

September 4, 1996

Mr. Michael W. Lyon
Director - Licensing
Clinton Power Station
P. O. Box 678
Mail Code V920
Clinton, IL 61727

Distribution w/encls:

Docket File	GHill (2)
PUBLIC	JRoe
PDIII-3 r/f	CGrimes
ACRS	OGC
WAxelson, RIII	GMarcus

SUBJECT: ISSUANCE OF AMENDMENT NO.106 TO FACILITY OPERATING LICENSE NO. NPF-62 - CLINTON POWER STATION, UNIT 1 (TAC NO. M94889)

Dear Mr. Lyon:

The U. S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No.106 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit No. 1. The amendment is in response to your application dated February 22, 1996 (U-602549) and supplemented by letter dated July 3, 1996 (U-602596).

The amendment revises the Clinton Power Station Technical Specifications for the drywell to permit bypass testing on a 10-year frequency with increased testing if performance degrades, changes the drywell air lock testing and surveillance requirements, deletes action notes for the drywell air lock and drywell isolation valves when the bypass leakage limit is not met, and deletes the specific leakage limits for the drywell air lock seal.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by:
Douglas V. Pickett, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures: 1. Amendment No.106 to NPF-62
2. Safety Evaluation

cc w/encls: See next page

DOCUMENT NAME: G:\CLINTON\CLI94889.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure
"N" = No copy

OFFICE	LA:PDIII-3	<input checked="" type="checkbox"/> PM:PDIII-3	BC:SCSB	OGC
NAME	DFoster-Curseen	DPickett:	CBerlinger	CHobbes
DATE	7/18/96	7/26/96	7/25/96	8/13/96

OFFICIAL RECORD COPY

100053

NRC FILE CENTER COPY

9609110009 960904
PDR ADDOCK 05000461
PDR

CP1

September 4, 1996

Distribution w/encs:

Mr. Michael W. Lyon
Director - Licensing
Clinton Power Station
P. O. Box 678
Mail Code V920
Clinton, IL 61727

Docket File
PUBLIC
PDIII-3 r/f
ACRS
WAxelson, RIII
GHill (2)
JRoe
CGrimes
OGC
GMarcus

SUBJECT: ISSUANCE OF AMENDMENT NO.106 TO FACILITY OPERATING LICENSE NO.
NPF-62 - CLINTON POWER STATION, UNIT 1 (TAC NO. M94889)

Dear Mr. Lyon:

The U. S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No.106 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit No. 1. The amendment is in response to your application dated February 22, 1996 (U-602549) and supplemented by letter dated July 3, 1996 (U-602596).

The amendment revises the Clinton Power Station Technical Specifications for the drywell to permit bypass testing on a 10-year frequency with increased testing if performance degrades, changes the drywell air lock testing and surveillance requirements, deletes action notes for the drywell air lock and drywell isolation valves when the bypass leakage limit is not met, and deletes the specific leakage limits for the drywell air lock seal.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by:
Douglas V. Pickett, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures: 1. Amendment No.106 to NPF-62
2. Safety Evaluation

cc w/encs: See next page

DOCUMENT NAME: G:\CLINTON\CLI94889.AMD

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure
"N" = No copy

OFFICE	LA:PDIII-3	<input checked="" type="checkbox"/> PM:PDIII-3	BC:SCSB	OGC
NAME	DFoster-Curseen	DPickett:	CBerlinger	CHolmes
DATE	7/18/96	7/24/96	7/25/96	8/13/96

OFFICIAL RECORD COPY



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 4, 1996

Mr. Michael W. Lyon
Director - Licensing
Clinton Power Station
P. O. Box 678
Mail Code V920
Clinton, IL 61727

SUBJECT: ISSUANCE OF AMENDMENT NO. 106 TO FACILITY OPERATING LICENSE NO.
NPF-62 - CLINTON POWER STATION, UNIT 1 (TAC NO. M94889)

Dear Mr. Lyon:

The U. S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 106 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit No. 1. The amendment is in response to your application dated February 22, 1996 (U-602549) and supplemented by letter dated July 3, 1996 (U-602596).

The amendment revises the Clinton Power Station Technical Specifications for the drywell to permit bypass testing on a 10-year frequency with increased testing if performance degrades, changes the drywell air lock testing and surveillance requirements, deletes action notes for the drywell air lock and drywell isolation valves when the bypass leakage limit is not met, and deletes the specific leakage limits for the drywell air lock seal.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script that reads "Douglas V. Pickett".

