



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-498 and 50-499; NRC-2010-0375]

South Texas Project Nuclear Operating Company

AGENCY: Nuclear Regulatory Commission.

ACTION: Record of decision; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing a record of decision for the South Texas Project (STP), located in Bay City, Texas. This notice provides the record of decision that supports the NRC decision to renew facility operating license Nos. NPF-76 and NPF-80 for an additional 20 years of operation for the South Texas Project (STP), Units 1 and 2.

DATES: The record of decision was issued on September 18, 2017.

ADDRESSES: Please refer to Docket ID **NRC-2010-0375** when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID **NRC-2010-0375**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection

at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select “[ADAMS Public Documents](#)” and then select “[Begin Web-based ADAMS Search](#).” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

- **NRC’s PDR:** You may examine and purchase copies of public documents at the NRC’s PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Tam Tran, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-3617; e-mail: Tam.Tran@nrc.gov.

SUPPLEMENTARY INFORMATION:

The text of the record of decision is attached.

Dated at Rockville, Maryland, this 19th day of September, 2017.

For the Nuclear Regulatory Commission.

Joseph E. Donoghue, Deputy Director,
Division of License Renewal,
Office of Nuclear Reactor Regulation.

**RECORD OF DECISION
U.S. NUCLEAR REGULATORY COMMISSION
DOCKET NO. 50-498 AND 50-499
LICENSE RENEWAL APPLICATION FOR
SOUTH TEXAS PROJECT, UNITS 1 AND 2**

BACKGROUND:

The U.S. Nuclear Regulatory Commission (NRC) received an application, dated October 28, 2010, from STP Nuclear Operating Company (STPNOC or applicant), filed pursuant to Section 103 of the Atomic Energy Act of 1954, as amended (AEA), and Parts 51 and 54 of title 10 of the *Code of Federal Regulations* (CFR), to issue renewed operating licenses for the South Texas Project, Units 1 and 2 (STP). The renewed licenses would authorize the applicant to operate STP for an additional 20-year period beyond that specified in the current operating licenses.

The South Texas Project is a two-unit nuclear powered steam electric generating facility located in Matagorda County, Texas, that began commercial operations on August 25, 1988 (Unit 1) and June 19, 1989 (Unit 2). The nuclear units are Westinghouse pressurized-water reactors, producing a reactor core rated power of 3,853 megawatts-thermal (MWt). The gross electrical capacity is 1,350 megawatts-electric (MWe) (1,250 MWe net) each. The current operating licenses for STP (NPF-76 and NPF-80), expire on August 20, 2027 (Unit 1) and December 15, 2028 (Unit 2).

On January 13, 2011, the NRC published a Notice of Acceptance and Opportunity for Hearing for South Texas Project, Units 1 and 2, in the *Federal Register* (76 FR 2426) and began the environmental and safety review of the STP license renewal application. As required by 10 CFR Part 51, on January 31, 2011, the NRC published a Notice of Intent To Prepare an Environmental Impact Statement and Conduct the Scoping Process for South Texas Project, Units 1 and 2, in the *Federal Register* (76 FR 5410). Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), directs that a detailed statement be prepared for major Federal actions significantly affecting the quality of the human environment. By Commission regulation, the NRC prepares an environmental impact statement (EIS) or a supplement to an EIS (SEIS) for all renewed reactor operating licenses, regardless of the action's environmental impact significance (10 CFR 51.20(b)(2)). In this instance, the NRC's major Federal action is to decide whether to issue renewed operating licenses for STP for an additional 20-year period beyond that specified in the current operating licenses.

On March 2, 2011, the NRC held two public meetings at the Bay City Civic Center in Bay City, Texas, to obtain public input on the scope of the environmental review related to the STP license renewal application. The NRC staff reviewed the oral and written comments received during the scoping process and contacted Federal, State, Tribal, regional, and local agencies to solicit comments. A Scoping Summary Report was issued on November 14, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11153A082).

The NRC's environmental review involved the preparation of a site-specific SEIS, which is a supplement to the NRC's NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), in accordance with 10 CFR 51.95(c). The GEIS documents the results of the NRC staff's systematic approach to evaluate the environmental consequences

of renewing the operating licenses of nuclear power plants and operating them for an additional 20 years.

The GEIS facilitates the NRC's environmental review process by identifying and evaluating environmental impacts that are considered generic and common to all nuclear power plants (Category 1 issues). For Category 1 issues, no additional site-specific analysis is required in the SEIS unless new and significant information is identified that would change the conclusions in the GEIS. The GEIS also identifies site-specific issues (Category 2 issues) that could not be resolved generically. For Category 2 issues, an additional site-specific review is required, and the results are documented in the site-specific SEIS.

