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

July 26, 2013

Mr. Louis P. Cortopassi
Site Vice President and Chief Nuclear Officer
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Omaha, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 - ISSUANCE OF EXIGENT AMENDMENT RE: REVISE CURRENT LICENSING BASIS FOR ADDRESSING DESIGN-BASIS TORNADO/TORNADO MISSILE IMPACT (TAC NO. MF2469)

Dear Mr. Cortopassi:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 272 to Renewed Facility Operating License No. DPR-40 for the Fort Calhoun Station, Unit No. 1. The amendment consists of changes to the Updated Safety Analysis Report (USAR) in response to your application dated July 21, 2013, as supplemented by letter dated July 24, 2013.

The amendment revises the USAR for the design basis tornado (DBT) and tornado missiles to include NRC Regulatory Guide 1.76, Revision 1, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," and Bechtel Power Corporation, Topical Report BC-TOP-9A, Revision 2, September 1974, "Design of Structures for Missile Impact." The changes revise the current licensing basis pertaining to protection from tornadoes and tornado-generated-missiles.

This amendment is being issued under exigent circumstances in accordance with paragraph 50.91(a)(6) of Title 10 of the *Code of Federal Regulations*. The exigent circumstances and final no significant hazards considerations are addressed in Sections 4.0 and 5.0 of the enclosed Safety Evaluation.

The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

Joseph M. Sebrosky, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures:
1. Amendment No. 272 to DPR-40
2. Safety Evaluation

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

OMAHA PUBLIC POWER DISTRICT

DOCKET NO. 50-285

FORT CALHOUN STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 272
Renewed License No. DPR-40

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

   A. The application for amendment by the Omaha Public Power District (the licensee), dated July 21, 2013, as supplemented by letter dated July 24, 2013, 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 license 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, Renewed Facility Operating License No. DPR-40 is amended by changes to the Fort Calhoun Station, Unit 1, Updated Safety Analysis Report and, as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-40 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 272, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented upon approval.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. DPR-40
and Technical Specifications

Date of Issuance: July 26, 2013

ATTACHMENT TO LICENSE AMENDMENT NO. 272

RENEWED FACILITY OPERATING LICENSE NO. DPR-40

DOCKET NO. 50-285

Replace the following page of the Renewed Facility Operating License No. DPR-40 with the attached revised page. The revised page is identified by amendment number and contain vertical lines indicating the areas of change.

License Page

REMOVE	INSERT
-3-	-3-

(4) 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 when associated with radioactive apparatus or components;

(5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by operation of the facility.

3. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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:

A. Maximum Power Level

Omaha Public Power District is authorized to operate the Fort Calhoun Station, Unit 1, at steady state reactor core power levels not in excess of 1500 megawatts thermal (rate power).

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 272 are hereby incorporated in the license. Omaha Public Power District shall operate the facility in accordance with the Technical Specifications.

C. Security and Safeguards Contingency Plans

The Omaha Public Power District shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Fort Calhoun Station Security Plan, Training and Qualification Plan, Safeguards Contingency Plan," submitted by letter dated May 19, 2006.

OPPD shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The OPPD CSP was approved by License Amendment No. 266.

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 272 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-40

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

1.0 INTRODUCTION

By application dated July 21, 2013 (Reference 1), as supplemented by letter dated July 24, 2013 (Reference 2), Omaha Public Power District (OPPD, the licensee) submitted a license amendment request (LAR) that proposes to revise the Fort Calhoun Station, Unit 1 (FCS) Updated Safety Analysis Report (USAR) for the design basis tornado (DBT) and tornado missiles to include U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.76, Revision 1, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," March 2007 (Reference 3) [1], and Bechtel Power Corporation, Topical Report BC-TOP-9A, Revision 2, "Design of Structures for Missile Impact," September 1974 (Reference 4) [2]. The amendment requests changes to relevant sections of the FCS USAR to reflect the changes to the design basis for tornadoes. Specifically, USAR Section 2.5.2.8, "Tornadoes," is added and Sections 5.4.7 and 5.8.2.2 are revised.

The changes provide a means to analyze and document that the plant will be able to withstand, without loss of the capability to protect the public, the additional forces that might be imposed by a tornado. Among the changes, the maximum wind speeds considered would be reduced from 500 mph (for containment) or 300 mph (for "Class 1" structures other than containment) to a uniform maximum wind speed of 230 mph.

The supplemental letter dated July 24, 2013, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Omaha-World Herald* located in Omaha, Nebraska, on July 24 and 25, 2013.

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[1] Regulatory Guide 1.76, Rev. 1, provides licensees and applicants with new guidance that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in selecting the design-basis tornado and design-basis tornado-generated-missiles that a nuclear power plant should be designed to withstand to prevent undue risk to the health and safety of the public.

[2] BC-TOP-9A, Revision 2, provides a methodology approved by the Atomic Energy Commission (AEC) for evaluating the impact of tornado missiles

2.0 REGULATORY EVALUATION

Nuclear power plants must be designed so that they remain in a safe condition during the most severe tornado that could reasonably be predicted to occur at the site. Structures, systems, and components (SSCs) important to safety must be appropriately protected against dynamic effects, including the effects of missiles, including both internally and externally generated missiles.

The subject LAR from OPPD proposes to revise the FCS current licensing basis (CLB) requirements related to the protection of SSCs from tornadoes and tornado-generated-missiles. Specifically the LAR revises the Updated Safety Analysis Report (USAR) to follow with RG 1.76, Revision 1, and Bechtel Topical Report BC-TOP-9A, Revision 2 (References 3 and 4, respectively). The subject Topical Report was reviewed by the Atomic Energy Commission ((AEC), the predecessor to the NRC) and approved for use in future applications by a Topical Report Evaluation, dated November 25, 1974. As indicated in the AEC staff's Topical Report Evaluation, included as part of the Topical Report, the future use of the Topical Report is subject to four "Regulatory Positions" documented in the Topical Report Evaluation. Upon the issuance of the license amendment for this LAR, these documents would form the basis for a revised methodology used to address the DBT and tornado-generated-missiles at FCS.