Douglas V. Pickett, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures: 1. Amendment No. 106 to NPF-62
2. Safety Evaluation

cc w/encls: See next page

Mr. Michael W. Lyon
Illinois Power Company

Clinton Power Station
Unit No. 1

cc:

Mr. Wilfred Connell
Vice President
Clinton Power Station
Post Office Box 678
Clinton, Illinois 61727

Illinois Department
of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Mr. Daniel P. Thompson
Manager Nuclear Station
Engineering Department
Clinton Power Station
Post Office Box 678
Clinton, Illinois 61727

Resident Inspector
U.S. Nuclear Regulatory Commission
RR#3, Box 229 A
Clinton, Illinois 61727

Mr. R. T. Hill
Licensing Services Manager
General Electric Company
175 Curtner Avenue, M/C 481
San Jose, California 95125

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Chairman of DeWitt County
c/o County Clerk's Office
DeWitt County Courthouse
Clinton, Illinois 61727

Mr. J. W. Blattner
Project Manager
Sargent & Lundy Engineers
55 East Monroe Street
Chicago, Illinois 60603



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ILLINOIS POWER COMPANY, ET AL.

DOCKET NO. 50-461

CLINTON POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 106
License No. NPF-62

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Illinois Power Company* (IP), and Soyland Power Cooperative, Inc. (the licensees) dated February 22, 1996 and supplemented by letter dated July 3, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-62 is hereby amended to read as follows:

*Illinois Power Company is authorized to act as agent for Soyland Power Cooperative, Inc. and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 106, are hereby incorporated into this license. Illinois Power Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Douglas V. Pickett, Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: September 4, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 106

FACILITY OPERATING LICENSE NO. NPF-62

DOCKET NO. 50-461

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages

Insert Pages

3.6-54

3.6-54

3.6-54a

3.6-54b

3.6-55

3.6-55

3.6-56

3.6-56

3.6-59

3.6-59

3.6-60

3.6-60

3.6-61

3.6-61

3.6 CONTAINMENT SYSTEMS

3.6.5.1 Drywell

LCO 3.6.5.1 The drywell shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Drywell inoperable.	A.1 Restore drywell to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<u>AND</u> B.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.5.1.1 Perform leakage rate test for each drywell air lock door seal by pressurizing the gap between the door seals to ≥ 3.0 psig.	Once within 72 hours after each drywell air lock door closing

(continued)

SURVEILLANCE REQUIREMENTS (continued)

**Drywell
3.6.5.1**

SURVEILLANCE	FREQUENCY
<p>SR 3.6.5.1.2</p> <p>-----NOTE----- An inoperable air lock door does not invalidate the previous successful performance of the overall drywell air lock leakage rate test. -----</p> <p>Perform overall drywell air lock leakage rate test at ≥ 3.0 psig.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Drywell
3.6.5.1

SURVEILLANCE	FREQUENCY
<p>SR 3.6.5.1.3 Verify bypass leakage is less than or equal to the bypass leakage limit. However, during the first unit startup following bypass leakage testing performed in accordance with this SR, the acceptance criterion is $\leq 10\%$ of the drywell bypass leakage limit.</p>	<p>24 months following 2 consecutive tests with bypass leakage greater than the bypass leakage limit until 2 consecutive tests are less than or equal to the bypass leakage limit</p> <p><u>AND</u></p> <p>48 months following a test with bypass leakage greater than the bypass leakage limit</p> <p><u>AND</u></p> <p>-----NOTE----- SR 3.0.2 is not applicable for extensions > 12 months. -----</p> <p>120 months</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Drywell
3.6.5.1

SURVEILLANCE	FREQUENCY
SR 3.6.5.1.4 Visually inspect the exposed accessible interior and exterior surfaces of the drywell.	Once prior to each Type A test required by SR 3.6.1.1.1.

3.6 CONTAINMENT SYSTEMS

3.6.5.2 Drywell Air Lock

LC0 3.6.5.2 The drywell air lock shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----

Entry and exit is permissible to perform repairs of the affected air lock components.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Drywell air lock inoperable for reasons other than Condition A or B.</p>	<p>C.1 Verify a door is closed. <u>AND</u> C.2 Restore air lock to OPERABLE status.</p>	<p>1 hour 24 hours</p>
<p>D. Required Action and associated Completion Time not met.</p>	<p>D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 4.</p>	<p>12 hours 36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.6.5.2.1 -----NOTE----- Only required to be performed upon entry into drywell. ----- Verify only one door in the drywell air lock can be opened at a time.</p>	<p>24 months</p>

3.6 CONTAINMENT SYSTEMS

3.6.5.3 Drywell Isolation Valves

LCO 3.6.5.3 One drywell isolation valve in each drywell penetration flow path shall be OPERABLE, except for the drywell vent and purge penetrations in which two drywell isolation valves shall be OPERABLE.

