

# Abstract

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2  
3  
4 The U.S. Nuclear Regulatory Commission (NRC) considered the environmental effects of  
5 renewing nuclear power plant operating licenses for a 20-year period in the *Generic*  
6 *Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437,  
7 and codified the results in 10 CFR Part 51. The GEIS (and its Addendum 1) identifies  
8 92 environmental issues and reaches generic conclusions related to environmental impacts for  
9 69 of these issues that apply to all plants or to plants with specific design or site characteristics.  
10 Additional plant-specific review is required for the remaining issues. These plant-specific  
11 reviews are to be included in a supplement to the GEIS.

12  
13 This draft supplemental environmental impact statement (SEIS) has been prepared in response  
14 to an application submitted to the NRC by Southern Nuclear Operating Company (SNC) to  
15 renew the operating licenses (OLs) for Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2, for  
16 an additional 20 years under 10 CFR Part 54. This draft SEIS includes the staff's analysis that  
17 considers and weighs the environmental effects of the proposed action, the environmental  
18 effects of alternatives to the proposed action, and alternatives available for reducing or avoiding  
19 adverse effects. It also includes the staff's preliminary recommendation regarding the proposed  
20 action.

21  
22 Neither SNC nor the staff has identified significant new information for any of the 69 issues for  
23 which the GEIS reached generic conclusions and which apply to HNP. Therefore, the staff  
24 concludes for these issues that the impacts of renewing the HNP OLs will not be greater than  
25 impacts identified in the GEIS for these issues. For each of these issues, the GEIS conclusion  
26 is that the impact is of SMALL significance (except for collective offsite radiological impacts  
27 from the fuel cycle, high-level waste and spent fuel, which were not assigned a single  
28 significance level) and that additional mitigation measures are likely not to be sufficiently  
29 beneficial to be warranted.

30  
31 Each of the remaining 23 issues that applies to HNP is addressed in this draft SEIS. For each  
32 applicable issue, the staff concludes that the significance of the potential environmental effects  
33 of renewal of the OLs is SMALL. The staff has not identified any new issue applicable to HNP  
34 that has a significant environmental impact. The staff also concludes that additional mitigation  
35 measures are likely not to be sufficiently beneficial as to be warranted.

36  
37 The NRC staff's preliminary recommendation is that the Commission determine that the  
38 adverse environmental impacts of license renewal for HNP Units 1 and 2 are not so great that  
39 preserving the option of license renewal for energy-planning decisionmakers would be  
40 unreasonable. This preliminary recommendation is based on (1) the analysis and findings in  
41 the GEIS; (2) the Environmental Report submitted by SNC; (3) consultation with Federal, State,

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1 and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of  
2 public comments during the scoping process.  
3

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# Executive Summary

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

13  
14 Under the National Environmental Policy Act of 1969 (NEPA), an environmental impact  
15 statement (EIS) is required for major Federal actions that significantly affect the quality of the  
16 human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51. In  
17 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS  
18 for renewal of a reactor operating license; 10 CFR 51.95(c) states that the EIS prepared at the  
19 operating license renewal stage will be a supplement to the *Generic Environmental Impact*  
20 *Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437.<sup>(a)</sup>

21  
22 Upon acceptance of the SNC application, the NRC staff began the environmental review  
23 process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and to  
24 conduct scoping. The staff visited the HNP site in May 2000 and held public scoping meetings  
25 on May 10, 2000, in Vidalia, Georgia. The staff reviewed the SNC Environmental Report (ER)  
26 and compared it with the GEIS; consulted with Federal, State, and local agencies; conducted  
27 an independent review of the issues following the guidance set forth in *Standard Review Plans*  
28 *for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License*  
29 *Renewal*, NUREG-1555, Supplement 1; and considered the public comments received during  
30 the scoping process for HNP. This draft supplemental environmental impact statement (SEIS)  
31 includes the NRC staff's preliminary analysis that considers and weighs the environmental  
32 effects of the proposed action, the environmental impacts of alternatives to the proposed action,  
33 and alternatives available for reducing or avoiding adverse effects. It also includes the staff's  
34 preliminary recommendation regarding the proposed action.  
35

