GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

May 12, 1993

Docket No. STN 52-001

Chet Poslusny, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Review Schedule - **DFSER Chapter 7 and Outstanding Issues**

Dear Chet:

Enclosed are SSAR markups addressing Open Issues 3.7.2-2 and 3.8.4-3. COL Action Item 3.8.4-1 was addressed as part of my April 26, 1993 letter. COL Action Item 3.8.5-1 is provided by SSAR current Subsections 3.8.5.4 and 3.8.6.1.

Please provide a copy of this transmittal to Tom Cheng.

Sincerely,

Jack Fox

Jack Fox
Advanced Reactor Programs

cc: Gary Ehlert (GE)
Norman Fletcher (DOE)

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The design and analysis is based on the elastic method. All loads are resisted by the integral action of the inner and outer steel shells. The concrete placed in the annulus between the inner and outer shells acts to distribute loads between the steel shells, and provides stability to the compression elements of the pedestal.

3.8.3.4.3 Reactor Shield Wall

The design and analysis procedures used for the reactor shield wall are similar to those used for the reactor pedestal described in Subsection 3.8.3.4.2.

3.8.3.4.4 Drywell Equipment and Pipe Support Structure

(2EPSS) The drywell equipment and pipe support structure is designed using the AISC working stress methods for steel safety-related structures for nuclear facilities (ANSI/AISC N690). ~~The design of beams supporting pipe whip restraints allows inelastic deformations due to postulated pipe rupture loads. All safety-related items which the inelastic beam deformations may affect are evaluated to verify that no required safety function would be compromised.~~

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3.8.3.4.5 Other Internal Structures

The design and analysis procedures used for other internal structures are similar to those used for the drywell equipment and pipe support structure as described in Subsection 3.8.3.4.4.

3.8.3.5 Structural Acceptance Criteria

3.8.3.5.1 Drywell Equipment and Pipe Support Structure

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3.8.3.5.2 other Internal Structures

The structural acceptance criteria for internal concrete or steel structures are in accordance with ACI-349 and ANSI/AISC-N690, respectively.

3.8.3.6 Materials, Quality Control, and Special Construction Techniques

3.8.3.6.1 Diaphragm Floor

The materials, quality control, and construction techniques used for the diaphragm floor and liner plate are the same as those used for the containment wall and liner plate in Subsection 3.8.1.6.

3.8.3.6.2 Reactor Pedestal

The materials conform to all applicable requirements of ANSI/AISC N690 and ACI 349 and comply with the following:

Item	Specification
Inner and outer shells	ASTM A441
Internal stiffeners	ASTM A441
Concrete fill	f'c = 4000 psi

3.8.3.6.3 Reactor Shield Wall

The materials conform to all applicable requirements of ANSI/ASIC N690 and ACI 349 and comply with the following:

Item	Specification
Inner and outer shells	ASTM A441
Internal stiffeners	ASTM A441
Concrete fill	f'c = 4000 psi
Stainless Steel Clad	SA-240 Type 304 L

3.8.3.6.4 Drywell Equipment and Pipe Support Structure

The materials conform to all applicable requirements of ANSI/AISC N690 and comply with the following:

Item	Specification
Structural steel and connections	ASTM A36

OI 3.8.4-1

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The DEPSS is designed using similar guidelines as a "frame type" piping support as described in subsection 3.7.3.3.4. As per 3.7.3.3.4, the structural group will provide amplification factors for the support points on the DEPSS where either the displacement or stiffness criteria are not met. Otherwise, if the displacement, stiffness, and stress criteria are met the design is adequate and the amplification factor is 1.0. The beams and columns supporting pipe supports will carry piping dynamic loads while remaining elastic. Those beams supporting pipe whip restraints allow inelastic deformations due to pipe rupture loads. All safety-related items which the inelastic beam deformations may effect are evaluated to verify that no required safety function would be compromised.

