



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

October 14, 2015

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO)  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2, ISSUANCE OF AMENDMENTS  
RE: REVISION OF TECHNICAL SPECIFICATIONS SECTION 3.5.1,  
"EMERGENCY CORE COOLING SYSTEMS OPERATING" (TAC NOS. MF5570  
and MF5571)**

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 217 to Facility Operating License No. NPF-11 and Amendment No. 203 to Facility Operating License No. NPF-18 for LaSalle County Station (LSCS), Units 1 and 2, respectively. The amendments are in response to your application dated January 12, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15012A544).

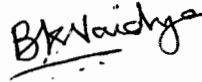
The amendments will change the technical specifications (TSs) for LSCS, Units 1 and 2, by deleting a Note in the TS Limiting Condition for Operation 3.5.1, "Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling, ECCS – Operating." The Note is being deleted because plant operation, in accordance with the Note, could result in damage to the residual heat removal system.

B. Hanson

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

Sincerely,

Handwritten signature of Bhalchandra K. Vaidya in black ink.

Bhalchandra K. Vaidya, Project Manager  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosures:

1. Amendment No. 217 to NPF-11
2. Amendment No. 203 to NPF-18
3. Safety Evaluation

cc w/encls: ListServ



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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-373

LASALLE COUNTY STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 217  
License No. NPF-11

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated January 12, 2015, 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 attachment 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. 217, 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 of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Travis L. Tate, Chief  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications and Facility Operating License

Date of Issuance: October 14, 2015



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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-374

LASALLE COUNTY STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 203  
License No. NPF-18

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by the Exelon Generation Company, LLC (the licensee), dated January 12, 2015, 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. 203, 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 of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Travis L. Tate, Chief  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications and Facility Operating License

Date of Issuance: October 14, 2015

ATTACHMENT TO LICENSE AMENDMENT NOS. 217 AND 203

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

DOCKET NOS. 50-373 AND 50-374

Replace the following pages of the Facility Operating Licenses and Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

License NPF-11  
Page 3

License NPF-18  
Page 3

TS  
Page 3.5.1-1

Insert

License NPF-11  
Page 3

License NPF-18  
Page 3

TS  
Page 3.5.1-1

Am. 146  
01/12/01 (4) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

Am. 202  
07/21/11 (5) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of LaSalle County Station, Units 1 and 2, and such Class B and Class C low-level radioactive waste as may be produced by the operation of Braidwood Station, Units 1 and 2, Byron Station, Units 1 and 2, and Clinton Power Station, Unit 1.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

Am. 198  
09/16/10 (1) Maximum Power Level  
The licensee is authorized to operate the facility at reactor core power levels not in excess of full power (3546 megawatts thermal).

Am. 217  
10/14/15 (2) Technical Specifications and Environmental Protection Plan  
The Technical Specifications contained in Appendix A, as revised through Amendment No. 217, 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.

Am. 194  
08/28/09 (3) DELETED

Am. 194  
08/28/09 (4) DELETED

Am. 194  
08/28/09 (5) DELETED

Am. 194  
08/28/09 (6) DELETED

Am. 194  
08/28/09 (7) DELETED



Am. 189  
07/21/11 (5) Pursuant to the Act and 10 CFR Parts 30, 40, and 70 possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of LaSalle County Station, Units 1 and 2, and such Class B and Class C low-level radioactive waste as may be produced by the operation of Braidwood Station, Units 1 and 2, Byron Station, Units 1 and 2, and Clinton Power Station, Unit 1.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

Am. 185  
09/16/10 (1) Maximum Power Level  
The licensee is authorized to operate the facility at reactor core power levels not in excess of full power (3546 megawatts thermal). Items in Attachment 1 shall be completed as specified. Attachment 1 is hereby incorporated into this license.

Am. 203  
10/14/15 (2) Technical Specification and Environment Protection Plan  
The Technical Specifications contained in Appendix A, as revised through Amendment No. 203, 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.

Am. 181  
08/28/09 (3) DELETED

Am. 181  
08/28/09 (4) DELETED

Am. 181  
08/28/09 (5) DELETED

Am. 181  
08/28/09 (6) DELETED

Am. 181  
08/28/09 (7) DELETED

Am. 181  
08/28/09 (8) DELETED

Am. 181  
08/28/09 (9) DELETED

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS-Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1, MODES 2 and 3, except ADS valves are not required to be OPERABLE with reactor steam dome pressure  $\leq$  150 psig.

