participants. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources

The proposed action does not involve the use of any resources beyond those already necessary to conduct the EP exercise during 2001, and would merely delay the exercise.

Agencies and Persons Consulted

In accordance with its stated policy, the NRC staff consulted with the following officials regarding the environmental impact of the proposed action: William Brandes, Chair, Local Emergency Planning Committee, St. Louis, Missouri; Nick Granani, Deputy Director, Office of Emergency Management, Chesterfield, Missouri; Keith Henke, State Emergency Management Agency, Jefferson City, Missouri; Charles Hooper, Missouri Department of Health, Jefferson City, Missouri; and Tom Lange, Sr. Planner, Office of the Director, Missouri Department of Natural Resources. No objections were received.

Finding of No Significant Impact

Based on the environmental assessment, the Commission concludes that the proposed action will not have a significant affect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

List of Preparers

This document was prepared by Kevin G. Null, Senior Health Physicist, Nuclear Materials Licensing Branch, Division of Nuclear Materials Safety, U.S. Nuclear Regulatory Commission, Region III, Lisle, Illinois. Mr. Null is the Licensing Project Manager for the Nuclear Materials License issued to Mallinckrodt, Inc.

For further details with respect to the proposed action, see the Mallinckrodt letter dated November 26, 2001, available for public inspection at the Commission's Public Document Room at One White Flint North, 11555 Rockville Pike, Rockville, MD, and accessible electronically through the ADAMS Public Electronic Reading Room link at the NRC Web Site *(http://www.nrc.gov).*

Dated at Rockville, Maryland this 13th day of December, 2001.

For the Nuclear Regulatory Commission.

John W. Hickey,

Chief, Materials Safety and Inspection Branch, Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety and Safeguards.

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50–237 and 50–249]

Exelon Generation Company, LLC, Dresden Nuclear Power Station, Units 2 and 3; Environmental Assessment and Finding of No Significant Impact Related to a Proposed License Amendment to Increase the Maximum Thermal Power Level

The U. S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment to Facility Operating Licenses Nos. DPR–19 and DPR–25, issued to Exelon for the operation of the Dresden Nuclear Power Station, Units 2 and 3 (DNPS), located on the Illinois River in Grundy County, Illinois. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

Environmental Assessment

Identification of the Proposed Action

The proposed action would allow Exelon, the operator of DNPS, to increase its electrical generating capacity at DNPS by raising the maximum reactor core power level from 2527 MWt to 2957 MWt. This change is approximately 17 percent above the current licensed maximum power level for DNPS. The change is considered an extended power uprate (EPU) because it would raise the reactor core power level more than 7 percent above the original licensed maximum power level. DNPS has not submitted a previous power uprate application. A power uprate increases the heat output of the reactor to support increased turbine inlet steam flow requirements and increases the heat dissipated by the condenser to support increased turbine exhaust steam flow requirements.

The proposed action is in accordance with the licensee's application for amendments dated December 27, 2000, and supplemental information dated February 12, April 6 and 13, May 3, 18, and 29, June 5, 7, and 15, July 6 and 23, August 7, 8, 9, 13 (two letters), 14 (two letters), 29, and 31 (two letters), September 5 (two letters), 14, 19, 25, 26, and 27 (two letters), November 2, 16, and 30, and December 10, 2001. The original amendment request was submitted by Commonwealth Edison Company (ComEd), the former licensee. ComEd subsequently transferred the licenses to Exelon Generation Company, LLC (Exelon, the licensee). By letter dated February 7, 2001, Exelon informed the NRC that it assumed responsibility for all pending NRC actions that were requested by ComEd.

The Need for the Proposed Action

Exelon evaluated its resource needs for the period 2000–2014 and forecast a 28-percent increase in electrical demand by 2014 within its Illinois service area. The proposed EPU would provide approximately 0.66 percent additional generating capacity per unit at DNPS. Exelon stated that in order to stay competitive, it must be able to fulfill not only customer power demands, but it also must sell power to other providers. In Illinois, approximately 40 gas turbine plants of various sizes are proposed to be built. The proposed additional generating capacity at DNPS would eliminate the need to build approximately two 100-MWe gas turbines.