-----NOTE-----
This LCO does not apply to OPERABILITY of Drywell Post-LOCA Vacuum Relief System valves.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTES-----
1. Penetration flow paths, except the 10 inch, 24 inch, and 36 inch drywell vent and purge penetration flow paths may be unisolated intermittently under administrative controls.
 2. Separate Condition entry is allowed for each penetration flow path.
 3. Enter applicable Conditions and Required Actions for systems made inoperable by drywell isolation valves.

(continued)



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 106 TO FACILITY OPERATING LICENSE NO. NPF-62

ILLINOIS POWER COMPANY, ET AL.

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By application dated February 22, 1996, and supplemented by letter dated July 3, 1996, Illinois Power Company (the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Facility Operating License No. NPF-62) for the Clinton Power Station (CPS). The proposed changes would revise the TSs as follows:

1. Deletes the Note associated with TS Surveillance Requirement (SR) 3.6.5.1.1 that permitted a one-time allowance to eliminate the drywell bypass leakage rate test during the fifth refueling outage;
2. Changes the drywell bypass test surveillance interval from 18 months to 10 years with an increased testing frequency required if performance degrades;
3. Adds a Note to revised SR 3.6.5.1.3 stating that SR 3.0.2 (which provides for extensions up to 25% of the frequency) is not applicable for extensions greater than 12 months;
4. Revises current SR 3.6.5.2.1 to relocate the drywell air lock door seal leakage limit of 2 scfh to the TS Bases. The door seal leakage will continue to be considered part of the overall drywell bypass leakage addressed by LCO 3.6.5.1, "Drywell," and renumbered as SR 3.6.5.1.1.
5. Revises current SR 3.6.5.2.3 to relocate the overall air lock (barrel) leakage limit of 2 scfh to the TS Bases. The overall air lock (barrel) leakage will continue to be considered part of the overall drywell bypass leakage addressed by LCO 3.6.5.1, "Drywell," and renumbered as SR 3.6.5.1.2.
6. Relocates Note 2 to current SR 3.6.5.2.3 to the TS Bases. Note 2 requires that the drywell air lock be pressurized to 19.7 psid prior to performance of the overall air lock leakage test. In addition, the frequency of this test has been changed from 18 to 24 months.

7. Revises the frequency of current SR 3.6.5.2.2, which requires periodic verification of the drywell air lock interlock mechanism, from 18 to 24 months.
8. Deletes LCO 3.6.5.2 Actions Note 2, LCO 3.6.5.2 Required Action C.1, and LCO 3.6.5.3 Actions Note 4 since these specifications no longer address drywell leakage. The drywell leakage is entirely addressed by LCO 3.6.5.1 and the Notes and Required Action proposed for deletion are considered unnecessary cross-references.
9. Renumbers SRs as a result of the above described changes.

2.0 GENERAL BACKGROUND

By letter dated August 12, 1994, the licensee for the Clinton Power Station, a BWR/6 with a Mark III containment, proposed changes to the TSs to relax the test frequency for conducting drywell bypass leak rate tests from once every 18 months to once every ten years based on plant performance. The licensee supplemented this with submittals dated October 14, 1994, and February 6, 1995. These submittals modified the August 12, 1994, submittal to permit a one-time postponement of the drywell bypass leakage rate test until entry into MODE 2 on the first plant startup from Refueling Outage (RFO) 6; that is, the test would not be performed during RFO 5.

On March 1, 1995, the NRC issued Amendment No. 96 to the CPS operating license which approved a one-time elimination of the drywell bypass leakage rate test for RFO 5. This action was intended to allow the staff additional time to review the licensee's original request.

By separate correspondence, Entergy Operations, Inc (EOI), the licensee for both the River Bend and Grand Gulf Stations, both of which are BWR/6 plants with Mark III containments, proposed changes to the TSs to allow the drywell bypass leakage rate tests to be performed on extended intervals. In addition, EOI also proposed to revise surveillances for drywell air lock testing and relocate certain drywell air lock tests from the TSs to administrative control. Because of the interest of these BWR/6 licensees, the NRC staff requested that the BWR/6 licensees work together on a common proposal. Subsequently, on September 12, 1995, the staff met with representatives of the BWR/6s to discuss increasing the drywell bypass leakage test interval.

Subsequently, by letter dated February 22, 1996, the licensee submitted a revised proposal for the CPS. The revised proposal included a relaxation in the test interval for the drywell bypass leakage rate test and several changes to the drywell air lock surveillance. The staff's evaluation of the drywell bypass leakage test proposals is discussed in Section 2.0 of this safety evaluation. An evaluation of the proposed drywell air lock TSs changes are discussed in Section 3.0.