A standard of significance was established for each NEPA issue evaluated in the GEIS based on the Council on Environmental Quality (CEQ) terminology for "significantly" (see 40 CFR 1508.27). Since the significance and severity of an impact can vary with the setting of the proposed action, both "context" and "intensity," as defined in CEQ regulations 40 CFR 1508.27, were considered. Context is the geographic, biophysical, and social context in which the effects will occur. In the case of license renewal, the context is the environment surrounding the nuclear power plant. Intensity refers to the severity of the impact in whatever context it occurs. Based on this, the NRC established a three-level standard of significance for potential impacts, SMALL, MODERATE, and LARGE, as defined below.

SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The applicant, STPNOC submitted its license renewal application and environmental report under the NRC's 1996 rule governing license renewal environmental reviews¹, as codified in the NRC's environmental protection regulation, 10 CFR Part 51. The 1996 GEIS² and Addendum 1³ to the GEIS provided the technical bases for the list of NEPA issues and associated environmental impact findings for license renewal contained in Table B-1 in Appendix B to Subpart A of 10 CFR Part 51. Therefore, for STP, the NRC staff initiated its environmental review in accordance with the 1996 rule and GEIS. Neither STPNOC nor the NRC staff identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. This conclusion is supported by the NRC staff's review of the applicant's environmental report and other documentation relevant to

¹ 61 FR 28467. U.S. Nuclear Regulatory Commission. "Environmental Review for Renewal of Nuclear Power Plant Operating Licenses." *Federal Register* 61 (109): 28467-28497. June 5, 1996.

² U.S. Nuclear Regulatory Commission. 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. Washington, DC. NUREG-1437. May 1996. ADAMS Accession Nos. ML040690705 and ML040690738.

³ U.S. Nuclear Regulatory Commission. 1999. Section 6.3-Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants. In: *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. Washington, DC. NRC. NUREG-1437, Volume 1, Addendum 1. August 1999. ADAMS Accession No. ML040690720.

STPNOC's activities; consideration of public comments received during the scoping process and the draft SEIS comment period; consultation with Federal, State, and local agencies as well as Tribal representatives; and the findings from the environmental site audit conducted by the NRC staff.

On December 5, 2012, the NRC issued a draft site-specific SEIS for public comment in support of the STP license renewal application (ADAMS Accession No. ML12324A049). A 45-day comment period began on the date of publication of the U.S. Environmental Protection Agency (EPA) Notice of Availability (77 FR 74479) and ended on February 22, 2013. The comment period was to allow members of the public and agencies to comment on the results of the environmental review presented in the draft SEIS. On January 15, 2013, the NRC held two public meetings at the Bay City Civic Center in Bay City, Texas, to describe the results of the environmental review, respond to questions, and accept public comments. All comments received on the draft SEIS during the comment period are included in Appendix A of the final SEIS (FSEIS).

On June 20, 2013, the NRC published a final rule revising 10 CFR Part 51, including the list of NEPA issues and findings in Table B-1.⁴ A revised GEIS,⁵ which updated the 1996 GEIS, provided the technical bases for the final rule. The revised GEIS supports the revised list of NEPA issues and associated environmental impact findings for license renewal contained in Table B-1 in Appendix B to Subpart A of the revised 10 CFR Part 51. The revised GEIS and final rule reflect lessons learned and knowledge gained during previous license renewal environmental reviews. Under NEPA, the NRC must consider and analyze in the SEIS the potential significant impacts described by the final rule's new Category 2 issues. If any new and significant information is identified for the final rule's new Category 1 issues, then their potential significant impacts must also be described.

Therefore, for the STP license renewal application, the NRC staff also reviewed information relating to the new issues identified in the 2013 final rule and GEIS. Specifically, the staff reviewed geology and soils; radionuclides released to groundwater; effects on terrestrial resources (non-cooling system impacts); exposure of terrestrial organisms to radionuclides; exposure of aquatic organisms to radionuclides; human health impacts from chemicals; physical occupational hazards; environmental justice; and cumulative impacts. These issues are documented in Section 4.11 of the FSEIS for the STP license renewal.

The NRC issued the FSEIS in support of the STP license renewal application on November 18, 2013 (ADAMS Accession No. ML13322A890) and a Final Errata on June 3, 2016 (ADAMS Accession No. ML16165A182). In the FSEIS, the NRC staff concluded that the adverse environmental impacts of license renewal for STP are not great enough to deny the option of license renewal for energy-planning decision-makers.

⁴ 78 FR 37282. U.S. Nuclear Regulatory Commission. "Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses." *Federal Register* 78 (119): 37282-37324. June 20, 2013.

⁵ U.S. Nuclear Regulatory Commission. 2013. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. Washington, DC. NUREG-1437, Revision 1, Volumes 1, 2, and 3. June 2013. ADAMS Accession Nos. ML13106A241, ML13106A242, and ML13106A244.

On November 29, 2013, the EPA issued the Notice of Availability for the FSEIS for the STP license renewal application (78 FR 71606). During the 30 days following publication of the notice, the NRC received one comment on the FSEIS from EPA Region 6 as discussed later in this document.

