APPENDIX A

SEISMIC DESIGN CRITERIA

Class I: A dynamic analysis will be used to determine loadings resulting from a postulated design earthquake. Primary steady state stresses when confined with seismic stresses calculated by the earthquake loading will be maintained within the allowable working stress limits accepted as good practice and where applicable set forth in appropriate design standards.

Values of damping coefficients to be used in the analysis are:

Type of Structure	% Critical Damping
1. Containment Structures	2.0
2. Concrete Support Structure of Reactor Vessel	2.0
3. Steel Assemblies	
a) Welded	1.0
b) Bolted or Riveted	2.5
4. Vital Piping Systems	0.5
5. Concrete Structures above Ground:	
a) Shear Wall	5.0
b) Rigid Frame	5.0

Class II: A static analysis using the earthquake regulations of the Uniform Building Code. (Latest Edition)

Class III: Design will conform to the earthquake regulations of applicable local building codes.

The classifications of all components, systems and structures of the Indian Point Unit 3 Nuclear Station for purposes of seismic design are given in Table 1.

TABLE 1

CLASSIFICATION FOR SEISMIC DESIGN

1. Definition of Classes

Class I

Those structures and components including instruments and controls whose failure might cause or increase the severity of a loss-of-coolant accident or result in an uncontrolled release of excessive amounts of radioactivity. Also, those structures and components vital to safe shutdown and isolation of the reactor.

Class II

Those structures and components which are important to reactor operation but not essential to safe shutdown and isolation of the reactor and whose failure could not result in the release of substantial amounts of radioactivity.

Class III

Those structures and components which are not related to reactor operation or containment.

2. Buildings and Structures*

Class	Items
I	Containment (including all penetrations and air locks, the concrete shield, the liner and the interior structures)
I	Spent fuel pit
I	Control room
I	Auxiliary building
I	Intake structure
III	Turbine structure
III	Buildings containing conventional facilities

e. Equipment, Piping and Their Supports*

Class	Items
I	Reactor Control and Protection System
I	Radiation Monitoring System
I	Process Instrumentation and Controls
I	Reactor
	Vessel and its supports
	Vessel internals
	Fuel assemblies
	RCC assemblies and drive mechanisms
	Supporting and positioning members
	In-core instrumentation structure
I	Reactor Coolant System
	Piping and valves (including safety and relief valves)
	Steam generators
	Pressurizer
	Reactor coolant pumps
I	Chemical and Volume Control System (portions)
I	Containment Ventilation System
	Fans
	Coolers
	Absolute filters
	Ducts
	Valves

Class	Items
I	Safety Injection System (including refueling water tank, accumulators, safety injection, residual heat removal and containment spray pumps, thiosulfate tank, sprays and connecting pipe)

* Class I equipment located in or supported on a Class II structure will be protected from earthquake damage or will be backed up by other Class I equipment located in or attached to a Class I structure.

I	Auxiliary Building Ventilation System
I	Primary water storage tanks
II	Condensate storage tanks
II	Pressurizer relief tank
I	Reactor Auxiliary Systems Residual heat removal loop Component cooling loop
II	Reactor Auxiliary Systems (excluding the above Class I items) Sampling System Spent fuel pit cooling loop
I	Fuel transfer tube
I	Emergency Power Supply System
I	Control Equipment, Facilities and Lines necessary for the above Class I items
I	Penetration Pressurization System
I	Waste Disposal System Moisture separators Waste holdup tank Sump tanks Spent resin storage tank Gas decay tanks Compressors Seal water heat exchangers Evaporator Evaporator concentrates demineralizers Waste holdup tanks recirculating pump Sump tank pumps Interconnecting waste gas piping

III	Waste Disposal System All elements not listed as Class I
I	Containment crane
III	Other cranes Manipulator crane Other cranes
III	Conventional equipment, tanks and piping, other than I and II classes
I	Emergency Boiler Feed, Service Water and Fire Protection Pumps and Piping

The components of the Chemical and Volume Control System which are not considered Class I are listed below in accordance with its class.

