November 7, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS (TAC NOS. MB2187 AND MB2188)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 149 to Facility Operating License No. NPF-11 and Amendment No. 135 to Facility Operating License No. NPF-18 for the LaSalle County Station, Units 1 and 2, respectively. The amendments are in response to your application dated May 30, 2001, as supplemented by letter dated September 10, 2001.

The amendments change the Technical Specifications (TS) to extend the baseline surveillance interval for the drywell-to-suppression chamber bypass leakage test to 120 months and adds two surveillance requirements which would require leakage testing on the four suppression chamber-to-drywell vacuum breakers with a 24-month interval.

A copy of the safety evaluation (SE) is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/RA/

William A. Macon, Jr., Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosures:
1. Amendment No. 149 to NPF-11
2. Amendment No. 135 to NPF-18
3. Safety Evaluation

cc w/encls: See next page

cc:

Exelon Generation Company, LLC
Site Vice President - LaSalle
2601 North 21st Road
Marseilles, Illinois 61341-9757

Exelon Generation Company, LLC
Station Manager - LaSalle
2601 North 21st Road
Marseilles, Illinois 61341-9757

Exelon Generation Company, LLC
Regulatory Assurance Manager - LaSalle
2601 North 21st Road
Marseilles, Illinois 61341-9757

U.S. Nuclear Regulatory Commission
LaSalle Resident Inspectors Office
2605 N. 21st Road
Marseilles, Illinois 61341-9756

Phillip P. Steptoe, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60603

Assistant Attorney General
100 W. Randolph St. Suite 12
Chicago, Illinois 60601

Chairman
LaSalle County Board
707 Etna Road
Ottawa, Illinois 61350

Attorney General
500 S. Second Street
Springfield, Illinois 62701

Chairman
Illinois Commerce Commission
527 E. Capitol Avenue, Leland Building
Springfield, Illinois 62706

Robert Cushing, Chief, Public Utilities Division
Illinois Attorney General's Office
100 W. Randolph Street
Chicago, Illinois 60601

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

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

Document Control Desk-Licensing
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. John Skolds
Chief Operating Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. John Cotton
Senior Vice President, Operation Support
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. William Bohlke
Senior Vice President, Nuclear Services
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. Robert J. Hovey
Vice President
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. Christopher Crane
Senior Vice President
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. Jeffrey Benjamin
Vice President - Licensing and Regulatory
Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. K. A. Ainger
Director - Licensing
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. Robert Helfrich
Senior Counsel, Nuclear
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

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AMendiola	OGC	WBeckner	

ADAMS Accession Number: **ML012850399**

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NAME	WMacon	CRosenberg	Uttal	AMendiola
DATE	10/17/01	10/16/01	10/22/01	10/3/01

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EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNIT 1

DOCKET NO. 50-373

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 149
License No. NPF-11

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated May 30, 2001, as supplemented on September 10, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;

   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 enclosure to this license amendment and paragraph 2.C.(2) of the Facility Operating License No. NPF-11 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 149, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: November 7, 2001

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNIT 2

DOCKET NO. 50-374

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 135
License No. NPF-18

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated May 30, 2001, as supplemented on September 10, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;

   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 enclosure to this license amendment and paragraph 2.C.(2) of the Facility Operating License No. NPF-18 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 135, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: November 7, 2001

ATTACHMENT TO LICENSE AMENDMENT NOS. 149 AND 135

FACILITY OPERATING LICENSE NOS. NPF-11 AND NPF-18

DOCKET NOS. 50-373 AND 50-374

Revise the Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain a vertical line indicating the area of change.

REMOVE	INSERT
3.6.1.1-2	3.6.1.1-2
3.6.1.1-3	3.6.1.1-3
	3.6.1.1-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 149 TO FACILITY OPERATING LICENSE NO. NPF-11

AND AMENDMENT NO. 135 TO FACILITY OPERATING LICENSE NO. NPF-18

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By application dated May 30, 2001, as supplemented September 10, 2001, Exelon Generation Company (the licensee) submitted a request for changes to the technical specifications (TS) for the LaSalle County Station, Units 1 and 2 (LaSalle). The proposed TS changes would revise requirements concerning drywell-to-suppression chamber bypass leakage. Specifically, the licensee has proposed to: (1) extend the baseline interval specified in Surveillance Requirement (SR) 3.6.1.1.3 for the drywell-to-suppression chamber bypass leakage test from 24 months to 120 months, and (2) add SR 3.6.1.1.4 and SR 3.6.1.1.5, which would establish specific testing requirements for the suppression chamber-to-drywell vacuum breakers. The September 10, 2001, supplement contained clarifying information. The material did not expand the scope of the original Federal Register notice (66 FR 38761).