Each application for an operating license includes a final safety analysis report, which the NRC (or AEC) considered when issuing the plant's operating license. The final safety analysis report includes information that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components and of the facility as a whole. Appendix G of the FCS USAR describes the design criteria of FCS, and how the design matches generic design criteria which AEC published for comment in the *Federal Register* (32 FR 10213) on July 11, 1967 as 70 numbered draft general design criteria (GDC).

The licensee has not requested changes with respect to this section of the USAR. Thus, based upon the FCS USAR, the NRC staff considered how FCS would continue to follow draft GDC 2 (requiring that those systems and components of reactor facilities, which are essential to the prevention of accidents, which could affect public health and safety, or to mitigation of their consequences, to be designed, fabricated, and erected to performance standards that will enable the facility to withstand, without loss of the capability to protect the public, the additional forces that might be imposed by natural phenomena such as earthquakes, tornadoes, flooding conditions, winds, ice, and other local site effects). The NRC staff also considered how FCS would continue to follow draft GDC 40, which requires protection for engineered safety features against dynamic effects and missiles that might result from plant equipment failures. While draft GDC 40 pertains to internally generated missiles, it is considered here in this review due to its relationship to the protection of plant equipment against the effects of postulated missiles.

The licensee requested to change its CLB, described in the FCS USAR, to follow the guidance in RG 1.76, Revision 1. This guidance addresses the parameters associated with DBTs in various portions of the contiguous United States and parameters associated with missiles which may be generated during a tornado.

During the review of the licensee's proposed change to Section 5.8.8.2, "Tornado Generated Missiles," of the FCS USAR, regarding the use of a new tornado missile impact methodology,

the NRC staff also considered the guidance in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (SRP), Section 3.5.3, Revision 3, "Missile Barrier Design." The SRP provides a set of methods and criteria for meeting the regulatory requirements pertinent to the use of missile barriers. As indicated in the SRP, additional methods and criteria used in the design of missile barriers are reviewed by the NRC staff on a case-by-case basis to determine whether these alternatives satisfy the regulatory acceptance criteria outlined above.

With respect to the NRC staff's review of whether the proposed change in the LAR can be processed in an exigent manner, the applicable requirements are found in 10 CFR 50.91(a)(6).

3.0 TECHNICAL EVALUATION

Section 3.1 of this safety evaluation (SE) evaluates the addition of RG 1.76, Revision 1, into the FCS USAR and Section 3.2 of this SE evaluates the addition of BC-TOP-9A, Revision 2, to the FCS USAR.

3.1 Addition of Regulatory Guide 1.76, Revision 1 into the FCS USAR

USAR Section 5.4.7 describes the characteristics of the existing DBT used for the design of the FCS containment structure. The containment structure was designed to withstand a postulated tornado with a maximum wind velocity of 500 miles per hour (mph) including the associated pressure differential and hypothetical tornado missiles. USAR Section 5.11.3 states that Class I structures other than containment were designed to withstand a tornado with a maximum wind velocity of 300 mph and the same spectrum of tornado-generated-missiles used for containment. The spectrum of tornado-generated-missiles used in the design of FCS is given in USAR Section 5.8.2.2, Table 5.2-2 as follows:

Item	Weight (lbs)	Impact Area (sq. ft.)	Velocity (fps)
3" pipe x 10 ft. long	76	0.095	640
4" x 12" plank, 12 ft long	104	0.29	710
Automobile	4000	31.5	665

The LAR proposes to change which DBT and tornado-generated-missiles must be considered to correlate with the RG 1.76, Revision 1, with one exception. The exception regards the potential impact height of an automobile missile; procedural controls will prohibit vehicle access to higher surrounding elevations during periods of increased potential for tornadoes. The DBT and tornado-generated-missile characteristics given in RG 1.76 will be applied in the evaluation of all new and existing SSCs that must withstand a tornado in accordance with USAR Appendix G, Criterion 2.

RG 1.76 defines the DBT and tornado-generated-missile spectrum based on a regionalization of the continental United States. FCS is located in RG 1.76 Region I and corresponds to a DBT with a maximum wind speed of 230 mph. The Region I DBT-generated missile spectrum, taken from Table 2 of RG 1.76, is as follows:

Missile Type	Dimensions	Mass	C_DA/m	V_{Mh}^{max} *
Schedule 40 Pipe	6.625 in. dia x 15 ft long	287 lb	0.0212 ft^2/lb	135 ft/s
Automobile	16.4 ft x 6.6 ft x 4.3 ft	4000 lb	0.0343 ft^2/lb	135 ft/s
Solid Steel Sphere	1 in. dia	0.147 lb	0.0166 ft^2/lb	26 ft/s

* maximum horizontal missile speed

All missiles in RG 1.76 Table 2 are capable of striking in all directions with a horizontal velocity of V_{Mh}^{max} and a vertical velocity equal to 67 percent of V_{Mh}^{max}. The design of missile barriers should assume an impact normal to the barrier surface for the pipe and automobile missile. And finally, the automobile missile is considered to impact at all altitudes less than 30 feet above all grade levels within 0.5 miles of the plant structures. Application of these assumptions constitutes an acceptable use of the RG 1.76 missile spectrum for the evaluation of tornado protection for SSCs at nuclear power plants.