ACTIONS

-----NOTE-----  
LCO 3.0.4.b is not applicable to HPCS.  
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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days

(continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 217 TO FACILITY OPERATING LICENSE NO. NPF-11  
AND AMENDMENT NO. 203 TO FACILITY OPERATING LICENSE NO. NPF-18  
EXELON GENERATION COMPANY, LLC  
LASALLE COUNTY STATION, UNIT 1 AND UNIT 2  
DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By application to the U.S. Nuclear Regulatory Commission (NRC, the Commission) dated January 12, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15012A544), Exelon Generation Company, LLC (the licensee), requested changes to the technical specifications (TSs) and facility operating licenses for LaSalle County Station (LSCS), Units 1 and 2.

The proposed changes would revise TS Limiting Condition for Operation (LCO) 3.5.1, "Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System, ECCS - Operating," for LSCS, Units 1 and 2, to delete the following Note:

Low pressure coolant injection (LPCI) subsystems may be OPERABLE during alignment and operation for decay heat removal with reactor vessel pressure less than the residual heat removal cut-in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable.

The application requests the Note be deleted because plant operation, in accordance with the Note, could result in damage to the residual heat removal (RHR) system.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance documents the NRC staff considered in its review of the proposed amendment included the following:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, General Design Criterion (GDC) 34, Residual heat removal," requires that a system to remove residual heat be provided with a safety function to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Part 50 of 10 CFR, Appendix A, GDC 35, "Emergency core cooling," requires that a system to provide abundant emergency core cooling be provided with a safety function to transfer heat from the reactor core following any loss of reactor coolant at a rate such that: (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

Part 50 of 10 CFR, Appendix A, GDC 37, "Testing of emergency core cooling system," requires that the emergency core cooling system design provide the capability for periodic pressure and functional testing. This testing shall assure that: (1) structural and leak-tight integrity of components, (2) operability and performance of active components, and (3) operability of the whole system under conditions as close to design as possible.

Section 50.36 of 10 CFR, "Technical specifications," details the content and information that must be included in a station's TSs. In accordance with 10 CFR 50.36, TSs are required to include: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) SRs, (4) design features; and (5) administrative controls. As described in 10 CFR 50.36(c)(2), "Limiting conditions for operation," are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO is not met, the licensee shall shut down the reactor or follow any other actions permitted by TSs.

Section 50.46(a)(1)(i) of 10 CFR, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," requires that each boiling or pressurized light-water nuclear power reactor be provided with an emergency core cooling systems (ECCSs) designed with a calculated cooling performance in accordance with an acceptable evaluation model following a postulated loss-of-coolant accident (LOCA).

The proposed change does not involve any physical changes to the structures, systems, or components at LSCS. The proposed change will reflect current plant configuration of the RHR system design and assure safe operation by continuing to meet applicable regulations and requirements.

### 3.0 TECHNICAL EVALUATION

The safety function of the ECCS is to provide core cooling following a LOCA. The ECCS consists of two high-pressure and two low-pressure systems. The high-pressure systems are the high-pressure core spray system and the automatic depressurization system. The low-pressure systems are the low pressure coolant injection (LPCI) mode of RHR and the low-pressure core spray (LPCS) system. The LPCI, LPCS, and shutdown cooling (SDC) modes, including the system alignments, are further described in Section 6.3.2, "Emergency Core Cooling Systems," and 6.3.3, "ECCS Performance Evaluation," of the Updated Final Safety Analysis Report for LSCS, Units 1 and 2 (ADAMS Accession No. ML14113A090).

Following a LOCA, the RHR system performs two functions as the low head portion of the ECCS:

- Restore and maintain the coolant inventory in the reactor vessel so that the core is adequately cooled; and
- provide cooling for the containment so that condensation of the steam resulting from the blowdown is ensured.

The RHR system may also be used in the SDC mode to remove residual heat from the nuclear system to maintain reactor water inventory below 212 °F so that refueling and nuclear system servicing can be performed.

Currently, TS 3.5.1 LCO is modified by a Note that allows RHR system alignment for LPCI mode to be considered OPERABLE for the LPCI function when the subsystem is being aligned or is operating in the SDC mode, and the unit is in MODE 3 below the RHR cut-in permissive pressure of 150 per square inch gauge. Utilization of this Note requires that for the LPCI mode of the RHR system to be declared OPERABLE, it must be capable of manual realignment from SDC mode to the LPCI mode and not be otherwise INOPERABLE. The Note was added to TS LCO 3.5.1 during LSCS improved TSs conversion as part of TS Amendments 147 and 133 for LSCS, Units 1 and 2, respectively, which the NRC approved on March 30, 2001 (ADAMS Accession No. ML011130202). The Note was intended to provide clarity that LPCI may be considered operable during alignment and operation in the decay heat removal mode, SDC mode.