CLASS II

Excess letdown heat exchanger
Batching tank
Surge tank
Surge tank drain pumps
Evaporator condensate demineralizers
Monitor tanks
Monitor tank pumps
Deborating demineralizers
Concentrates holding tank
Holding tank transfer pumps

CLASS III

Chemical mixing tank
Resin fill tank

3. Earthquake Response Spectra

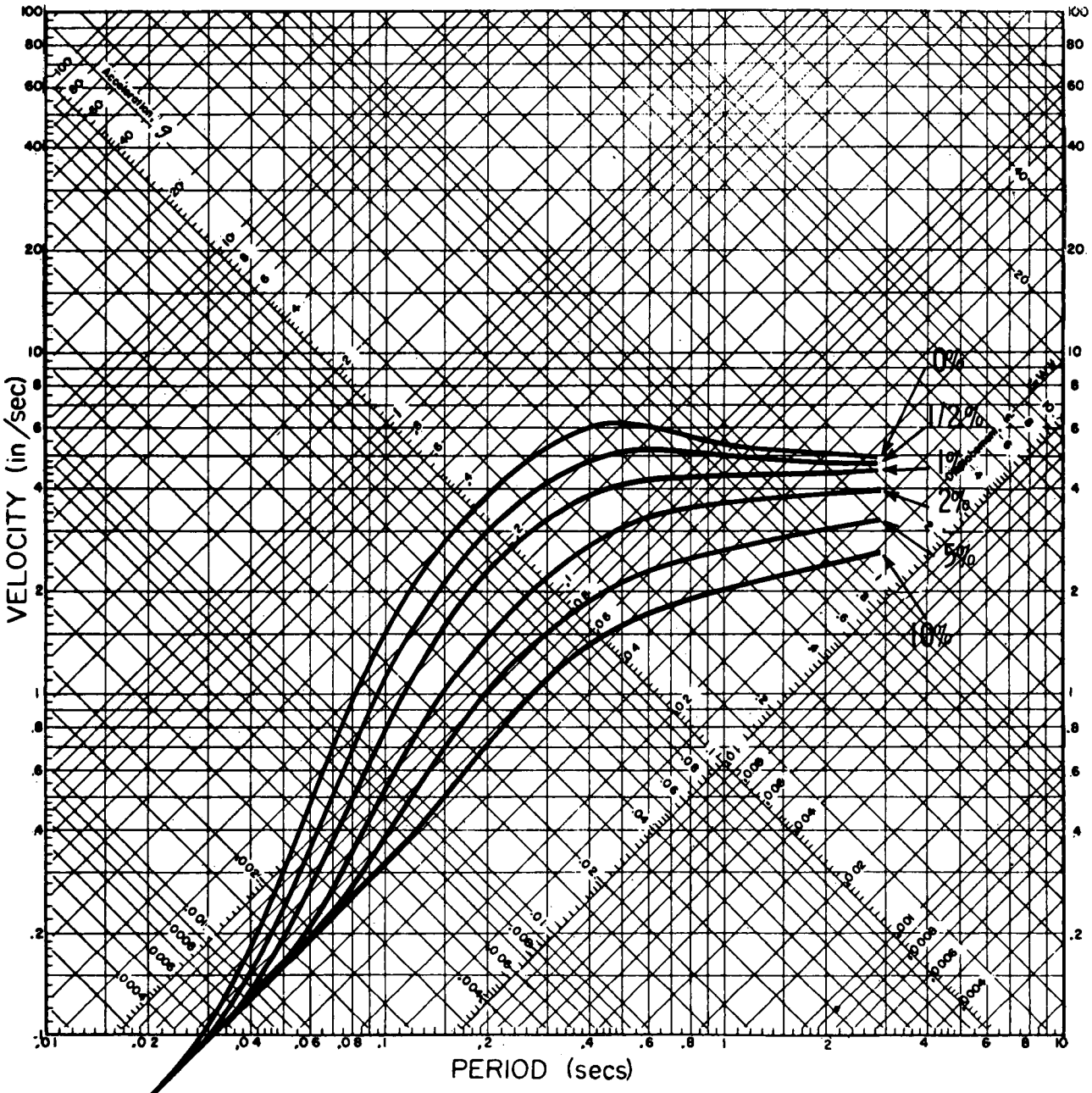
The earthquake to be used for the design of this plant is a ground acceleration of 0.10 g. horizontally and 0.05 g. vertically, acting simultaneously. In addition there will be no loss of function for an earthquake with a ground acceleration of 0.15 g horizontal and 0.10 g vertical.

Figures A-1 and A-2 show the acceleration response spectra to be used for the design and are based upon the recommendations of TID 7024.