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The structural acceptance criteria for the DEPSS are in accordance with ANSI/AISC-N690. If the frame type pipe support requirements of subsection 3.7.3.3.4 can not be met at some pipe supports, amplification factors will be developed for the ARS for the piping group.

OI#3.8.4-3

Reactor Building

- Minimum Translational Speed: 2.23 m/sec (5 mph)
- Radius: 45.7m (150 ft)
- Maximum Pressure Drop: 1.4 t/m^2 (2 psi)
- Maximum Rate of Pressure Drop: 0.84 t/m^2/sec (1.2 psi/sec)
- Missile Spectrum: Spectrum I of SRP Section 3.5.1.4, Rev. 2

3H.1.4.2.9 Maximum Rainfall

Design Rainfall is 493 mm/hr (19.4 in/hr). Roof parapets are furnished with scuppers to supplement roof drains and or, are designed without parapets so that excessive ponding of water cannot occur. Such roof design meets the provisions of ASCE-7, Section 8.0.

3H.1.4.3 DESIGN LOADS AND LOADING COMBINATIONS

3H.1.4.3.1 Design Loads

3H.1.4.3.1.1 Dead Load (D) and Live Load (L) and Lo

- Top Head wt. 60t (132k)
- RPV wt. 1900t (4190k) Normal Operating
  2250t (4960k) Flooded
- Reactor shield wall 1000t (2205k)
- Suppression pool water depth 7.1m (23.3 ft) HWL
- Tunnel (2 pieces) 135t (298k)
- Equipment load on D/F slab 1.0 t/m^2 (205 psf)

OI# 3.8.4-3

CONTROL BUILDING

3H.2 4.0 STRUCTURAL DESIGN CRITERIA

3H.2.4.1 DESIGN CODES

Reinforced concrete is designed by the strength design method in accordance with ACI 349-90 as augmented by USNRC Regulatory Guide 1.142, Rev. 1.

Structural steel is designed by the allowable stress design method in accordance with the ANSI/AISC N690-1984.

The design meets the loads, load combinations, and acceptance criteria of Standard Review Plan, Section 3.8.4.

3H.2.4.2 SITE DESIGN PARAMETERS

The site design parameters are based on EPRI-Evolutionary ALWR Utility Requirements Document. The following are some of the key design parameters.

3H.2.4.2.1 Soil Parameters

- Minimum shear wave velocity: 300 m/sec (1000 ft/sec)
- Poison's ratio: 0.3 to ~~0.4~~ 0.38
- Liquefaction potential: None
- Minimum Static Safe Bearing Capacity Demand: ≥ 718 kPa (15 ksf)

3H.2.4.2.2 Design Ground Water Level

Design ground water level is at 0.61 m (2 ft) below grade level.

3H.2.4.2.3 Design Flood Level

Design flood level is at 0.30 m (1 ft) below grade level.

3H.2.4.2.4 Maximum Snow Load

Design snow load is 245 kg/m^2(50 psf).

3H.2.4.2.5 Maximum Rainfall

Design rainfall is 493 mm/hr (19.4 in/hr). Roof parapets are furnished with scuppers to supplement roof drains or are designed without parapets so that excessive ponding of water cannot occur. Such roof design meets the provisions of ASCE-7, Section 8.0.

OI 3.8.4-3
Radwaste Building

3H-3.4.2.5 **Maximum Rainfall**

Design rainfall intensity is 493 mm/hr (19.4 in/hr). Roof Parapets are furnished with scuppers to supplement roof drains, or, are designed without parapets so that excessive ponding of water cannot occur. Such roof designs meets the provisions of ASCE-7 Section 8.0.

3H-3.4.2.6 **Design Temperatures**

- Maximum Ambient External: 38°C (100°F)
- Minimum Ambient External: -23°C (-10°F)
- Stress Free Temperature: 15.5°C (60°F)
- Building Internal Temperature: # Not controlling design