Environmental Impacts of the Proposed Action

At the time of the issuance of the operating licenses for DNPS, the NRC staff noted that any activity authorized by the licenses would be encompassed by the overall action evaluated in the Final Environmental Statement (FES) for the operation of DNPS, which was issued in November 1973. The original operating licenses for DNPS allowed a maximum reactor power level of 2527 MWt. On December 27, 2000, Exelon submitted a supplement to its Environmental Report supporting the proposed EPU and provided a summary of its conclusions concerning the environmental impacts of the EPU at DNPS. Based on the staff's independent analyses and the evaluation performed by the licensee, the staff concludes that the environmental impacts of the EPU are bounded by the environmental impacts previously evaluated in the FES, because the EPU would involve no extensive changes to plant systems that directly or indirectly interface with the environment. Additionally, no changes to any State permit limits would be necessary. This environmental assessment first discusses the non-radiological and then the radiological environmental impacts of the proposed EPU at DNPS.

Non-Radiological Impacts at DNPS

The following is the NRC staff's evaluation of the non-radiological environmental impacts of the proposed EPU on land use, water use, waste discharges, terrestrial and aquatic biota, transmission facilities, and social and economic conditions at DNPS.

Land Use Impacts

The proposed EPU at DNPS would result in some modifications to current land use at DNPS, due to the proposed addition of 6–8 new cooling tower cells. The proposed addition of new mechanical draft cooling tower cells to the existing 48 cells would handle the additional heat load resulting from the EPU. The additional cooling tower cells would require approximately 0.5 acres of land for siting. Access roads and pipe bridge installations, necessary to support the proposed cooling tower cells, might cause additional land disturbances; however, the new cells would be in an area that has been previously disturbed. The construction impacts would be temporary. Due to the small area (0.5 acres) disturbed, and the fact that the area has been previously disturbed, impacts to terrestrial biota will be minimal. Based on a previous archeological and history survey, the licensee has determined that the proposed cooling tower cells would not disturb lands with historic or archaeological significance. There would be minor changes to visual and aesthetic resources; however, the proposed cooling tower cells would not be visible from any major highway or block the view of any historic site or picture scape. The cooling tower cells would be built in accordance with the appropriate safety standards and any deviation from the standards would be evaluated in the staff's safety evaluation report.

Apart from the proposed change detailed above, the licensee indicated that it has no plans to construct new facilities or alter the land around existing facilities, including buildings, access roads, parking facilities, laydown areas, or onsite transmission and distribution equipment, including power line rights-of-way, in conjunction with the uprate or operation after uprate. The EPU would not significantly affect the storage of materials, including chemicals, fuels, and other materials stored above or under the ground. Therefore, the staff's conclusions in the FES on land use would remain valid under the proposed EPU conditions.

Water Use Impacts

The steam produced by the DNPS turbines is condensed in the condensers, demineralized, and pumped back to the reactor vessel. Cooling water used in the condensers is pumped from the Kankakee and Des Plaines Rivers and does not come in contact with the steam from the turbines. The original design called for a once-through cooling water system in which all the heated water used in the condensers was returned to the Illinois River downstream of the intake. A number of configuration changes have been made in the cooling system at DNPS since the original design. These include the construction of a cooling pond and associated cooling canals, installation of spray modules in the cooling canals, installation of temporary mechanical draft cooling towers, and the construction of mechanical draft cooling towers.

DNPS operates in the indirect open-cycle mode from June 15 through September 30. In this operating mode, a maximum of 940,000 gallons per minute (gpm) may be withdrawn from the Kankakee and Des Plaines Rivers for condenser cooling water. After the water circulates through the condensers, the water is discharged into a 2-mile-long cooling canal, called the hot canal. As water travels through the hot canal, it may be withdrawn and circulated through a bank of 36 mechanical draft cooling tower cells and then discharged back into the hot canal at a lower temperature. The cooling towers operate, as needed, to maintain water temperatures within the National Pollutant Discharge Elimination System (NPDES) permit limits and have a maximum water withdrawal capacity of 630,000 gpm. From the hot canal, a lift station pumps the water into a 1275-acre cooling pond. The cooling pond consists of 5 areas through which the water is circulated for approximately 2.5 days. After circulating through the cooling pond, the water is discharged via a spillway into another 2-mile-long canal, called the cold canal. The water may then be circulated through a bank of 12 mechanical draft cooling tower cells at a maximum rate of approximately 213,000 gpm, as needed, to maintain water temperature within the NPDES permit limits. The water is returned to the cold canal at a lower temperature and is then discharged into the Illinois River.

