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ILLINOIS POWER COMPANY

CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

December 21, 1984

Docket No. 50-461

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Clinton Power Station Unit 1
Plant-Specific 1/10 Scale Encroachment Tests
Confirmatory Issue #71

Dear Mr. Schwencer:

Based on Illinois Power Company's meeting with your staff on December 19, 1984 in Bethedsa, Maryland, we are providing you a program to address the effects of local encroachments on pool swell impact loads for Clinton Power Station.

The NRC staff and consultants expressed concerns in the November 16, 1984, Containment Issues Owner's Group meeting that Clinton's plant-unique encroachments are not enveloped by the generic 1/10-scale Mark III encroachments tests.

Attachment 1 is a description of two test configurations which will be tested in the 1/10-scale Mark III encroachment test facility. Attachment 2 is a draft test specification and Attachment 3 is a milestone schedule.

Illinois Power believes that the proposed test program will address your plant-unique concerns and will resolve this issue for Clinton Power Station.

Sincerely yours,

F. A. Spangenberg
Director - Nuclear Licensing
and Configuration
Nuclear Station Engineering

Attachments

JLP/lm
cc: B. L. Siegel, NRC Clinton Licensing Project Manager
NRC Resident Office
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety

A001
1/1

Clinton Unique Encroachment Testing

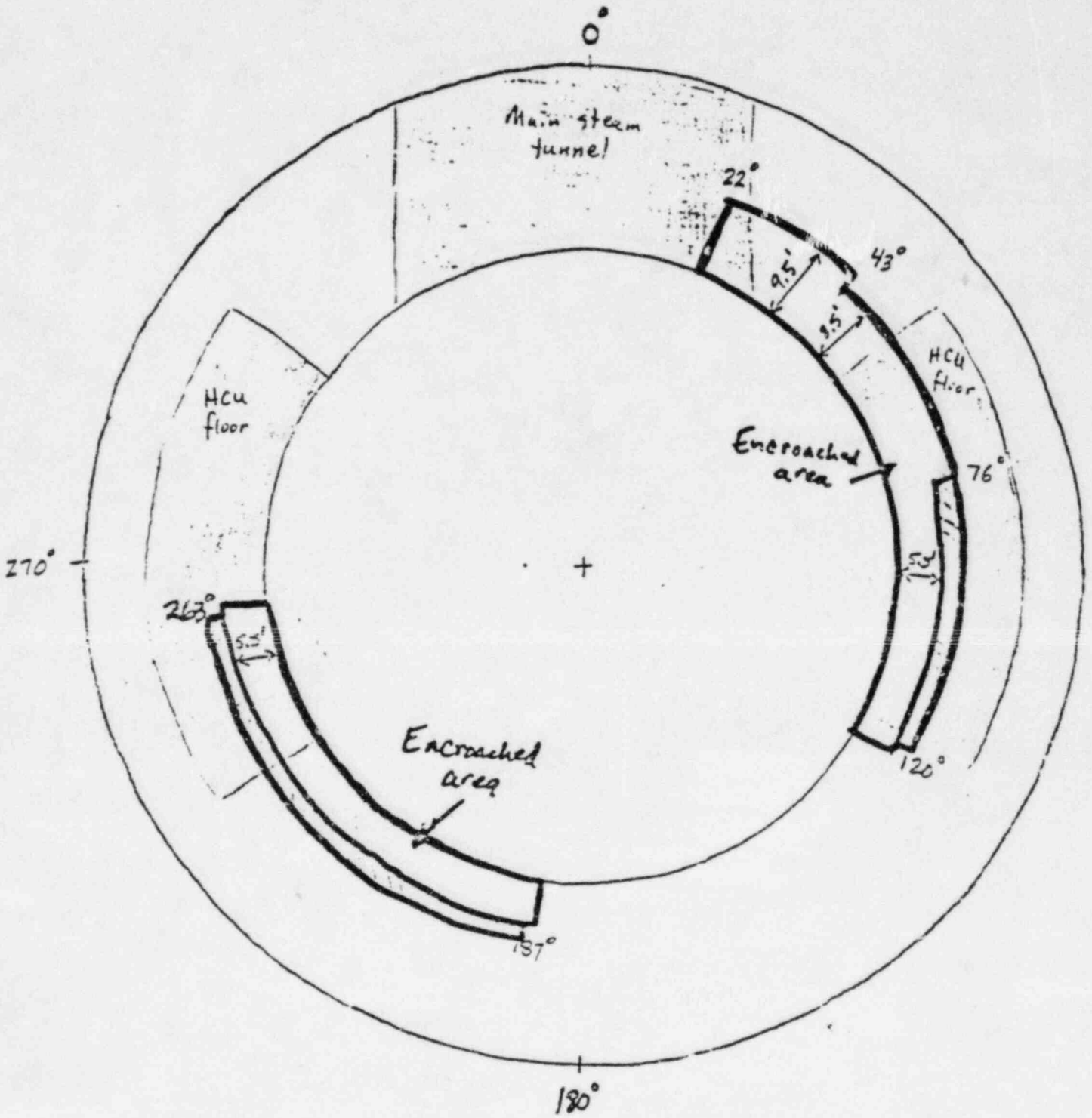
Two configurations will be tested in the 1/10-scale Mark III encroachments test facility.

