTS AND CONCLUSIONS

BACKGROUND

- 1985 EVENTS

- FORMATION OF WELDING PROJECT

DESCRIPTION OF WELDING PROJECT PROGRAM

ASSESSMENT OF WRITTEN WELDING PROGRAM (PHASE I)

REVIEW OF WELDING PROGRAM IMPLEMENTATION (PHASE II)

RECURRENCE CONTROL ACTIVITIES (PHASE III)

WBN WELDING

EVALUATION ACTIVITIES

- INITIAL ACTIVITIES
- SPECIFIC CORRECTIVE ACTIONS
- ADDED ACTIVITIES

WELDING PROJECT

CORRECTIVE ACTIONS

- STRUCTURAL PLATFORM WELDS - ELEVATION 741.0
- RADIOGRAPHS FOR ASME PIPING WELDS
- PIPING SHEAR LUGS
- WALL-MOUNTED INSTRUMENT PANELS
- HVAC DUCTWORK WELDING
- STRUCTURAL STEEL PARTITION WALL - ELEVATION 755.0
- TEMPORARY ATTACHMENTS - PIPING
- CLASSIFICATION OF CONTAINMENT LINER WELDS
- MISSING ANGLE BRACE ON MONORAIL SUPPORT STRUCTURE

WELDING PROJECT

ADDED ACTIVITIES

- AUDIT PROGRAM REVIEW
- INDEPENDENT WELD DEVIATION REPORTS
- EVALUATION OF GENERIC NCRs
- CODE APPLICABILITY FOR WORK PERFORMED AFTER COMPLETION OF N-5 REPORTS
- CODE OF RECORD
- WELDS ON VENDOR SUPPLIED EQUIPMENT
- MAIN STEAM IMPINGEMENT SLEEVES
- NORTH/SOUTH VALVE ROOMS
- MISIDENTIFIED RADIOGRAPHS
- FILLET WELD ADEQUACY

WELDING PROJECT

STATUS OF COMPLETED ITEMS

- DISCOVERY PORTION OF PHASES I AND II
- EG&G WEP AND EG&G REPORTS
- EMPLOYEE CONCERNS PROGRAM
- NRC MEETING ON WBN 1
- WBN 1 WELDING CAP
- SPECIFIC CORRECTIVE ACTIONS 1, 7, AND 9

WELDING PROJECT

STATUS OF INCOMPLETE ITEMS

- REPORTS FOR PHASES I AND II
- SPECIFIC CORRECTIVE ACTIONS 2 THRU 6 AND 8
- PHASE III

WELDING PROJECT

RESULTS AND CONCLUSIONS .

- EXISTING HARDWARE

- PROGRAM IMPROVEMENTS

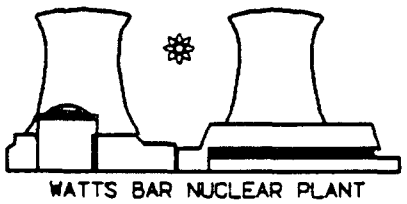
WATTS BAR NUCLEAR PLANT

PRESENTATION OF CORRECTIVE ACTION PROGRAM TO THE NUCLEAR REGULATORY COMMISSION

ROCKVILLE, MARYLAND

FEBRUARY 8, 1989

QUALITY ASSURANCE RECORDS



QA RECORDS

AGENDA

- BACKGROUND
- SCOPE
- DESCRIPTION OF PROGRAM
- SUMMARY
- DISCUSSION

BACKGROUND

- STORAGE ISSUES
  - SINGLE COPY RECORDS NOT IN LIFETIME RECORD STORAGE FACILITY (LRSF)
  - LRSF FIRE PROTECTION DEFICIENCIES
- RETRIEVABILITY ISSUES
  - SLOW RETRIEVAL
  - EXCESSIVE RELIANCE ON INDIVIDUAL KNOWLEDGE
- QUALITY ISSUES
  - ADMINISTRATIVE
  - TECHNICAL
  - MISSING RECORDS

