85.10

MAINE YANKEE ATOMIC POWER COMPANY

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

March 14, 1986
MN-86-41

GDW-86-68

RESPONSIBILITY N/A
RESPOND BY N/A
NRC DUE DATE N/A

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Ashok C. Thadani, Director
PWR Project Directorate #8
Division of Licensing

References:
(a) License No. DPR-36 (Docket No. 50-309)
(b) MYAPCo Letter to USNRC dated June 24, 1983 (MN-83-135)
(c) MYAPCo Letter to USNRC dated August 26, 1983 (MN-83-179)
(d) MYAPCo Letter to USNRC dated May 31, 1984 (MN-84-96)
(e) MYAPCo Letter to USNRC dated June 18, 1984 (MN-84-110)
(f) MYAPCo Letter to USNRC dated July 5, 1984 (MN-84-121)
(g) MYAPCo Letter to USNRC dated July 31, 1984 (MN-84-126)
(h) MYAPCo Letter to USNRC dated August 3, 1984 (MN-84-137)
(i) MYAPCo Letter to USNRC dated September 24, 1984 (MN-84-162)
(j) MYAPCo Letter to USNRC dated October 3, 1984 (MN-84-174)
(k) MYAPCo Letter to USNRC dated December 4, 1984 (MN-84-211)
(l) MYAPCo Letter to USNRC dated February 5, 1985 (MN-85-27)
(m) MYAPCo Letter to USNRC dated April 17, 1985 (MN-85-75)
(n) MYAPCo Letter to USNRC dated April 29, 1985 (MN-85-81)
(o) MYAPCo Letter to USNRC dated June 19, 1985 (MN-85-123)
(p) MYAPCo Lett[illegible] to USNRC dated October 18, 1985 (MN-85-181)

Subject: Seismic Assessment Program

Gentlemen:

With the submittal of Reference (p), Maine Yankee Atomic Power Company completed a voluntary program to demonstrate the seismic adequacy of the plant to a greater than design earthquake. This work was performed for a R.G. 1.60 earthquake spectra anchored at 0.1g, approximately twice the effective loadings of the Housner design basis. Portions of the plant were also assessed for a 0.2g R.G. 1.60 spectra. The results were documented in the referenced series of submittals (b) through (p), extending over a two-year period.

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United States Nuclear Regulatory Commission
Attention: Mr. Ashok C. Thadani, Director

The overall conclusion of this seismic review effort is that the Maine Yankee plant, in its upgraded state, is designed within recognized codes and standards for a seismic event equal to a 0.1g Regulatory Guide 1.60 event, and that it has adequate seismic ruggedness to withstand an earthquake equal to at least 0.2g Regulatory Guide 1.60 event and still safely shut down without danger to the public health and safety.

To provide additional assurance of the ability of Maine Yankee to safely shut down following a 0.2g earthquake, we performed an assessment of hot shutdown systems by extending the application of the SQUG seismic experience database and utilizing recent work by EPRI. A copy of our assessment is attached.

As a result, we have concluded that the existing Maine Yankee design provides a high degree of protection to public health and safety in the event of a postulated 0.2g seismic event.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G. D. Whittier, Manager
Nuclear Engineering and Licensing

GDW/bjp

Attachment

cc: Dr. Thomas E. Murley
Mr. Pat Sears
Mr. Cornelius F. Holden

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INTRODUCTION

This seismic assessment identifies the required active and passive functions to achieve and maintain Hot Safe Shutdown (HSSD) at Maine Yankee. It further identifies the systems required to perform these functions, categorizes the equipment comprising the HSSD systems, and identifies structures housing these systems.

The capability of the identified systems and structures to achieve and maintain HSSD is assessed for functional performance at 0.2g Regulatory Guide 1.60 through evaluation against the Seismic Qualification Utility Group (SQUG) seismic experience data base.

HSSD FUNCTIONS

The following functions are necessary to assure achieving and maintaining Hot Safe Shutdown condition following a seismic event:

1. A manual or automatic reactor trip.

2. Reactor Coolant System makeup and boration.

3. Secondary System makeup and decay heat removal.

4. Maintenance of the integrity of the Reactor Coolant and Secondary System pressure boundaries.

The systems, components, and structures necessary to perform these functions are identified below.

HOT SAFE SHUTDOWN SYSTEMS AND STRUCTURES

Four specific Maine Yankee systems are used to reach and maintain a Hot Safe Shutdown condition:

1. Reactor Coolant System - The primary side of the steam generators, reactor coolant pumps (pressure boundary only), pressurizer, piping, valves, control rod drive mechanisms, reactor internal structures, and support structures.

2. Main Steam System - The secondary side of the steam generators and piping out to the Excess Flow Check Valves. Also included are the steam generator Code Safety Valves.

3. Emergency Feedwater System - The Demineralized Water Storage Tank (DWST) and Emergency Feedwater Pumps including piping and valves from the tank to the pumps to the steam generators.

4. Safety Injection/Chemical and Volume Control System - The Refueling Water Storage Tank (RWST) and HPSI/Charging Pumps including piping and valves from the tank to the pumps to the Reactor Coolant System.

In addition to these four major system classes, the following support systems are required:

1. Service Water System - The service water pumps, piping, and valves to the component cooling water heat exchangers.

2. Component Cooling Water System - The Primary and Secondary Component Cooling Water Systems (PCC and SCC) seismic pressure boundaries including pumps, heat exchangers, surge tanks, piping, and valves.

3. Instrumentation Systems - The instrumentation necessary to provide the following critical plant parameters and control functions:

   - Pressurizer level and pressure.
   - Reactor coolant hot and cold leg temperatures.
   - Steam generator level and pressure.
   - Source range neutron flux.
   - Reactor trip controls.

4. Emergency Power System - The diesel generators, diesel support systems, and electrical distribution systems for HSSD equipment.

In preparing this listing, the structures that house the key HSSD systems and support systems were identified. The components which comprise the HSSD systems at Maine Yankee are housed within the following structures:

1. Reactor Containment
2. Primary Auxiliary Building
3. Emergency Feedwater Pumphouse
4. Containment MCC and Electrical Penetration Structure
5. Emergency Diesel Generator Rooms
6. Turbine Building
7. Intake Structure
8. Service Building (Protected Areas)
9. Steam and Feed Valve House

These structures or the portion housing critical equipment are all seismically designed or exhibit good seismic resistance from the requirement to meet design basis wind loads.

EVALUATION

The equipment comprising the HSSD systems at Maine Yankee is typical of the equipment found in the Seismic Qualification Utility Group (SQUG) data base. Properly anchored, this equipment has been demonstrated to consistently perform its design function given real earthquakes at, or well above, 0.2g Regulatory Guide 1.60.

HSSD equipment has been categorized by the SQUG into 20 classes. This classification is depicted in Table 1. Of these equipment classes, a representative sample (the first eight) was favorably evaluated in "A Comparison of Maine Yankee to the SQUG Seismic Experience Data Base" (Reference 1), including particular attention to anchorage. Generic Classes 9 through 13 are not necessary to achieve HSSD at Maine Yankee.

The bounding generic spectra used in this comparison are shown in Figure 1. These spectra envelope a 0.2g Regulatory Guide 1.60 spectrum with one exception. This exception is the Type C spectrum which applies only to large motor-operated valves supported by small lines. A lack of experience data resulted in this constraint at the time the review was performed (mid-1984).

The seismic data base is a living document and additional earthquake experience data has resulted from the March 1985 and September 1985 earthquakes in Chile and Mexico, respectively. These new data are expected to ultimately result in the removal of the Type C spectrum restriction. All eight classes will then be confirmed to demonstrate seismic ruggedness in excess of 0.2g Regulatory Guide 1.60.

Work is continuing in 1986 under the auspices of the SQUG to establish bounding spectra for all 20 classes of HSSD equipment. Drafts of these are available to Maine Yankee through SQUG membership. In Attachment A, Figures 1 through 11 show the proposed bounding spectra for all 20 classes of equipment. The table, entitled "Summary of Generic Spectrum for Safe Shutdown Equipment," keys the equipment class to the proposed bounding spectrum. These drafts will be submitted for review and approval by the Senior Seismic Review and Advisory Panel (SSRAP) by midyear, 1986. Note that these proposed spectra all bound 0.2g Regulatory Guide 1.60 and show greater margins to 0.2g for the initial set of eight equipment types as well.

Based on this ongoing work, we are confident that the SSRAP bounding spectra for all 20 classes will be at or above the Type A/Type B spectra which bound 0.2g Regulatory Guide 1.60.