The staff has concluded, for the reasons given in this evaluation, that the test interval for the drywell bypass leakage rate test may be extended from

18 months to 10 years. The staff also finds the proposed changes to the drywell air lock TSs to be acceptable.

2.1 Drywell Bypass Leakage Discussion

2.1.1 Description of Drywell Safety Function

The Mark III is a pressure suppression containment which is designed to condense steam and contain fission products released during a loss-of-coolant (LOCA) accident. The Mark III containment is only used in this country with the BWR/6 reactor design. The effectiveness of the pressure suppression containment depends on the ability to condense steam released from the primary system during a LOCA. Condensation of the steam precludes overpressurization of the containment. The steam is condensed by directing its flow through a vent system from the drywell, through the suppression pool, to the containment.

The design of the Mark III containment makes allowance for a given amount of steam to bypass the suppression pool and enter the containment without being condensed by the suppression pool. If the bypass leakage were too large, the containment design pressure could be exceeded. There is some margin above the design pressure before the containment would fail; however, if the amount of steam leaking into the containment were large enough, not only could the containment fail, but bypassing the suppression pool could result in a radiation source term much larger than would otherwise be the case.

2.1.2 Drywell Bypass Limit

CPS Updated Final Safety Analysis Report (UFSAR) Section 6.2.1.1.5 defines allowable bypass leakage as the amount of steam which could bypass the suppression pool without exceeding the design containment pressure of 15 psig. This allowable bypass leakage is determined by examining a spectrum of LOCA break sizes. The allowable leakage is expressed in terms of the parameter A/\sqrt{K} where

$$A = \text{Flow area of the leakage path, ft}^2$$
$$K = \text{Geometric and friction loss coefficient, dimensionless.}$$

This parameter is dependent on the geometry of the drywell leakage paths with only a slight flow dependence, which is negligible.

The CPS TSs require that, prior to startup after performing a drywell bypass leakage rate test, the drywell bypass leakage rate shall be $\leq 10\%$ of the bypass leakage limit. The drywell bypass leakage rate limit is given in the TSs Bases as $A/\sqrt{K} = 1.18 \text{ ft}^2$.

The drywell bypass limit is based on a small reactor system break which will not automatically result in a reactor depressurization. This analysis assumes that the containment spray system and the other heat sinks are available. The A/\sqrt{K} of 1.18 ft^2 is equivalent to a bypass leakage rate of 136,400 scfm at a drywell design pressure of 30 psid and 43,120 scfm at 3 psid. For large break

LOCA events, larger bypass leakage areas are allowable since the break would rapidly depressurize the reactor and terminate the blowdown. The maximum allowable leakage path area (A/\sqrt{K}) for the large break LOCA case was calculated to be 10.15 ft², a factor of eight larger than for the small break LOCA case.

Preoperational drywell bypass leakage rate tests were performed at CPS. These tests were performed at drywell design pressure (30 psig) with the drywell isolated from the containment by capping the horizontal vents. The results of these tests were acceptable. This is discussed further below.

The CPS TSs currently require that a test be performed at least every 18 months to measure the drywell bypass leakage rate. The test is performed at a pressure difference of 3 psi between the drywell and the wetwell. This pressure difference corresponds to the steady state maximum differential pressure due to suppression pool vent clearing.

2.2 Evaluation

The staff's acceptance of the proposed 10-year test interval is based on the licensee's capability to assure that the likelihood of significant bypass leakage is acceptably low. This is based on the design of the drywell and its penetrations, the TSs and administrative controls, the results of previous leakage tests, as well as deterministic calculations. The staff gave considerable weight in its evaluation to the licensee's commitment for monitoring of the drywell leakage at least once per cycle to assure that the drywell remains operable. The monitoring program is further discussed in section 2.2.7 of this evaluation.

2.2.1 Overview

The drywell contains penetrations for piping systems; electrical cables for power, control and instrumentation; a drywell equipment hatch; and a personnel air lock. Piping penetrations have automatic or remote manual isolation valves or are required to be in the closed position when drywell integrity is required. The electrical penetrations contain a sealing medium to limit leakage. The TSs specify leakage rate testing of the drywell air lock and specify the leakage rate criteria. The licensee proposes to modify the air lock requirements. An evaluation of the licensee's proposal for revising the drywell air lock TSs is provided in Sections 3.2 of this evaluation.

2.2.2 Operating Experience

The table below provides a summary of the drywell bypass leakage rate testing experience at CPS. A total of six drywell bypass leakage rate tests have been performed and the operating experience has been good.