Drywell-to-suppression chamber bypass leakage pathways can be grouped into three categories: (1) the drywell floor and drywell floor penetrations, (2) piping externally connected to both the drywell and suppression chamber airspace, and (3) the suppression chamber-to-drywell vacuum breakers. The licensee's proposed TS changes would effectively extend the bypass leakage testing interval for the first two categories, while maintaining the current surveillance interval for the vacuum breakers.

2.0 BACKGROUND

Both units at LaSalle County Station are General Electric BWR/5 plants with Mark II containments. The Mark II containment consists of two compartments, the drywell and the suppression chamber. The drywell has the shape of a truncated cone, and is located above the cylindrically shaped suppression chamber. The drywell floor separates the drywell and suppression chamber, forming the primary boundary to bypass leakage.

During a design-basis loss-of-coolant accident, steam would enter the drywell, resulting in a relatively rapid increase in drywell-to-suppression chamber differential pressure. Once this differential pressure exceeds approximately 5 psid, the steam and gases in the drywell atmosphere would clear the 98 downcomers which penetrate the drywell floor, and be discharged into the suppression chamber pool. The cool water in the suppression chamber pool would then condense the steam to limit the pressure inside primary containment to less

than its design value. For the pressure-suppression feature of the Mark II containment to be effective, it is imperative that an excessive amount of steam does not bypass the intended condensation pathway by leaking directly to the suppression chamber airspace. Thus, the basis for bypass leakage testing requirements is to verify the functionality of the pressure-suppression feature of containment, in order to assure containment integrity.

2.1 Proposed TS Changes

The licensee's proposed TS changes would extend the bypass leakage testing interval for the drywell floor, drywell floor penetrations, and piping lines externally connecting the drywell to the suppression chamber airspace, while maintaining the current interval for the suppression chamber-to-drywell vacuum breakers. However, the acceptance criteria in proposed SR 3.6.1.1.4 and SR 3.6.1.1.5 are new; currently, bypass leakage testing for all pathways is performed simultaneously, and thus no specific acceptance criteria are established for the vacuum breakers. The proposed changes are similar to TS changes approved by the NRC for Susquehanna Steam Electric Station on August 11, 1993, and September 6, 1996.

2.1.1 Proposed Extension to Test Interval of SR 3.6.1.1.3

Surveillance Requirement (SR) 3.6.1.1.3 reads:

> "Verify drywell-to-suppression chamber bypass leakage is $\leq$ 10% of the acceptable $A/\sqrt{k}$ design value of 0.030 ft^2 at an initial differential pressure of $\geq$ 1.5 psid."

Currently, the baseline surveillance interval for SR 3.6.1.1.3 is 24 months. However, after two consecutive failures, SR 3.6.1.1.3 must be performed with a 12-month interval, until two consecutive passes are achieved.

The licensee has proposed to change the frequency for SR 3.6.1.1.3 to the following:

> "120 months,
>
> AND
>
> 48 months following a test with bypass leakage greater than the bypass leakage limit,
>
> AND
>
> 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."

2.1.2 Proposed Addition of SR 3.6.1.1.4 and SR 3.6.1.1.5

The licensee has proposed to add SR 3.6.1.1.4, which would read:

> "Verify individual drywell-to-suppression chamber vacuum relief valve bypass leakage is $\leq$ 1.2% of the acceptable $A/\sqrt{k}$ design value of 0.030 ft^2 at an initial differential pressure of $\geq$ 1.5 psid."

The licensee has proposed to add SR 3.6.1.1.5, which would read:

> "Verify total drywell-to-suppression chamber vacuum relief valve bypass leakage is $\leq$ 3.0% of the acceptable A/$\sqrt{k}$ design value of 0.030 ft^2 at an initial differential pressure of $\geq$ 1.5 psid."