The "nuclear" specific equipment; reactor vessel, internals, reactor coolant pumps and piping, pressurizer, steam generators, control rod drive assemblies, and associated support structures are generally not represented in the data base, but are designed to withstand other design basis loads (i.e., LOCA) which far exceed the postulated seismic loadings.

TABLE 1

Generic Classes of Safe Shutdown Equipment[1]

1. Motor Control Centers
2. Low Voltage Switchgear
3. Medium Voltage
4. Transformers
5. Horizontal Pumps
6. Vertical Pumps
7. Fluid-Operated Valves
8. Motor-Operated Valves
9. Fans
10. Air Handlers
11. Chillers
12. Air Compressors
13. Motor Generators
14. Distribution Panels
15. Batteries and Racks
16. Battery Chargers and Inverters
17. Engine Generators
18. Instrument Racks
19. Temperature Sensors
20. Control and Instrumentation Cabinets

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1. Classes 9-13 are not required to achieve Hot Safe Shutdown at Maine Yankee.

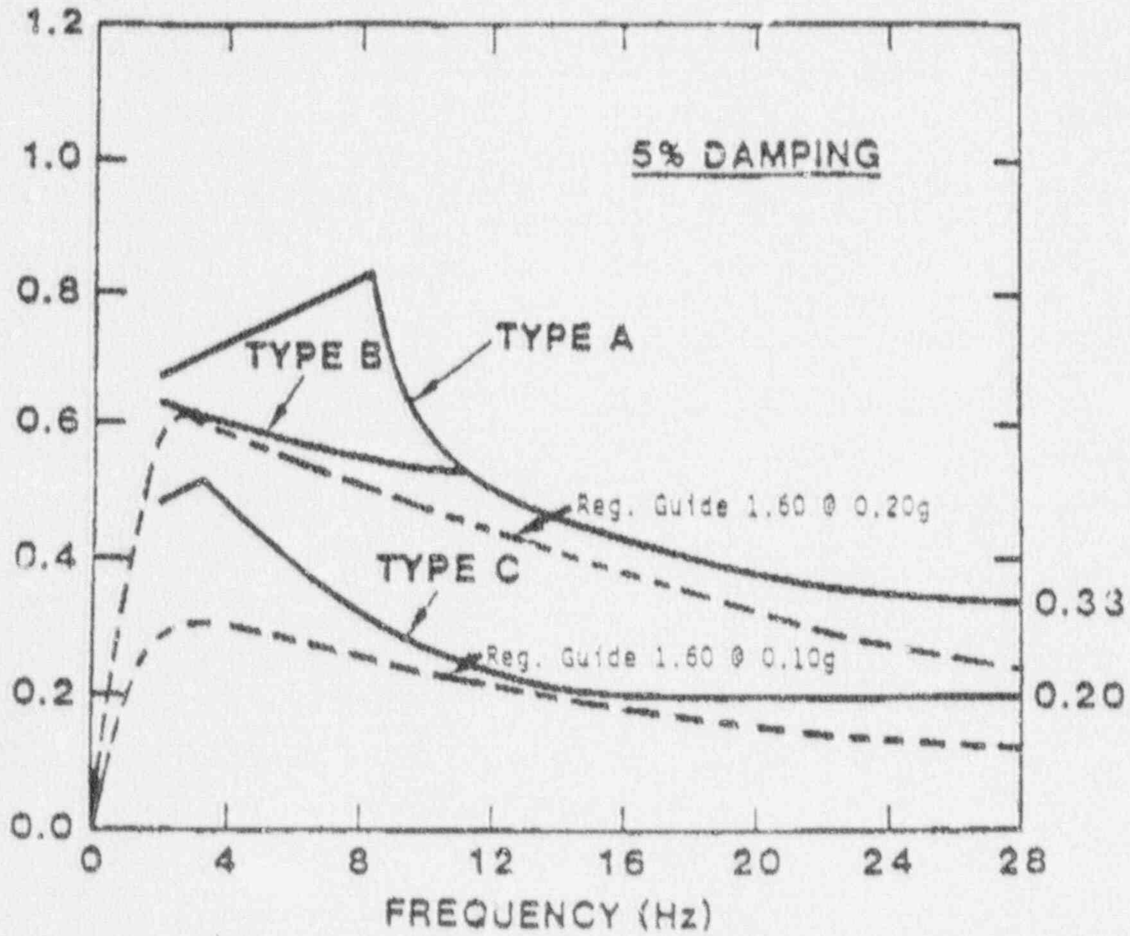

Figure 1 Response spectra defining seismic motion bounds for the applicability of experience data to nuclear plant equipment superimposed on the Regulatory Guide 1.60 spectrum normalized to PGAs of 0.10g and 0.20g

HSSD STRUCTURES

The following structures, some of which are portions of larger buildings (which are included in the list) or are interconnected, contain HSSD equipment:

Primary Auxiliary Building
Emergency Feedwater Pumphouse
Containment MCC and Penetration Enclosure
Main Steam Valve Enclosure
Turbine Building
Service Building
Diesel Generator Rooms
Intake Structure

Note that the containment structure is discussed separately.

All of the structures were designed to resist seismic and extreme wind and tornado loads. The steel structures were designed for both hurricane loads of 100 mph and tornado loads of 360 mph (300 mph rotational and 60 mph translational). Concrete structures were designed using a Housner spectrum with a PGA of 0.10g. All concrete walls are steel reinforced and two feet (or more) thick to prevent possible missile hazards.

As shown in Table 2, two types of structural systems are employed utilizing heavily braced steel frames or massive reinforced concrete shear walls. Some of the structures combine the two types of systems.

A review was conducted to determine the previous seismic performance of comparable and weaker structures. More than ninety industrial facilities (which include more than twenty power plants with over seventy conventional and a few nuclear units), as well as numerous reinforced concrete shear wall structures, were studied. The review addressed the employed structural systems and various parameters that are important to building performance during strong ground motion (symmetry and eccentricity, aspect ratios, connection details, etc).

TABLE 2

SUMMARY OF STRUCTURES AT

THE MAINE YANKEE ATOMIC POWER PLANT

Building	Plan Dimensions	Max/Min Bldg. Elevation	General Description	Basis for Representation in Seismic Experience Data Base
1. Primary Auxiliary Building	96' x 120' Rectangular, Irregular elevation	35' above grade 7' below grade	Reinforced concrete shear wall and slab structure up to 16' above grade, with steel braced framed structure above (the higher steel structure encloses a concrete, shear wall structure with partial steel framing). Structurally connected to Fuel Building which is a steel braced frame, high bay structure.	Significant construction parameters are represented by Power Buildings in fossil power plants. Power Buildings are typically braced steel structures with concrete slabs at floors, and include basements with reinforced concrete walls.
2. Emergency Feedwater Pump House	52' x 46' Irregular	12' above grade 11' below grade (pipe tunnel)	Reinforced concrete, shear wall structure; structurally attached to reinforced concrete portions of the Primary Auxiliary building.	Significant construction parameters are represented by Power Buildings in fossil power plants, control buildings in substations and many others. In some cases, Power Buildings are reinforced concrete beam, slab and column construction.
3. Containment MCC and Penetration	16'6" x 28' Irregular	47' above grade approx. at grade	Reinforced concrete, shear wall structure (shear walls in both directions). Attached, at grade to Emergency Feedwater Pump House.	Significant construction parameters are represented by Power Buildings in fossil power plants and conventional shear wall buildings.
4. Main Steam Valve Enclosure	47' x 53' Irregular	47' above grade at grade	Reinforced concrete high bay, shear wall structure. Concrete walls are 2'6"-3' thick, roof is 2' concrete slab.	Significant construction parameters are represented by Power Buildings in fossil power plants and conventional shear wall buildings.

TABLE 2 (cont.)