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

## Executive Summary

1 The Commission has adopted the following definition of purpose and need for license renewal  
2 from the GEIS:

3  
4 The purpose and need for the proposed action (renewal of an operating license) is to  
5 provide an option that allows for power generation capability beyond the term of a  
6 current nuclear power plant operating license to meet future system generating needs,  
7 as such needs may be determined by State, utility, and, where authorized, Federal  
8 (other than NRC) decision makers.  
9

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

12  
13 ... whether or not the adverse environmental impacts of license renewal are so great  
14 that preserving the option of license renewal for energy planning decisionmakers would  
15 be unreasonable.  
16

17 Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that  
18 there are factors, in addition to license renewal, that will ultimately determine whether HNP  
19 continues to operate beyond the period of the current operating licenses.  
20

21 The GEIS contains the results of a systematic evaluation of the consequences of renewing an  
22 operating license and operating a nuclear power plant for an additional 20 years. It evaluates  
23 92 environmental issues using a three-level standard of significance—SMALL, MODERATE, or  
24 LARGE—based on Council on Environmental Quality guidelines. These significance levels are  
25 as follows:  
26

27 SMALL: Environmental effects are not detectable or are so minor that they will neither  
28 destabilize nor noticeably alter any important attribute of the resource.  
29

30 MODERATE: Environmental effects are sufficient to alter noticeably, but not to  
31 destabilize, important attributes of the resource.  
32

33 LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize  
34 important attributes of the resource.  
35  
36

1 For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:  
2

3 (1) The environmental impacts associated with the issue have been determined to apply either  
4 to all plants or, for some issues, to plants having a specific type of cooling system or other  
5 plant or site characteristics.  
6

7 (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the  
8 impacts (except for collective offsite radiological impacts from the fuel cycle and from high-  
9 level waste and spent fuel disposal).  
10

11 (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis,  
12 and it has been determined that additional plant-specific mitigation measures are likely not  
13 to be sufficiently beneficial to warrant implementation.  
14

15 These 69 issues are identified in the GEIS as Category 1 issues. In the absence of significant  
16 new information, the staff relied on conclusions as amplified by supporting information in the  
17 GEIS for issues designated Category 1 in 10 CFR Part 51, Subpart A, Appendix B, Table B-1.  
18

19 Of the 23 issues not meeting the criteria set forth above, 21 are classified as Category 2 issues  
20 requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues,  
21 environmental justice and chronic effects of electromagnetic fields, are not categorized.  
22 Environmental justice was not evaluated on a generic basis and must also be addressed in a  
23 plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic  
24 fields was not conclusive at the time the GEIS was prepared.  
25

26 This draft SEIS documents the staff's evaluation of all 92 environmental issues considered in  
27 the GEIS. The staff considered the environmental impacts associated with alternatives to  
28 license renewal and compared the environmental impacts of license renewal and the  
29 alternatives. The alternatives to license renewal that are considered include the no-action  
30 alternative (not renewing the HNP operating licenses) and alternative methods of power  
31 generation. Among the alternative methods of power generation, coal-fired and gas-fired  
32 generation appear to be the most likely if the power from HNP is replaced. These alternatives  
33 are evaluated assuming that the replacement power-generation plant is located at either the  
34 HNP site or an unspecified "greenfield" site (an undisturbed, pristine site).  
35

36 SNC and the staff have established independent processes for identifying and evaluating the  
37 significance of any new information on the environmental impacts of license renewal. Neither  
38 SNC nor the staff has identified any significant new information related to Category 1 issues

## Executive Summary

1 that would call into question the conclusions in the GEIS. Similarly, neither SNC nor the staff  
2 has identified any new issue applicable to HNP that has a significant environmental impact.  
3 Therefore, the staff relies upon the conclusions of the GEIS for all 69 Category 1 issues.  
4

