

9.0 Summary and Conclusions

By letter dated February 29, 2000, Southern Nuclear Operating Company (SNC) submitted an application to the NRC to renew the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2 operating licenses (OLs) for an additional 20-year period (SNC 2000). If the OLs are renewed, Federal (other than NRC) decisionmakers, State regulatory agencies, and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, the units will be shut down at or before the expiration of the current OLs, which are August 6, 2014, for Unit 1, and June 13, 2018, for Unit 2.

Under the National Environmental Policy Act (NEPA) (42 USC 4321-4370d), an environmental impact statement (EIS) is required for major Federal actions significantly affecting the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437 (NRC 1996; 1999).^(a)

Upon acceptance of the SNC application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping (65 FR 19797). The staff visited the HNP site on May 10 and 11, 2000, and held public scoping meetings on May 10, 2000, in Vidalia, Georgia (NRC 2000a). The staff reviewed the SNC Environmental Report (ER; SNC 2000) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000b).

This draft of the supplemental environmental impact statement (SEIS) is being published for public comment and contains the preliminary results of the staff's evaluation and recommendation. The staff will hold two public meetings during the comment period for this report in December 2000. When the comment period ends, the staff will consider and dispose of all of the comments received. These comments will be discussed in Appendix A of the final report.

This draft SEIS presents the staff's analysis of the environmental impacts of renewal of the HNP OLs. The analysis considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. All references to the "GEIS" include the GEIS and its Addendum 1.

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1 available for reducing or avoiding adverse impacts. It also includes the staff's preliminary
2 recommendation regarding the proposed action.

3
4 The Commission has adopted the following statement of purpose and need for license renewal
5 from the GEIS:

6
7 The purpose and need for the proposed action (renewal of an operating license) is to
8 provide an option that allows for power generation capability beyond the term of a
9 current nuclear power plant operating license to meet future system generating needs,
10 as such needs may be determined by State, utility, and, where authorized, Federal
11 (other than NRC) decision makers.

12
13 The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is
14 to determine:

15
16 ... whether or not the adverse environmental impacts of license renewal are so great
17 that preserving the option of license renewal for energy planning decisionmakers would
18 be unreasonable.

19
20 Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that
21 there are factors, in addition to license renewal, that will ultimately determine whether an
22 existing nuclear power plant continues to operate beyond the period of the current OLS.

23
24 NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of
25 SEISs prepared at the license renewal stage:

26
27 The supplemental environmental impact statement for license renewal is not required to
28 include discussion of need for power or the economic costs and economic benefits of the
29 proposed action or of alternatives to the proposed action except insofar as such benefits
30 and costs are either essential for a determination regarding the inclusion of an alternative in
31 the range of alternatives considered or relevant to mitigation. In addition, the supplemental
32 environmental impact statement prepared at the license renewal stage need not discuss
33 other issues not related to the environmental effects of the proposed action and the
34 alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the
35 generic determination in § 51.23(a) ["Temporary storage of spent fuel after cessation of
36 reactor operations—generic determination of no significant environmental impact"] and in
37 accordance with § 51.23(b).^(a)

(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations—generic determination of no significant environmental impact."

1 The GEIS contains the results of a systematic evaluation of the consequences of renewing an
2 operating license and operating a nuclear power plant for an additional 20 years. It evaluates
3 92 environmental issues using the following three-level standard of significance—SMALL,
4 MODERATE, or LARGE—based on Council on Environmental Quality guidelines.

5
6 SMALL: Environmental effects are not detectable or are so minor that they will neither
7 destabilize nor noticeably alter any important attribute of the resource.

8
9 MODERATE: Environmental effects are sufficient to alter noticeably, but not to
10 destabilize, important attributes of the resource.

11
12 LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize
13 important attributes of the resource.

14
15 For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:

- 16
17 (1) The environmental impacts associated with the issue have been determined to apply either
18 to all plants or, for some issues, to plants having a specific type of cooling system or other
19 plant or site characteristics.
20
21 (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the
22 impacts (except for collective offsite radiological impacts from the fuel cycle and from
23 high-level waste and spent fuel disposal).
24
25 (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis,
26 and it has been determined that additional plant-specific mitigation measures are likely not
27 to be sufficiently beneficial to warrant implementation.
28

29 These 69 issues were identified in the GEIS as Category 1 issues. In the absence of significant
30 new information, the staff relied on conclusions as amplified by supporting information in the
31 GEIS for issues designated Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.

32
33 Of the 23 issues not meeting the criteria set forth above, 21 are classified as Category 2 issues
34 requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues,
35 environmental justice and chronic effects of electromagnetic fields, were not categorized.
36 Environmental justice was not evaluated on a generic basis and must also be addressed in a
37 plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic
38 fields was not conclusive at the time the GEIS was prepared.
39

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1 This draft SEIS documents the staff's evaluation of all 92 environmental issues considered in
2 the GEIS. The staff considered the environmental impacts associated with alternatives to
3 license renewal and compared the environmental impacts of license renewal and the
4 alternatives. The alternatives to license renewal that were considered include the no-action
5 alternative (not renewing the HNP OLS) and alternative methods of power generation. Among
6 the alternative methods of power generation, coal-fired and gas-fired generation appear to be
7 the most likely if the power from HNP is replaced. These alternatives are evaluated assuming
8 that the replacement power generation plant is located at either the HNP site or an unspecified
9 "greenfield" site.