SUMMARY OF STRUCTURES AT

THE MAINE YANKEE ATOMIC POWER PLANT

Building	Plan Dimensions	Max/Min Bldg. Elevation	General Description	Basis for Representation in Seismic Experience Data Base
5. Turbine Building	275' x 135' Rectangular	107' above grade At grade	Steel braced framed structure with two intermediate floors. Building includes mat foundation for turbine pedestal and service crane.	Significant construction parameters are represented by Turbine Buildings and Boiler support structures in fossil-power plants and conventional industrial buildings.
6. Service Building	338' x 87' 56' x 115' L-shaped	19' and 40' above grade At grade	Steel braced frame, shear wall structure; attached to Turbine Building. Includes 3 story reinforced concrete box structure for control and switchgear room and single story concrete box structure for diesel generators. Floors are 9"-15" concrete slabs.	Significant construction parameters are represented by Power Buildings and Boiler support structures in fossil-power plants. These buildings are typially braced steel structures with concrete slabs at floors, and include basements with reinforced concrete walls.
7. Diesel Generator Rooms	42'3" x 56' Rectangular	18' above grade At grade	Rooms are part of the service building; rooms have 2' concrete roof and shear walls.	Significant construction parameters are represented by Control Buildings in large substations and numerous conventional shear wall buildings.
8. Intake Structure	72' x 57' Rectangular	16' above grade 46' below grade	Reinforced concrete shear wall structure. Below grade includes 4'-6" partition walls with 3'-6" exterior walls to grade level with steel braced framed structure above. Roof is a 14" concrete slab.	Significant construction parameters are represented by pumping stations, power buildings, and a variety of industrial buildings.

The two types of structural systems employed at Maine Yankee have an excellent performance record during strong ground motion. In power facilities, damage has been inconsequential to operations. The record shows that such structures, when detailed carefully to allow for smooth load paths, have exhibited high margins above their original design criteria.

Based on the performance of similar structures in strong motion earthquakes, it is concluded that the reviewed building structures at Maine Yankee are sufficiently rugged to survive and remain operable after a seismic event with a peak ground acceleration of 0.20g.

CONTAINMENT BUILDING

The Maine Yankee containment structure was evaluated, by Structural Mechanics Associates (SMA), (Reference 4) to determine its seismic capacity with and without internal pressure. Three different approaches to identify the seismic capacity were adopted in this study. The first approach is essentially equivalent to a design code evaluation, the second approach is a deterministic failure evaluation using conservative methods, and the third approach uses probabilistic techniques

The code-equivalent acceleration capacities were based upon a comparison of the code allowable stresses against the applied stresses, including those due to the seismic loads developed in accordance with current licensing criteria. The conservative deterministic acceleration capacities correspond to the conservatively calculated seismic input levels at which the structure would be expected to approach gross structural failure. The probabilistic acceleration capacities were defined as the ground acceleration levels at which there is a high confidence that a low probability of structural failure exists.

All three approaches show that the structure has adequate capacity to resist earthquakes well in excess of the design SSE peak horizontal ground acceleration of 0.10g.

The conservative deterministic and probabilistic evaluations were developed to provide conservative seismic capacities at which the structure will be approaching failure. Based upon these evaluations, the structure is not expected to suffer severe damage for earthquakes having peak ground accelerations less than 1.0g.

PIPING

In a study sponsored by EPRI (Reference 2), the performance of piping during past earthquakes was reviewed to identify nuclear piping features which would not withstand peak ground accelerations up to 0.5g. Piping performance in 29 earthquakes occurring from 1923 to 1985 were studied. The primary objective of the study was the development of seismic adequacy criteria based on earthquake experience data. Such criteria may eliminate the need to requalify piping currently affected by margin issues for higher seismic loads.

The results of the EPRI study concur with earlier research by Stevenson, Cloud, and Shibata (Reference 3), which also documented piping performance. There are no known cases of inertial failure of welded, steel piping.

Experience data suggests that seismic anchor movement is a consideration in the cause of above ground welded steel piping failure. Considering the substantial equipment anchorage in a typical nuclear power facility, seismic anchor movement in excess of the piping system's ductility to accommodate it is unlikely in an earthquake as small as 0.2g. We, therefore, have a high confidence in the expected performance of the HSSD piping at Maine Yankee during an 0.2g earthquake.

REFERENCES

1. "A Comparison of the Maine Yankee Atomic Power Plant with the SQUG Experience Data Base," September 1985, Docketed Under MN-85-181, dated October 18, 1985.

2. M. M. Silver, G. S. Hardy, P. D. Smith, P. I. Yanev, "Power Piping During and After Earthquakes," Draft Report Prepared by EQE Incorporated for EPRI, RP 2635-1, Volumes 1 and 2, November 1985.

3. J. D. Stevenson, "Summary and Addendum to Volume 2 of NUREG-1061," Prepared for the NRC by Stevenson and Associates, April 1985.

4. R. P. Kennedy, Structural Mechanics Associates, Conservative Seismic Capacities of the Maine Yankee Reactor Containment Building, December 1984, Docketed Under MN-85-27, February 3, 1985.

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ATTACHMENT A

Generic Bounding Spectra for HSSD Equipment

SUMMARY OF GENERIC BOUNDING SPECTRUM FOR SAFE SHUTDOWN EQUIPMENT

	Equipment Class	Spectrum No.	Basis for Generic Bounding Spectrum
1.	Motor Control Centers	1	Chile near-field Coalinga near-field Sylmar Converter Station El Centro Steam Plant
2.	Low Voltage Switchgear	1	Same as for MCCs
3.	Medium Voltage Switchgear	1	Same as for MCCs
4.	Transformers	1	Same as for MCCs
5.	Horizontal Pump	2	Chile near-field Coalinga near-field El Centro Steam Plant
6.	Vertical Pumps	2	Same as for horizontal pumps
7.	Fluid-Operated Valves	2	Same as for horizontal pumps
8.	Motor-Operated Valves	3	Chile near-field Coalinga near-field El Centro Steam Plant Valley Steam Plant
9.	Fans	1	Same as for MCCs
10.	Air Handlers	4	Coalinga near-field Sylmar Converter Station El Centro Steam Plant
11.	Chillers	5	Coalinga near-field Sylmar Converter Station
12.	Air Compressors	1	Same as for MCCs
13.	Motor Generators	6	Sylmar Converter Station El Centro Steam Plant
14.	Distribution Panels	1	Same as for MCCs
15.	Batteries and Racks	7	Chile near-field Sylmar Converter Station El Centro Steam Plant

SUMMARY OF GENERIC BOUNDING SPECTRUM FOR SAFE SHUTDOWN EQUIPMENT
(Continued)

Equipment Class	Spectrum No.	Basis for Generic Bounding Spectrum
16. Battery Chargers and Inverters	8	Chile near-field Coalinga near-field Sylmar Converter Station
17. Engine Generators	9	Chile near-field Coalinga near-field United Tech. Chemical Plant
18. Instrument Racks	10	Coalinga near-field El Centro Steam Plant
19. Temperature Sensors	10	Same as for instrument racks
20. Control and Instrument Cabinets	1	Same as for MCCs