Pursuant to 10 CFR 51.102 and 51.103(a)(1)-(5), the NRC staff has prepared this concise public record of decision (ROD) to accompany its action on the STP license renewal application. In accordance with 10 CFR 51.103(c), this ROD incorporates by reference the materials contained in the FSEIS.

DECISION:

Pursuant to 10 CFR 54.29, a renewed license may be issued by the Commission if the Commission finds that actions have been identified and have been or will be taken with respect to (1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review and (2) time-limited aging analyses that have been identified to require review, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis, and that any changes made to the plant's current licensing basis in order to comply with this requirement are in accord with the AEA and the Commission's regulations, and that any applicable requirements of Subpart A of 10 CFR Part 51 have been satisfied.

In making its final decision on the proposed license renewal to authorize the continued operation of STP for an additional 20 years beyond the expiration of the current operating licenses, the NRC must make a favorable safety finding. The purpose of the NRC's safety review is to determine if the applicant has adequately demonstrated that the effects of aging will not adversely affect any safety structures or components as specified in 10 CFR 54.4 and 10 CFR 54.21. The applicant must demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained during the license renewal period. The detailed results of the NRC's safety review are documented in a safety evaluation report (SER) to be published separately. Further, the Advisory Committee on Reactor Safeguards (ACRS) must complete its review and report in accordance with 10 CFR 54.25.

The FSEIS, which is incorporated by reference herein, documents the NRC's environmental review of the STP license renewal application, including the determination that the adverse environmental impacts of license renewal for STP are not so great that preserving the option of license renewal for energy-planning decision makers would be unreasonable, in accordance with 10 CFR 51.103(a)(5).

PURPOSE AND NEED:

As identified in Section 1.2, "Purpose and Need for the Proposed Federal Action," of the FSEIS, the purpose and need for the proposed action (issuance of renewed licenses) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by energy-planning decision makers, such as State, utility, and, where authorized, Federal agencies (other than the NRC). This definition of purpose and need reflects the NRC's recognition that, unless there are findings in the safety review required by the AEA or findings in the NEPA environmental analysis that would lead the NRC to reject a license renewal

application, the NRC does not have a role in the energy-planning decisions as to whether a particular nuclear power plant should continue to operate.

Ultimately, the appropriate energy-planning decision makers and STPNOC will decide whether the plant will continue to operate based on factors such as the need for power or other factors within the state's jurisdiction or the purview of the owners.

NRC EVALUATION OF ALTERNATIVES:

Section 102(2)(C)(iii) of NEPA and the NRC's regulations in 10 CFR Part 51 require the consideration of alternatives to the proposed action in the EIS. Consistent with these requirements, in license renewal environmental reviews, the NRC considers the environmental consequences of the proposed action (i.e., renewing the operating license), the environmental consequences of the no-action alternative (i.e., not renewing the operating license), and the environmental consequences of various alternatives for replacing the nuclear power plant's generating capacity. Specifically, the proposed action is the issuance of renewed operating licenses for STP, which will authorize the applicant to operate the plant for an additional 20-year period beyond the expiration dates of the current licenses. Chapter 8, "Environmental Impacts of Alternatives," of the FSEIS presents the NRC staff's evaluation and analysis of alternatives to license renewal.

i. *No-Action Alternative*

The no-action alternative refers to a scenario in which the NRC decides not to renew the operating licenses for STP and the licenses expire at the end of their current terms: 2027, for Unit 1 and 2028, for Unit 2. The environmental consequences of this alternative are the direct impacts from nuclear power plant shut down. After shut down, the nuclear plant operators will initiate decommissioning in accordance with 10 CFR 50.82. As described in Chapter 7 of the FSEIS, the separate environmental impacts from decommissioning and related activities are addressed in several other NRC documents.

Assuming that a need currently exists for the power generated by STP, the no-action alternative would require the appropriate energy-planning decision makers (not the NRC) to rely on alternatives to replace the capacity of STP, to rely on energy conservation or power purchases to offset the STP capacity, or to rely on some combination of measures to offset and replace the generation provided by the facility. Therefore, the no-action alternative does not satisfy the purpose and need for the FSEIS, as it neither provides power-generation capacity nor meets the needs currently met by STP or that the alternatives evaluated in detail would satisfy.

ii. *Alternative Energy Sources*

In evaluating alternatives to license renewal, the NRC considered energy technologies or options currently in commercial operation, as well as technologies not currently in commercial operation but likely to be commercially available by the time the current STP operating licenses expire. The current operating licenses for STP reactors will expire on August 20, 2027, (Unit 1) and December 15, 2028, (Unit 2), and, therefore, to be considered in this evaluation, reasonable alternatives must be available (i.e., constructed, permitted, and connected to the grid) by the time of license expiration.

