POINT BEACH NUCLEAR PLANT UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

LIST OF EFFECTIVE PAGES

The following is a List of Effective Pages for the Point Beach Nuclear Plant Final Safety Analysis Report (FSAR). This List of Effective Pages is complete through the June, 2005 update and should be filed at the front of your FSAR manual.

All holders of this FSAR should check their manuals against this List of Effective Pages to ensure that your FSAR is accurate and complete. If there is no date given for a page number, then that page has not been revised since the Final Facility Description Safety Analysis Report (FFDSAR).

Some figures are stored electronically and are reprinted with an updated header date with the other pages of that section when the section is revised. This is reflected in the List of Effective Pages. Several figures that have been electronically stored and reprinted with an updated header date also show the date of origination or last revision of the figure.

Testing of uncoated concrete specimens in the post accident environment showed that attack by both boric acid and the alkaline boric acid solution is negligible and the amount of deterioration product formation is insignificant. Other specimens covered with modified phenolic and epoxy protective coatings showed no deterioration product formation. These observations are in agreement with Orchard (Reference 17) who lists the following resistances of Portland Cement concrete to attack by various compounds:

Boric Acid	- Little or No Attack
Alkali Hydroxide Solution under 10%	- Little or No Attack
Sodium Borate	- Mild Attack
Sodium Hydroxide over 10%	- Very Little Attack

Exposure of uncoated concrete to spray solution between 320°F and 210°F has shown a tendency to remove boron very slowly, presumably precipitating an insoluble calcium salt. The rate of change of boron in solution was measured at about 130 ppm per month with pH 9 solution at 210°F for an exposed surface of about 36 sq. in. per gallon of solution (much greater than any potential exposure in the containment). The boron loss during the high-temperature transient test (320°F maximum) was about 200 ppm. Figure 5.6-3 shows a representation of the boron loss from the ECC solution versus time by a boron-concrete reaction following a DBA. The time period from 0-6 hours shows the loss during a conservative high temperature transient test, ambient to 320°F to 285°F. The data from 6 hours to 30 days is based on 210°F data.

A depletion of boron at this rate poses no threat to the safety of the reactor because of the large shutdown margin and the feasibility of adding more boron solution should sample analysis show a need for such action.

5.6.2.6 MISCELLANEOUS MATERIALS OF CONSTRUCTION

1. <u>Sealants</u>

Candidate sealant materials for use in the reactor containment system were evaluated in simulated DBA environments. Cured samples of various sealants were exposed in alkaline sodium borate solution, pH 10.0, 3,000 ppm to a maximum temperature of 320°F.

Table 5.6-5 presents a summary of the sealant materials tested together with a description of the panel's appearance after testing. Three generic types of sealants were tested: butyl rubber, silicone, and polyurethane. Each of the materials was the "one package" type, i.e., no mixing of components was necessary prior to application. The materials were applied on stainless steel and allowed to cure well prior to testing.

The test results showed that silicone sealants tested were chemically resistant to the DBA environment and are acceptable for use in containment.

2. PVC Protective Coating

Tests were conducted to determine the stability of the polyvinyl chloride protective coating, of the type which might be used on conduit in the DBA environment. Samples of the PVC exposed to alkaline sodium borate solutions at DBA conditions showed no loss in structural rigidity and no change in weight or appearance.

A sample of PVC-coated aluminum conduit (1" O.D. x 8 in. length) was irradiated by means of a Co-60 source, at an average dose rate of 3.2×10^6 rads/hr to a total accumulated dose of 9.1×10^7 rads. The specimen was immersed in alkaline sodium borate solution (ph 10, b = 3,000 ppm) at 70°F. Visual examination of the coating after the test showed no evidence of cracking, blistering or peeling and the specimen appeared completely unaffected by the gamma exposure. Chemical analysis of the test solution indicated that some bond breakage had occurred in the PVC coating as evidenced by an increase in the chloride concentration. The gamma exposure of $\sim 10^8$ rad resulted in a release to the solution of 26 mg of chloride per sq. ft. of exposed PVC surface. Considering a total surface area of PVC coating present in containment (~500 ft²) and an ECC solution volume of 313,000 gal., the chloride concentration increase in the ECC solution due to irradiation of the coating would be ~0.01 ppm.

It is concluded, therefore, that PVC protective coating will be stable in the DBA environment.

3. Fan Cooler Materials

Samples of the following air handling system materials were exposed in an autoclave facility to the DBA temperature-pressure cycle:

a. Moisture separator pad
b. High efficiency particulate filter media
c. Asbestos separator pads
d. Adhesive for joining separator pads and HEPA filter media corners
e. Neoprene gasketing material.

The materials were exposed in both the steam phase and liquid phase of a solution of sodium tetraborate (15 ppm B) to simulate the concentrations expected downstream of the fan cooler cooling coils. Examination of the specimens after exposure showed the following:

a. Moisture separator pads were somewhat bleached in color but maintained their structural form and showed good resiliency as removed in both liquid and steam phase exposure.

b. High efficiency particulate filter media maintained its structural integrity in both the liquid and steam phase. No apparent change.

c. Asbestos separator pads showed some slight color bleaching, however, both steam and liquid phase samples maintained their structural integrity with no significant loss in rigidity.

d. Adhesive material for the HEPA/separator pad edges showed no deterioration or embrittlement and maintained its adhesive property.

e. Neoprene gasketing material is also satisfactory in both the steam and liquid phase. The material showed only weight gain and a shrinkage of 15% to 30% based on a superficial, one flat side area. The gasket thickness decreased about 10%. The gasket material was unrestrained during the exposure and hence the dimensional changes experienced are greater than those which would result in the fan cooler unit.

4. Power and Instrumentation Cable

Power and instrumentation cables have been subjected to the following series of tests and have shown acceptable performance.

a. Thermal aging of the cable to simulate 40 effective full power years.
b. Exposure to radiation ranging up to 2.0×10^8 rads.
c. Exposure to temperature, steam and chemical environment simulating post accident conditions.