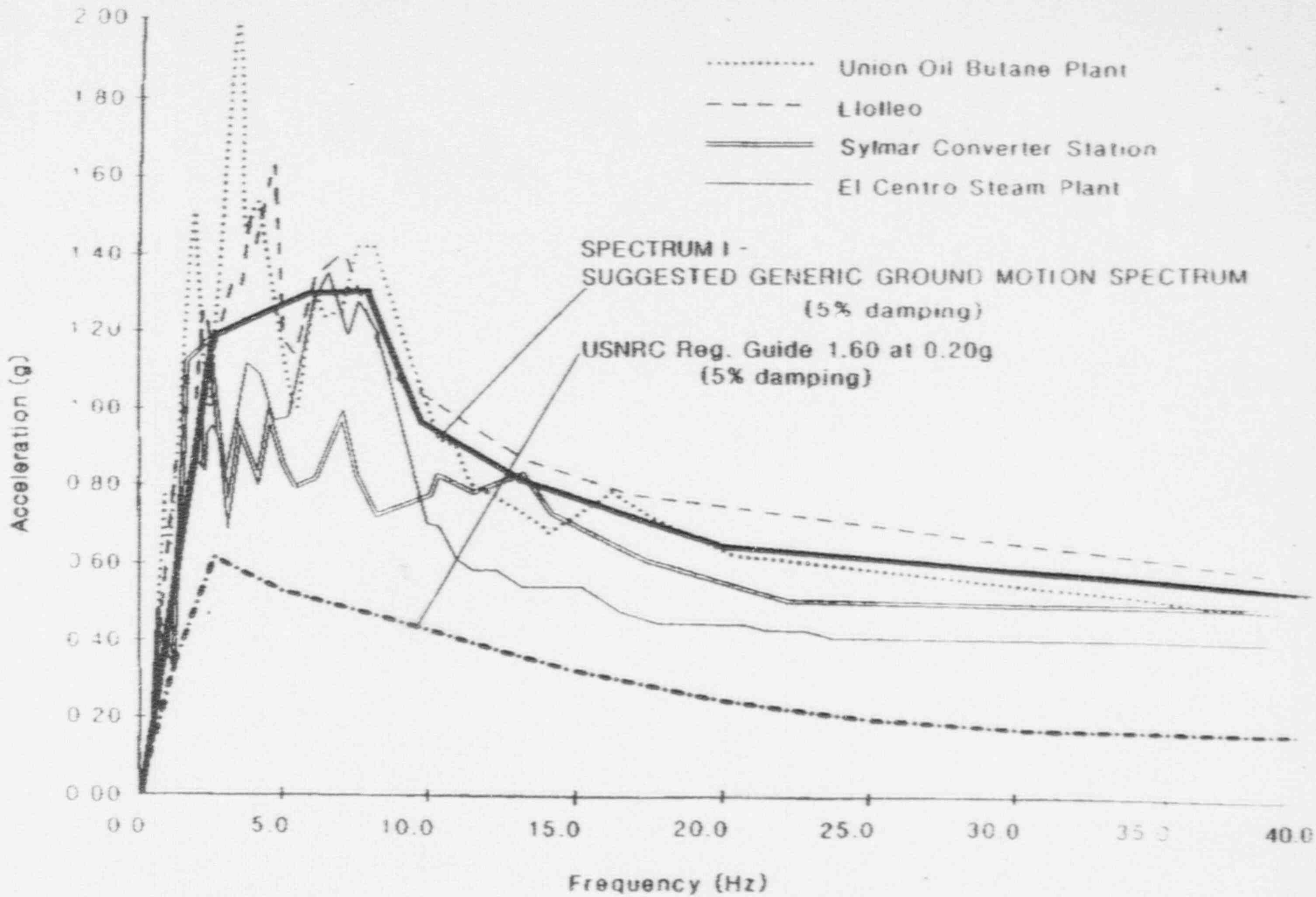
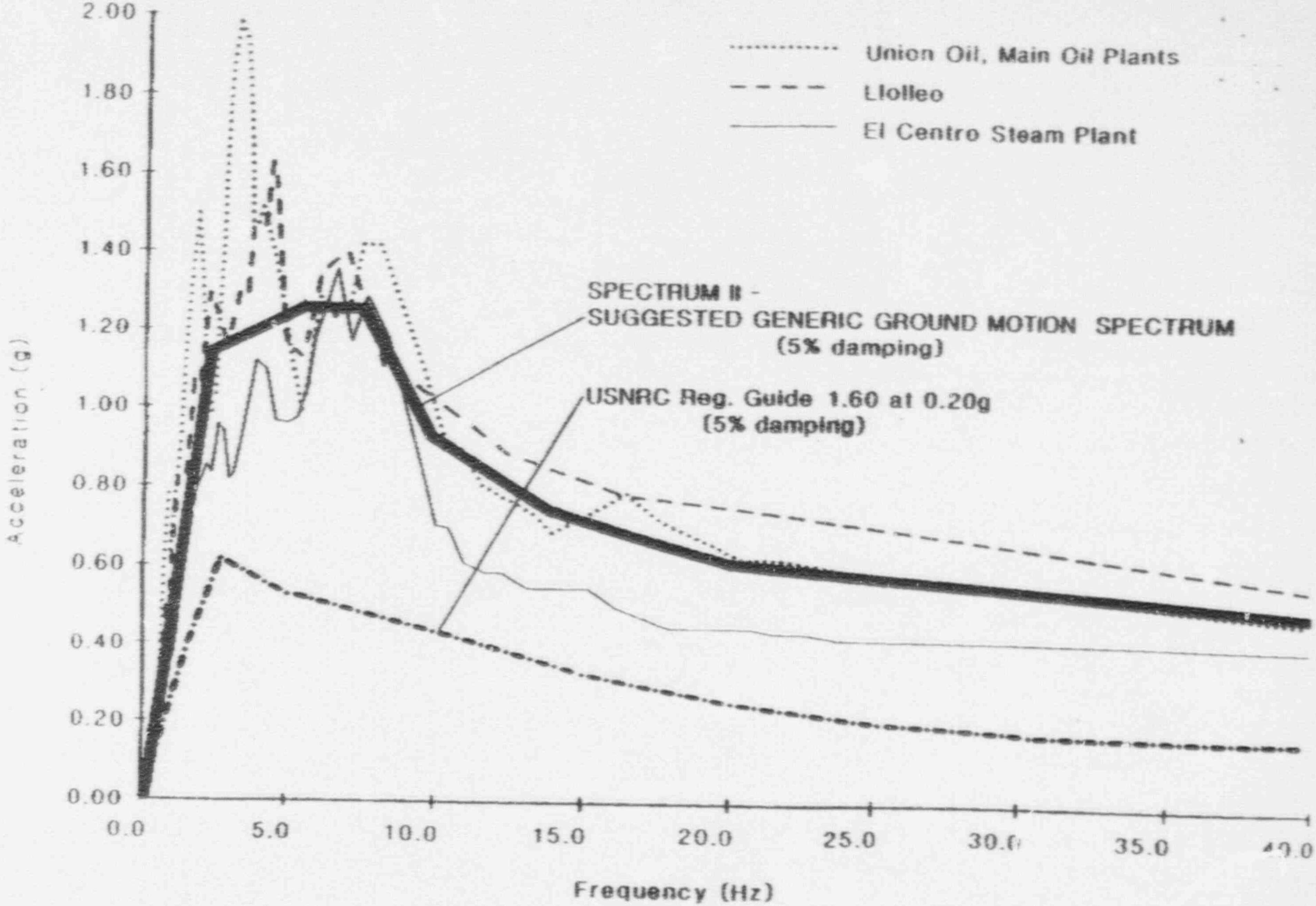
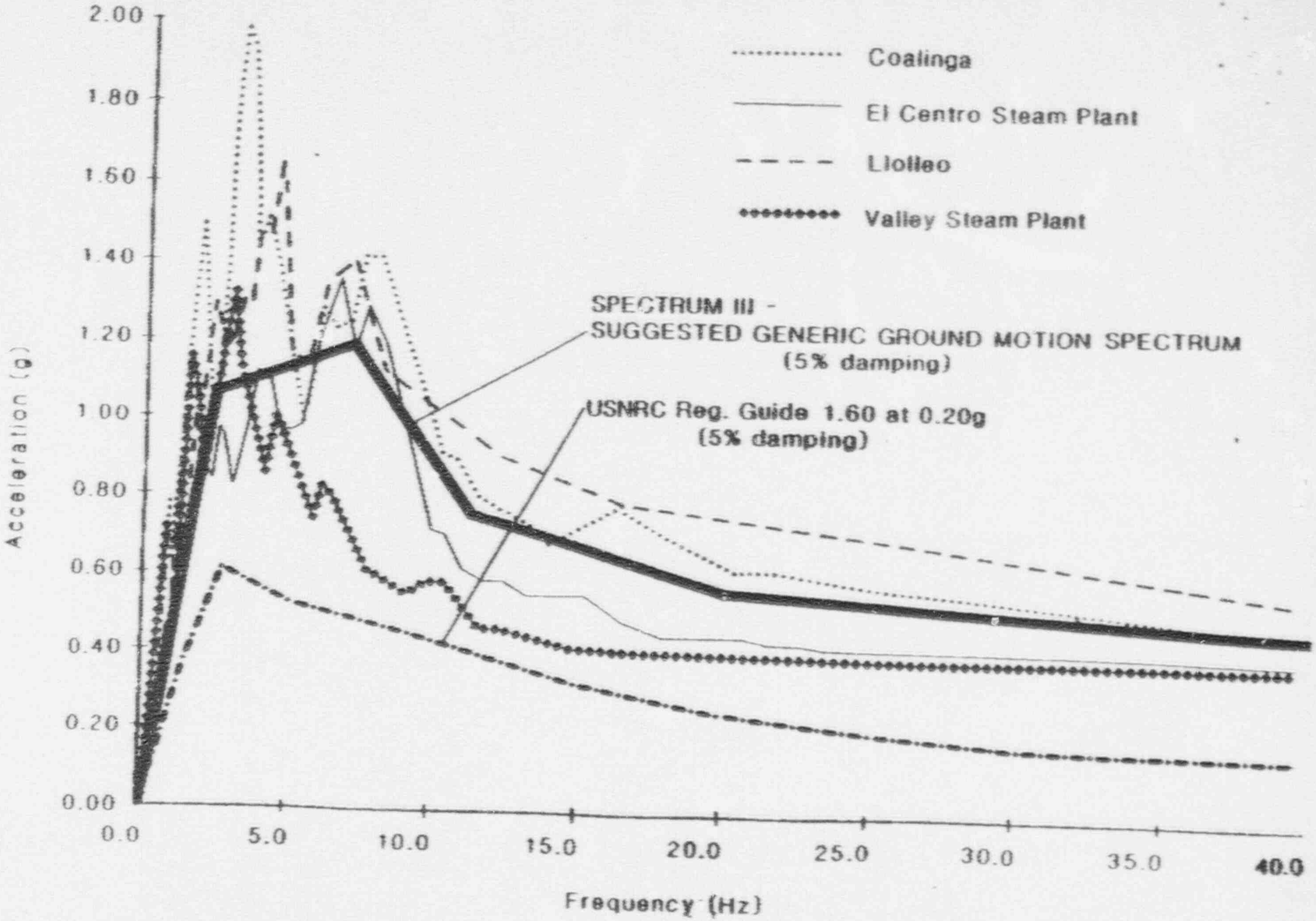