DNPS normally operates in the closed-cycle mode from October 1 to June 14. Typically, the mechanical draft cooling tower cells are utilized during this period. Water is drawn into the intake structure, circulated through the condensers for Units 2 and 3, passed through the hot canal, the cooling pond, the cold canal, and is then routed back to the intake structure via the flow regulating station gates. A small amount of condenser cooling water (70,000 gpm) is withdrawn from the Kankakee and Des Plaines Rivers to make up evaporative and seepage losses in the cooling pond. Additionally, approximately 50,000 gpm of the cooling water is permitted to be discharged into the Illinois River to prevent an increase in the dissolved solids concentrations in the cooling pond.

DNPS has approval from the Grundy County Emergency Management Agency to operate a de-icing project on the Kankakee River using heated water from the DNPS cooling pond. Heated water from the cooling pond is transported through a permanent pipe by siphon to the Kankakee River, where it is used to prevent river ice from damaging docks and other structures.

The staff evaluated surface water use and groundwater use as environmental impacts of water usage at DNPS. The licensee stated that the surface water intake amounts would not be changed by the proposed EPU. The licensee also stated that it would not seek to change permit requirements for thermal or flow limits or conditions for the proposed EPU. Therefore, the staff's conclusions in the FES on water use would remain valid under the proposed EPU conditions.

Groundwater is withdrawn from two wells at DNPS and is used for domestic and industrial purposes. Groundwater is not used for condenser cooling. The proposed EPU would not affect the groundwater use at DNPS; therefore, the staff's conclusions in the FES on groundwater would remain valid under the proposed EPU conditions.

Discharge Impacts

The staff evaluated environmental impacts such as cooling tower emissions, drift, icing, fog, noise, chemical and wastewater discharge, cold shock to an aquatic biota, and air emissions.

Cooling Tower Emission, Drift, Icing, Fog, and Noise

Environmental impacts such as air quality, fogging, icing, cooling tower drift, and noise could result from the increased heat load on the cooling towers under the EPU conditions. The FES did not include a discussion of cooling towers, but did discuss 98 spray modules, which are no longer operated, in the cooling canal. The staff

concluded in the FES that the operation of the DNPS cooling system was not harmful to the surrounding environment. No substantial changes from the conditions reported in the FES are anticipated.

The cooling tower cells are regulated by the Illinois Environmental Protection Agency (IEPA) through a Federally Enforceable State Operating Permit (FESOP). The cooling towers emit particulate matter with a diameter of 10 microns or less (PM_{10}) in the form of drift with river water sediment entrained in the droplets. The existing 48 cooling tower cells have a potential to emit 67.2 tons of PM_{10} per year. Eight additional cooling tower cells could potentially emit an additional 11.2 tons of PM_{10} per year, resulting in a total discharge of 78.4 tons of PM_{10} per year. DNPS is in an attainment area for PM_{10} in which the major source threshold is 100 tons per year. The total emissions from DNPS under the EPU conditions would be below the major threshold for PM_{10}. Emissions from all other sources governed by the FESOP are expected to remain the same.

The licensee stated that removal of the 98 spray modules mitigated some icing effects and that the cooling tower cells currently in operation at DNPS were sited in their present locations to reduce potential fogging impacts on local roads. The cooling towers minimize drift and maximize efficiency by limiting the loss of water droplets from the cells to not more than 0.008 percent of the circulating water flow, corresponding to a drift factor of 0.00008. Fog typically forms in the cold season when the cooling tower cells are not likely to be in operation. The proposed EPU would increase the temperature of the water in the hot canal by approximately 4.2 degrees Fahrenheit (°F). The proposed temperature increase would not cause an observable increase in the intensity of fog, but because the EPU increases the temperature differential between the cooling water and ambient air, fog may form at slightly higher ambient air temperatures. However, the impacts from fogging, icing, and cooling tower drift from the proposed EPU would be bounded by the conclusions of the FES.

As stated previously, the cooling system discussed in the FES did not have cooling towers cells, but the FES did include an analysis of elevated noise levels from the presently inactive 98 spray modules. Operation of the new cooling tower cells under the proposed EPU conditions and the potential extended operation of the existing cooling towers would result in intermittent increases in noise levels during periods of high ambient air temperatures. The licensee stated that noise from the cooling tower operations would be in compliance with the applicable noise requirements. The EPU would not be expected to significantly raise the noise levels above the levels assumed in the FES; therefore, the staff's conclusions in the FES on noise impacts would remain valid under the EPU conditions.