Previous Results of CPS Drywell Bypass Leakage Rate Tests

Test Date	Leak Rate (at 3.0 psig)	Ratio to Design Limit	Calculated A/√k
1/86	273.0 scfm*	0.63%	0.0075 ft ²
11/86	20.8 scfm	0.05%	0.0006 ft ²
4/89 (RF-1)	19.0 scfm	0.04%	0.0005 ft ²
2/91 (RF-2)	21.9 scfm	0.05%	0.0006 ft ²
5/92 (RF-3)	18.0 scfm	0.04%	0.0005 ft ²
11/93 (RF-4)	30.2 scfm	0.07%	0.0008 ft ²

The maximum value of bypass leakage was during a pre-operational test in January 1986 when bypass leakage of 0.63% of the design limit was measured. This was attributed to a defective electrical penetration seal which was subsequently corrected. The staff considers this incident to have little bearing on current operation since it is extremely unlikely that the circumstances could be repeated. The electrical penetrations are now permanently sealed, and even if an electrical penetration were reopened for some reason, the level of attention and procedural controls is much higher with the plant in an operational status as opposed to being under construction.

The staff has reviewed the drywell operating experience at all four domestic BWR/6 facilities to determine if there were any operating issues which would indicate that extending the test interval may not be appropriate. None was identified. Based on the above test results, which reveal an A/√k that is two orders of magnitude less than the allowable limit, the licensee believes that a reduction in testing is warranted.

2.2.3 Drywell Structure

The licensee's submittal discusses leakage considerations related to the drywell structure. During preoperational testing the drywell was pressurized to its design pressure (30 psig) while deflections and strains and concrete crack patterns in the structure were recorded. The results showed that the structure was not stressed as much as predicted and there were only slight signs of concrete cracking. The licensee stated that visual inspections of the accessible drywell surfaces performed since the preoperational tests have not detected additional cracking or other abnormalities in the drywell structure. During the drywell bypass leakage rate test, the drywell is pressurized to only 3 psid. Thus, the staff expects no significant challenge to the integrity of the drywell structure.

By letter dated June 21, 1996, the licensee was granted an amendment to permit leakage rate testing of the primary containment in accordance with Option B to

10 CFR Part 50, Appendix J. Option B permits Type A testing to be done, when justified by previous performance, on a 10-year interval. Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," Regulatory Position C.3, states that inspection of the primary containment surfaces must be performed "... prior to initiating a Type A test, and during two other refueling outages before the next Type A test if the interval for the Type A test has been extended to 10 years." This position was included in the NRC's letter of June 21, 1996, to the licensee. Thus, containment inspections will continue to be conducted at a frequency of at least three times per 10-year interval.

The staff requested the licensee to address the frequency of performing drywell inspections and the licensee responded in their letter of July 3, 1996. CPS TS SR 3.6.5.1.2 requires that the exposed accessible interior and exterior surfaces of the drywell be inspected prior to the performance of each Type A test pursuant to 10 CFR Part 50, Appendix J. Regulatory Guide 1.163, which specifically prohibits extending the frequency of containment inspections to ten years, does not address drywell inspections. The licensee stated their intention to conduct drywell inspections in accordance with their approved technical specifications. Justification for this inspection schedule included proceduralized valve lineups, leak testing of the equipment hatch and drywell air locks, past performance of drywell bypass leakage rate tests, the large margin between the allowable drywell leakage rate and the size of potentially open valves, and the capability to perform online assessment of drywell integrity as discussed in Section 2.2.7 of this safety evaluation. Thus, the licensee will visually inspect the drywell on an interval no greater than once per 10 years.

The staff does not consider leakage through the drywell structure to be a significant concern in extending the drywell bypass leakage rate testing frequency and considers the 10-year visual inspection frequency to be adequate.

It is possible that the licensee may, at some time, modify the drywell structure or some pressure retaining component of the drywell. In the licensee's letter of July 3, 1996, the licensee stated that the drywell will continue to be required to be leak tested following modification to the drywell structure or penetrations via Technical Specification LCO 3.6.5.1 (via SR 3.0.1). The Bases section of SR 3.0.1 states that appropriate post-maintenance testing is required to declare equipment operable. The staff considers this to be sufficient to assure that the drywell remains capable of performing its safety function following maintenance.