The purpose for testing two configurations is to address the effects of Clinton's long circumferential encroachment from 22° to 120° which consists of the TIP platform (22°-43°), equipment drain sump platform (43°-76°) and the personnel hatch platform (76°-120°). The attached Figure 1 shows the general layout of these encroachments.

Test Configuration #1 will represent the TIP and sump platforms. Test Configuration #2 will represent both the personnel hatch platform and the equipment hatch platform (from 187° to 263°).

Test Configuration #1 will consist of approximately 4.25 cells encroached with radial extents of 42% and 38%. (See Figures 2 and 3). The second configuration will consist of 3 cells encroached with a radial extent of 38%. This second configuration will also model the shielding blocks that exist above the personnel and equipment hatch encroachments. (See Figures 2 and 4).

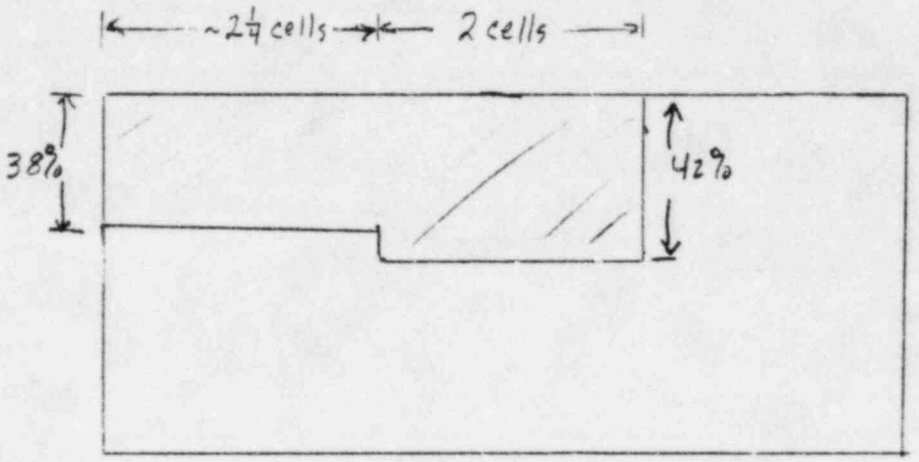
Clinton-unique FSAR drywell pressures will be used as input into the model. The initial matrix authorized by this specification is 3 repeat tests of each encroached pool response.