Union Oil Butane Plant
Llolleo
Sylmar Converter Station
El Centro Steam Plant
SPECTRUM I -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
2.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0

Figure 1



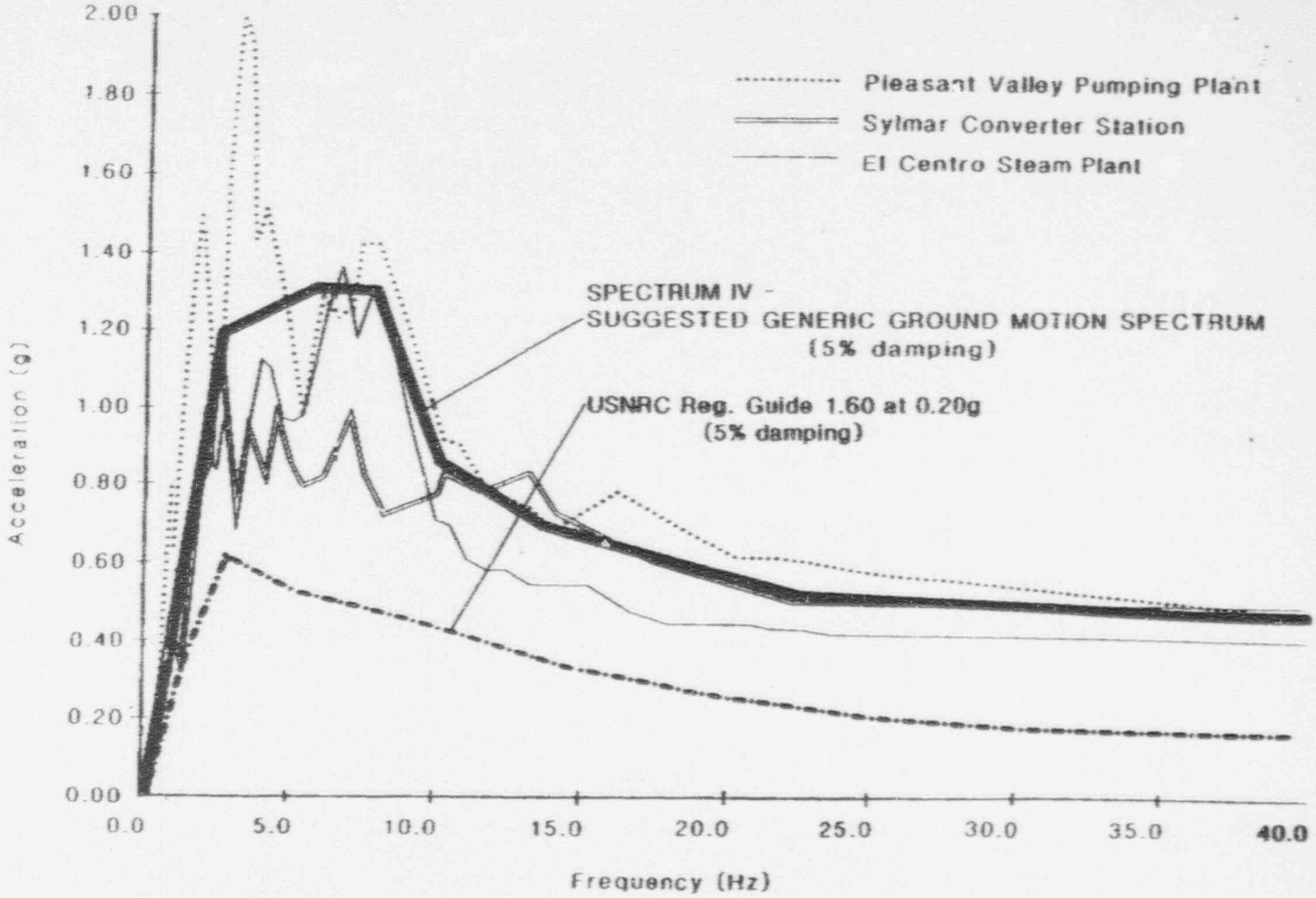
Union Oil, Main Oil Plants
Llolleo
El Centro Steam Plant
SPECTRUM II -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
35.0

Figure 2



Coalinga
El Centro Steam Plant
Llolleo
Valley Steam Plant
SPECTRUM III -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Frequency (Hz)

Figure 3



Pleasant Valley Pumping Plant
Sylmar Converter Station
El Centro Steam Plant
SPECTRUM IV -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0

Figure 4

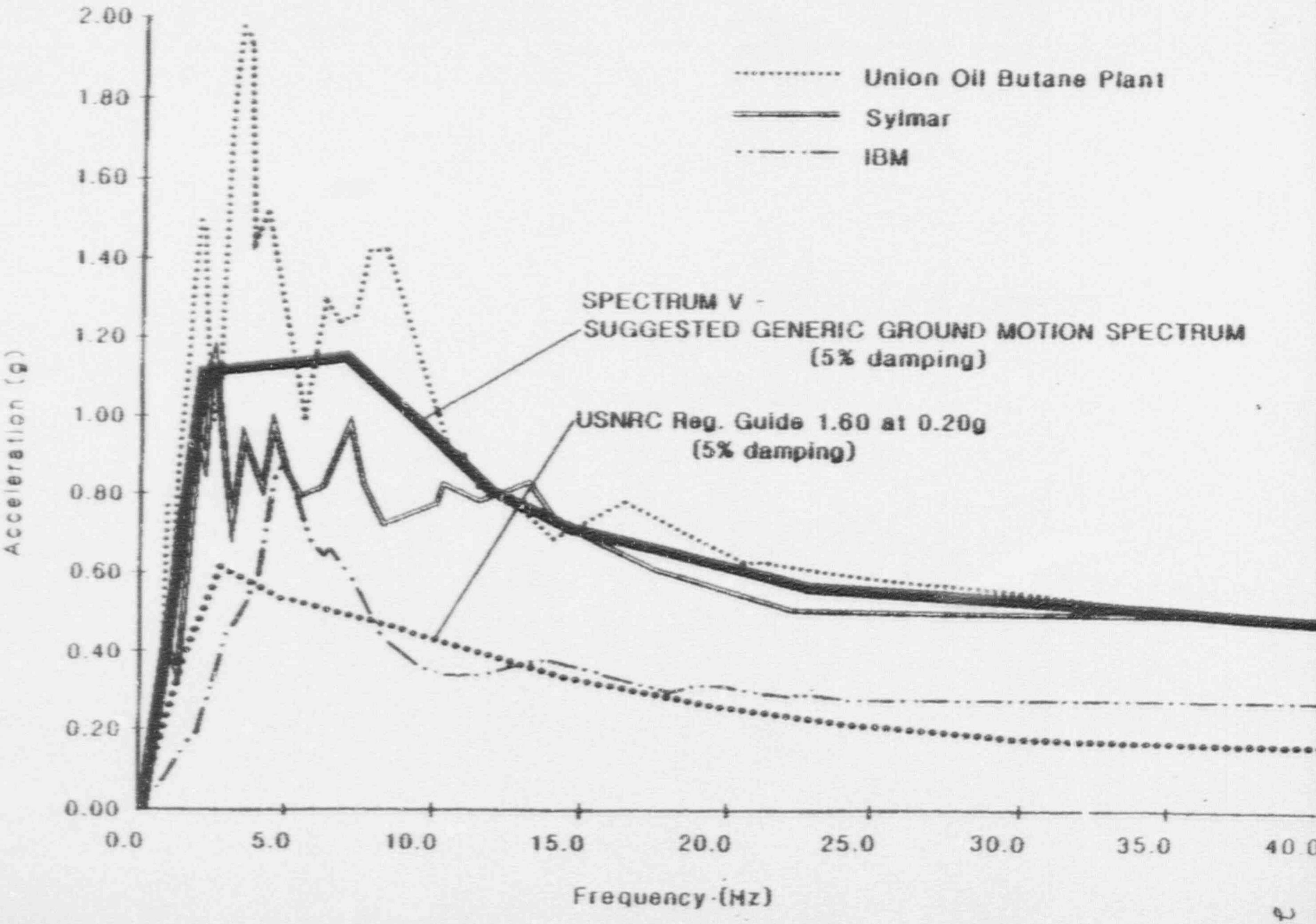

Union Oil Butane Plant
Sylmar
IBM
SPECTRUM V -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Frequency (Hz)