Both proposed SRs would be performed with a 24-month interval. A note would precede each SR, indicating that the performance of SR 3.6.1.1.3 satisfies SR 3.6.1.1.4 and SR 3.6.1.1.5. As the TS Bases for proposed SR 3.6.1.1.4 and SR 3.6.1.1.5 explains, "[The inclusion of this note] is acceptable since drywell to suppression chamber vacuum relief valve leakage is included in the measurement of the drywell-to-suppression chamber bypass leakage required by SR 3.6.1.1.3."

3.0 EVALUATION

This evaluation consists of two parts: (1) an analysis of the proposed surveillance interval extension for SR 3.6.1.1.3, and (2) an analysis of the proposed acceptance criteria for SR 3.6.1.1.4 and SR 3.6.1.1.5.

3.1 Analysis of the Proposed Surveillance Interval Extension for SR 3.6.1.1.3

3.1.1 Leakage Pathways Affected by Proposed Surveillance Interval Extension for SR 3.6.1.1.3

Two categories of leakage pathways would be affected by the proposed surveillance interval extension for SR 3.6.1.1.3. These are: (1) the drywell floor and its penetrations, and (2) piping which is externally cross-connected between the drywell and suppression chamber airspace.

3.1.1.1 Drywell Floor and Floor Penetrations

The drywell floor, which separates the drywell and suppression chamber, is a 3-foot thick, circular slab of reinforced concrete. The drywell floor is lined on the suppression chamber side with a 0.25-inch stainless steel plate, as are the drywell support columns. Non-destructive testing was performed on the liner plate seam welds to verify acceptable quality, structural integrity, and leak-tightness. Drywell floor penetrations include the downcomers, safety-relief valve (SRV) discharge lines, and instrument penetrations for use during outages.

Eighteen 12-inch, zinc-coated, carbon steel SRV discharge lines penetrate the drywell floor and terminate below the water level of the suppression chamber pool. During the Unit 2 refueling outage in 1999, 5 of the 18 SRVs were permanently removed. A blind flange was installed on the inlet and outlet piping, and a cap was welded to the end of the discharge lines. A similar modification is planned for Unit 1.

Ninety-eight 23.5-inch, stainless steel downcomers connect the drywell to the suppression chamber pool. The upper end of each downcomer projects 6 inches above the drywell floor into the drywell airspace and the lower end is submerged 12 feet 4 inches below the low water level of the suppression chamber pool.

Both the downcomers and the SRV discharge lines were designed to the requirements of the American Society of Mechanical Engineers (ASME), Section III, “Rules for Construction of Nuclear Facility Components.” Though not required by the ASME Code, the licensee performed a fatigue analysis for the downcomers and SRV discharge lines which confirmed that these lines would maintain their structural integrity under all postulated loading conditions.

Additionally, the drywell floor contains normally sealed penetrations to accommodate instrument cables during outages. The penetration sleeves are designed in accordance with the ASME Code, Section III. When a blind flange is removed from an instrument penetration, examinations to verify leak-tightness are performed on all accessible surfaces of the penetration in accordance with the ASME Code, Section XI. The reinstallation process for a blind flange is also controlled by a procedure which includes dual verification.

The licensee has stated that a comprehensive periodic visual examination program for the primary containment structure is already in place and is being implemented as part of the LaSalle Containment Inservice Inspection (CISI) Program. LaSalle’s CISI Program is intended to identify defects which could jeopardize the leak-tightness and structural integrity of the containment, and it complies with the ASME Code, Section XI. The CISI inspections are required to be conducted three times within each ten-year testing interval.

Based upon the high quality of the components and structures which constitute the drywell floor and penetrations, and the licensee’s other inspection and leakage testing requirements and procedures, the staff finds that a drywell-to-suppression chamber bypass leakage surveillance interval of 120 months is justified for these potential leakage pathways.

3.1.1.2 Externally Cross-Connected Piping

Externally cross-connected piping consists of those lines which connect the drywell and suppression chamber airspace without penetrating the drywell floor. The licensee has identified 5 systems containing piping that meet this definition:

1. Containment vent and purge lines, including the nitrogen inerting/de-inerting/make-up lines (two flow paths of 26-inch diameter piping).
2. Drywell and suppression chamber Residual Heat Removal (RHR) System spray lines (three flow paths of 16-inch and 4-inch diameter piping).
3. Hydrogen and oxygen analyzer lines (four flow paths of 0.5-inch diameter piping).
4. Containment instrument gas lines (two flow paths of 0.5-inch diameter piping and one flow path of 1.5-inch diameter piping).
5. Hydrogen recombiner lines (two flow paths of 4-inch and 6-inch diameter piping).