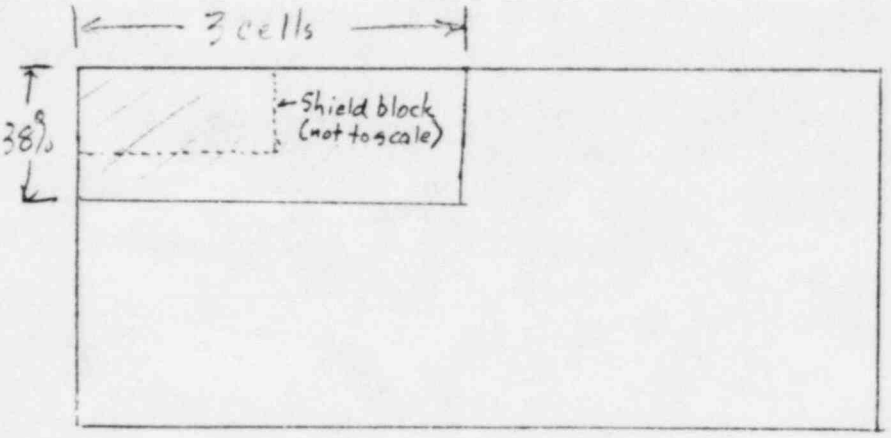
CPS Encroachments with Major Structures above