The licensee has identified the appropriate RG 1.76 region for FCS and has proposed to adopt the RG 1.76 DBT characteristics without exception. As applied to FCS, the RG 1.76 DBT has a lower maximum wind speed, 230 mph, than the current DBT, 500 mph or 300 mph (depending on the analysis). As stated in Regulatory Position C1 of RG 1.76, "The parameter values specified in Table 1 for the appropriate regions identified in Figure 1 are generally acceptable to the NRC staff for defining the design-basis tornado for a nuclear power plant." The DBT of RG 1.76 corresponds with a frequency of 10^{-7} per year and the selection of the wind speed was based on an improved correlation of observed tornado damage to tornado wind speed. As such, the NRC concludes that the RG 1.76 DBT better represents the maximum potential wind speed of an actual tornado at FCS.

The RG 1.76 DBT-generated missile spectrum contains different missiles than those in the current FCS design basis and the maximum horizontal velocities of the RG 1.76 missiles are lower. As stated in Regulatory Position C2 of RG 1.76, "The design-basis tornado-generated-missile spectrum in Table 2 is generally acceptable to the staff for the design of nuclear power plants." The lower maximum horizontal velocity of the RG 1.76 missile spectrum is directly attributed to the lower maximum wind speed of the RG 1.76 DBT versus the current FCS DBT. The RG 1.76 missile spectrum is comparable to the current FCS missile spectrum in that it is meant to be representative of expected items or debris in the site area. The automobile missile is essentially the same in both missile spectrums. The schedule 40 pipe missile is similar to the 3 inch pipe and the plank missile used in the current FCS missile spectrum, but has larger dimensions and significantly more mass. As a rigid missile for testing penetration, the schedule 40 pipe serves a similar role to the 3-inch pipe and the plank. The solid steel sphere missile does not have a comparable missile in the current FCS missile spectrum. It is intended to represent a small rigid object capable of testing the design of any openings in protective barriers.

The licensee proposed one exception from the guidance of RG 1.76 in the LAR related to the treatment of the automobile missile. RG 1.76 states, "The automobile missile is considered to impact at all altitudes less than 30 feet (9.14 meters) above all grade levels within 0.5 mile (0.8 kilometer) of the plant structures." Application of this statement results in the potential impact of an automobile missile on the auxiliary building roof. The licensee proposed elimination of the possibility of this impact by implementing procedural controls to exclude vehicles from all

elevations of concern with 0.5 miles of the plant. By e-mail dated July 23, 2013 (Reference 7), the NRC staff sent the licensee a request additional information (RAI) related to this exception from the guidance in Balance of Plant Branch (SBPB) RAI 1. By letter dated July 24, 2013, the licensee provided its response to the RAI.

The licensee explained that the topography of the area surrounding FCS is generally flat land at an elevation ranging from approximately 1002 to 1005 feet mean sea level (MSL). To the south-west the ground rises sharply, with a maximum elevation of approximately 1080 feet MSL within 0.5 miles of the plant structures. The licensee provided a map of the area within 0.5 miles of the plant structures in their RAI response. Only the area to the south-west has grade elevations such that an additional 30 feet would be higher than the auxiliary building roof. The main access road ascends this elevation change from the site out to the access control point and further to Highway 75.

In addition to the main access road and access control point, the licensee identified other structures or parking areas within the area of higher elevation. Per the RAI response, "In addition to the main access road to the plant, there is a gravel road leading from the switchyard to the old steam generator storage building and up the hill to gravel parking lots located near Highway 75." The parking lots were created during the 2011 flood but are no longer in use. These areas are not used for the stationing or storage of automobiles or other large equipment that could become airborne during a DBT. The licensee stated that unauthorized access to these areas and the access roads will be prevented by the installation of chains or barriers.

The main access road has frequent vehicle traffic. In order to exclude vehicles from this elevation, security personnel will close the main access road to all traffic in the event of a severe thunderstorm warning or tornado watch/warning. The access control point is staffed at all hours allowing the main entrance road to be closed promptly at any time. When the main access road is closed, access to the plant is still possible via the alternate access route which approaches from the south-east at a much lower elevation. The actions to close the main access road and open the alternate access route are provided in FCS procedures.

The licensee stated, in the RAI response, that the impact of an automobile missile with the auxiliary building roof is the only tornado missile impact being eliminated by the procedural controls. Those components located on or below the auxiliary building roof that are vulnerable to tornado-generated-missiles are evaluated and protected against the schedule 40 pipe missile and the solid steel sphere missile in accordance with the guidance in RG 1.76.

The NRC staff performed a qualitative evaluation of the licensee's procedural controls to determine the acceptability of this exception from the guidance of RG 1.76. The assumption in RG 1.76 that an automobile missile impacts at all elevations up to 30 feet above the highest grade elevation within 0.5 miles provides for conservatism in selecting potential targets. RG 1.76 does not give consideration to missile trajectories because they are by nature unpredictable. However, if the automobile missile is assumed to travel a maximum of 30 feet vertically, then an automobile missile capable of reaching the auxiliary building roof would have to originate from the elevations identified in the LAR and RAI response. Given the small portion of the surrounding area within 0.5 miles of the plant that is at an elevation of concern, the distance from this area to the plant structures and the active exclusion of vehicles from this area, the potential for an automobile missile to reach the auxiliary building roof is notably

reduced. The NRC staff concludes that the procedural controls proposed by the licensee are acceptable to eliminate the need for consideration of an automobile impact with the auxiliary building roof.