2.2.4 Piping Penetrations

Lines which penetrate the drywell contain drywell isolation valves. These valves prevent leakage from the drywell into the primary containment. The isolation valves on those lines which penetrate the primary containment as well as the drywell are included in the category of primary containment isolation valves. Primary containment isolation valves are tested according

to the requirements of 10 CFR Part 50 Appendix J. Appendix J defines a total leakage rate limit for the containment isolation valves and other penetrations. There is no corresponding limit for the drywell isolation valves. In fact, the drywell isolation valves are not required to be separately leak tested.

The magnitude of allowable drywell bypass leakage makes it unlikely that it will be exceeded due to leakage through a closed drywell isolation valve or valves. It is more likely that a drywell isolation valve, or valves, inadvertently left open would be necessary to exceed the limit. However, the licensee has presented several arguments to demonstrate that it is extremely unlikely that the drywell bypass leakage limit would be exceeded due to an inadvertently open drywell isolation valve. This is due to the large flow area necessary to exceed the allowable leakage value and the controls required by TSs and plant procedures to assure that the valves are closed.

The licensee's letter of February 22, 1996, discusses the consequences of leakage through drywell isolation valves and the associated effect on bypass flow. The licensee concluded that the allowable drywell leakage rate is so large that any penetration flow path less than or equal to 10 inches in diameter can have only a negligible impact on total drywell bypass leakage.

The CPS drywell post-LOCA vacuum relief system has four 10 inch drywell penetrations. Each drywell penetration is isolated by two check valves located in series. The calculated effective A/\sqrt{K} for each of these subsystems for forward flow (that is, from containment into the drywell) is 0.217 ft^2 (i.e., 18.4% of the design limit). As a result, all four 10-inch penetration flow paths would have to fail fully open in order to challenge the allowable drywell bypass leakage limit of 1.18 ft^2 .

The licensee separately assumed that one of the purge and exhaust penetration flow paths is fully open in addition to other drywell bypass leakage equal to the TS value. The drywell vent and purge system drywell isolation valves are large (10-, 24- and 36-inch) Posi-seal butterfly valves. This corresponds to a A/\sqrt{K} value of approximately 1.0 ft^2 . Thus, the design bypass leakage limit of 1.18 ft^2 will not be exceeded even if the drywell vent and purge exhaust penetration flow path is full open in conjunction with other drywell bypass leakage equal to 10% of the drywell bypass design leakage limit (i.e., TS limit) since the effective A/\sqrt{K} would be estimated to be 1.118 ft^2 (i.e., $1.0 \text{ ft}^2 + 0.118 \text{ ft}^2$). The drywell vent and purge isolation valves are closed during MODES 1, 2 and 3 and they are verified to be sealed closed at least once per 31 days in accordance with TS SR 3.6.5.3.1.

The licensee's letter of July 3, 1996, provided a listing of all drywell isolation valves. This listing includes piping diameters, indicates which valves receive automatic isolation signals to close following a LOCA and which valves have control room position indication. According to the licensee's submittal, all but 14 drywell isolation valves either receive an automatic isolation signal to close or are locked closed when drywell integrity is required. The following summarizes the licensee's assurance that the remaining 14 drywell isolation valves will be shut following a LOCA:

- Five of the valves are 3/4" solenoid-operated equalizing valves associated with the test feature of the associated ECCS injection line check valves. These valves are RCS pressure isolation valves and are leak tested with water at 1000 psi at least once every 18 months. The valves are normally closed and have control room position indication.
- Two of the valves are 1 1/2" remotely operated motor-operated valves. These are normally closed valves, have position indication in the control room and are verified to be closed as part of system lineups performed prior to plant startup.
- Two of the valves are 1" solenoid-operated valves which are installed as spares. They are not electrically connected (i.e., de-energized in the closed position) and, as such, do not have control room position indication.
- The remaining five valves are 3/4" test connections that are capped closed and, as such, do not have control room position indication.

In addition to the above controls for the 14 drywell isolation valves, the licensee has examined the consequences of these valves being left open following a LOCA. The licensee has determined that, based on the A/√K values, the ten 3/4", two 1" and two 1 1/2" valves (9.52 square inches total area) could all fail fully open without exceeding the design drywell bypass leakage limit.

These examples demonstrate significant margin to the drywell bypass leakage limit for drywell isolation valves.

2.2.5 Air Locks and Equipment Hatch

The TSs require the drywell air lock to be leak rate tested during every refueling outage. The test interval is currently 18 months. The licensee has proposed to change this interval to 24 months to accommodate longer operating cycles. As discussed in Section 3.2, the staff finds this proposed change to be acceptable. Both the equipment hatch and drywell air lock have double compression seals and are leak tested in accordance with TSs.

