

9.0 Summary and Conclusions

By letter dated July 2, 2001, the Exelon Generation Company, LLC, (Exelon) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for Peach Bottom Units 2 and 3 for an additional 20-year period (Exelon 2001a). If the OLs are renewed, State regulatory agencies and Exelon 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, then the plant must be shut down at or before the expiration of the current OLs, which expire on August 8, 2013, for Unit 2, and July 2, 2014, for Unit 3.

Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321) directs that an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, which identifies licensing and regulatory actions that require an EIS. 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, Volumes 1 and 2 (NRC 1996; 1999).^(a)

Upon acceptance of the Exelon 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 (66 FR 48892 [NRC 2001]) on September 24, 2001. The staff visited the Peach Bottom site in November 2001, and held public scoping meetings on November 7, 2001, in Delta, Pennsylvania (NRC 2002). The staff reviewed the Exelon Environmental Report (ER; Exelon 2001b) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff also considered the public comments received during the scoping process for preparation of this draft Supplemental Environmental Impact Statement (SEIS) for Peach Bottom Units 2 and 3. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part 1, of this SEIS.

The staff will hold two public meetings in Delta, Pennsylvania in July 2002, to describe the preliminary results of the NRC environmental review and to answer questions to provide members of the public with information to assist them in formulating their comments. When the

(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.

Summary and Conclusions

1 comment period ends, the staff will consider and disposition all of the comments received.
2 These comments will be addressed in Appendix A, Part 2, of the final SEIS.

3
4 This draft SEIS includes the NRC staff's preliminary analysis that considers and weighs the
5 environmental effects of the proposed action, the environmental impacts of alternatives to the
6 proposed action, and mitigation measures available for reducing or avoiding adverse effects. It
7 also includes the staff's preliminary recommendation regarding the proposed action.

8
9 The NRC has adopted the following statement of purpose and need for license renewal from
10 the GEIS:

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

17
18 The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is
19 to determine

20
21 ... whether or not the adverse environmental impacts of license renewal are so great that
22 preserving the option of license renewal for energy planning decisionmakers would be
23 unreasonable.

24
25 Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that
26 there are factors, in addition to license renewal, that will ultimately determine whether an
27 existing nuclear power plant continues to operate beyond the period of the current OL.

28
29 NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of
30 SEISs prepared at the license renewal stage:

31
32 The supplemental environmental impact statement for license renewal is not required to
33 include discussion of need for power or the economic costs and economic benefits of the
34 proposed action or of alternatives to the proposed action except insofar as such benefits
35 and costs are either essential for a determination regarding the inclusion of an alternative in
36 the range of alternatives considered or relevant to mitigation. In addition, the supplemental
37 environmental impact statement prepared at the license renewal stage need not discuss
38 other issues not related to the environmental effects of the proposed action and the
39 alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the
40 generic determination in § 51.23(a) and in 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 OL and operating a nuclear power plant for an additional 20 years. In the GEIS, the NRC
3 evaluated 92 environmental issues using the NRC's three-level standard of
4 significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental
5 Quality guidelines. The following definitions of the three significance levels are set forth in a
6 footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:
7

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

10
11 MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize,
12 important attributes of the resource.

13
14 LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize
15 important attributes of the resource.
16

17 For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:
18

- 19 (1) The environmental impacts associated with the issue have been determined to apply either
20 to all plants or, for some issues, to plants having a specific type of cooling system or other
21 specified plant or site characteristic.
22
- 23 (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the
24 impacts (except for collective off site radiological impacts from the fuel cycle and from high
25 level waste [HLW] and spent fuel disposal).
26
- 27 (3) Mitigation of adverse impacts associated with the issue has been considered in the
28 analysis, and it has been determined that additional plant-specific mitigation measures are
29 likely not to be sufficiently beneficial to warrant implementation.
30

31 These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and
32 significant information, the staff relied on conclusions as amplified by supporting information in
33 the GEIS for issues designated Category 1 in Table B-1 of 10 CFR Part 51, Subpart A,
34 Appendix B.
35

36 Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2
37 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues,
38 environmental justice and chronic effects of electromagnetic fields, were not categorized.
39 Environmental justice was not evaluated on a generic basis and must also be addressed in a
40 plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic
41 fields was not conclusive at the time the GEIS was prepared.
42

Summary and Conclusions

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 OLs for Peach Bottom Units 2 and 3) and alternative methods of
6 power generation. These alternatives are evaluated assuming that the replacement power
7 generation plant is located at either the Peach Bottom site or some other unspecified location.
8