Figure 5

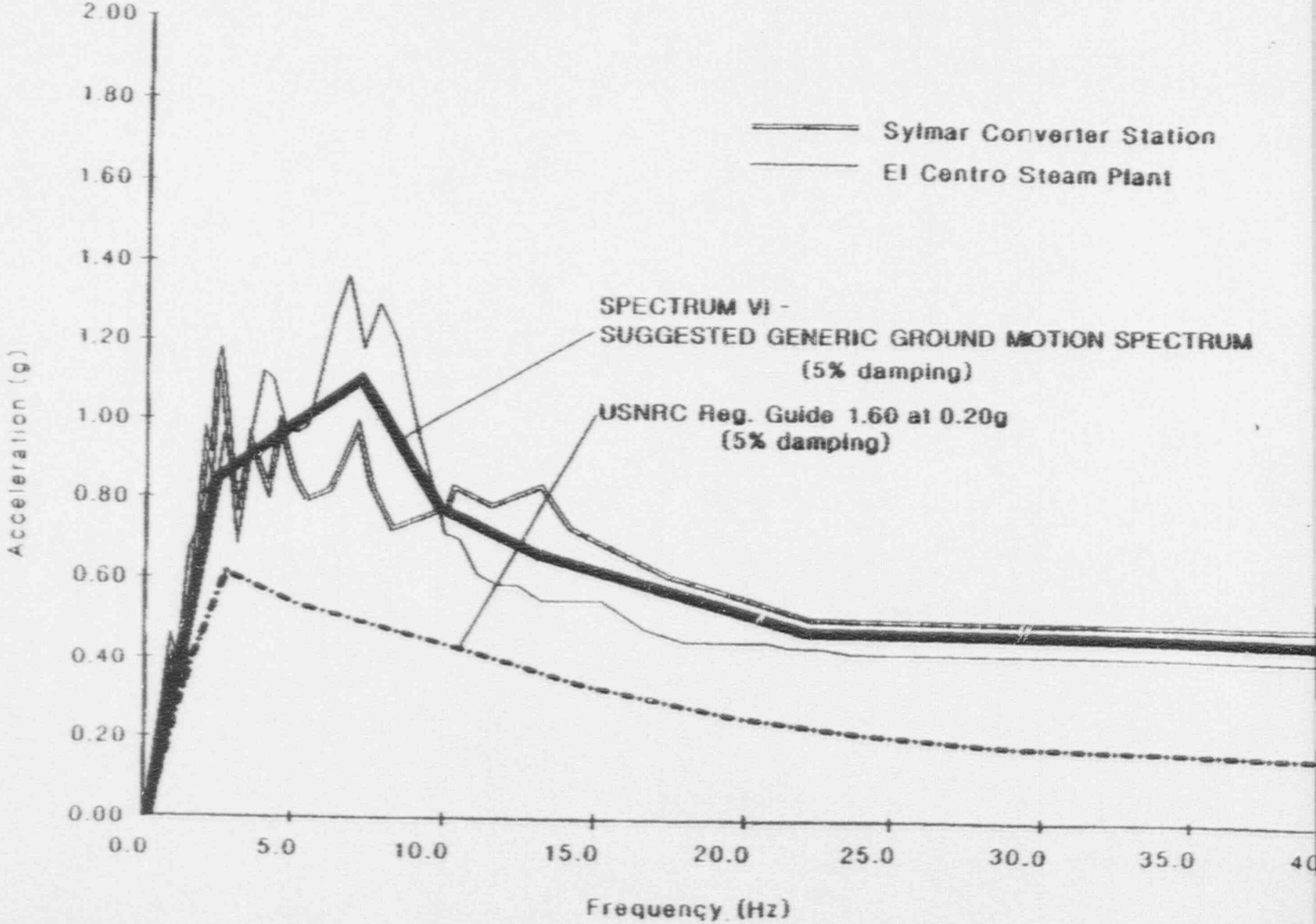

2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Acceleration (g)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40
Frequency (Hz)
Sylmar Converter Station
El Centro Steam Plant
SPECTRUM VI -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)