Surface Water and Wastewater Discharge

Surface water and wastewater discharge is regulated by the State of Illinois. The NPDES permit for DNPS covers the following discharges:

1. Unit 1 housing service water (inactive)
2. Unit 1 intake screen backwash (inactive)
3. Cooling pond blowdown
4. Unit 2 and 3 intake screen backwash
5. Wastewater treatment system effluent
6. Radiological waste treatment system effluent
7. Demineralizer regenerant waste
8. Northwest material access runoff
9. Sewage treatment plant effluent
10. Cooling pond discharge
11. Southeast area runoff
12. Northeast area runoff

All of the discharges are into the Illinois River except for the sewage treatment plant effluent, cooling pond discharge, Southeast area runoff, and Northeast area runoff, which discharge to the Kankakee River. As stated previously, DNPS must operate in closed-cycle mode from October 1 to June 15 and may operate in indirect open-cycle mode from June 15 through September 30. During the indirect open-cycle operation, the NPDES permit limits the temperature of the discharges not to exceed 90 °F more than 10 percent of the time and is not permitted to exceed 93 °F. DNPS may also operate in accordance with the DNPS Variable Blowdown Plan, as governed by the original July 6, 1977, Thermal Compliance Plan calculations, from June 1 to June 15, as deemed necessary by management. Under the DNPS Variable Blowdown Plan, cooling water from the condenser must be circulated through the cooling system before being discharged into the Illinois River. DNPS is allowed to discharge augmented blowdown at rates between 111 cubic feet per second (cfs) and 1115 cfs. Discharge flow rates are varied to prevent power deratings, which can be caused by heated cooling water recirculating to the condensers. Operation of the cooling towers is implicitly covered by the thermal requirements of Special Condition 4 of the NPDES permit.

Special Condition 7 of the NPDES permit states that DNPS has complied with 35 Illinois Administrative Code, Subpart B, ''General Use Water Quality Standards,'' Section 302.211(f), ''Temperature,'' and Section 316(a) of the Clean Water Act in demonstrating that the thermal discharge from the station has not caused, cannot cause, and cannot be reasonably expected to cause, significant ecological damage to the receiving water. The special condition further states that no additional monitoring or modification is required for re-issuance of the NPDES permit.

DNPS monitors wastewater streams, as required by the NPDES permit, and only uses approved chemicals for conditioning water to prevent scaling, corrosion, and biofouling. The current NPDES permit limits discharge of chlorine to the receiving waters. The licensee may also use a dispersant to limit fouling of the cooling tower fill. Exelon is not seeking to change the NPDES permit requirements for thermal or flow conditions, flow rates, water sources, or for chemical or thermal discharges, and would be subject to existing NPDES requirements. Instead, additional cooling tower cells would be installed to assure compliance with current thermal limits without derating the units during the summer. The use of chemicals and their subsequent discharge to the environment would not be expected to change significantly as a result of the proposed EPU. Furthermore, discharges into receiving waters from plant operation will be in compliance with NPDES permit requirements.

Cold Shock

Cold shock to aquatic biota occurs when the warm water discharge from a plant abruptly stops because of an unplanned shutdown, resulting in a temperature drop of the river water and a possible adverse impact on aquatic biota. The probability of an unplanned shutdown is independent of the EPU. The FES stated that cold kill (cold shock) of fish is not expected from the shutdown of DNPS during the winter because of the large heat sink in the cooling lake. Additionally, the licensee is not proposing to change permit levels to river water. Therefore, the risk of an aquatic biota being killed by cold shock would be bounded by the conclusions in the FES.

Terrestrial Biota Impacts

A study performed during the first years of indirect open-cycle operation

found no adverse impacts on waterfowl or wildlife. The FES stated that the DNPS cooling pond provides additional foraging and resting area for waterfowl and provides nesting grounds in an area of the State where natural lakes are less abundant. Implementation of the proposed EPU would not alter these conditions.

The licensee stated that no known threatened or endangered species live within the construction area of the proposed cooling tower cells. The species, Mead's milkweed (Asciepias meadii), lakeside daisy (Hymenopsis herbacea), leafy prairie clover (Dalea foliosa), eastern prairie fringed orchid (Platanthaera leucophaea), Hines emerald dragonfly (Somatochlora hineana), bald eagle (Haliaeetus leucocephalus), and Indiana bat (Myotis sodalis) are Federally-listed as threatened or endangered species and have been identified in Grundy and Will counties. The operation of the current 48 mechanical draft cooling towers have had no observed detrimental impact on the terrestrial community. The licensee stated that the additional 6–8 cooling tower cells would not be expected to impact this resource.