11 **9.1 Environmental Impacts of the Proposed Action—** 12 **License Renewal**

13
14 SNC and the staff have established independent processes for identifying and evaluating the
15 significance of any new information on the environmental impacts of license renewal. Neither
16 SNC nor the staff has identified any significant new information related to Category 1 issues
17 that would call into question the conclusions in the GEIS. Therefore, the staff relies upon the
18 conclusions of the GEIS for all 69 Category 1 issues.

19
20 Similarly, neither SNC nor the staff has identified any new issue applicable to HNP that has a
21 significant environmental impact.

22
23 SNC's license renewal application presents analyses of the Category 2 issues. The staff has
24 reviewed the SNC analysis for each issue and has conducted an independent review of each
25 issue. Five Category 2 issues are not applicable because they are related to plant design
26 features or site characteristics not found at HNP. Four Category 2 issues are not discussed in
27 this draft SEIS because they are specifically related to refurbishment. SNC (SNC 2000) has
28 stated that their evaluation of structures and components as required by 10 CFR 54.21 did not
29 identify any major plant refurbishment activities or modifications as necessary to support the
30 continued operation of HNP beyond the end of the existing operating licenses. In addition, any
31 replacement of components or additional inspection activities are within the bounds of normal
32 plant component replacement and therefore are not expected to affect the environment outside
33 of the bounds of the plant operations evaluated in the final environmental statements
34 (AEC 1972; NRC 1978) for HNP.

35
36 Twelve Category 2 issues, as well as environmental justice and chronic effects of electro-
37 magnetic fields, are discussed in detail in this draft SEIS. Five of the Category 2 issues apply
38 to both refurbishment and to operation during the renewal term and are only discussed in this
39 draft SEIS in relation to operation during the renewal term. For all 12 Category 2 issues and

1 environmental justice, the staff concludes that the potential environmental effects are of SMALL
2 significance in the context of the standards set forth in the GEIS. In addition, the staff
3 concluded that a consensus has not been reached by appropriate Federal health agencies that
4 there are adverse effects from electromagnetic fields. Therefore, no further evaluation of this
5 issue is required. For severe accident mitigation alternatives (SAMAs), it is the staff's
6 preliminary conclusion that a reasonable, comprehensive effort was made to identify and
7 evaluate SAMAs and that none of the candidate SAMAs are cost-beneficial.

8
9 Mitigation measures were considered for each Category 2 issue. Current measures to mitigate
10 environmental impacts of plant operation were found to be adequate, and no additional
11 mitigation measures were deemed sufficiently beneficial to be warranted.

12
13 The following subsections discuss unavoidable adverse impacts, irreversible or irretrievable
14 commitments of resources, and the relationship between local short-term use of the
15 environment and long-term productivity.

16 17 **9.1.1 Unavoidable Adverse Impacts**

18
19 An environmental review conducted at the license renewal stage differs from the review
20 conducted in support of a construction permit because the plant is in existence at the license
21 renewal stage and has operated for a number of years. As a result, adverse impacts associat-
22 ed with the initial construction have been avoided, have been mitigated, or have occurred. The
23 environmental impacts to be evaluated for license renewal are those associated with refurbish-
24 ment and continued operation during the renewal term.

25
26 The adverse impacts identified are considered to be of SMALL significance, and none warrants
27 implementation of additional mitigation measures. The adverse impacts of likely alternatives in
28 the event that HNP ceases operation at or before the expiration of the current operating license
29 will not be smaller than those associated with continued operation of HNP, and they may be
30 greater for some impact categories in some locations.

31 32 **9.1.2 Irreversible or Irretrievable Resource Commitments**

33
34 The commitment of resources related to construction and operation of HNP during its current
35 license period was made when the plant was built. The resource commitments to be
36 considered in this draft SEIS are associated with continued operation of the plant for an
37 additional 20 years. These resources include materials and equipment required for plant
38 maintenance and operation, the nuclear fuel used by the reactors, and, ultimately, permanent
39 offsite storage space for the spent fuel assemblies.

40

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1 The most significant resource commitments related to operation during the renewal term are
2 the fuel and the permanent storage space. HNP replaces approximately 250 fuel assemblies
3 annually. Assuming no change in use rate, about 5,000 spent fuel assemblies would be
4 required for operation during a 20-year license renewal period.

5
6 The likely power generation alternatives in the event HNP ceases operation on or before the
7 expiration of the current OLS will require a commitment of resources for construction of the
8 replacement plants as well as for fuel to run the plants.