Figure 6

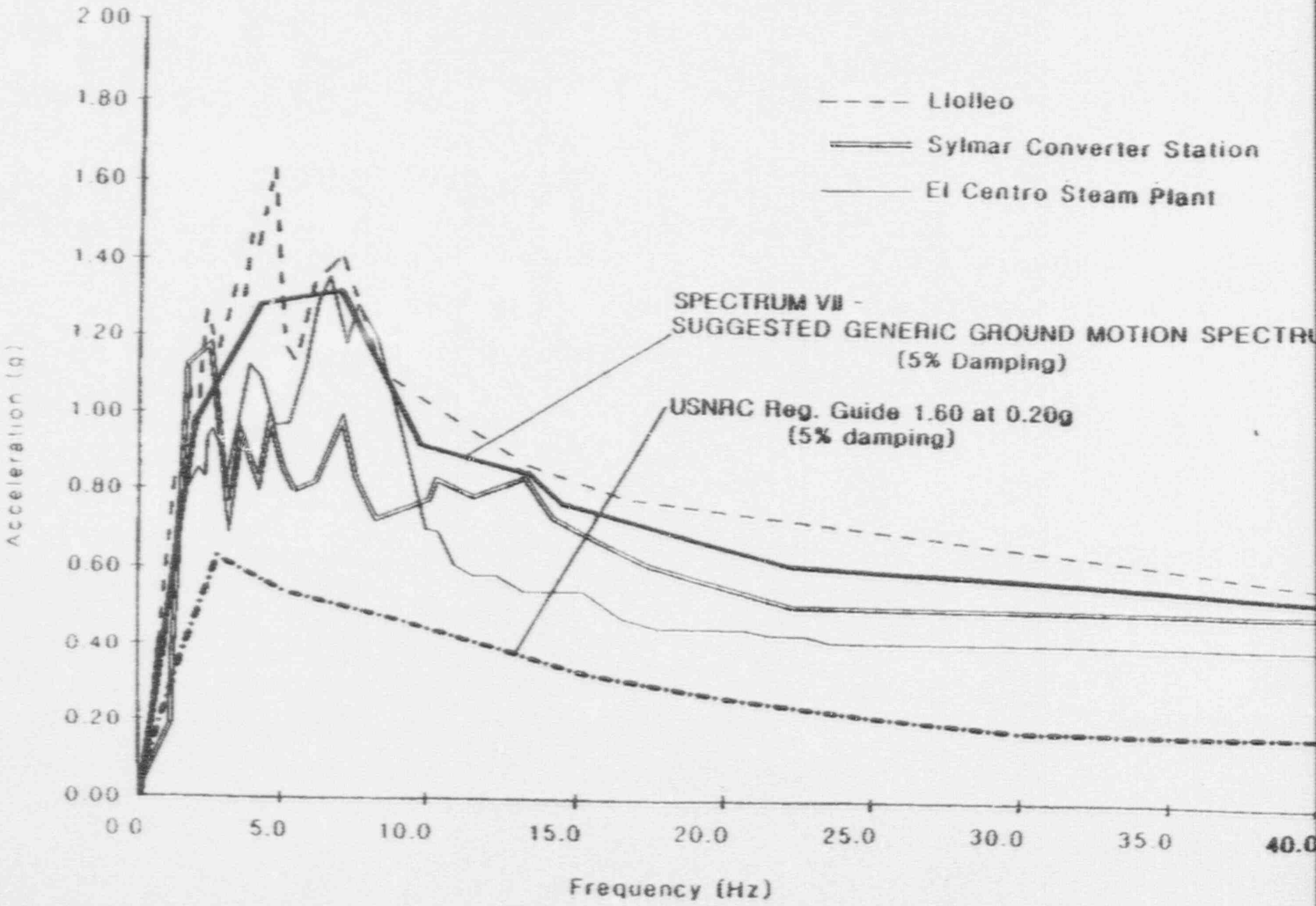
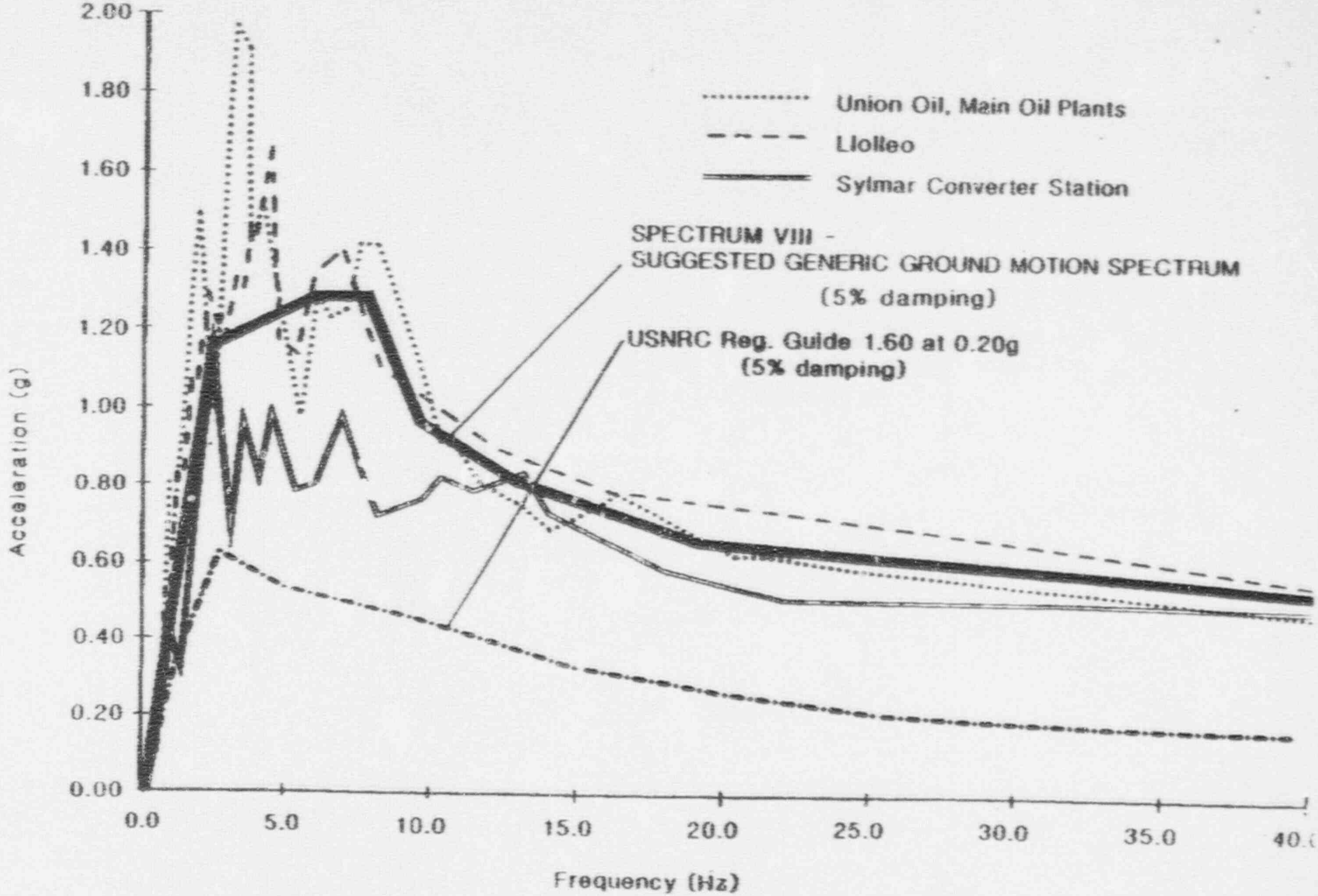
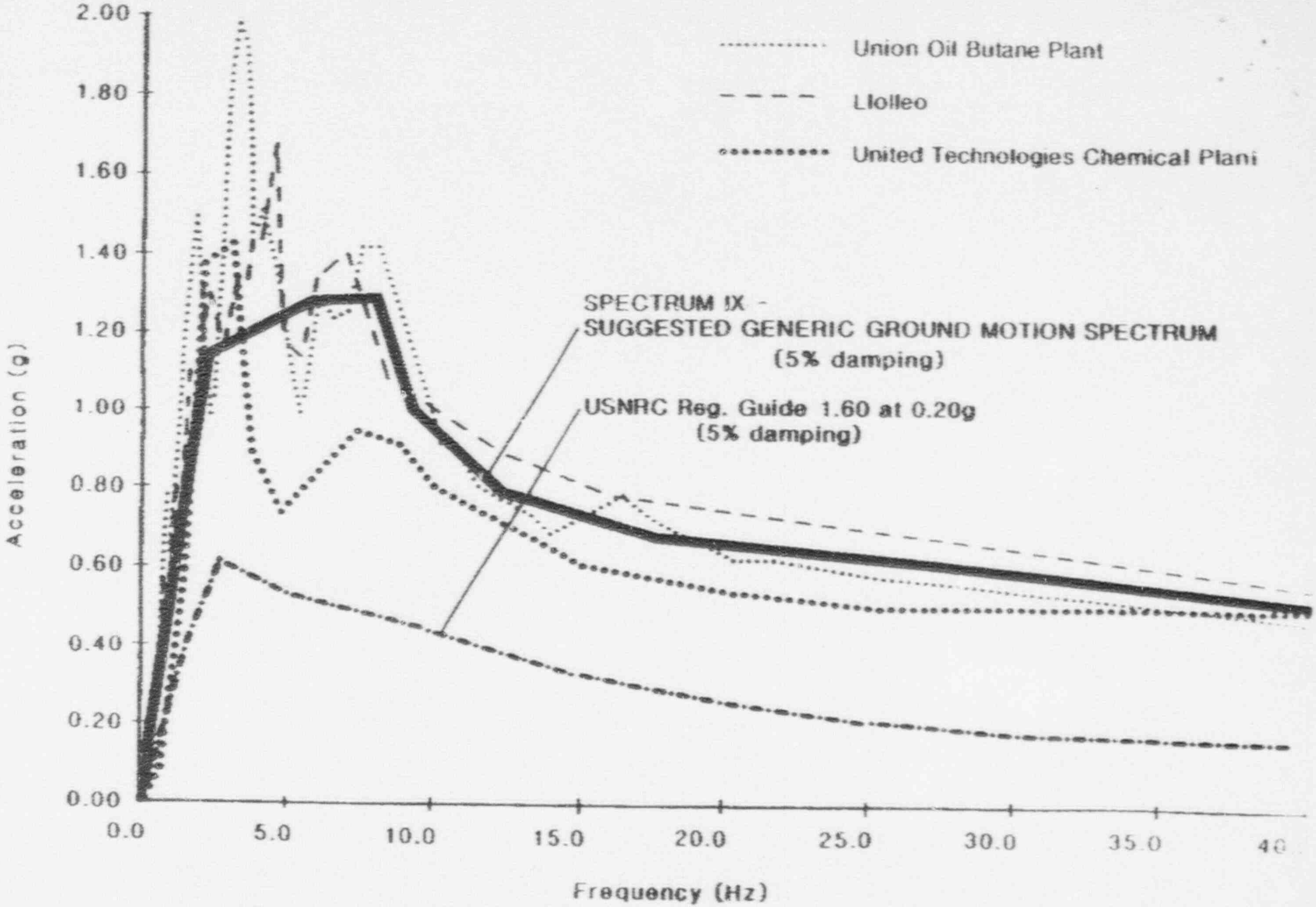

Llolleo
Sylmar Converter Station
El Centro Steam Plant
SPECTRUM VII -
SUGGESTED GENERIC GROUND MOTION SPECTRU
(5% Damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0