The licensee has proposed to adopt the tornado-generated-missile spectrum of RG 1.76 and to use this missile spectrum to evaluate existing and new SSC as directed by the guidance, with the exception from that guidance discussed above. In conjunction with the adoption of the DBT characteristics of RG 1.76, this constitutes a full replacement of the current DBT and tornado-generated-missile spectrum. As stated in RG 1.76, this DBT and tornado-generated-missile spectrum are considered generically acceptable for the design of nuclear power plants. Use of the these inputs to evaluate the performance of tornado protection features as part of an accepted methodology will continue to follow draft GDC 2 as discussed in the FCS USAR Appendix G. The NRC staff has reviewed the changes and concludes they are acceptable.

The LAR refers to "designated SSCs" (see e.g., pages 6, 7, 8, 10, 12). The term "designated SSCs" is not used in the current USAR. By email dated July 24, 2013 (Reference 8), the NRC staff asked the licensee in SBPB-RAI 2 if OPPD was proposing a change to the CLB regarding SSCs that will be protected from tornadoes and tornado-generated-missiles. In its response to this RAI dated July 24, 2013, the licensee stated that no changes were being requested regarding equipment to be protected from tornadoes and tornado missiles. Since the licensee is not proposing to change the licensing bases for what equipment is to be protected from tornadoes and tornado missiles, as stated in USAR Appendix G, Criterion 2, the staff concludes that this response is acceptable.

The NRC staff issued Mechanical and Civil Engineering Branch (EMCB)-RAI 1 dated July 23, 2013 (Reference 7), regarding the scope of applicability of RG 1.76 in the proposed amendment. The licensee confirmed in its July 24, 2013, RAI response that the appropriate DBT and tornado-generated-missile spectrum included in RG 1.76 will apply to both new and existing SSCs which are required to be protected from tornadoes and tornado-generated-missiles. The licensee also included an extensive discussion on the effect of the implementation of RG 1.76 on the design basis of the containment structure. The licensee confirmed in its response that tornado missiles are not a critical design consideration for the containment structure and the containment design basis will not change following the implementation of the proposed methodology using RG 1.76 at FCS.

3.1.1 Conclusion Regarding RG 1.76, Revision 1

The licensee proposed to replace the current DBT and tornado-generated-missile spectrum with the RG 1.76 DBT and tornado-generated-missile spectrum. As described in the LAR, the license adopted all characteristic information from the regulatory guide and applied it as intended, with one exception from the guidance. The impact of an automobile missile with the auxiliary building roof was excluded from consideration in light of procedural controls implemented by the licensee. The NRC staff has reviewed the LAR and RAI responses and concludes that the proposed change to the DBT and tornado-generated-missile spectrum at FCS is acceptable.

3.2 FSAR and Missile Barrier Design in Accordance with BC-TOP-9A, Revision 2

The NRC staff's review in the area of missile barrier design focused on the methods for the prediction of local damage in an impacted area, including estimation of the depth of penetration and, in the case of concrete barriers, the potential for generation of secondary missiles by spalling or scabbing in concrete barriers. Additionally, the NRC staff's review also considered the methods used for the prediction of the overall response of the structure or barrier due to a postulated missile impact. This includes assumptions on acceptable ductility ratios where elasto-plastic behavior is relied upon, and procedures for the estimation of forces, moments, and shears induced in the barrier by the impact force of the missile.

3.2.1 Licensee's Basis for a Revised Missile Barrier Design Methodology

As part of the licensee's DBT and tornado-generated-missile methodology changes documented in the LAR submittal, the licensee requested to change the methodology used for evaluating the impact of tornado missiles (i.e., missile barrier design). The original methods and design criteria for barriers used to protect against tornado-generated-missiles at the FCS are based on work performed by the United States Navy and documented in NAV DOCKS P-51, "Design of Protective Structures (A New Concept of Structural Behavior)," August 1950 (Reference 6). By letter dated July 24, 2013, in response to an NRC staff RAI, the licensee provided a general comparison between the impact assessment methods in NAV DOCKS P-51 and BC-TOP-9A (Reference 2). The licensee noted in its RAI response that the former only addresses the impact assessment of concrete barriers, unlike BC-TOP-9A, which addresses concrete barriers, in addition to steel and composite sections. The licensee also provided a quantitative comparison between concrete perforation and scabbing thicknesses calculated using the methods of both NAV DOCKS P-51 and BC-TOP-9A. The results of this comparison show that at velocities similar to those assumed in RG 1.76, Revision 1, the methods prescribed by BC TOP-9A produce conservative results with respect to required thicknesses for a barrier impacted by a missile comparable to that being proposed for use in this LAR (i.e., Schedule 40 pipe missile).

The BC-TOP-9A Topical Report provides guidance on predicting local damage in missile barriers which are fabricated from reinforced concrete, steel, and composite sections consisting of both concrete and steel barriers (termed Multiple Element Barriers in BC-TOP-9A). For reinforced concrete barriers, the penetration depth is determined using the Modified Petry formula. The minimum barrier thickness is determined by calculating the thickness of a concrete element which would be just perforated in accordance with the Ballistic Research Laboratory (BRL) equation; this value is conservatively increased to prevent perforation. Additional provisions are included in the guidance for the prevention of concrete spalling; these provisions provide a conservative increase in the barrier thickness to prevent spalling. Steel missile barriers designed in accordance with BC-TOP-9A also make use of the BRL equation to determine the minimum plate thickness, with a recommended increase in thickness for conservatism. For composite sections, the Topical Report provides guidance on calculating the residual velocity of the missile as it passes through each successive layer of the missile barrier. Formulations for the calculation of the residual velocities in both concrete and steel are provided.