9 10 **9.1.3 Short-Term Use Versus Long-Term Productivity**

11
12 An initial balance between short-term use and long-term productivity of the environment at the
13 HNP site was set when the plants were approved and construction began. That balance is now
14 well established. Renewal of the HNP OLS and continued operation of the plants will not alter
15 the existing balance, but it may postpone the availability of the site for other uses. Denial of the
16 application to renew the OLS will lead to shutdown of the plants and will alter the balance in a
17 manner that depends on subsequent uses of the site. For example, the environmental
18 consequences of turning the HNP site into a park or an industrial facility are quite different.

19 20 **9.2 Relative Significance of the Environmental Impacts of** 21 **License Renewal and Alternatives**

22
23 The proposed action is renewal of the OLS for HNP Units 1 and 2. Chapter 2 describes HNP
24 and the environment in the vicinity of the plant. Chapters 4 through 7 discuss environmental
25 issues associated with renewal of the OLS. Environmental issues associated with the no-action
26 alternative, and alternatives involving power generation are discussed in Chapter 8.

27
28 The significance of the environmental impacts from the proposed action (approval of the
29 application for renewal of the OLS), the no-action alternative (denial of the application),
30 alternatives involving coal and gas-fired generation of power at the HNP site and an unspecified
31 "greenfield site," and a combination of alternatives are compared in Table 9-1. Continued use
32 of the HNP cooling-tower-based heat dissipation cooling system is assumed for Table 9-1.
33 Substitution of a once-through cooling for the closed-cycle cooling system in the evaluation of
34 the coal-fired and gas-fired generation alternatives would result in somewhat greater
35 environmental impacts in some impact categories.

36
37 Table 9-1 shows that the significance of the environmental effects of the proposed action are
38 SMALL for all impact categories. The alternative actions, including the no-action alternative,
39 may have environmental effects in at least some impact categories that reach MODERATE or
40 LARGE significance.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation (Including a Combination of Alternatives) Assuming a Closed-Cycle Cooling System

Impact Category	Proposed Action	No-Action Alternative	Coal-Fired Generation		Gas-Fired Generation		Combination	
	License Renewal	Denial of Renewal	HNP Site	Greenfield Site	HNP Site	Greenfield Site	HNP Site	Greenfield Site
Land Use	SMALL	SMALL	MODERATE	MODERATE to LARGE	MODERATE	MODERATE	MODERATE	MODERATE
Ecology	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	SMALL	SMALL to MODERATE
Water Quality — Surface Water	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Water Quality — Groundwater	SMALL	SMALL	SMALL	SMALL to LARGE	SMALL	SMALL to LARGE	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	MODERATE	MODERATE	SMALL to MODERATE	SMALL to MODERATE
Waste	SMALL	SMALL	MODERATE	MODERATE	SMALL	SMALL	SMALL	SMALL
Human Health	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE	MODERATE to LARGE	MODERATE	MODERATE to LARGE
Aesthetics	SMALL	SMALL	SMALL To MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Historic and Archaeological Resources	SMALL	SMALL to LARGE	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Environmental Justice	SMALL	MODERATE to LARGE	MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	SMALL to MODERATE

9.3 Staff Conclusions and Recommendations

The staff's preliminary recommendation is that the Commission determine that the adverse environmental impacts of license renewal for HNP, Units 1 and 2, are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants* (GEIS), NUREG-1437, (NRC 1996; 1999); (2) the ER submitted by SNC (SNC 2000); (3) consultation with other Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments.

9.4 References

10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51.20, "Criteria for and identification of licensing and regulatory actions requiring environmental impact statements."

10 CFR 51.23, "Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR Part 51, Subpart A, Appendix B, "Environmental effect of renewing the operating license of a nuclear power plant."

10 CFR 54.21, "Contents of application—technical information."

65 FR 19797, "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process." April 12, 2000.

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Southern Nuclear Operating Company (SNC). 2000. *Application for License Renewal for the Edwin I. Hatch Nuclear Plant Units 1 and 2. Appendix D, Applicant's Environmental Report—Operating License Renewal Stage Edwin I. Hatch Nuclear Plant.*

1 U.S. Atomic Energy Commission (AEC). 1972. *Final Environmental Statement for the Edwin I.*
2 *Hatch Nuclear Plant Units 1 and 2.* Washington, D.C.

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4 U.S. Nuclear Regulatory Commission (NRC). 1978. *Final Environmental Statement related to*
5 *Operation of Edwin I. Hatch Nuclear Plant Unit No. 2. Georgia Power Company.* Docket No.
6 50-366, NUREG-0417, Office of Nuclear Reactor Regulation, Washington, D.C.

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8 U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement*
9 *for License Renewal of Nuclear Plants (GEIS).* NUREG-1437, Washington, D.C.

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11 U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement*
12 *for License Renewal of Nuclear Plants, Main Report, Section 6.3 - Transportation, Table 9.1,*
13 *Summary of findings on NEPA issues for license renewal of nuclear power plants.* NUREG-
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17 *Scoping Process: Summary Report - Hatch Nuclear Station, Units 1 and 2, Appling County,*
18 *Georgia.* Washington, D. C. August 23, 2000

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20 U.S. Nuclear Regulatory Commission (NRC). 2000b. *Standard Review Plans for*
21 *Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal,*
22 NUREG-1555, Supplement 1. Washington, D.C.