Figure 7



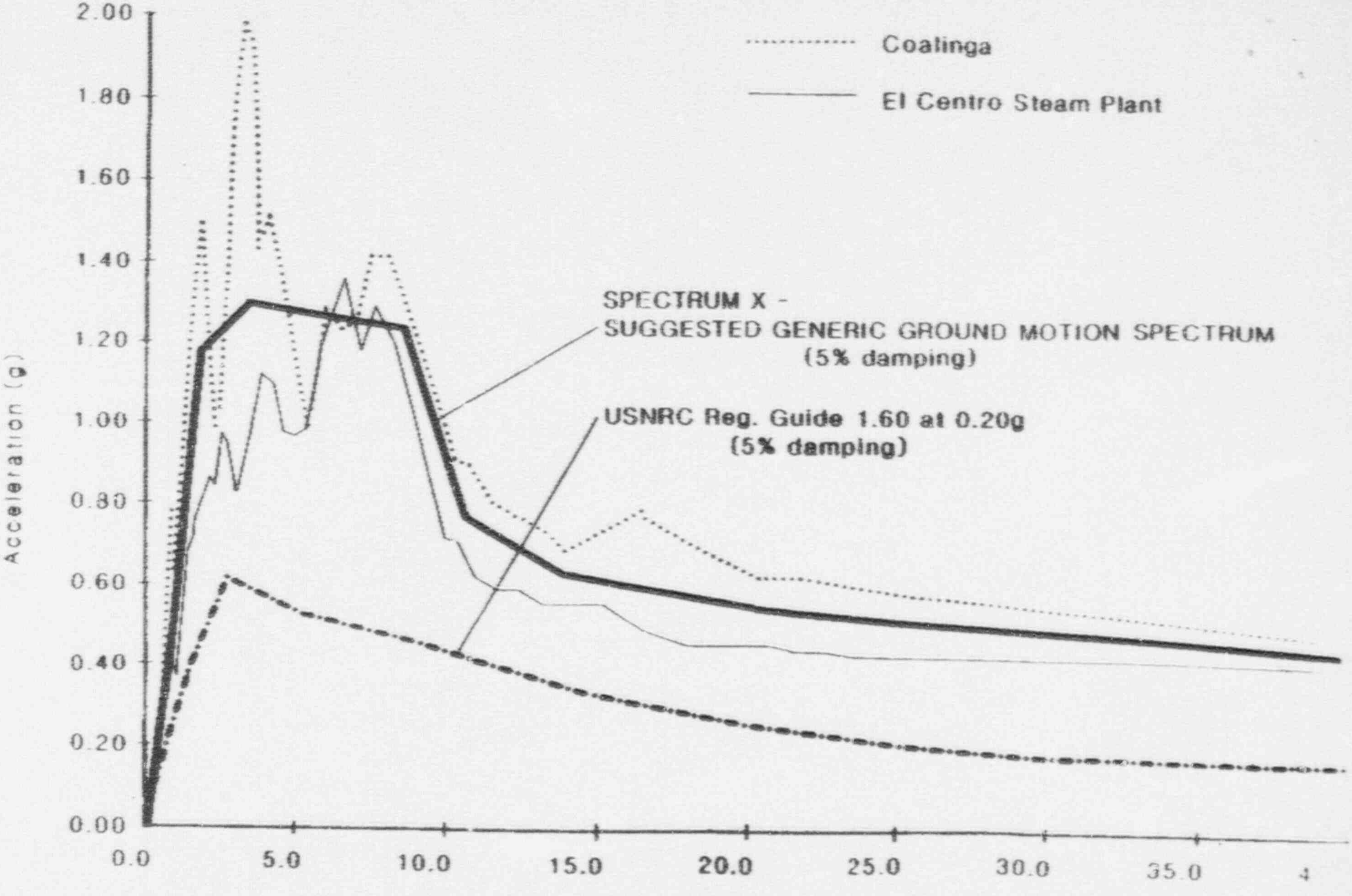
Union Oil, Main Oil Plants
Llolleo
Sylmar Converter Station
SPECTRUM VIII -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0

Figure 8



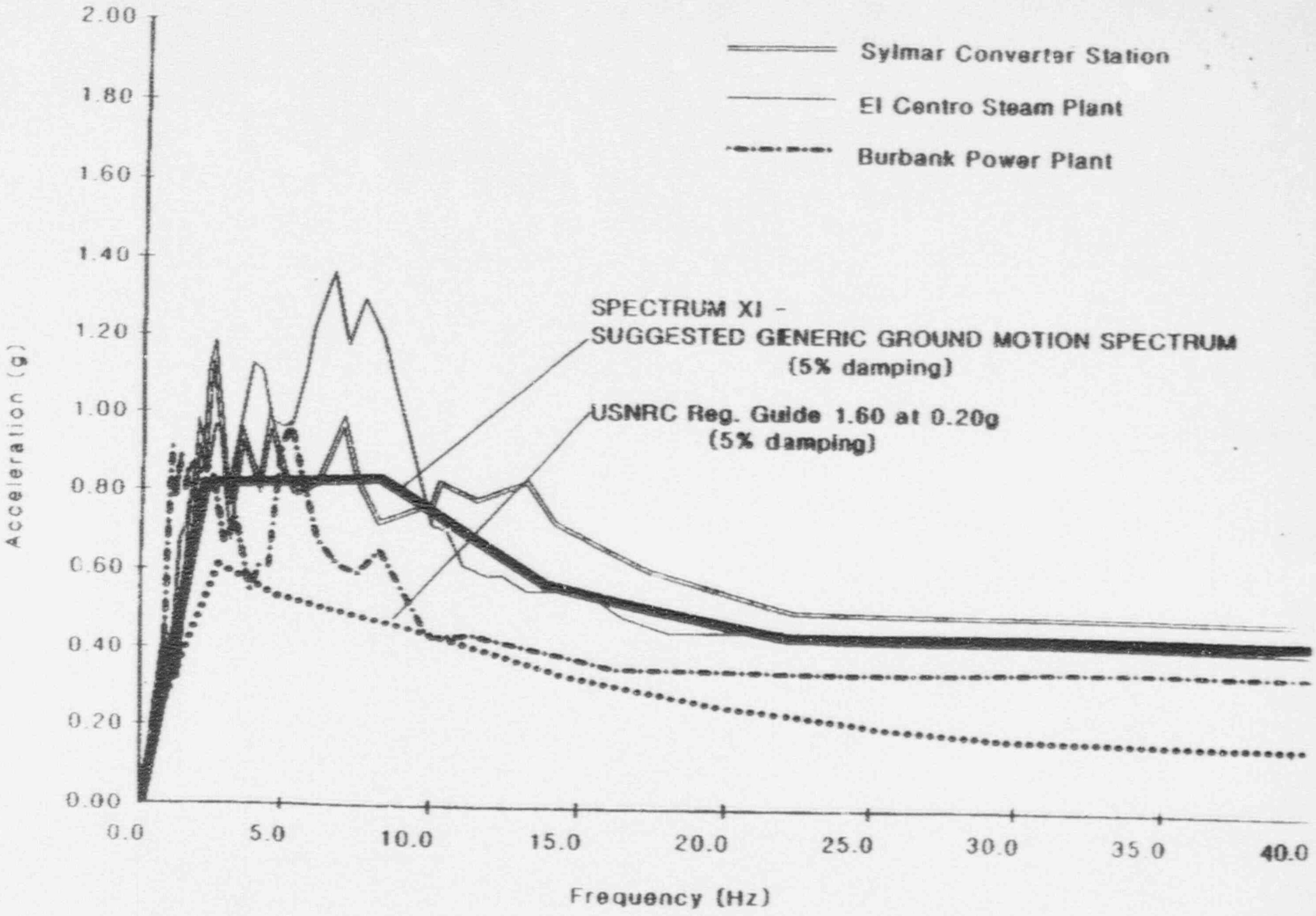
Union Oil Butane Plant
Llolleo
United Technologies Chemical Plani
SPECTRUM IX -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
Frequency (Hz)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40

Figure 9



2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Acceleration (g)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
4
Frequency (Hz)
Coalinga
El Centro Steam Plant
SPECTRUM X -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)

Figure 10



Sylmar Converter Station
El Centro Steam Plant
Burbank Power Plant
SPECTRUM XI -
SUGGESTED GENERIC GROUND MOTION SPECTRUM
(5% damping)
USNRC Reg. Guide 1.60 at 0.20g
(5% damping)
Acceleration (g)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Frequency (Hz)

Figure 11

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1. "A Comparison of the Maine Yankee Atomic Power Plant with the SQUG Experience Data Base," September 1985, Docketed Under MN 85-181, dated October 18, 1985

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3. J. D. Stevenson, "Summary and Addendum to Volume 2 of NUREG-1061," Prepared for the NRC by Stevenson and Associates, April 1985.

4. R. P. Kennedy, Structural Mechanics Associates, Conservative Seismic Capacities of the Maine Yankee Reactor Containment Building, December 1984, Docketed Under MN-85-27, February 5, 1985.

23 JAN 91

To:

Doc Control Desk

FROM:

ED TROTTIER, MAINE YANKEE PM

This did NOT make it on the Docket. (Do NOT know why.)

Please put this letter + its attachment on NUDOCS system + add this to the Maine Yankee Docket (50-309)

Thanks!

Ed Trottier

X23045