In its January 12, 2015, application, the licensee stated that during an NRC inspection conducted in 2012 in accordance with Temporary Instruction 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01)," NRC inspectors identified a concern because the operability of LPCI was not ensured in MODE 3 while an RHR subsystem was operating in SDC mode as required by TS. The Inspection Report (Reference 1) stated that TS LCO 3.5.1 required, in part, that each ECCS subsystem be operable during MODE 3 but the TS LCO included the Note discussed above. This Note does not fulfill intention of the TS LCO 3.5.1.

The licensee further stated that contrary to the configuration allowed by this LCO 3.5.1 Note, LSCS had implemented procedural restrictions from following the Note in 1995. Instead, LSCS has been disregarding the Note and procedurally declaring a LPCI subsystem inoperable, thus preventing the realignment of an RHR subsystem from SDC mode to LPCI mode.

These procedural restrictions resulted from LSCS specific operating experience which identified that the LPCI suction valve from the suppression pool was susceptible to thermal binding. This condition exists when the differential temperature across the valve is greater than or equal to 60 °F, as it may be when the valve is closed to support the SDC mode of operation. This temperature differential results from the high temperature SDC water on one side of the valve and the cool suppression pool water on the other. Subsequent to these procedural restrictions, an LSCS review of NRC Information Notice (IN) 2010-11 [Reference 2] and operating experience at Prairie Island Licensee Event Report (LER) 1-09-04 [Reference 3], determined that during operation in MODE 3 (hot shutdown), the potential exists for the water in the RHR pump suction piping aligned for SDC to flash/boil when realigned to the LPCI mode. This phenomenon is due to the physical arrangement (i.e., common interface) of the SDC and LPCI suction lines for the RHR pumps. The realignment from SDC mode to LPCI mode transfers the

suction source for the RHR pump; thereby, exposing the high temperature SDC water to the low pressure LPCI suction piping from the suppression pool. The resultant flashing/boiling of the high pressure, high temperature water, when introduced to the low pressure piping, could result in voiding in the suction piping, RHR pump cavitation, water hammer and associated RHR system damage. This threat is greatest during the early stages of MODE 3 operation when the SDC water temperature is highest.

The flashing/boiling in the RHR suction piping and the suppression pool suction valve thermal binding are the result of the RHR system design that supports several different operating modes using common equipment. This design feature, and the associated temperature phenomenon, prevents timely realignment of the RHR subsystem from SDC mode to LPCI mode. Therefore, the TS 3.5.1 Note that allows an RHR subsystem to remain OPERABLE for LPCI mode when being aligned or operated in SDC mode is inappropriate and should be removed from the LSCS TS. As such, the licensee stated that the removal of the Note is appropriate.

Based on the above, the NRC staff agrees that operation in accordance with the current Note in LCO 3.5.1 could potentially allow operating conditions to exist that adversely impacts the function of the RHR system. The NRC staff agrees that when introducing the RHR system to the low pressure piping, high pressure, high temperature water, could result in voiding in the suction piping, RHR pump cavitation, water hammer and associated RHR system damage. As such, the NRC staff finds that removal of the Note is acceptable.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of a facility's components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (80 FR 17090; March 31, 2015). Accordingly, the amendments meet 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 amendments.

#### 6.0 CONCLUSION

The Commission 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 7.0 REFERENCES

1. Letter from M. Kunowski (U. S. NRC) to M. J. Pacilio (Exelon), "LaSalle County Station, Units 1 and 2 NRC Integrated Inspection Report 05000373/2012004; 05000374/2012004," dated October 30, 2012. (ADAMS Accession No. ML12305A166)
2. NRC Information Notice 2010-11, "Potential for Steam Voiding Causing Residual Heat Removal System Inoperability," dated June 16, 2010.
3. Prairie Island Nuclear Generating Plant LER 1-09-04, "Residual Heat Removal System Inoperability While in Mode 4 Due to Potential Steam Voiding," dated June 5, 2009.

Principal Contributor: M. Razzaque

Date of issuance: October 14, 2015

B. Hanson

- 2 -

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

Sincerely,

*/RA/*

Bhalchandra K. Vaidya, Project Manager  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosures:

1. Amendment No. 217 to NPF-11
2. Amendment No. 203 to NPF-18
3. Safety Evaluation

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Amendment Accession No. ML15244B410

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OFFICE	DIRS/STSB	OGC - NLO	LPL3-2/BC	LPL3-2
NAME	RElliot	JLindell	TTate	BVaidya
DATE	9/ 16 /15	9 / 24 /15	10/13/15	10/14/15

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