Figure 1

Plan View of Test Configurations



Test Configuration #1
~4¼ cells
38, 42% radial extent



Test Configuration #2
3 Cells
38% radial extent

Figure 2

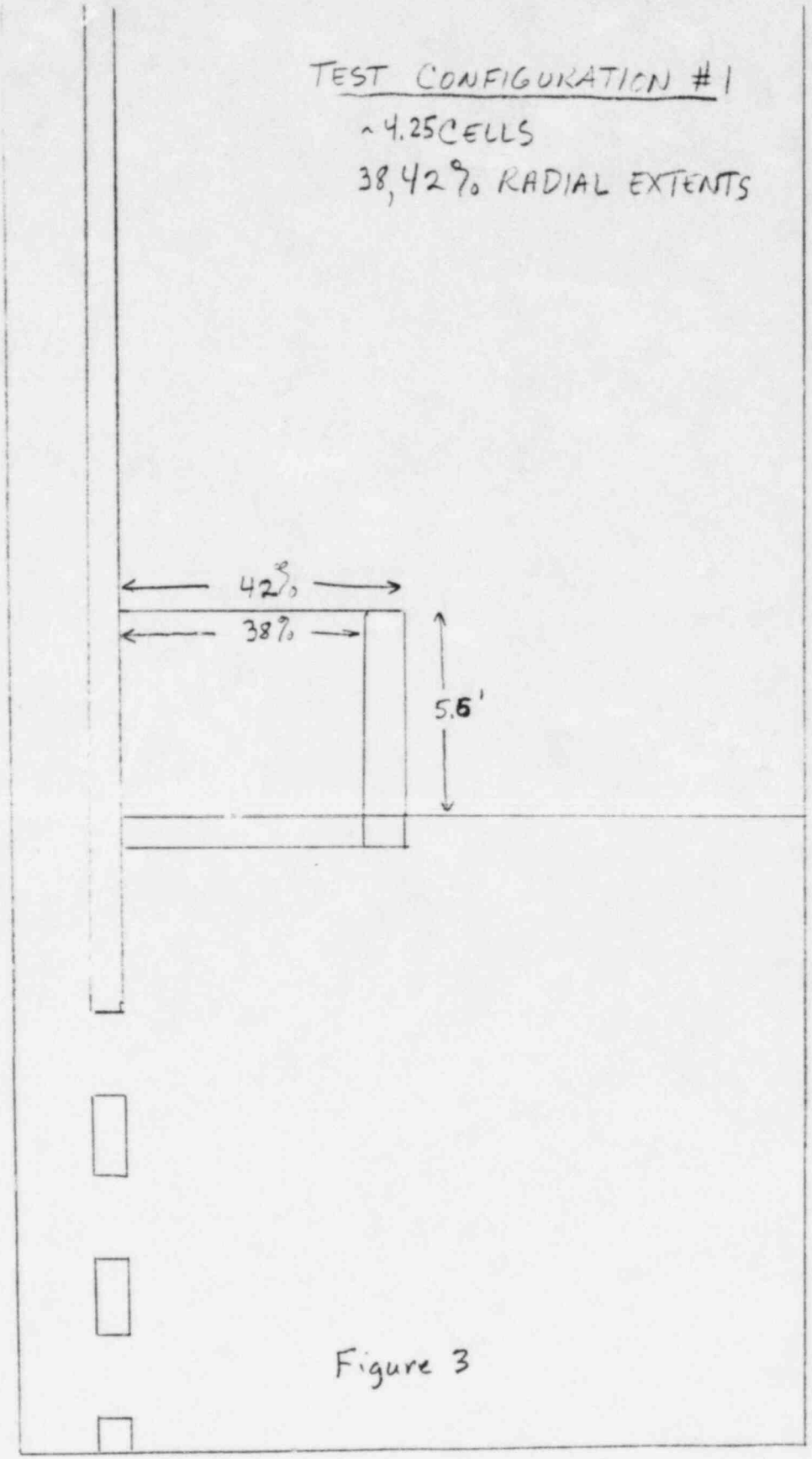


Figure 3

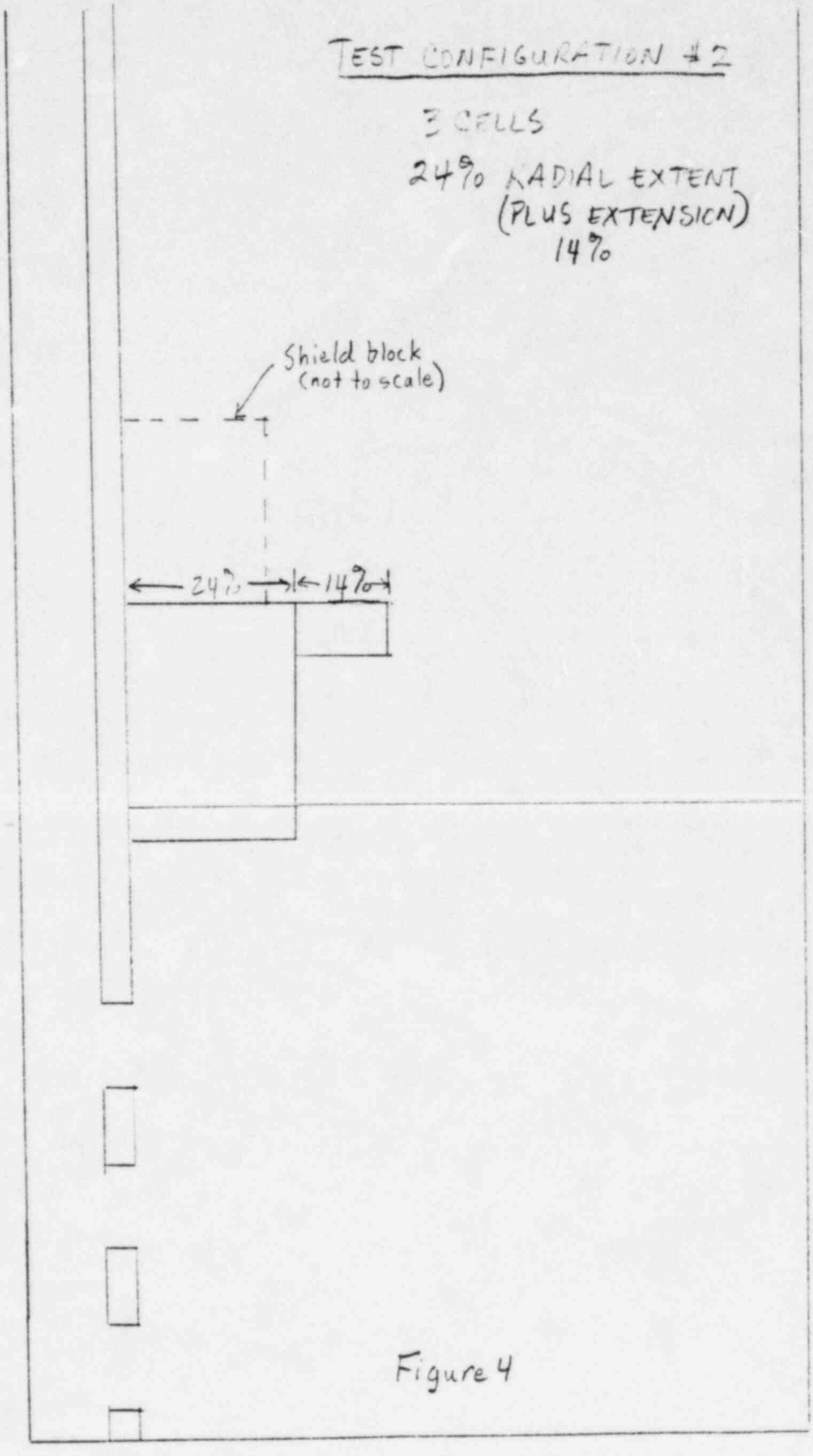

TEST CONFIGURATION #2
3 CELLS
24% RADIAL EXTENT
(PLUS EXTENSION)
14%
Shield block
(not to scale)
24%
14%

Figure 4

DRAFT

TEST SPECIFICATION

MARK III 1/10 LINEAR FROUDE SCALED PLANT UNIQUE RECTANGULAR ENCROACHMENTS TEST (TEST SERIES 6104)

December 19, 1984

TABLE OF CONTENTS - TEST SPECIFICATION

1.0 INTRODUCTION/OBJECTIVES

2.0 EQUIPMENT TO BE TESTED

3.0 TEST CONDITIONS

4.0 TEST QUALITY REQUIREMENTS

5.0 EXPECTED TEST RESULTS

6.0 ACCEPTANCE LIMITS

7.0 RECORDS AND RETENTION

8.0 DISPOSITION OF EQUIPMENT/MATERIAL

9.0 TECHNICAL/LEGAL RISK EVALUATION

10.0 SPECIAL TEST REQUIREMENTS

REFERENCES

1.0 INTRODUCTION/OBJECTIVES

The Mark III 1/10 linear Froude scaled rectangular encroachments tests (Test Series 6104), will be conducted to determine the effect of plant unique encroachments on a pool swell transient. Previous 1/10 scale testing (Test Series 6101) determined the effect of typical Mark III encroachments on the transient. The major modification of this test series is that plant unique encroachment geometries will be used.

2.0 EQUIPMENT TO BE TESTED

The multivent encroachment test will be performed in the drywell of the Pressure Suppression Test Facility (PSTF) utilizing a 1/10 linear Froude scale test system based on the Mark III containment geometry. As shown in Figure 1, this test tank will consist of a drywell (with volume of 44.8 ft^3) discharging into a weir annulus having 1/100 scale floor area