With respect to the assessment of overall damage predicted in missile barriers, resulting from impact events, BC-TOP-9A focuses on the use of energy methods whereby the available strain energy (capacity) of the target is compared to the kinetic energy imparted to the target (demand). The overall objective is to ensure that the demand does not exceed the capacity of the target. Various formulations are provided for the calculation of the residual velocities following missile impact and the strain energies required to resist both elastic and plastic impact. To this end, the Topical Report notes that plastic collisions can be assumed for all postulated tornado-generated-missiles. Additional guidance is provided by the Topical Report for the use of dynamic increase factors, allowable ductility ratios, and an allowable range of steel ratios used in reinforced concrete missile barriers. The governing design criterion associated with the use of BC-TOP-9A, to calculate the overall damage prediction for missile barriers, is that the maximum deflection of a barrier resulting from an impact load must not impair the function of other safety-related SSCs.

By letter dated July 24, 2013, in response to an NRC staff RAI, the licensee provided a detailed comparison between the criteria contained in SRP Section 3.5.3 and BC-TOP-9A. With respect to the local damage prediction of concrete barriers, the licensee notes that the penetration prediction methods of SRP Section 3.5.3 and BC-TOP-9A are identical, given that the National Defense Research Council (NRDC) method cited in the SRP also utilizes the Modified Petry formula. With respect to the local effects of missile impacts on steel, both the SRP and BC TOP-9A cite the use of the BRL equation. The licensee also notes that allowable ductility ratios are based on the American Institute of Steel Construction (AISC) Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities (i.e., ANSI/AISC N-690), which is cited in SRP Section 3.5.3. The guidance contained in SRP Section 3.5.3 for the evaluation of impact loads on composite sections is substantially similar to the method used in BC-TOP-9A, in that both rely on the computation of the residual velocities of a postulated missile as the missile passes through various layers of the barrier. Furthermore, both SRP Section 3.5.3 and BC-TOP-9A rely on the use of energy methods for the assessment of the overall structural response of a barrier to a postulated missile impact (elastic and plastic).

3.2.2 NRC Staff Evaluation

The NRC staff has reviewed the licensee's request to implement the methods and criteria for missile barrier design in BC-TOP-9A at FCS. Based on this review, the NRC staff considers the licensee's request acceptable. The NRC staff notes that this Topical Report has previously been reviewed by the AEC staff in its November 25, 1974, Topical Report Evaluation. This evaluation is included as part of BC-TOP-9A. The evaluation performed by the AEC staff determined that the use of the Topical Report was deemed acceptable for future applications associated with the assessments of missile impact and barrier integrity, subject to four considerations outlined in the "Regulatory Position" portion of the evaluation for BC-TOP-9A. As such, the NRC staff considers the use of BC-TOP-9A for the assessment of tornado-generated-missile impacts at FCS acceptable, subject to the four Regulatory Positions included in the evaluation.

Furthermore, the NRC staff notes that the methods used to assess the local damage resulting from missile impacts of barriers in BC-TOP-9A assume that postulated missiles strike targets normal to their surface and that the axis of the missile is parallel to the line of flight. Combined, these result in a conservative positioning of the missile as it impacts the target. Hence, a

conservative impact load is imparted on the barrier, given that the missile striking a target at an angle other than normal would serve to reduce the available kinetic penetration energy. In making the determination regarding the acceptability of the use of BC-TOP-9A, the NRC staff also considered the guidance of SRP Section 3.5.3, Revision 3. The NRC staff notes that a number of the methods and criteria used in BC-TOP-9A are identical to those considered in SRP Section 3.5.3, Revision 3. Where these methods and criteria are not identical, the NRC staff notes that the methods and criteria associated with the assessment of both local and global impact consequences are substantially similar such that the use of BC-TOP-9A provides reasonable assurance that the regulatory requirements associated with the protection of SSCs important to safety from the consequences of tornado-generated-missiles will remain satisfied following the implementation of the Topical Report at FCS.

With respect to additional precedents associated with the use of BC-TOP-9A, the NRC staff also notes that the use of BC-TOP-9A has been recently approved for use in similar applications, including for the design of missile barriers for the Economic Simplified Boiling Water Reactor (ESBWR). As indicated in the NRC staff's Final Safety Evaluation Report (FSER) for the ESBWR Design Control Document (DCD) (Reference 9), the NRC staff found the use of the methods described in BC-TOP-9A acceptable for the prediction of the overall damage which would be incurred by missile barriers. Additionally, the NRC staff notes that a number of operating commercial nuclear power plants currently utilize the guidance of BC-TOP-9A as part of their licensing basis requirements related to the design of missile barriers, including the Seabrook nuclear power plant, Arkansas Nuclear One nuclear power plant, and the Watts Bar Nuclear Plant, Unit 1.

3.2.3 Conclusion

Based on the evaluations noted above, the NRC staff has determined that the tornado-generated-missile barrier design procedures in Topical Report BC-TOP-9A are acceptable. These procedures satisfy the intent of AEC draft GDC 2 and AEC draft GDC 40 with respect to the capabilities of the subject missile barriers to provide sufficient protection to SSCs that must withstand the effects of tornado-generated-missile impact loads. Thus, the design of FCS is unaffected with respect to meeting draft GDC 2 and 40. This determination is based on the NRC staff's review of the licensee's proposed method for evaluating the local and global effects of missile impacts on missile barriers constructed of concrete, steel, and multiple elements. Therefore, the NRC staff concludes that the licensee has provided reasonable assurance that the proposed methodology for missile barrier design provides an acceptable means to adequately protect SSCs important to safety, which may be subject to the impact loads resulting from tornado-generated-missiles.

4.0 EXIGENT CIRCUMSTANCES

The NRC's regulations contain provisions for issuance of amendments when the usual 30-day public comment period cannot be met. These provisions are applicable under exigent circumstances. Consistent with the requirements in 10 CFR 50.91(a)(6), exigent circumstances exist when: (1) a licensee and the NRC must act quickly; (2) time does not permit the NRC to publish a *Federal Register* notice allowing 30 days for prior public comment. The NRC requires the licensee to explain the exigency and why the licensee cannot avoid it, and use its normal public notice and comment procedures.