To determine whether alternatives were reasonable, or likely to be commercially available by 2027, the NRC staff reviewed energy relevant statutes, regulations, and policies; the state of technologies; and information on energy outlook from sources such as the Energy Information Administration, other organizations within the U.S. Department of Energy, the EPA, industry sources and publications, and information submitted by STPNOC in its environmental report. The NRC staff also considered the generation capacity mix and electricity production data within the Electric Reliability Council of Texas (ERCOT) service area, in which STP is located. Within ERCOT, the generation capacity mix includes natural gas, coal, wind, nuclear, and other sources.

The NRC staff initially considered 18 alternatives or options to the license renewal of STP; 13 of these were dismissed or eliminated from detailed study because of technical, resource availability, or commercial limitations that currently exist and that the NRC staff believes are likely to continue to exist when the existing STP licenses expire, rendering these alternatives not feasible or commercially viable.

Alternatives considered, but dismissed, were:

- Offsite Nuclear-, Gas-, and Coal-Fired Capacity
- Energy Conservation and Energy Efficiency
- Wind Power
- Solar Power
- Hydroelectric Power
- Wave and Ocean Energy
- Geothermal Power
- Municipal Solid Waste
- Biomass
- Biofuels
- Oil-Fired Power
- Fuel Cells
- Delayed Retirement.

Each alternative eliminated from detailed study and the basis for its removal is provided in Section 8.6 of the FSEIS.

The NRC staff determined that five alternatives would be feasible and commercially viable replacement power alternatives, including:

- New Nuclear Generation
- Natural Gas-Fired Combined-Cycle Generation (NGCC)
- Supercritical Coal-Fired Generation (SCPC)
- Combination Alternative of NGCC, Wind Power, and Energy Conservation and Efficiency
- Purchased Power.

For these five alternatives considered in depth, the NRC staff evaluated the environmental impacts across the following impact categories: air quality; surface water resources; groundwater resources; aquatic ecology; terrestrial ecology; human health; land use; socioeconomics; transportation; aesthetics; historic and archaeological resources; environmental justice; and waste management. This section provides a summary of the

environmental impacts of each of the alternatives considered in depth, and compares those impacts to the environmental impacts of license renewal.

New Nuclear Alternative

For the new nuclear generation alternative, the NRC staff assumed a light-water reactor such as the Advanced Boiling Water Reactor (ABWR) similar to what the NRC staff analyzed in its environmental analysis for the proposed STP, Units 3 and 4. The FSEIS incorporates the results from the final EIS for combined licenses for STP, Units 3 and 4 (ADAMS Accession Nos. ML11049A000 and ML11049A001) because it provides a site-specific analysis of new nuclear plants at the STP site. Thus, in its analysis, the NRC staff assumed that two new reactors would be installed on the STP site, allowing for the maximum use of existing ancillary facilities (e.g., transmission lines and cooling systems). Based on the analysis for STP, Units 3 and 4, the NRC staff estimated that 540 acres (ac) (219 hectares (ha)) of land would be required for the two new reactors. Water use would be similar to that of STP, Units 1 and 2. The NRC staff determined that the impacts to all resource areas would be SMALL, except for Socioeconomics and Transportation. Socioeconomic impacts in communities near the STP site could range from SMALL to LARGE based on the estimated number of workers employed and regional effects. Traffic-related transportation impacts during construction could range from MODERATE to LARGE primarily from workers commuting to the STP site and transportation of materials and equipment to the plant site.

NGCC Alternative

For the NGCC alternative, the NRC staff examined NGCC-generation built at the STP site because NGCC can operate with high thermal efficiency (approximately 60 percent for some units) and is capable of economically providing baseload power. Therefore, NGCC generation was considered a reasonable alternative to STP license renewal. To replace the 2,500 MWe power that STP generates, the NRC staff evaluated four gas-fired units, each with a net capacity of 640 MWe. Approximately 312 ac (126 ha) of land would be needed to support an NGCC alternative to replace STP, including land for a new 2-mile (mi) (3-kilometer (km)) pipeline. Facility operations would require much less cooling water than STP and consumptive water use would be much less. The NRC staff determined that the impacts to most resource areas would be SMALL, except for Air Quality, Land Use, Socioeconomics, and Transportation. Air quality impacts would be SMALL to MODERATE based on noticeable increases in greenhouse gas emissions. Overall land-use impacts could range from SMALL to MODERATE, considering the additional offsite land needed for new gas pipeline infrastructure and gas well and collection station development. Socioeconomic impacts in communities near the STP site could range from SMALL to MODERATE based on the estimated number of workers employed and regional effects. Traffic-related transportation impacts during construction could range from SMALL to MODERATE primarily from workers commuting to the STP site and transportation of materials and equipment to the plant site.