per vent station (with width of 2.6 in.). In addition, six cells, each having three horizontal vents of 1/10 scale length (6 in.) and diameter (2.75 in.), discharging into a rectangular 1/10 linear scale pool of depth 22.2 in., width 22.6 in. and length 51 in., which represents a 48° sector of a Mark III suppression pool, will be modeled. The wetwell airspace volume need not be specifically modeled, since the entire test tank will be installed in a vacuum chamber for the test. The volume of the vacuum chamber, less the volume of the test tank and associated hardware and instrumentation must be greater than 220 ft^3. The test tank will contain removable encroachments attached to the simulated drywell wall in the corner of the suppression pool. This test facility will also include a quick opening valve which will admit the blowdown medium (air at atmospheric pressure) to drive the transient.

These are the only primary suppression system components modeled. Safety relief valves, the residual heat removal system, and other auxiliary systems need not be simulated.

3.0 TEST CONDITIONS

The initial conditions are to be set at the following values:

(1)	Drywell Initial Pressure	1.47 psia
(2)	Wetwell Initial Pressure	1.47 psia
(3)	Pool Initial Temperature	Ambient
(4)	Top Vent Centerline Submergence	9 in.
(5)	Blowdown Medium	Air at atmospheric pressure

4.0 TEST QUALITY REQUIREMENTS

These tests will provide data to supplement the current product design basis and expand the product performance data base. Thus, all quality assurance procedural requirements, performance and evaluations shall be consistent with EOP 35-3.00 requirements for a Type B2 test program (design basis).