2.2.6 Electrical Penetrations

In its letter of July 3, 1996, the licensee provided a description of the electrical penetrations and discussed the likelihood of failure of an electrical penetration in such a manner as to provide a significant leakage path. Each electrical conduit has been sealed with an epoxy-based sealing compound qualified for harsh environmental conditions. The two sealing compounds used at CPS have a nominal density of either 150 or 200 pounds per cubic foot. The licensee has not experienced any shrinkage or other problems with the sealing configurations following initial startup testing, nor is the licensee aware of any industry problems with the sealing compounds. Therefore, based on the geometry of the penetrations and the sealants used, the licensee has concluded that significant bypass leakage is highly unlikely.

As part of the rulemaking concerning the revision to 10 CFR Part 50, Appendix J, the staff examined the leakage behavior of primary containment electrical penetrations and found the operating experience sufficient to justify an increase in the leakage rate test interval from the two years specified in the previous rule to a maximum of 10 years (based on previous performance) under the new rule.

The staff therefore, concludes that the likelihood of significant leakage or failure of the electrical penetrations is very small.

2.2.7 Monitoring Leakage

The staff requested that the licensee consider a method of monitoring the drywell for significant leakage during plant operation. The licensee responded by proposing methods which provide a reasonable assurance that the TS value of drywell bypass leakage will not be exceeded.

The licensee's letter of February 22, 1996 indicates an ability to make a continuing, qualitative on-line assessment of drywell integrity. The drywell is constantly being pressurized due to instrument air in-leakage and must be vented approximately once per day when drywell pressure approaches the upper TS limit of 1.0 psig. An analysis using the drywell leakage rate measured during the last refueling outage and the most recent drywell pressurization rate (known to be approximately 0.04 psi/hr), has back-calculated the instrument air in-leakage to be approximately 23 scfm. This information can be used by the licensee to provide a qualitative assessment of drywell integrity. While an increase in the pressurization rate would be indicative of an increase in instrument air in-leakage, a decrease in pressurization rate would be indicative of a larger drywell leak path. The A/\sqrt{k} for a 23 scfm leak at 0.2 psig is 0.0025 ft^2 or 0.2% of the allowable leakage area. Because of this large margin to the allowable drywell leakage rate, the licensee has concluded that as long as the drywell continues to pressurize, regardless of the rate, an unacceptable leakage path does not exist and drywell integrity is assured.

In order to provide added assurance that the drywell has not seriously degraded between the performance of drywell bypass leakage rate tests, the licensee has committed to perform a qualitative assessment of the drywell leak tightness at least once per operating cycle. The first assessment will be performed prior to Operating Cycle 7. By checking for gross leakage, this assessment will provide an indication of the ability of the drywell to perform its design function. As a check for gross leakage, the assessment may not identify drywell leakage that is masked by plant conditions, or identify leakage through systems that are not communicating with the drywell atmosphere at the time of the assessment. For example, minor increases in drywell bypass leakage could be masked by a small leak in the instrument air system inside the drywell. The assessment would not be detailed enough to account for such minor changes. However, as demonstrated above, as long as the drywell continues to pressurize, drywell integrity is assured.

2.2.8 Staff Position

The staff reviewed the licensee's proposal to increase the test interval for drywell bypass leakage rate testing from 18 months to ten years. The staff finds this extension in the test interval to be acceptable. As discussed above, this is because of the demonstrated margin available due to the large amount of leakage necessary to exceed the containment design pressure, and the licensee's commitment to assess the drywell bypass leakage in order to maintain a reasonable assurance that the drywell remains OPERABLE.

3.0 PROPOSED TECHNICAL SPECIFICATION CHANGES

3.1 Drywell Bypass Leakage Rate Test Surveillance Interval Extension

A change to the surveillance frequency is proposed for the drywell bypass leakage test from 18 months to 10 years with an increased testing frequency required if performance degrades. An extension of the test interval by 12 months is permitted.

The licensee has proposed that following a drywell bypass test for which the leakage is greater than the drywell bypass leakage limit, tests will be required at an increased frequency of at least once every four years. Although this is not an Appendix J test, the decrease in the test interval upon failure of a drywell leakage rate test is consistent with the industry guidance approved in Regulatory Guide 1.163, September 1995, for a Type A primary containment leakage rate test.

Following two consecutive failed drywell leakage rate tests, the frequency will be returned to the current frequency of every refueling outage until two successful consecutive tests are performed.

This change is discussed in Section 2.0 of this safety evaluation and the staff finds the licensee's proposal acceptable for the reasons discussed therein.