SCPC Alternative

For the SCPC alternative, the NRC staff considered new coal-fired plants to be reasonable alternative to STP license renewal as the Texas Commission on Environmental Quality (TCEQ) has granted permits to several proposed coal-fired plants, despite regulatory efforts and concerns to limit greenhouse gas emissions. To replace the 2,500 MWe of power that STP generates, the NRC staff evaluated four coal-fired units, each with a net capacity of 640 MWe. Facility construction would require 353 ac (143 ha) of land with an additional 200 ac (81 ha) of

land area needed for onsite waste disposal; land would also be required on site for frequent coal and limestone deliveries by rail or barge. Operational cooling water demands would be similar to those of STP. The NRC staff determined that the impacts to most resource areas would be SMALL, except for Air Quality, Terrestrial Resources, Land Use, Socioeconomics, Transportation, and Waste Management. Air quality impacts would be MODERATE based on noticeable increases in air pollutants. Because of the potential for habitat disturbance and potential pollutant deposition, impacts to terrestrial resources would be MODERATE. Overall land-use impacts would be MODERATE since onsite land at the STP site would be converted for coal and limestone delivery and waste disposal. Socioeconomic impacts in communities near the STP site could range from SMALL to MODERATE based on the estimated number of workers and regional effects. Traffic-related transportation impacts during construction could range from MODERATE to LARGE primarily from workers commuting to the STP site and transportation of materials and equipment to the plant site.

Combination Alternative

For the combination alternative, the NRC staff evaluated a mix of replacement power technologies including 640 MWe supplied by one NGCC unit at STP, 1,620 MWe supplied by wind energy projects, and 300 MWe of energy conservation and efficiency (also known as demand-side management). Because wind is an intermittent resource, the NRC staff assumed wind energy projects would be interconnected on the transmission grid, and the NGCC unit could be used, if needed, to provide baseload generation capacity. The impacts for the combination alternative would be SMALL for surface water, ground water, human health, and waste management. For Air Quality, the impacts would range from SMALL to MODERATE, primarily due to noticeable increases in greenhouse gas emissions. Because of potential habitat disturbance and noticeable impacts on aquatic organisms during construction and operation of offshore wind projects, impacts on aquatic resources would be SMALL to MODERATE. Impacts on terrestrial resources would be MODERATE as wind energy projects and construction of new transmission lines could have a noticeable impact on avian and bat communities because wind energy projects in the Trans-Gulf migratory route could result in increased mortality of migratory and resident birds and bats. Land use impacts would range from SMALL to MODERATE because the wind energy portion of this combination alternative would require a substantial amount of open land, although only a small portion would be used directly. Socioeconomic impacts during operations could range from SMALL to MODERATE as the STP site transitions to the new, single-unit NGCC power plant. Traffic-related transportation impacts during construction could range from SMALL to MODERATE depending on the location of the wind energy sites, road capacities, and traffic volumes. Depending on their location and surrounding viewsheds, the aesthetic impacts from the wind energy projects could be MODERATE to LARGE. Depending on the historical and cultural resource richness of the site chosen for the wind energy projects, the impacts could be SMALL to MODERATE.

Purchased Power Alternative

For the purchased power alternative, the FSEIS assumes STPNOC would purchase 2,500 MWe of electricity from other power generators. No new generating capacity would be built and operated by STPNOC. Purchased power is a reasonable alternative, as listed in the FSEIS, for the following reasons:

- A wholesale electricity market currently exists in the ERCOT region.
- ERCOT implements rules to anticipate and meet electricity demands and promote competition among electricity suppliers.

- Most of ERCOT's retail customers can choose a supplier to purchase electricity.

The impacts associated with purchased power are bounded by the impacts of the purchased energy mix, ranging from new nuclear to wind. Construction impacts would be similar to those described in the analyses for the new nuclear, NGCC, SCPC, and combination alternatives, respectively. For example, impacts to (a) aquatic and terrestrial resources and (b) historical and cultural resources are likely to be greater due to land clearing of previously undisturbed areas associated with construction. For operation, impacts of existing coal- and natural gas-fired plants would likely be greater than the operations of new plants because older plants are likely to be less efficient and lacking modern emission controls.

iii. *Summary*

In the November 2013 STP FSEIS, the NRC staff considered the environmental impacts associated with license renewal and with alternatives to license renewal, including other methods of power generation and not renewing the STP operating licenses (the no-action alternative). The STP FSEIS concludes that the continued operation of STP during the license renewal term would have SMALL environmental impacts in all areas, except for electric shock (human health) that has impacts of SMALL to MODERATE. The FSEIS concludes that the overall environmental impacts of renewal of the operating licenses for STP would either be similar to or smaller than those of the five feasible and commercially viable replacement power alternatives that were considered. The FSEIS also concludes that under the no-action alternative, the act of shutting down STP would have mostly SMALL impacts, although socioeconomic impacts would be SMALL to MODERATE. However, as a result of shutdown should the option of license renewal be denied, the no-action alternative necessitates the implementation of one or a combination of alternatives in order to make up for the loss of power generation, all of which have potentially greater impacts than the proposed action. Thus, the environmentally preferred alternative is the license renewal of STP.