The licensee has stated that all cross-connected piping lines have multiple, in-series containment isolation valves which are designed to meet the requirements of Appendix J to 10 CFR Part 50. Periodic local leakage rate testing is performed on these isolation valves, in accordance with the requirements of Appendix J. Leakage rate testing at LaSalle is controlled by LaSalle County Station Procedure LTS-300-5, “Primary Containment Leak Rate Testing Program.” The total leakage allowed by this procedure from all possible sources is approximately 5 percent of the drywell-to-suppression chamber bypass leakage limit.

Due to a design which includes multiple isolation valves in series, and the licensee's leakage rate testing program, the staff finds that the proposed extension of the bypass leakage surveillance interval to 120 months is justified for externally cross-connected piping.

3.1.2 Historical Drywell-to-Suppression Chamber Bypass Leakage Test Results

The drywell-to-suppression chamber bypass leakage test involves the pressurization of the drywell, and it may be performed either individually or concurrently with the integrated leakage rate test (ILRT) for primary containments required by Appendix J to 10 CFR Part 50. When the bypass leakage test is performed concurrently with the ILRT, six normally closed drywell floor penetrations are opened to allow access for ILRT instrument cables. Prior to 1994, the areas surrounding the ILRT cables were temporarily sealed with tape, and the measured bypass leakages for these concurrent tests are significantly higher than those in which the normally closed drywell floor penetrations had their blind flanges installed. The NRC staff agrees with the licensee's conclusion that, due to the proper alignment of the drywell floor penetrations, more accurate results are obtained when the bypass leakage test is performed individually.

Table 1, below, is the NRC staff's summary of the bypass leakage test results provided by the licensee for LaSalle County Station, Units 1 and 2. Table 1 demonstrates that bypass leakage has consistently been a relatively small percentage of TS allowable leakage, and that design limits have not been approached. Therefore, the NRC staff finds that past test results support the proposed extension to the bypass leakage surveillance interval for the drywell floor, drywell floor penetrations, and externally cross-connected piping. The staff additionally notes that the data in Table 1 includes bypass leakage from all pathways (i.e., including the vacuum breakers), and is therefore conservative for this determination.

Table 1: Summary of Test Results for Bypass Leakage Test

Bypass Leakage Test Performed:	Individually	Concurrently with ILRT
Number of Tests:	14	7
AVERAGE MEASURED BYPASS LEAKAGE VALUES		
% of TS Allowable Leakage:	2.8%	14%
% of Design Leakage:	0.28%	1.4%
MAXIMUM MEASURED BYPASS LEAKAGE VALUES		
% of TS Allowable Leakage:	12%	32%
% of Design Leakage:	1.2%	3.2%

3.1.3 Containment Over-Pressurization Analysis

As described in Section 2.0 of this evaluation, performance of SR 3.6.1.1.3 is intended to verify that drywell-to-suppression chamber bypass leakage pathways are not large enough such that

the bypass leakage due to an analyzed accident could result in the over-pressurization of the primary containment. Therefore, it is necessary to consider the potential effect upon the primary containment over-pressurization frequency due to the proposed increase to the surveillance interval for SR 3.6.1.1.3.

The licensee has stated that the dominant contributor to the failure of the primary containment pressure-suppression function is the suppression chamber-to-drywell vacuum breakers failing to operate as designed. The drywell floor, its penetrations, and cross-connected piping are reliable passive features which make relatively small contributions to the containment over-pressurization frequency. As explained in Section 2.1 of this evaluation, the proposed surveillance interval extension would only apply to these passive barriers to bypass leakage (i.e., all barriers except the vacuum breakers). Therefore, the licensee's proposal would not be expected to significantly increase the frequency of large bypass leakage events.

If a significant bypass leakage event were to occur, however, alternate means are available to limit the pressure inside the primary containment. Both units at LaSalle County Station are equipped with drywell and suppression chamber sprays, which would suppress pressure by condensing steam in the primary containment atmosphere. Procedure directs operators to initiate the suppression chamber sprays once drywell pressure exceeds 1.93 psig. If drywell pressure continued to rise and exceeded 12 psig, procedure would direct operators to initiate drywell sprays. The drywell sprays are capable of terminating any analyzed pressure rise in the primary containment. In the unlikely event that the drywell and suppression chamber sprays were to fail to terminate a primary containment pressure rise, procedure would direct operators to depressurize the primary containment to less than its design limit of 60 psig using the drywell and suppression chamber vents.