Therefore, the staff's conclusions in the FES on terrestrial ecology, including endangered and threatened plant or animal species, remain valid under the proposed EPU conditions.

Aquatic Biota Impacts

The ecology of the area surrounding the DNPS cooling pond and the intake and discharge structures has been studied extensively since the late 1960s. Studies of the lower trophic levels (phytoplankton, zooplankton, periphyton, and benthic invertebrates), and the fish community, indicated that operation of the DNPS has not had a measurable detrimental impact on the ecology of the Illinois River system. Surveys of the fish community in the vicinity of the DNPS have been conducted annually since 1971. These studies have monitored the fish population near the confluence of the Kankakee and Des Plaines Rivers and in the waters directly behind the Dresden Island Lock and Dam, called the Dresden Island Pool. The Dresden Island Pool area includes sampling stations near the intake and discharge areas of DNPS. These studies have concluded that the fish community in the area of DNPS has improved since the study began. The number of species collected by the various collection methods increased from the 1970s through the early to mid-1980s and leveled off in the early 1990s. The increase in species numbers that occurred during the 1980s was primarily the result of improvements in water quality due to the implementation of the Clean Water Act, most notably, the removal of sewage discharge from the city of Chicago.

The licensee conducted impingement sampling at the traveling intake screens at DNPS from 1977 to 1987. The study concluded that the number of fish impinged at DNPS was low and that the fish in the adjacent river system were not being adversely impacted by DNPS operations. In April 1987, the Illinois Department of Conservation agreed to eliminate impingement sampling from the DNPS Aquatic Monitoring Program. No Federally-listed fish or aquatic plant species has been collected in the vicinity of DNPS. However, three Illinois endangered or threatened listed species, the pallid shiner (*Notropis amnis*), the greater redhorse (*Moxostoma valenciennesi*), and the river redhorse (*Moxostoma carinatum*), have been collected near DNPS. The pallid shiner has only been collected downstream of Dresden Island Lock and Dam and both redhorse species prefer a more complex channel substrate than is found near DNPS.

The licensee submitted information on the DNPS intake structure to the IEPA pursuant to section 316(b) of the Clean Water Act. IEPA determined that additional monitoring was not required, but further monitoring might be necessary at the time of any modification or re-issuance of the NPDES permit. Impacts on an aquatic biota from the proposed EPU conditions are not expected to change because implementation of the EPU would not alter the intake structure or significantly change intake flows at DNPS. Therefore, the staff's conclusions in the FES about impingement and entrapment, along with aquatic threatened and endangered species, would remain bounding.

Transmission Facility Impacts

Environmental impacts, such as the installation of transmission line equipment, or exposure to electromagnetic fields and shock, could result from a major modification to transmission line facilities. The licensee stated that there would be no change in operating transmission voltages, onsite transmission equipment, or power line rights-of-way to support the proposed EPU conditions. No new equipment or modification would be necessary for the offsite power system to maintain grid stability. However, an increase in onsite power would be required to support the 6–8 new cooling tower cells and other new equipment associated with the EPU. Power to service these additional energy needs would come from DNPS's existing power supplies. Therefore, no significant environmental impacts from changes in the transmission design and equipment are expected, and the conclusions in the FES would remain valid.

The electromagnetic field (EMF) created by transmission of electricity would increase linearly as a function of power; however, exposure to EMFs from the offsite transmission system would not be expected to increase significantly and any such increase would not be expected to change the staff's conclusion in the FES that there are no significant biological effects attributable to EMFs from high-voltage transmission lines.

No changes in transmission facilities would be needed for the EPU. DNPS transmission lines are designed and constructed in accordance with the applicable shock prevention provisions of the National Electric Safety Code. Therefore, the expected slight increase in current, attributable to the proposed EPU, is not expected to change the staff's conclusion in the FES that adequate protection is provided against hazards from electrical shock.