As discussed in the licensee's application dated July 21, 2013, the licensee requested that the proposed amendment be processed by the NRC on an exigent basis.

In its July 21, 2013, letter, the licensee provided the following as the basis for exigency:

> On April 22, 2013, representatives of the Omaha Public Power District (OPPD) held a public meeting with Nuclear Reactor Regulation (NRR) staff to discuss the need for potential license amendments. Tornado missile targets was one of the issues discussed. At that meeting, OPPD noted that the raw water (RW) pump pull box target would be addressed by installing a modification prior to core reload and that the other tornado missile targets would be addressed by installing similar modifications prior to plant restart. OPPD also briefed the staff on its plan to submit a license amendment request after plant restart that would change the current licensing basis regarding tornado and tornado missile characteristics to adhere to those described in Regulatory Guide (RG) 1.76, Revision 1. At the time, OPPD understood this approach to be satisfactory to the staff.
>
> However, subsequent to the April 22, 2013 public meeting, it was recently determined that in addition to the modifications discussed at the meeting, the tornado wind velocities assumed in the current licensing basis were overly conservative in comparison to current NRC guidance (i.e., RG 1.76, Revision 1). Within the last several weeks, additional tornado missile vulnerabilities have been identified, and are being aggressively corrected through the modification process. Discussions between OPPD and the NRC have concluded that a license amendment must be obtained to support plant startup. Due to the complex and integrated nature of the activities required to recover from an extended outage, an extended delay in a key activity would have a cascading, adverse impact. This will allow OPPD to document that the physical modifications to the RW pull boxes and other identified targets were performed in accordance with NRC-approved methodologies (i.e., RG 1.76, Revision 1, and Bechtel Topical Report BC-TOP-9A, Revision 2).

The NRC will not use exigent procedures if it determines that the licensee has failed to use its best efforts to make a timely application for the amendment in order to create the exigency and to take advantage of this procedure. However, in this instance, the NRC staff concludes that the licensee made a timely application for the proposed amendment following identification of the issue. The NRC staff concludes that the licensee could not avoid the exigency because until recently OPPD believed that the USAR changes described in its application could be made without prior approval from the NRC because OPPD was changing from a method described in the USAR to another method that had been approved by the NRC for the intended application. However, OPPD only recently concluded that the adoption of RG 1.76 is a change to an element of the method described in the USAR and does need prior NRC approval because the use of RG 1.76 leads to results of the tornado analysis that are less conservative or not essentially the same.

The NRC staff also concludes that it needed to act quickly and that time did not permit the Commission to publish a *Federal Register* notice allowing 30 days for prior public comment because the amendment is necessary for the resumption of operations.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Under the provisions in 10 CFR 50.91(a)(6), if the NRC has determined that exigent circumstances exist, and if the NRC also determines that the amendment involves no significant hazards consideration, then it will either issue a *Federal Register* notice providing notice of an opportunity for hearing and allowing at least two weeks from the date of the notice for prior public comment; or it will use local media to provide reasonable notice to the public in the area surrounding a licensee's facility of the licensee's amendment and of its proposed determination consulting with the licensee on the proposed media release and on the geographical area of its coverage. In this case, the NRC published a notice in the *Omaha-World Herald* located in Omaha, Nebraska, on July 24 and 25, 2013.

The Commission may issue the license amendment before the expiration of the 60-day period provided that its final determination is that the amendment involves no significant hazards consideration. This amendment is being issued prior to the expiration of the 60-day period. Therefore, a final finding of no significant hazards consideration follows.

The Commission has made a final determination that the amendment request involves no significant hazards consideration. Under the Commission's regulations in 10 CFR 50.92, this means that operation of the facility in accordance with the proposed amendment does not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration which is presented below.

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change to the current licensing basis (CLB) utilizes current NRC guidance (i.e., Regulatory Guide (RG) 1.76, Revision 1), regarding the characteristics of the design basis tornado (DBT) and associated missiles and NRC-approved methodology (i.e., Bechtel Topical Report BC-TOP-9A, Revision 2) for the analysis thereof. These NRC-approved documents will form the basis for ensuring that recently identified tornado missile targets are adequately protected.

   The proposed change does not [significantly] increase the probability or consequences of an accident previously evaluated. The proposed change is more comprehensive than the CLB as it will require consideration of the vertical velocity component of DBT missiles, and use an approved methodology BC-TOP-9A for analyzing tornado missile impact. This will provide a basis for analyzing and protecting designated SSCs using protective barriers to enable the plant to reach safe shutdown and be maintained in a safe shutdown condition during a tornado.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed amendment provides the regulatory basis for changing the CLB to require compliance with RG 1.76, Revision 1 for the DBT and associated missiles, and use an approved methodology BC-TOP-9A for analyzing tornado missile impact. The proposed amendment does not involve a change in methods governing plant operation. The proposed amendment requires consideration of the vertical velocity component of DBT missiles not presently required by the CLB. Designated SSCs are protected by barriers against the RG 1.76, Revision 1 DBT and associated missiles to ensure the plant can reach safe shutdown and be maintained in a safe shutdown condition during a tornado.

   No new interactions between systems or components are created. No new failure mechanisms of associated systems will exist. The proposed amendment ensures that designated SSCs are protected from the effects of the DBT and associated missiles in accordance with current NRC guidance.

   Therefore, the amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No.