9 **9.1 Environmental Impacts of the Proposed Action —** 10 **License Renewal**

11
12 Exelon and the NRC staff have established independent processes for identifying and
13 evaluating the significance of any new information on the environmental impacts of license
14 renewal. Neither Exelon nor the staff has identified information that is both new and significant
15 related to Category 1 issues that would call into question the conclusions in the GEIS.
16 Similarly, neither the scoping process, Exelon, nor the staff has identified any new issue
17 applicable to Peach Bottom Units 2 and 3 that has a significant environmental impact.
18 Therefore, the staff relies upon the conclusions of the GEIS for all Category 1 issues that are
19 applicable to Peach Bottom Units 2 and 3.
20

21 Exelon's license renewal application presents an analysis of the Category 2 issues that are
22 applicable to Peach Bottom Units 2 and 3 plus environmental justice and chronic effects from
23 electromagnetic fields. The staff has reviewed the Exelon analysis for each issue and has
24 conducted an independent review of each issue. Three Category 2 issues are not applicable
25 because they are related to plant design features or site characteristics not found at Peach
26 Bottom. Four Category 2 issues are not discussed in this draft SEIS because they are
27 specifically related to refurbishment. Exelon (Exelon 2001b) has stated that its evaluation of
28 structures and components, as required by 10 CFR 54.21, did not identify any major plant
29 refurbishment activities or modifications as necessary to support the continued operation of
30 Peach Bottom Units 2 and 3 for the license renewal period. In addition, any replacement of
31 components or additional inspection activities are within the bounds of normal plant component
32 replacement and, therefore, are not expected to affect the environment outside of the bounds of
33 the plant operations evaluated in the *Final Environmental Statement Related to Operation of*
34 *Peach Bottom Atomic Power Station Units Nos. 2 and 3* (AEC 1973).
35

36 Fourteen Category 2 issues related to operational impacts and postulated accidents during the
37 renewal term, as well as environmental justice and chronic effects of electromagnetic fields, are
38 discussed in detail in this draft SEIS. Five of the Category 2 issues and environmental justice
39 apply to both refurbishment and to operation during the renewal term and are only discussed in
40 this draft SEIS in relation to operation during the renewal term. For all 14 Category 2 issues
41 and environmental justice, the staff concludes that the potential environmental effects are of

1 SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff
 2 determined that appropriate Federal health agencies have not reached a consensus on the
 3 existence of chronic adverse effects from electromagnetic fields. Therefore, no further
 4 evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), the
 5 staff concludes that a reasonable, comprehensive effort was made to identify and evaluate
 6 SAMAs. Based on its review of the SAMAs for Peach Bottom Units 2 and 3, and the plant
 7 improvements already made, the staff concludes that none of the candidate SAMAs are cost-
 8 beneficial.

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

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

17
 18 **9.1.1 Unavoidable Adverse Impacts**

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

26
 27 The adverse impacts of continued operation identified are considered to be of SMALL
 28 significance, and none warrants implementation of additional mitigation measures. The
 29 adverse impacts of likely alternatives if Peach Bottom Units 2 and 3 ceases operation at or
 30 before the expiration of the current OLS will not be smaller than those associated with continued
 31 operation of these units, and they may be greater for some impact categories in some
 32 locations.

33
 34 **9.1.2 Irreversible or Irretrievable Resource Commitments**

35
 36 The commitment of resources related to construction and operation of Peach Bottom Units 2
 37 and 3 during the current license periods was made when the plant was built. The resource
 38 commitments to be considered in this draft SEIS are associated with continued operation of the
 39 plant for an additional 20 years. These resources include materials and equipment required for
 40 plant maintenance and operation, the nuclear fuel used by the reactors, and ultimately,
 41 permanent offsite storage space for the spent fuel assemblies.

Summary and Conclusions

1 The most significant resource commitments related to operation during the renewal term are
2 the fuel and the permanent storage space. Peach Bottom Units 2 and 3 replace approximately
3 one third of the fuel assemblies in each of the two units during every refueling outage, which
4 occurs on a 24-month cycle.

5
6 The likely power generation alternatives if Peach Bottom Units 2 and 3 cease operation on or
7 before the expiration of the current OLs will require a commitment of resources for construction
8 of the 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 Peach Bottom site was set when the plants were approved and construction began. That
14 balance is now well established. Renewal of the OLs for Peach Bottom Units 2 and 3 and
15 continued operation of the plant will not alter the existing balance, but may postpone the
16 availability of the site for other uses. Denial of the application to renew the OLs will lead to
17 shutdown of the plant and will alter the balance in a manner that depends on subsequent uses
18 of the site. For example, the environmental consequences of turning the Peach Bottom site
19 into a park or an industrial facility are quite different.

20 21 **9.2 Relative Significance of the Environmental Impacts of** 22 **License Renewal and Alternatives**

23
24 The proposed action is renewal of the OLs for Peach Bottom Units 2 and 3. Chapter 2
25 describes the site, power plant, and interactions of the plant with the environment. As noted in
26 Chapter 3, no refurbishment and no refurbishment impacts are expected at Peach Bottom Units
27 2 and 3. Chapters 4 through 7 discuss environmental issues associated with renewal of the
28 OLs. Environmental issues associated with the no-action alternative and alternatives involving
29 power generation and use reduction are discussed in Chapter 8.