SCOPE

- CONSTRUCTION AND OPERATIONS RECORDS

- ESSENTIAL RECORDS

  (THOSE THAT SUBSTANTIATE THE CHARACTERISTICS OF A COMPONENT THAT ARE SIGNIFICANT TO IT'S SAFETY-RELATED FUNCTION)

STORAGE ISSUES

PROGRAM DESCRIPTION

- QUALIFY ONE FACILITY AS LIFETIME RECORD STORAGE FACILITY (LRSF)

- IDENTIFY NECESSARY MICROFILMING
  - RECORD COPY STABILITY
  - RECORD VOLUME
  - MICROFILMABILITY

- TRANSFER CONSTRUCTION RECORDS TO LRSF
  - SINGLE COPY RECORDS
  - SET OF MICROFILMED RECORDS

RETRIEVABILITY ISSUES

PROGRAM DESCRIPTION

- DEVELOP CONTROLLED INDEX
  - SINGLE COPY RECORDS
  - MICROFILMED RECORDS
- DEVELOP RECORD RETRIEVAL GUIDE
  - USER FRIENDLY
  - COMPUTER INDEX, RELATIONAL DATA BASE, MANUAL PROCESS
- VERIFY IMPROVED RETRIEVABILITY
  - TEST THE INDEX AND RETRIEVAL GUIDE
  - RETRIEVE SELECTED RECORDS

RECORD QUALITY ISSUES

PROGRAM DESCRIPTION

- SORT OPEN CAQs, EMPLOYEE CONCERNS

GROUPING	RESOLUTION
- NON-RECORD ISSUE	- OUT OF SCOPE
- RECORD STORAGE	- CAP SECTION 4.1
- RECORD RETRIEVABILITY	- CAP SECTION 4.2
- RECORD QUALITY	- FURTHER EVALUATION

- RESOLUTION OF RECORD QUALITY ISSUES

CONSIDER	RESOLUTION
NON-ESSENTIAL DATA AFFECTED	USE-AS-IS
RECORD RETRIEVED	FILE
DATA / ALTERNATE DATA IN OTHER RECORD	SUPERSEDE/SUPPLEMENT
WITHIN OTHER CAP	" "
NEW INSPECTION OR TEST	" "

- DISPOSITION NONCONFORMING HARDWARE

SIGNIFICANCE	RESOLUTION
NOT DESIGN SIGNIFICANT	- DISPOSITION HARDWARE
DESIGN OR SAFETY SIGNIFICANT	- DISPOSITION HARDWARE - ROOT CAUSE/GENERIC CORRECTION - RECURRENCE CONTROL

RECORD QUALITY

PILOT PROGRAM

- SORTED APPROX 1500 CAQs
  - 57 RECORD CAQs
  - APPROXIMATELY 1000 PROBLEM UNITS

- SELECTED PILOT SAMPLE
  - 14 RECORD CAQs
  - 52 PROBLEM UNITS

- EVALUATED EACH THROUGH A QA RECORDS CAP LOGIC PATH

1	- NON RECORD ISSUE
2	- RECORD STORAGE
8	- NON ESSENTIAL DATA AFFECTED
13	- RECORD RETRIEVED
5	- DATA/ALTERNATE DATA IN OTHER RECORD
16	- NEW INSPECTION/TEST
7	- WITHIN OTHER CAP
52	

CONCLUSION: LOGIC OUTLINED IN QA RECORDS CAP IS ADEQUATE

TREND ANALYSIS

- RECORD QUALITY ISSUES PLUS VSR IDENTIFIED RECORD QUALITY ISSUES
- IDENTIFY ADVERSE TRENDS OF POTENTIAL SIGNIFICANCE
- REVIEW FOR EXTENT AND EFFECT OF CONDITION
- ADMINISTER EVALUATION AND CORRECTION UNDER CAQ PROGRAM

SUMMARY

- ENSURE ADEQUATE RECORDS STORAGE
- ENSURE ADEQUATE RECORDS RETRIEVABILITY
- ENSURE ADEQUATE RECORDS QUALITY