   The proposed amendment provides the regulatory basis for changing the CLB to utilize updated NRC guidance regarding the characteristics of the DBT and associated missiles. Designated SSCs are protected in accordance with the most recent NRC guidance and approved methodologies as documented above regarding the characteristics of the DBT and DBT missiles and how to analyze their impact on structures, systems and components. The proposed amendment does not alter the manner in which safety limits or limiting safety system settings are determined. The safety analysis acceptance criteria are not affected by the proposed amendment. Further, the proposed amendment does not change the design function of any equipment assumed to operate in the event of an accident. The proposed change provides a basis for protecting designated SSCs in accordance with current NRC guidance and approved methodologies to enable the plant to reach safe shutdown and be maintained in a safe shutdown condition during a tornado.

> Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

The NRC staff has reviewed the licensee's analysis and based on this review as supplemented by the additional considerations below, the staff has determined that the three standards of 10 CFR 50.92 are satisfied.

Regarding the first standard, the relevant accidents are discussed in Chapter 14 of the USAR. However, the accidents are not directly attributed to tornadoes, but may involve failures of equipment which could be initiated by a tornado. The LAR reduces the requirements for tornado protection by reducing the maximum wind speed to which the plant is designed from a highly-improbable 500 mph to reasonable value. However, it is not a significant reduction in a margin of safety because the reduction reflects improved information and estimates for windspeed and a tornado frequency. Therefore, based on a review of the licensee's analysis and considering that the revision to the FCS USAR to include RG 1.76, Revision 1, and BC TOP 9A, Revision 2, does not involve a significant increase in the probability or consequences of an accident previously evaluated in Chapter 14 of the FCS USAR, the NRC staff concludes that the first standard of 10 CFR 50.92 is satisfied.

Regarding the second standard, based on a review of the licensee's analysis and considering that the revision to the FCS USAR to include RG 1.76, Revision 1, and BC TOP 9A, Revision 2, does not create the possibility of a new or different kind of accident from any accident previously evaluated in Chapter 14 of the FCS USAR, because tornadoes were already considered. The NRC staff concludes that the second standard of 10 CFR 50.92 is satisfied.

Regarding the third standard, the LAR reduces the requirements for tornado protection by reducing the maximum wind speed to which the plant is designed. However, it is not a significant reduction in a margin of safety because the reduction reflects improved data establishing the windspeed associated with a tornado having a return frequency of less than one in 10 million years at the site. Therefore, based on a review of the licensee's analysis and the considerations above the staff concludes that the third standard of 10 CFR 50.92 is satisfied.

Therefore, the NRC staff has determined that the amendment does not involve a significant hazards consideration.

6.0 STATE CONSULTATION

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

7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the 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 made a preliminary finding that the amendment involves no significant hazards consideration which was published in the *Omaha-World Herald* located in Omaha, Nebraska, on July 24 and 25, 2013.

In response to this publication, the NRC staff received the following comment:

1. OPPD's assertion that the LAR involves no significant hazards consideration is unsupported by its application.

    a. One cannot reasonably conclude, as OPPD does, that the proposed amendment will not involve a significant reduction in a margin of safety when OPPD plans to reduce by more than 50 percent (from 500 miles per hour to 230 mph) the maximum wind velocity it plans to protect the Fort Calhoun containment structure against during a tornado.

    b. Use of the different regulatory guide OPPD proposes—Regulatory Guide 1.76—may not protect to an adequate level of safety at Fort Calhoun and may also significantly reduce the margin of safety. The LAR states that the roof of the auxiliary building at 1,044 feet MSL is a potential target for the RG 1.76 automobile missile launched from the access control point. It is not clear that the auxiliary building roof is strong enough to withstand an RG 1.76 automobile missile.

2. OPPD's claimed basis for exigent circumstances and request for approval of the proposed amendment within seven days is not justified. OPPD's assertion that an extended delay in "a key activity would have a cascading, adverse impact" on OPPD's efforts to restart the plant is greatly overstated in light of the current situation at the nuclear plant. Fort Calhoun has already been shut down for 27 months due in large part to OPPD's prolonged poor performance in recognizing and resolving pervasive problems plant wide. OPPD's repeated assertions over the past two years that the plant is ready for heat-up or restart have routinely been proven to be inaccurate as have many of its assertions that it was ready for inspection. OPPD's claim now that "a cascading, adverse impact" will befall Fort Calhoun's efforts to restart if the NRC does not approve the proposed LAR within seven days similarly lacks credibility.

    In light of the numerous documented instances of OPPD's inadequate and/or incorrect analyses identified by NRC inspectors recently regarding all areas of plant operation, it would be highly imprudent and likely unsafe to rush this LAR through based upon OPPD's assertions and analysis. Public safety demands that this LAR be treated with appropriate deliberation including an opportunity for public hearing prior to an NRC determination regarding issuance.

3. The public comment period of less than 48 hours for this LAR is wholly inadequate and unjustified. Such a short period effectively precludes a meaningful opportunity for public participation regarding this LAR. As noted in 2. above, OPPD has not demonstrated that an exigent circumstance actually exists. The comment period should be extended to no less than 30 days.

Regarding comment 1a, the change of maximum wind speed does not involve a significant reduction in the margin of safety because the probability of having a tornado strike the plant with a wind speed above 230 mph is extremely low. As such, a change to a more reasonable speed of 230 mph as analyzed in RG 1.76 is not considered to be a significant decrease in the margin of safety. Additionally, as noted in OPPD's July 24, 2013, response to (EMCB)-RAI-1, the containment structure is robust. For example, the FCS containment is designed as follows:

- 60 psig internal pressure at the associated design temperature, and by the application of forces resulting from an earthquake whose ground motion is 0.08g horizontally and 0.053g vertically.

- The containment structure will be designed to withstand a sustained wind velocity of 90 mph in combination with the dead load and design internal pressure and temperature conditions. The wind load is based on the highest velocity wind at the site location for the 100-year period of recurrence: 90 mph base wind at 30 feet above ground level.