CONSIDERATION OF COMMENTS ON THE FINAL SEIS AND EMERGING INFORMATION

Comments on the FSEIS

Following publication of the FSEIS, EPA Region 6 responded to the NRC by letter dated December 17, 2013 (ADAMS Accession No. ML14002A262), and stated that it had reviewed the FSEIS, including NRC's responses to EPA's comments (ADAMS Accession No. ML13071A059) on the draft SEIS (ADAMS Accession No. ML12324A049). Section A.2 of the FSEIS contains the NRC staff's responses to EPA's comments on the draft SEIS. The EPA observed that NRC's FSEIS included updated information on topics EPA previously commented on including threatened and endangered species and consultation with the U.S. Fish and Wildlife Service (FWS). The EPA specifically requested that the NRC finalize Endangered Species Act of 1973, as amended (ESA) Section 7 consultation and include the FWS concurrence in the ROD and further requested that the NRC not issue the ROD until Section 7 consultation was complete. On May 15, 2014, the NRC responded to this EPA comment (ADAMS Accession No. ML14111A442). As part of the consideration of emerging information following publication of the FSEIS, the NRC staff has documented its completion of Section 7 consultation responsibilities as described below.

The NRC received no other comments on the FSEIS from any source, including State or local agencies, other Federal agencies, Tribal governments, or other stakeholders such as members

of the public who requested direct distribution of the FSEIS. Nevertheless, the NRC staff also considered emerging information as part of its completion of the environmental review for the STP license renewal application as discussed below.

Updated Status of ESA Section 7 Consultation

In conjunction with reviewing the license renewal application, the NRC staff conducted consultations with the National Marine Fisheries Service (NMFS) and the FWS (collectively, “the Services”) pursuant to Section 7 of the ESA. Following issuance of the draft SEIS, the NRC staff submitted letters to the Services (ADAMS Accession Nos. ML12286A010 and ML12285A415) requesting the Services’ concurrence with the NRC’s determinations related to the effects of license renewal on federally listed species and habitats.

For species under the NMFS’s jurisdiction, the NRC staff concluded that there would be no effect on these species. The NMFS Southeast Regional Office stated in an e-mail dated January 29, 2013 (ADAMS Accession No. ML13036A306), that it does not typically concur with “no effect” determinations by the staff. Thus, no further consultation between the NRC and NMFS occurred related to the proposed license renewal.

For species under the FWS’s jurisdiction, the FWS Clear Lake Ecological Services Office contacted the NRC by phone in January 2013, to discuss NRC’s request for concurrence and to request additional maps of the transmission lines. The NRC provided the requested information via e-mail on January 31, 2013 (ADAMS Accession No. ML13036A305). On February 5, 2013, the FWS and the NRC staff spoke again by phone, and the FWS noted that it was preparing additional information requests that it would send the NRC. The FWS sent these requests as well as additional species-specific information in an e-mail dated March 14, 2013 (ADAMS Accession No. ML13077A117). The NRC updated its federally listed species and habitats effects analysis in the FSEIS as a result of the information provided in FWS’s March 14, 2013, e-mail. Following issuance of the FSEIS, the NRC renewed its request for the FWS’s concurrence with its ESA effect determinations in a letter dated December 2, 2013 (ADAMS Accession No. ML13177A041). The FWS provided its concurrence by letter dated March 28, 2014 (ADAMS Accession Nos. ML14087A234).

Since the NRC concluded its consultations with the Services, the staff has not identified any new information that would necessitate further consultation with either the NMFS or the FWS. Thus, the NRC has fulfilled its obligations under Section 7 of the ESA for the STP license renewal.

Final Rule for Continued Storage of Spent Nuclear Fuel

On August 26, 2014, the Commission approved a revised rule at 10 CFR 51.23 and associated “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel” (NUREG-2157, ADAMS Accession Nos. ML14196A105 and ML14196A107). Subsequently, on September 19, 2014, the NRC published the revised rule (79 FR 56238) and NUREG-2157 (79 FR 56263). The revised rule adopts the generic impact determinations made in NUREG-2157 and codifies the NRC’s generic determinations regarding the environmental impacts of continued storage of spent nuclear fuel beyond a reactor’s operating license (i.e., those impacts that could occur as a result of the storage of spent nuclear fuel at at-reactor or away-from reactor sites after a reactor’s licensed operating life and until a permanent repository becomes available). As directed by 10 CFR 51.23(b), the impacts assessed in NUREG-2157 regarding continued storage were deemed incorporated into the STP FSEIS for a license renewal

application. The Continued Storage Rule (formerly known as Waste Confidence) and accompanying technical analyses were being developed as the STP FSEIS was being prepared for publication. Therefore, the STP FSEIS further indicated that the NRC staff would address any impacts from the revised rule by performing any appropriate additional NEPA review before the NRC makes a final licensing decision.

