SEP 2 8 1964

Saul Levine, Chief
Test & Power Reactor Safety Branch

Raymond R. Maccary, Technical Asst. Branch
Division of Safety Standards

PEACH BOTTOM ATOMIC POWER STATION CONTAINMENT BUILDING
50-171

As a result of a recent discussion with Philadelphia Electric Co. representatives during their visit to the AEC, the matter of NDT temperature of the containment vessel material was explored, in relation to current rules of the ASME Code Section III.

Although the containment vessel complies with the ASME Code rules of Section VIII (including code case interpretation) in effect at the time the vessel was built, current code rules impose other criteria, for containment structures.

Present interpretation, of the Section III code rules imply that a containment vessel steel should always be in ductile temperature range, under operating conditions when the vessel must perform its intended function. For an uninsulated containment vessel, the safe operating temperature becomes NDT + 30° F. Operations at ambient atmospheric temperatures below NDT + 30° F would be interpreted as not meeting the intent of the code rules. This interpretation imposes plant shutdown requirements unless it can be demonstrated that the actual metal temperature can be maintained at all times above NDT + 30°F.

It is my understanding that the applicant is attempting to estimate the NDT temperature for the Peach Bottom containment steel and examine the weather data available for the site area before submitting further information.

In any case, a more fundamental question is whether a containment structure built in accord with the ASME Code rules, in effect, at the time of construction, must now comply with NDT criteria introduced in the latest published rules Section III of the ASME Code. The answer may also involve some legal and jurisdictional considerations as, interpreted by the applicable regulations of the State of Pennsylvania.

Recent discussions with the ACRS Committee relative to the LOFT containment indicated that its members favored the conservative interpretation of the NDT criteria applicable to containment vessels as currently specified in the ASME Code Section III rules.

cc: FWestern
DiNunno
ABHolt
KGoller

OFFICE ▶		DSS:TAB RRM				
SURNAME ▶		RRMaccary:bch				
DATE ▶		9/25/64 9/25/64				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

A-356

Saul Levine, Chief
Test & Power Reactor Safety Branch, DRL

October 1, 1964

V. A. Moore
Facilities Standards Branch, SS

PEACH BOTTOM INSTRUMENTATION AND CONTROL

50-171

In accordance with your request, the Peach Bottom Atomic Power Station instrumentation and control as presented in the Final Hazards Summary Report (FHSR) was reviewed. Although the overall design is considered generally satisfactory, one general item of control philosophy was noted: considerably more emphasis appears to have been placed on the reliability of the plant protective system than on the systems which control the release of radiation from the plant. Although the plant protective system is a significant factor in preventing the release of fission products, public protection appears to be more directly dependent on the stack gas and the liquid radwaste discharge monitoring systems.

Reactor Protection System

The plant protective system as described in the FHSR appears adequate, subject to resolution of the following comments:

1. It is not clear from the FHSR (Fig. II-114) whether there are single components associated with either of the dual power stages whose failure could render the scram system inoperative, since it appears that both dual power stages must trip to cause a scram. A schematic diagram of the portion of the scram system shown in Figure II-114 should be obtained so that we can determine whether there exists a single component whose failure could cause a complete loss of scram capability.

2. Each of the two channels of the high rate of change of flux and of the high intermediate range flux protection feeds a dual power stage through 1-of-1 logic. Since it appears that both dual power stages must trip to scram the

OFFICE ▶						
SURNAME ▶						
DATE ▶						

reactor, the actual logic in each case would be 2-of-2 which, of course, is even less reliable than single channel protection. Two-of-two channel logic alone is not considered adequate protection against an accident.

3. The prompt detection and correction of loss of a channel of protection is essential to plant protection. The following information should be obtained for us to evaluate this aspect of protection:

   (a) Design features allowing the detection of loss of a protection channel;

   (b) Frequency of periodic critical testing of the protective system; and

   (c) Items checked during periodic critical testing.

   Records of protection equipment malfunctions during the 1 Mw operation should be maintained and provided for further evaluation of the periodic test program prior to high power operation. Any additional reliability data from previous applications of similar equipment or from suppliers tests and calculations would assist in further evaluation.

Rod Control System

The evaluation of the severity of rod withdrawal accidents assumed the correct functioning of the interlocking which allows no more than three control rods in the outer two rings or one in the central two rings to be withdrawn simultaneously below 10% power and no more than one rod above 10% power. A schematic diagram showing the rod control interlocks should be provided to allow us to evaluate the reliability of the interlocking.

Radioactive Effluent Protection

1. The line monitoring of the liquid radwaste discharge to the condenser circulating water discharge line appears to contain only a single channel of instrumentation which provides an alarm but no control action. The limiting of radioactive waste discharge appears to require the proper functioning of this single instrument channel, proper corrective action by the operator, and satisfactory discharge valve closure. This channel alone is not considered adequate for the control of liquid radioactive discharge.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

2. Containment isolation requires high radiation signals from both the stack and ventilation exhaust monitoring systems. This appears to be 2-of-2 logic. Each system seems to contain a single sampling system supplying two channels of gamma instrumentation. It is not clear whether either gamma instrument channel can actuate the control or alarm functions. This 2-of-2 logic alone is considered not to provide adequately reliable control of gaseous radioactive effluent discharge. It should be determined what measures are taken upon failure of either the inlet or exhaust valve to close when a high radiation signal exists.

3. In order to further evaluate the reliability of the stack gas and exhaust gas monitoring systems, the following is required:

   (a) Location of the detectors;

   (b) Location of the electronics;

   (c) Length and size of sensing line (from the sampling probe to the detectors);

   (d) Length of detector cable;

   (e) Method and frequency of testing;

   (f) Equipment manufacturer; and

   (g) Control and alarm logic diagram, block diagram, or schematic diagram.

cc: J. J. DiNunno, SS
J. E. McEwen, DRL

OFFICE ▶	FS:SS					
SURNAME ▶	Moore:jjb					
DATE ▶	10-1-64					