Based upon the above discussion, the NRC staff concludes that the proposed surveillance interval extension to SR 3.6.1.1.3 would not be expected to significantly increase the frequency of large bypass leakage events, and that alternate methods of pressure suppression in the primary containment are available to mitigate a potential containment over-pressurization.

3.2 Analysis of the Proposed Acceptance Criteria for SR 3.6.1.1.4 and SR 3.6.1.1.5

Through the proposed addition of SR 3.6.1.1.4 and SR 3.6.1.1.5, the licensee would maintain the current surveillance interval of 24 months for suppression chamber-to-drywell vacuum breaker leakage. However, as explained in Section 2.1 of this evaluation, SR 3.6.1.1.4 and SR 3.6.1.1.5 would establish new acceptance criteria for vacuum breaker testing.

3.2.1 Description of Suppression Chamber-to-Drywell Vacuum Breakers

Suppression chamber-to-drywell vacuum breakers are provided to prevent exceeding the drywell floor negative design pressure and the siphoning of the suppression chamber pool water into the drywell. At LaSalle, there are four suppression chamber-to-drywell vacuum breakers which are located outside of the primary containment structure on a special piping run that is an extension of the primary containment boundary. The vacuum breakers' design incorporates two double-gasket flanges and a manual actuator O-ring and shaft seal. Each vacuum breaker has an upstream and a downstream locally operated manual isolation valve.

3.2.2 Analysis of Proposed Acceptance Criteria

The LaSalle Updated Final Safety Analysis Report does not prescribe a specific design limit for bypass leakage through the suppression chamber-to-drywell vacuum breakers, but rather, a single limit through all leakage pathways. Therefore, by establishing a specific leakage test acceptance criterion for the vacuum breakers, the implicit assumption is that the leakage through all other pathways would be less than the difference between the total bypass leakage limit and the specific leakage limit for the vacuum breakers. Accounting for the factor of ten margin between the design limit and the TS allowable limit, the licensee's proposed SR 3.6.1.1.5 effectively assumes, therefore, that non-vacuum breaker pathways would account for not more than 70 percent of the TS allowable leakage. Based upon the past test results shown in Table 1 and the accompanying discussion in Section 3.1 of this evaluation, the staff finds that the proposed SR 3.6.1.1.5 is sufficiently conservative.

Proposed SR 3.6.1.1.4 is intended to ensure that a single vacuum breaker does not account for an excessive proportion of the total TS allowable leakage for all four sets of vacuum breakers. Based on information provided in Section 2.1.2 of this evaluation, SR 3.6.1.1.4 would limit a single vacuum breaker to not more than 40 percent of the total allowable vacuum breaker leakage. The acceptance criterion of proposed SR 3.6.1.1.4 is reasonable and consistent with good maintenance and testing practices, therefore, the staff finds it to be acceptable.

The staff has also evaluated the acceptance criteria for proposed SR 3.6.1.1.4 and SR 3.6.1.1.5 against the licensee's historical vacuum breaker bypass leakage test results. In 16 reported as-left tests, the maximum measured value for total vacuum breaker bypass leakage is only 2.2 percent of the acceptance criterion for total vacuum breaker leakage in the proposed SR 3.6.1.1.5. Additionally, the maximum measured value for total vacuum breaker bypass leakage is only 5.4 percent of the acceptance criterion for the individual vacuum breaker leakage in the proposed SR 3.6.1.1.4. Therefore, the acceptance criteria in proposed SR 3.6.1.1.4 and SR 3.6.1.1.5 are not expected to be unduly challenged by future vacuum breaker bypass leakage testing.

4.0 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.

5.0 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. 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 (66 FR 38761). 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.

6.0 CONCLUSION

The NRC staff has concluded, based on the analysis in Section 3.0 of this evaluation and 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. The staff finds the licensee's proposed TS changes to be acceptable and recommends that the Exelon request for amendment of the Technical Specifications be approved.

Principal Contributor: J. Lehning

Date: November 7, 2001