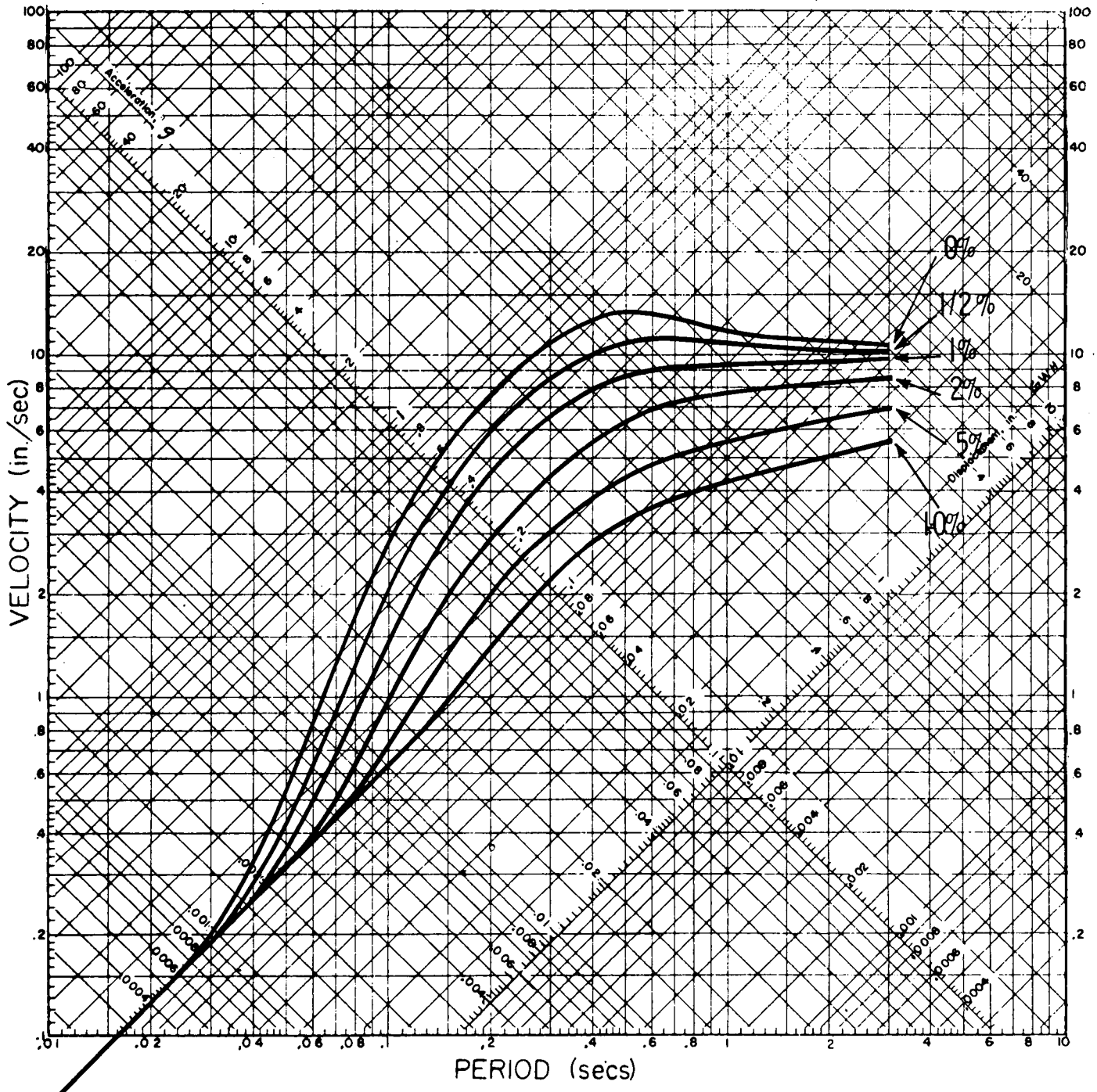
4. No Loss-of-Function Criteria

For the no loss-of-function earthquake condition as defined above, the criterion is that there shall be no loss of function for components that are necessary to bring the plant to a safe shutdown condition. No loss of function implies that rotating equipment will not freeze, pressure vessels will not rupture, supports will not collapse under the load, systems required to be leak tight will remain leak tight and components required to respond actively (such as valves and relays) will respond actively.

To satisfy the criteria (1) in steel supports and reinforced concrete supports and in Class I Civil Engineering type structures, the sum of primary stresses resulting from normal operation and seismic stresses will not exceed the yield stresses: (2) in mechanical components and piping systems, stresses will be limited to 120% of the stress limits normally allowed under code rules of; (3) in piping system, the hangers, which are normally installed to limit deflection for proper drainage, will be designed to limit stresses below the yield strength; (4) on rotating equipment, the stresses associated with the seismic load are an insignificant item inasmuch as moving parts are deflection limited rather than stress limited. The seismic load manifests itself as a temporary bearing overload that is well below the normal design margins in bearings.



ACCELERATION RESPONSE SPECTRA
0.05g FIG. A-1



ACCELERATION RESPONSE SPECTRA
0.10g

FIG. A-2

(1)