In the Commission Memorandum and Order CLI-14-08 (ADAMS Accession No. ML14238A242), the Commission held that the revised 10 CFR 51.23 and associated NUREG-2157 cure the deficiencies identified by the court and stated that the rule satisfies the NRC's NEPA obligations with respect to continued storage for initial, renewed, and amended licenses for reactors. Therefore, the November 2013, STP FSEIS, which by rule now incorporates the impact determinations in NUREG-2157 regarding continued storage, contains an analysis for the generic issues of "Onsite storage of spent nuclear fuel" and "Offsite radiological impacts of spent nuclear fuel and high-level waste disposal" that satisfies NEPA. As the Commission noted in CLI-14-08, the NRC staff must account for these environmental impacts before finalizing its licensing decision in this proceeding. To account for these impact determinations, the NRC staff analyzed whether the revised rule at 10 CFR 51.23 and the associated NUREG-2157 present new and significant information such that a supplement to the STP FSEIS is required in accordance with 10 CFR 51.92(a).

As detailed in the NRC staff's evaluation (ADAMS Accession No. ML15190A042), NUREG-2157 and the revised rule do not constitute new and significant information because they do not present a "seriously different picture" of the environmental impacts of the proposed action (license renewal) as compared to the impacts analysis presented in the STP FSEIS. By virtue of revised 10 CFR 51.23, the STP FSEIS incorporates the impact determinations in NUREG-2157 regarding continued storage such that there is a complete analysis of the environmental impacts associated with spent fuel storage beyond the licensed life for reactor operations and prior to disposal in a geologic repository.

The NRC staff also considered whether the revised rule and NUREG-2157 altered the NRC staff's recommendation in the STP FSEIS that the adverse environmental impacts of license renewal for STP are not great enough to deny the option of license renewal for energy planning decision-makers.

As described in the NRC staff's evaluation (ADAMS Accession No. ML15190A042), NUREG-2157 analyzes continued storage of spent fuel at-reactor and away-from-reactor sites during three timeframes: the short-term timeframe (60 years beyond the licensed life of a reactor), the long-term timeframe (an additional 100 years after the short-term timeframe), and an indefinite timeframe. The analysis in NUREG-2157 supports the conclusion that the most likely impacts of continued storage are those discussed for at-reactor storage. For continued at-reactor storage, impacts in the short-term timeframe would be SMALL. Over the longer timeframes, impacts to certain resource areas would be a range (for historic and cultural resources during both the long-term and indefinite timeframes the range is SMALL to LARGE and for nonradioactive waste during the indefinite timeframe the range is SMALL to MODERATE). In NUREG-2157, the NRC stated that disposal of the spent fuel before the end of the short-term timeframe is most likely. There are inherent uncertainties in determining impacts for the long-term and indefinite timeframes, and, with respect to some resource areas, those uncertainties could result in impacts that, although less likely, could be larger than those that are to be expected at most sites and have therefore been presented as ranges rather than as a single impact level. Those uncertainties exist, however, regardless of whether the impacts are analyzed generically or site-specifically. As a result, these impact ranges provide

correspondingly more limited insights to the decision-maker in the overall picture of the environmental impacts from the proposed action (i.e., license renewal).

The NRC staff concludes that when weighed against the array of other fuel cycle impacts presented in Section 6.1 of the STP FSEIS, and the more-likely impacts of continued storage during the short-term timeframe in NUREG-2157, which are SMALL, the uncertainties associated with the impact ranges for the long-term and indefinite timeframes also do not present a seriously different picture of the direct, indirect, and cumulative environmental impacts compared to the NRC staff's analysis of the impacts from issuance of renewed operating licenses for STP attributable to the uranium fuel cycle and waste management (which includes the impacts associated with spent fuel storage).

In consideration of this information, the NRC staff concludes that the revised rule and the impact determinations related to continued storage in NUREG-2157 do not alter the NRC staff's recommendation in the STP FSEIS that the adverse environmental impacts of license renewal for STP are not great enough to deny the option of license renewal for energy planning decision-makers.

New Information on Greenhouse Gas Emissions and Climate Change

On November 3, 2009, the Commission directed (CLI-09-21)⁶ the NRC staff "to include consideration of carbon dioxide and other greenhouse gas emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act." In order to comply with the Commission's direction in CLI-09-21, the NRC staff considered greenhouse gas (GHG) emissions from the nuclear lifecycle and fossil and renewable energy sources in Chapter 6 of the STP FSEIS. Chapter 4 of the STP FSEIS considers climate change impacts on affected resources during the license renewal term.

Following publication of the STP FSEIS in November 2013, the NRC staff conducted a new and significant climate change information review following publication of the U.S. Global Change Research Program's (USGCRP) Third National Climate Assessment report in May 2014. The USGCRP integrates and presents the prevailing consensus of Federal research on U.S. climate change, as sponsored by thirteen federal agencies. The NRC uses consensus information from the USGCRP to evaluate the effects of climate change in its environmental impact statements (EISs) for license renewal of nuclear power plants.