5.0 EXPECTED TEST RESULTS

The drywell pressure history will be measured to assure a response representative of the actual plant being tested. High speed movies of the pool response will be taken to determine the effect of the encroachment on the pool swell transient. It is expected that the

encroached response will be slower than the clean pool response. It is also expected that impact characteristics at the HCU floor level will be less severe than those seen in the 'A' configuration of the Test Series 6101 testing (Reference 2).

6.0 ACCEPTANCE LIMITS

The measurement uncertainties and test initial conditions shall be set within generally expected instrument resolutions and possible environmental deviations. Initial conditions tolerances are given in the table below. However, deviations from these limits will be left to the discretion of the responsible test engineer in cases of adverse environmental or test conditions.

INITIAL CONDITIONS TOLERANCE

PARAMETER	SPECIFIED LIMITS
Initial Pool Temperature	ambient
Initial System Pressure	1.37 - 1.57 psia
Pool Depth	22.1 - 22.3 in.

The required measurement accuracy for the drywell pressure measurement is ± 0.1 psia in the 0 to 5 psia range. The pressure measurement system must be capable of tracking a 10 psi/sec. transient. Data is to be recorded on a strip chart recorder with a dynamic response greater than the rest of the measurement system.

7.0 RECORDS AND RETENTION

Output from the Data Acquisition System (DAS), test logs, reduced data, and the method and results of the analysis performed shall be kept under Design Record File (DRF) number (later) with (later) as designated Responsible Engineer. The DRF shall be closed and microfilmed following the issuance of the final test report in accordance with EOP 60-3.10.

8.0 DISPOSITION OF EQUIPMENT/MATERIAL

Equipment, facilities or other structures which are designed and built to fulfill the purpose of this test specification shall be consigned to either the responsible test component's inventory or the Test Facility Operation's inventory, whichever is considered appropriate by the Responsible Test Manager and Test Engineer.

9.0 TECHNICAL/LEGAL RISK EVALUATION (TRE/LRE)

A TRE/LRE is not required for these tests.

10.0 SPECIAL TEST REQUIREMENTS

Provision must be made for the filming of high speed motion pictures. The viewing window must be large enough such that the test facility and a mirror which is at a 45° angle attached to one side of the test tank are easily visible in the films. Lighting from both the bottom and top of the tank must be available. The film speed should be approximately 500 frames per second.

REFERENCES

1. McNamara, EJ, "Test Specification - Mark III Encroachments 1/10 Linear Froude Scaled Bubble Pressure Equalization Test, (Test Series 6101)", PWA #3695ZZ Rev. OK, January 3, 1984.

2. Mintz, S. et al "Mark III Encroachments Summary Report", October, 1984.

ATTACHMENT 3

Clinton Encroachment Issue
Closure Schedule

	Milestones	Schedule
1.	Meeting with NRC to discuss Clinton's proposal test configurations.	Dec. 19, 1984
2.	Issue Draft Test Specification	Dec. 21, 1984
3.	Issue Draft Test Plan/Test Procedures	Jan. 4, 1985
4.	Issue Test Specification.	Jan. 4, 1985
5.	Issue Test Plan/Test Procedure	Jan. 11, 1985
6.	Start Shakedown Testing.	Jan. 11, 1985
7.	Start Testing Series.	Jan. 28, 1985
8.	Complete Testing Series.	Feb. 8, 1985
9.	Issue Apparent Test Report.	Mar. 1, 1985
10.	Issue Draft Test Report.	Mar. 30, 1985
11.	Proceed with Clinton Specific Load Definitions (if needed).	Mar. 2, 1985
12.	Issue Final Test Report	Apr. 12. 1985
13.	Complete Load Definitions (if needed).	Apr. 12, 1985
14.	Start Clinton Evaluation of Load Definitions (if needed).	Apr. 12, 1985