5 The staff has reviewed the SNC analysis for each Category 2 issue and has conducted an  
6 independent review of each issue. Five Category 2 issues are not applicable because they are  
7 related to plant design features or site characteristics not found at HNP. Four Category 2  
8 issues are not discussed in this draft SEIS because they are specifically related to  
9 refurbishment. Five additional Category 2 issues and environmental justice apply to both  
10 refurbishment and to operation during the renewal term and are only discussed in relation to  
11 operation during the renewal term. SNC has stated that its evaluation of structures and  
12 components, as required by 10 CFR 54.21, did not identify any major plant refurbishment  
13 activities or modifications necessary to support the continued operation of HNP beyond the end  
14 of the existing operating licenses. In addition, routine replacement of components or additional  
15 inspection activities are within the bounds of normal plant component replacement and,  
16 therefore, are not expected to affect the environment outside of the bounds of the plant  
17 operations evaluated in the final environmental statements for HNP.  
18

19 Twelve Category 2 issues, as well as environmental justice and chronic effects of  
20 electromagnetic fields, are discussed in detail in this draft SEIS. For all 12 Category 2 issues  
21 and environmental justice, the staff concludes that the potential environmental effects are of  
22 SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff  
23 concluded that a consensus has not been reached by appropriate Federal health agencies that  
24 there are adverse effects from electromagnetic fields. Therefore, no further evaluation of this  
25 issue is required. For severe accident mitigation alternatives (SAMAs), it is the staff's  
26 preliminary conclusion that a reasonable, comprehensive effort was made to identify and  
27 evaluate SAMAs and that none of the candidate SAMAs is cost-beneficial.  
28

29 Mitigation measures were considered for each Category 2 issue. Current measures to mitigate  
30 environmental impacts of plant operation were found to be adequate, and no additional  
31 mitigation measures were deemed sufficiently beneficial to be warranted.  
32

33 In the event that the HNP operating licenses are not renewed and the units cease operation on  
34 or before the expiration of their current operating licenses, the adverse impacts of likely  
35 alternatives will not be smaller than those associated with continued operation of HNP. The  
36 impacts may, in fact, be greater in some areas.  
37

38 The NRC staff's preliminary recommendation is that the Commission determine that the  
39 adverse environmental impacts of license renewal for HNP are not so great that preserving the

1 option of license renewal for energy-planning decisionmakers would be unreasonable. This  
2 recommendation is based on (1) the analysis and findings in the GEIS; (2) the ER submitted by  
3 SNC; (3) consultation with other Federal, State, and local agencies; (4) the staff's own  
4 independent review; and (5) the staff's consideration of public comments.

# Abbreviations/Acronyms

1		
2		
3		
4	AC	alternating current
5	ACC	averted cleanup and decontamination costs
6	ADAMS	Agencywide Document Access Management System
7	AEA	Atomic Energy Act of 1954
8	AEC	U.S. Atomic Energy Commission
9	ALARA	as low as reasonably achievable
10	ALI	annual limit on intake
11	AOC	averted offsite property damage costs
12	AOE	averted occupational exposure
13	AOSC	averted onsite costs
14	APE	averted public exposure
15	ATWS	Anticipated Transient Without Scram
16		
17	BTU	British thermal unit
18	BWR	boiling-water reactor
19		
20	CAA	Clean Air Act
21	CDF	core damage frequency
22	CEQ	Council on Environmental Quality
23	CFR	Code of Federal Regulations
24	cm	centimeter
25	CoE	U.S. Army Corps of Engineers
26	COE	cost of enhancement
27	CWA	Clean Water Act
28		
29	DAC	derived air concentration
30	DBA	design-basis accident
31	DC	direct current
32	DOE	U.S. Department of Energy
33		
34	EIA	Energy Information Administration (of DOE)
35	EIS	environmental impact statement
36	ELF-EMF	extremely low frequency-electromagnetic field
37	EPA	U.S. Environmental Protection Agency
38	EPD	Environmental Protection Division (of GADNR)
39	EPRI	Electric Power Research Institute
40	ER	Environmental Report
41	ESA	Endangered Species Act of 1973