3.2 Safety Evaluation on Drywell Air Lock Technical Specifications Changes

3.2.1 Leakage rate surveillance is moved from the air lock LCO (3.6.5.2) to the drywell LCO (3.6.5.1).

The licensee proposes to move the air lock leakage rate surveillance requirement to the drywell LCO since excess air lock leakage will require actions for drywell inoperability. While this is different in format from the Improved Standard Technical Specifications, it is essentially an editorial change and the staff finds it acceptable.

3.2.2 Relocate the requirement for the overall drywell air lock and the drywell air lock seals to meet a specific overall leakage rate limit.

Current SR 3.6.5.2.1 specifies the drywell air lock door seal leakage rate limit of 2 scfh whereas current SR 3.6.5.2.3 specifies the overall drywell air lock (barrel) leakage limit of 2 scfh. The licensee has proposed relocating these individual leakage limits to the TS Bases. These limits are intended as an indication of degradation. The ability of the drywell to perform its safety function is not dependent on the air lock meeting specific leakage limits. The limiting case for drywell bypass leakage is based on the total leakage through all drywell leakage paths, other than the suppression pool vents. As such, however, it is not necessary as a TS value and the staff agrees that it may be relocated to the TS Bases.

The above values of 2.0 scfh are insignificant compared to the drywell leakage rate limit of approximately 43,000 scfm. The leakage limits will be maintained in accordance with the change control provisions of the Bases Control Program of TS 5.5.11. Therefore, the staff concurs that these provisions will be adequately controlled.

3.2.3 Deletes LCO 3.6.5.2 Actions Note 2, LCO 3.6.5.2 Required Action C.1, and LCO 3.6.5.3 Actions Note 4

LCO 3.6.5.2 Actions Note 2, LCO 3.6.5.2 Required Action C.1, and LCO 3.6.5.3 Actions Note 4 all make cross references to LCO 3.6.5.1, "Drywell." All drywell leakage is now being included in LCO 3.6.5.1 and there is no need to include cross references in other TSs. The Notes and Required Actions proposed for deletion constitute unnecessary cross-references and their deletion is considered to be administrative in nature. The staff concurs with this proposed change.

3.2.4 Change surveillance test interval for the drywell air lock leakage and the air lock interlock mechanism from 18 months to 24 months.

This change is consistent with the guidance of Nuclear Energy Institute (NEI) 94-01, "Industry Guideline for Implementing Performance-Based Option of 10CFR50, Appendix J," which is referenced in Regulatory Guide 1.163, September 1995. The guidance has previously been reviewed and approved by the staff and, therefore, is acceptable.

3.2.5 Relocate Note 2 to current SR 3.6.5.2.3 to the TS Bases

Note 2 to current SR 3.6.5.2.3 requires that the air lock leakage test at 3 psid be preceded by pressurizing the air lock to 19.7 psid. The license proposes to relocate this pre-test condition to the TS Bases. The 19.7 psid pressure does not occur during the limiting event which determines the maximum allowable drywell bypass leakage rate (i.e., the small break LOCA) and, therefore, is not necessary as a TS value. The allowable drywell bypass leakage rate for the event during which the air lock could experience this pressure differential (i.e., during a large break LOCA) is eight times higher. The relocated pre-test condition will be controlled by the TS Bases Control Program of TS 5.5.11 and the staff concurs that this requirement will be adequately controlled.

3.2.6 Renumbering of TS SRs, Administrative changes

As a result of moving current SR 3.6.5.2.1 and SR 3.6.5.2.3 to LCO 3.6.5.1, the following administrative changes are being made:

- a) current SR 3.6.5.1.1 has been renumbered to SR 3.6.5.1.3;
- b) current SR 3.6.5.1.2 has been renumbered to SR 3.6.5.1.4; and
- c) current SR 3.6.5.2.2 has been renumbered to SR 3.6.5.2.1

In addition, the Note to current SR 3.6.5.1.1, which permitted a one-time deletion of the drywell bypass leak rate test for RFO 5, is being deleted.

These TS changes are purely administrative and the staff finds them acceptable.

4.0 EVALUATION SUMMARY

The staff finds that the licensee's proposal to increase the drywell bypass leakage rate test interval from 18 months to 10 years is acceptable. As previously described, this is based on the large margin for leakage, plant procedures to assure proper valve lineups, TS requirements to monitor local leakage of air lock doors, the equipment hatch and containment isolation valves along with the licensee's commitment to assess the drywell bypass leakage, and thereby assure operability, at least once every operating cycle.

The changes to the air lock TSs are acceptable in that they will add flexibility without decreasing safety for the reasons discussed above.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois state official was notified of the proposed issuance of the amendment. The state official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (61 FR 18170). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

**Principal Contributor: Richard Lobel
Douglas Pickett**

Date: September 4, 1996