- The containment structure is predicted to withstand without loss of function the simultaneous stresses produced by the dead load, by 75 psig internal pressure and temperature associated with this pressure and by an earthquake whose ground motion is 0.10g horizontally and 0.07g vertically.

- The containment structure is predicted to withstand without loss of function 125% of the force corresponding to a 90 mph wind impinging on the building concurrently with the stresses associated with the dead load and 75 psig internal pressure.

- With no earthquake or wind acting, the structure is predicted to withstand 90 psig internal pressure without loss of function.

- Under each of these conditions, stresses in the structural members will not exceed 0.95 yield.

Given the above criteria for the containment design, which are not changed by this license amendment, the NRC staff concludes that the tornado missile design is not a critical design characteristic for the containment building and that the margin for safety for the FCS containment is not significantly affected by issuance of this license amendment. Therefore, the staff concludes that comment 1a does not change the staff's determination regarding the significant hazards consideration found in Section 5 of this SE.

Regarding comment 1b, the commenter notes that the roof of the auxiliary building at 1,044 feet MSL is a potential target for the RG 1.76 automobile missile launched from the access control point. The commenter also notes that it is not clear that the auxiliary building roof is strong enough to withstand an RG 1.76 automobile missile. As discussed in Section 3.1 of this SE, the license amendment eliminates the possibility of an automobile missile impact on the auxiliary building roof by implementing procedural controls to exclude vehicles from all elevations of concern with 0.5 miles of the plant. The NRC staff notes that given the small portion of the surrounding area within 0.5 miles of the plant that is at an elevation of concern, the distance from this area to the plant structures, and the active exclusion of vehicles from this area the potential for an automobile missile to reach the auxiliary building roof is notably reduced. The staff concludes in Section 3.1 of this SE that the procedural controls proposed by the licensee are acceptable to eliminate the need for consideration of an automobile impact with the auxiliary building roof. Therefore, the staff concludes that comment 1b does not change the staff's determination regarding the significant hazards consideration found in Section 5.0 of this SE.

With respect to comment 2, the opportunity for a public hearing will be provided after issuance of the amendment, pursuant to the Commission's regulations. The NRC staff's discussion of the exigent circumstances is provided in Section 4.0 of this safety evaluation. As noted above, fuel loading is a part of the startup process, and the normal comment process would result in significant and unnecessary delay. The NRC staff's careful consideration of OPPD's LAR is presented above.

With respect to comment 3 and the requested extension of the comment period, the NRC staff has revisited its conclusion regarding exigent circumstances and concluded that exigent circumstances continue to exist. Accordingly, the NRC staff is declining to extend the comment period.

The NRC staff has concluded, based on the considerations discussed above, that the amendment does not (a) involve a significant increase in the probability or consequences of an accident previously evaluated, or (b) create the possibility of a new or different kind of accident from any previously evaluated, or (c) involve a significant reduction in a margin of safety and, therefore, the amendment does not involve a significant hazards consideration.

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.

8.0 CONCLUSION

The NRC 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) there is reasonable assurance that 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.

9.0 REFERENCES

1. Cortopassi, L. P., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Exigent License Amendment Request 13-02 Revise Current Licensing Basis to Adopt a Revised Design Basis/Methodology for Addressing Design-Basis Tornado/Tornado Missile Impact," dated July 21, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13203A136).

2. Cortopassi, L. P., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Reply to NRC Request for Additional Information (RAI) Regarding Exigent License Amendment Request 13-02 Revise Current Licensing Basis to Adopt a Revised Design Basis/Methodology for Addressing Design-Basis Tornado/Tornado Missile Impact," dated July 24, 2013 (ADAMS Accession No. ML13206A042).

3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.76, Revision 1, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," dated March 2007 (ADAMS Accession No. ML070360253).

4. Bechtel Power Corporation, Topical Report BC-TOP-9A, "Design of Structures for Missile Impact," Revision 2, September 1974.

5. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," November 2000 (ADAMS Accession No. ML003759710).

6. NAV DOCKS P-51, "Design of Protective Structures (A New Concept of Structural Behavior)," Arsham Amirikian, Bureau of Yards and Docks, Department of the Navy, August 1950.

7. Sebrosky, J., U.S. Nuclear Regulatory Commission, e-mail to B. Hansher, Omaha Public Power District, "Fort Calhoun Tornado Missile Protection Request for Additional Information (MF2469)," dated July 23, 2013 (ADAMS Accession No. ML13205A018).

8. Sebrosky, J., U.S. Nuclear Regulatory Commission, e-mail to B. Hansher, Omaha Public Power District, "Re: Fort Calhoun Tornado Missile Protection Request for Additional Information (MF2469)," dated July 24, 2013 (ADAMS Accession No. ML13205A125).

9. Economic Simplified Boiling Water Reactor (ESBWR) Design Certification Final Safety Evaluation Report (FSER), Chapter 3, "Design of Structures, Components, Equipment, and Systems," dated March 9, 2011 (ADAMS Accession No.: ML110040021).

Principal Contributors: Evan Davidson
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William Jessup

Date: July 26, 2013

The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Joseph M. Sebrosky, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures:
1. Amendment No. 272 to DPR-40
2. Safety Evaluation

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EDavidson, NRR/DSS/SBPB
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WJessup, NRR/DE/EMCB

ADAMS Accession No. ML13203A070 *via email

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DE/EMCB/BC	NRR/DSS/SBPB/BC
NAME	JSebrosky	JBurkhardt	AMcMurtray*	SJones for GCasto*
DATE	7/26/13	7/26/13	7/25/13	7/26/13
OFFICE	OGC*	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM	
NAME	DRoth (NLO)	MMarkley	JSebrosky	
DATE	7/26/13	7/26/13	7/26/13	

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