## Abbreviations/Acronyms

1	ESRP	Environmental Standard Review Plan, NUREG-1555, Supplement 1, Operating
2		License Renewal
3		
4	FERC	Federal Energy Regulatory Commission
5	FES	final environmental statement
6	FR	Federal Register
7	ft	feet
8	FWPCA	Federal Water Pollution Control Act (also known as the Clean Water Act of
9		1977)
10	FWS	U.S. Fish and Wildlife Service
11		
12	GADNR	Georgia Department of Natural Resources
13	GDA	Georgia Department of Audits
14	GDCA	Georgia Department of Community Affairs
15	GDL	Georgia Department of Labor
16	GEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants,
17		NUREG-1437
18	GOPB	Georgia Office of Planning and Budget
19	GPC	Georgia Power Company
20	gpd	gallons per day
21	gpm	gallons per minute
22	GTC	Georgia Transmission Company
23		
24	ha	hectare
25	HEPA	high-efficiency particulate air (filter)
26	HLW	high-level waste
27	HNP	Edwin I. Hatch Nuclear Plant
28	HPCI	high-pressure coolant injection
29		
30	in.	inch
31	IPA	integrated plant assessment
32	IPE	Individual Plant Examination
33	IPEEE	Individual Plant Examination for External Events
34	ISLOCA	Interfacing System Loss of Coolant Accident
35		
36	kg	kilogram
37	km	kilometer
38	kV	kilovolt
39	kWh	kilowatt hour

1	L	liter
2	LERF	Large Early Release Frequency
3	LOCA	loss-of-coolant accident
4		
5	m <sup>3</sup> /d	cubic meters per day
6	mA	milliampere
7	MAAP	Modular Accident Analysis Program
8	m	meter
9	MACCS	Melcor Accident Consequence Code System
10	mi	mile
11	mgd	millions of gallons per day
12	MTHM	metric tonnes of heavy metal
13	MT	metric ton (or tonne)
14	MTU	metric ton-uranium
15	MW	megawatt
16	MW(e)	megawatt electric
17	MW(t)	megawatt thermal
18	MWh	megawatt hour
19	MWd/MTU	megawatt-days per metric ton of uranium
20		
21	NAS	National Academy of Sciences
22	NEPA	National Environmental Policy Act of 1969
23	NESC	National Electric Safety Code
24	NIEHS	National Institute of Environmental Health Sciences
25	NMFS	National Marine Fisheries Service
26	NPDES	National Pollutant Discharge Elimination System
27	NO <sub>x</sub>	nitrogen oxide(s)
28	NRC	U.S. Nuclear Regulatory Commission
29		
30	ODCM	Offsite Dose Calculation Manual
31	OL	operating license

## Abbreviations/Acronyms

1	PARS	Publicly Available Records (a component of ADAMS)
2	PM <sub>10</sub>	particulate matter, 10 microns or less in diameter
3	ppm	parts per million
4	PRA	Probabilistic Risk Assessment
5	PSA	Probabilistic Safety Assessment
6	PSW	plant service water
7		
8	RAI	request for additional information
9	RCRA	Resource Conservation and Recovery Act
10	REMP	radiological environmental monitoring program
11	RPC	averted replacement power cost
12	ry	reactor year
13		
14	SAMA	Severe Accident Mitigation Alternative
15	SEIS	supplemental environmental impact statement
16	SNC	Southern Nuclear Operating Company
17	SO <sub>2</sub>	sulfur dioxide
18	SO <sub>x</sub>	sulfur oxide(s)
19	STI	Southeastern Technical Institute
20	Sv	Sievert
21		
22	TCDA	Toombs County Development Authority
23		
24	USCB	U.S. Census Bureau
25	USDA	U.S. Department of Agriculture