UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

December 4, 1970

Docket Nos. 50-250
and 50-251

Florida Power & Light Company
Attn: Mr. George Kinsman
Senior Vice President
P.O. Box 3100
Miami, Florida 33101

Gentlemen:

We understand that you plan to submit a report to us describing the nature and causes of the concrete cracking of the Turkey Point Unit 3 containment dome, and providing a description of a program for the repair of the dome.

We informed you by telephone on December 2, 1970 of the information we will require for evaluating the adequacy of your proposed repair. A summary of these requirements is provided in the attached list.

S/O'R/Staff 12/29/70
LLB
LK

Sincerely,

Peter A. Morris

Peter A. Morris, Director
Division of Reactor Licensing

Enclosure:
Additional Information Request

cc:
Mr. Roy B. Snapp
1725 K Street, N.W.
Washington, D.C. 20006

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[redacted]

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ADDITIONAL INFORMATION REQUEST

I. MATTERS TO BE ADDRESSED

A. Dome Ring Girder Condition

1. Dome geometry and dimensions.
2. Dome tendon and reinforcing arrangement details.
3. Dome construction details and construction drawings.
4. Surface and subsurface crack patterns.
5. Grease leakage.
6. Coring data.

B. Investigation of Possible Causes

1. Materials.

    a) Investigation of dome concrete properties (e.g., petrographic and mechanical).

2. Construction.

    a) Pouring sequence.
    b) Concrete placement and/or vibration.
    c) Grease percolation from leaking sheaths under pressure at high temperature.
    d) Environmental (temperature gradients, drying).

3. Design.

    a) Inadequate consideration of thermal or radial stress.
    b) Improper prestressing sequence.

4. Supporting Analysis.

    a) Model.
    b) Failure criteria.
    c) Input data and assumptions.
    d) Results (stresses, strains, and isostress plots).
    e) Extent to which known boundary conditions are simulated (known laminations, girder cracks, removed sections).

C. Removal Procedures

1. Extent of concrete removal.
2. Equipment employed.
3. Provisions to prevent damage and/or degradation.

    a) Bond between liner anchors and backing cement.

b) Damage to tendon sheaths.
c) Added cracking.
d) During detensioning.

D. Repair

1. Proposed procedures.

a) Surface preparation.
b) Formwork.
c) Placement, vibration, and curing.
d) Restressing sequence.
e) Quality control.

2. Scope.

a) General.
b) Added reinforcement.

3. Material compatibility (old and new sections with respect to elastic properties, creep, and shrinkage of concrete) at following stages:

a) Before prestressing.
b) During prestressing.
c) During plant operational life.

E. Testing

1. Procedures.
2. Instrumentation.
3. Environment.

II. INFORMATION REQUIRED

A. Analysis Procedures and Results

1. Describe the strength criteria used for plain concrete in a triaxial stress field including:

a) Compression biaxially and tension uniaxially.
b) Compression uniaxially and tension biaxially.
c) Compression triaxially.
d) Tension triaxially.

2. Provide an analysis of the case of a heat source outside the containment under transient conditions, considering radial tension, and a unity load factor.

3. Provide an explanation of the extent to which cracked section analysis has been used, the cracking criteria used, and the amount of cracking that is indicated to occur when this value is exceeded.

B. Construction

1. Provide an analysis of the response of sheathing during construction, movements under concrete placement, and response due to pressure during greasing operations.

2. Discuss the likelihood and presence of voids at construction joints.

3. Discuss the effect of percolation of grease at high temperature and under pressure from leaking sheaths in altering the stress field and generating or magnifying cracks.

4. Describe the investigation made to establish lack of liner separation from dome backup concrete.

C. Repair

1. Describe the additional radial and/or other reinforcement to be added during the repair program and furnish the basis for it.

2. Discuss the extent to which a silicone membrane or other combined insulation/roofing material will be provided after the concrete repair.

3. Discuss the damage that the use of pneumatic equipment may do to the remaining concrete by causing added cracking or deterioration of reinforcing bar bond or liner anchor embedment.

D. Testing

1. Discuss the possibility of testing the containment at operating temperature (approximately 120-140°F).

2. Discuss any special instrumentation and observations that will be required during acceptance testing. Discuss the extent to which this instrumentation will, apart from visual surface observations, be helpful in detecting internal cracking and/or laminations of the type now present.

E. General

1. Describe in detail any grease leaks that have occurred in any other Bechtel-designed containment structures and discuss potential relationships between such occurrences and the damage experienced with the Turkey Point containment structure.

2. Provide detailed construction drawings of repaired dome structure (proposed).