The staff's detailed analysis of potential new and significant information contained in the USGCRP's Third National Climate Assessment is documented in a memorandum to file (ADAMS Accession No. ML16334A400). In summary, in its analysis, the NRC staff identified, reviewed, and evaluated new information on climate change and related impacts presented in the USGCRP's 2014 report as related to land use, air quality, water resources, aquatic resources, terrestrial resources, human health, socioeconomics, and historic and archaeological resources. The evaluation did not identify new and significant information that would change the conclusions in the STP FSEIS. Therefore, with the completion of the climate change analysis by the NRC staff (ADAMS Accession No. ML61334A400), which is incorporated by reference herein, the NRC has determined that the FSEIS for the STP license renewal

⁶ *Duke Energy Carolinas, LLC* (Combined License Application for William States Lee III Nuclear Station, Units 1 and 2) and *Tennessee Valley Authority* (Bellefonte Nuclear Power Plant, Units 3 and 4), CLI-09-21 (ML093070689, NRC November 3, 2009).

application provides sufficient information on GHG emissions and climate change to inform its decision and that no further NEPA analysis is necessary.

Sensitivity Analyses for Severe Accident Mitigation Management

On May 4, 2016, the Commission issued a decision, CLI-16-07 (ADAMS Accession No. ML16125A150), in the Indian Point Nuclear Generating Units 2 and 3 license renewal proceeding stating that documentation was lacking for two inputs (TIMDEC and CDNFRM) that are part of the severe accident mitigation alternative (SAMA) analysis. The decision stated that uncertainties in these input values could potentially affect the SAMA analysis cost-benefit conclusions and directed the NRC staff to perform additional sensitivity analyses using values specified by the Commission. Based on this Commission decision, the NRC staff determined that additional sensitivity analyses using the values specified by the Commission should also be performed in support of the STP SAMA analysis that is provided at Appendix F of the STP license renewal FSEIS.

In response to an NRC staff request for additional information (ADAMS Accession No. ML16187A052) relating to CLI-16-07, STPNOC performed a SAMA sensitivity analysis for STP using the values specified by the Commission (ADAMS Accession No. ML16278A661) and determined that the potential SAMAs, provided in Table F.6-1 of the STP environmental report (ADAMS Accession No. ML103010263) did not change. The NRC staff evaluated STP's SAMA sensitivity analysis and concluded that no new SAMA candidates were identified as potentially cost-beneficial based on this additional analysis. Therefore, there are no changes to the conclusions of the NRC staff's STP SAMA analysis provided at Appendix F of the STP FSEIS.

Annual Updates to the STP License Renewal Application

As required by 10 CFR 54.21(b), each year following submittal of a license renewal application, an amendment to the application must be submitted by the license renewal applicant that identifies any change to the current licensing basis that materially affects the contents of the application, including the Updated Final Safety Analysis Report (UFSAR) supplement. The NRC staff's review of STPNOC's submittals for 2014, 2015, and 2016, (ADAMS Accession Nos. ML14308A073, ML15313A175, and ML16190A135) found no new and significant information within the context of 10 CFR 51.92(a)(2) that would change STPNOC's environmental report or that would otherwise change the NRC staff's environmental impact determinations as presented in the STP FSEIS.

In addition, on April 25, 2017, STPNOC submitted an update to the environmental report portion of its license renewal application comprising a revised summary of environmental authorizations for current STP operations (ADAMS Accession No. ML17116A324). Based on its review, the NRC staff finds that STPNOC continues to maintain valid permits and related environmental authorizations governing its operations and that the submittal does not constitute new and significant information regarding STP's affected environment or operations.

MITIGATION MEASURES

The NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the proposed action (license renewal). The FSEIS concludes that the continued operation of STP would have SMALL environmental impacts in all resources areas, except for electric shock, which is SMALL to MODERATE. Pursuant to 10 CFR 51.45(c), STPNOC has separately considered mitigation measures to reduce or avoid adverse impacts of

electric shock from its transmission lines at STP with a combination of options, as described in Section 4.8.4 of the STP FSEIS.

The NRC is not imposing any license conditions in connection with mitigation measures for the continued operation of STP. However, STP is subject to requirements imposed by other Federal, State, and local agencies. For example, the TCEQ-issued Texas Pollutant Discharge Elimination System (TPDES) permits issued to STPNOC imposes effluent limitations and monitoring requirements as well as best management practices to ensure that impacts to water quality and aquatic life are minimized. The NRC is not requiring any new environmental monitoring programs outside what is required for the TPDES permits or otherwise required of the licensee under NRC's regulations, as described in the STP FSEIS.

DETERMINATION:

Based on the NRC staff's independent review, analysis, and evaluation contained in the license renewal FSEIS; careful consideration of all of the identified social, economic, and environmental factors, and input received from other agencies, organizations, and the public; and consideration of mitigation measure outlined above, the NRC has determined that the requirements of Section 102 of NEPA and 10 CFR 54.29(b) have been satisfied.

Dated at Rockville, Maryland, this 19th day of September, 2017,

For the Nuclear Regulatory Commission.

Joseph E. Donoghue, Deputy Director,
Division of License Renewal.
Office of Nuclear Reactor Regulation.

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