30
31 The significance of the environmental impacts from the proposed action (approval of the
32 application for renewal of the OLs), the no-action alternative (denial of the application),
33 alternatives involving nuclear or coal- or gas-fired generation of power at the Peach Bottom site
34 and an unspecified "greenfield site," and a combination of alternatives are compared in
35 Table 9-1. Continued use of a once-through cooling system for Peach Bottom Units 2 and 3 is
36 assumed for Table 9-1.

37
38 Table 9-1 shows that the significance of the environmental effects of the proposed action are
39 SMALL for all impact categories (except for collective offsite radiological impacts from the fuel
40 cycle and from HLW and spent fuel disposal, for which a single significance level was not
41 assigned [see Chapter 6]). The alternative actions, including the no-action alternative, may

1 have environmental effects in at least some impact categories that reach MODERATE or
 2 LARGE significance.
 3

4 **Table 9-1.** Summary of Environmental Significance of License Renewal, the No-Action
 5 Alternative, and Alternative Methods of Generation
 6

7	Option	Impact Category	Land Use	Ecology	Water Use and Quality	Air Quality	Waste
8	Proposed Action	License Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
9							
10	No-Action Alternative	Denial of Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
11							
12	Coal-Fired Generation	Alternate Site	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	MODERATE	MODERATE
13		Alternate Site using Closed-Cycle Cooling	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	MODERATE	MODERATE
14							
15	Natural Gas-Fired Generation	Peach Bottom Site	SMALL to MODERATE	SMALL	SMALL	MODERATE	SMALL
16		Alternate Site	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL
17		Alternate Site using Closed-Cycle Cooling	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL
18							
19							
20	New Nuclear Generation	Peach Bottom Site	MODERATE	MODERATE	SMALL	SMALL	SMALL
21		Alternate Site	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	SMALL	SMALL
22		Alternate Site using Closed-Cycle Cooling	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	SMALL	SMALL
23							
24	Combination of Alternatives	Peach Bottom Site	SMALL to MODERATE	SMALL	SMALL	MODERATE	SMALL
25		Alternate Site	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL
26							
27							

Summary and Conclusions

Table 9-1 (contd)

Option	Impact Category	Human Health ^(a)	Socioeconomics	Aesthetics	Historic and Archeological Resources	Environmental Justice
Proposed Action	License Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
No-Action Alternative	Denial of Renewal	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
Coal-Fired Generation	Alternate Site	SMALL	SMALL to LARGE	MODERATE	SMALL	SMALL to MODERATE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to LARGE	MODERATE	SMALL	SMALL to MODERATE
Natural Gas-Fired Generation	Peach Bottom Site	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
	Alternate Site	SMALL	SMALL to MODERATE	MODERATE	SMALL	SMALL to MODERATE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to MODERATE	MODERATE	SMALL	SMALL to MODERATE
New Nuclear Generation	Peach Bottom Site	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL	SMALL to MODERATE
	Alternate Site	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL	SMALL to LARGE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL	SMALL to LARGE
Combination of Alternatives	Peach Bottom Site	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
	Alternate Site	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL to MODERATE

(a) Except for collective offsite radiological impacts from the fuel cycle and from HLW and spent-fuel disposal, for which single significance levels were not assigned. See Chapter 6 for details.

9.3 Staff Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS (NRC 1996; 1999), (2) the ER submitted by Exelon (Exelon 2001b), (3) consultation with Federal, State, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments received during the scoping process, the preliminary recommendation of the staff is that the Commission

determine that the adverse environmental impacts of license renewal for Peach Bottom Units 2 and 3 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

9.4 References

10 CFR 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

10 CFR 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants.”

Exelon Generation Company, LLC (Exelon). 2001a. Application for Renewed Operating Licenses, Peach Bottom Units 2 and 3. Kennett Square, Pennsylvania.

Exelon Generation Company, LLC (Exelon). 2001b. *Applicant’s Environmental Report - Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

National Environmental Policy Act of 1969 (NEPA). 42 USC 4321, et seq.

U.S. Atomic Energy Commission (AEC). 1973. *Final Environmental Statement Related to Operation of Peach Bottom Atomic Power Station Units Nos. 2 and 3*, Dockets No. 50-277 and 50-278. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report*, “Section 6.3–Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report.” NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

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

U.S. Nuclear Regulatory Commission (NRC). 2001. “Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process.” *Federal Register*: Vol. 66, No. 185, pp. 48892-48893. September 24, 2001.

U.S. Nuclear Regulatory Commission (NRC). 2002. *Environmental Impact Statement Scoping Process: Summary Report – Peach Bottom Units 2 and 3, Peach Bottom, Pennsylvania*. Washington, D.C.