Social and Economic Impacts

The staff reviewed information provided by the licensee regarding socioeconomic impacts, including possible impacts on the DNPS workforce and the local economy. DNPS employs more than 800 people and is a major contributor to the local tax base. DNPS personnel also contribute to the tax base by paying sales and property taxes. The proposed EPU would not significantly affect the size of the DNPS workforce and would have no material effect upon the labor force required for future outages. Plant modifications needed to implement the EPU would cost approximately $26 million. Local taxing authorities would collect more property taxes and local and national businesses would receive additional revenue from EPU-related activities. The increased direct revenue from the EPU would be a one-time benefit. The increase would not be sustained once the modifications are completed. It is expected that improving the economic performance of DNPS through lower total bus bar costs per kilowatt-hour would enhance the value of DNPS as a generating asset and reduce the likelihood of early plant retirement. Early plant retirement could have a possible negative impact upon the local economy and surrounding communities by reducing public services, employment, income, business revenues, and property values. These

reductions could be mitigated by decommissioning activities in the short term. The staff expects that the conclusions in the FES regarding social and economic impacts are expected to remain valid under the EPU conditions.

The staff also considered the potential for direct physical impacts of the proposed EPU, such as vibration and dust from construction activities. The construction of the 6–8 cooling tower cells may temporarily produce dust, vibration, noise, and vehicle exhaust. However, the licensee stated that construction traffic will not be routed through residential areas and no blasting will occur. In the year 2000, 36 cooling tower cells were constructed in the same general area in which the 6–8 new cooling tower cells are proposed to be located. The licensee stated that residents did not express concerns about construction noise. The distance between the proposed location of the 6–8 new cooling tower cells and the nearest residence is at least 1000 feet. Other than the construction of the proposed 6–8 cooling tower cells, the EPU would involve only limited changes in station operation and a few modifications to the station facility. These limited modifications would be accomplished without physical changes to transmission corridors, or other offsite facilities, and without significant changes to access roads or additional project-related transportation of goods or materials. Therefore, no significant construction disturbances causing noise, odors, vehicle exhaust, dust, vibration, or shock from blasting are anticipated, and the conclusions in the FES would remain valid.

Summary

In summary, the proposed EPU at DNPS would not result in a significant change in non-radiological impacts on land use, water use, waste discharges, terrestrial and aquatic biota, transmission facilities, or social and economic factors, and would not have other non-radiological environmental impacts from those evaluated in the FES. Table 1 summarizes the non-radiological environmental effects of the EPU at DNPS.

TABLE 1.—SUMMARY OF NON-RADIOLOGICAL ENVIRONMENTAL IMPACTS OF THE EPU AT DNPS

Impacts	Impacts of the EPU at DNPS
Land Use Impacts	Construction of 6–8 additional cooling tower cells on 0.5 acre on previously disturbed land. Minor aesthetic changes. No changes to lands with historic or archeological significance.
Water Use Impacts	No changes to the intake of surface water or groundwater use.
Waste Discharge Impacts	No significant increase in fog formation; however, fog may form at higher air temperatures. Air emission of PM_{10} would increase, but would remain within the regulatory limits. No significant change to icing or cooling tower drift. Noise levels may increase due to operation of the 6–8 new cooling tower cells, but would be within regulatory limits. No changes to the hydrodynamics of the condenser cooling water system intake or discharge amounts. No changes to permit requirements for thermal or flow limits or conditions. No changes to flow rates, water sources, and thermal discharges. The risk of cold shock to aquatic biota would not increase.
Terrestrial Biota Impacts	Small numbers of wildlife would be displaced by the construction of the cooling tower cells. No federally-listed threatened or endangered species are known to exist within the area of construction.
Aquatic Biota Impacts	No change to intake or outfall structures or flows; therefore, no change in aquatic impact biota would be expected. No federally-listed threatened or endangered species have been collected in the area of surface water intake or discharge.
Transmission Facilities Impacts	No change in operating transmission voltages, onsite transmission equipment, or power line rights-of-way. Slight increase in onsite power to support the 6–8 cooling tower cells would come from existing power supplies. EMF would increase linearly with the EPU; however, no change in exposure rate would be expected.
Social and Economic Impacts	No significant change in size of DNPS workforce. The construction of the 6–8 cooling tower cells may temporarily produce dust, vibration, noise, and vehicle exhaust; however, it is not expected to be significant. No shock from blasting is expected.

Radiological Impacts at DNPS

The staff evaluated radiological environmental impacts on waste streams, dose, accident analyses, and fuel cycle and transportation factors. The following is a general description of the waste treatment streams at DNPS and an evaluation of the environmental impacts.

Radioactive Waste Stream Impacts

DNPS uses waste treatment systems designed to collect, process, and dispose of radioactive gaseous, liquid, and solid waste in accordance with the requirements of 10 CFR part 20 and Appendix I to part 50. These radioactive waste treatment systems are discussed in the FES. The proposed EPU would not affect the environmental monitoring of these waste streams or the radiological monitoring requirements contained in licensing basis documents. The proposed EPU would not result in changes in operation or design of equipment in the gaseous, liquid, or solid waste systems. The proposed EPU would not introduce new or different radiological release pathways and would not increase the probability of an operator error or equipment malfunction that would result in an uncontrolled radioactive release. The staff evaluated specific effects of the proposed EPU on changes in the gaseous, liquid, and solid waste streams as a radiological environmental impact of the proposed EPU.

Gaseous Radioactive Waste

During normal operation, the gaseous effluent systems control the release of gaseous radioactive effluents to the site environs, including small quantities of activated gases and noble gases, so that routine offsite releases are below the limits of 10 CFR part 20 and Appendix I to part 50 (10 CFR part 20 includes the requirements of 40 CFR part 190). The major sources of gaseous radioactive wastes at DNPS are the condenser air ejector effluent and the steam packing exhaust system effluent. Based on the conservative assumption of a non-negligible amount of fuel leakage due to defects, the licensee stated that radioactive release volume would increase proportionally with the 17

percent EPU conditions. The current and expected fuel defect rate is extremely small and the expected radionuclide gaseous effluents under the EPU conditions would be within Appendix I limits. Therefore, the conclusions in the FES will continue to apply under the EPU conditions.

The licensee does not expect increases in gaseous waste from new fuel designs. The licensee stated that its contract with General Electric contains a warranty section that requires General Electric to meet a specified level of fuel performance. This level is at least as stringent as that imposed on current fuel designs.

Liquid Radioactive Waste

The liquid radwaste system is designed to process, and recycle, to the extent practicable, the liquid waste collected so that annual radiation doses to individuals are maintained below the guidelines in 10 CFR part 20 and 10 CFR part 50, Appendix I. Liquid radioactive wastes at DNPS include liquids from the reactor process systems and liquids that have become contaminated with process system liquids. Increases in flow rate through the condensate demineralizer and increases of fission products and activated corrosion products are expected under the EPU conditions. This would result in additional backwashes of condensate demineralizers and reactor water cleanup filter demineralizers. These additional backwashes would be processed through the liquid radioactive waste treatment system and are expected to be suitable for reuse. Therefore, liquid effluent release volumes are not expected to increase significantly as a result of the EPU. No changes in the liquid radioactive waste treatment system are proposed. Average treatment efficiency would not change; however, radioactivity levels of liquid effluent releases may increase linearly with the 17 percent EPU. These liquid effluents from DNPS would be within the regulatory limits of 10 CFR part 50, Appendix I.

Based on information submitted by the licensee, the staff concludes that no significant dose increase in the liquid pathway would result from the proposed EPU. Therefore, the conclusions in the FES would remain valid under the EPU conditions.

Solid Radioactive Waste

Solid radioactive wastes include solids recovered from the reactor process system, solids in contact with the reactor process system liquids or gases, and solids used in the reactor process system operation. The largest volume of solid radioactive waste at DNPS is low-level radioactive waste (LLRW). Sources of LLRW at DNPS include resins, filter sludge, dry active waste, metals, and oils. The annual burial volume of LLRW generated in 1998 was 208.40 cubic meters. In 1999, the burial volume decreased to 98.44 cubic meters, and the projected burial volume of LLRW for 2000 is approximately 144 cubic meters. A one-time increase in the burial volume of LLRW would be associated with the EPU. The volume of resin is expected to increase by as much as 17 percent under the EPU conditions because of the increased amount of iron removed by the condensate system from the increased feedwater flow. Adding the 17 percent increase in resin volume to the projected year 2000 LLRW burial volume rate results in a 156-cubic-meter post-EPU LLRW burial volume per year (an increase of approximately 8 percent), which would be bounded by the FES.

The number of fuel assemblies would increase in any given core load with the proposed EPU, reducing the storage space in the spent fuel pool. At current off-load rates, four dry storage casks would be filled during each refueling outage and a fifth dry storage cask would be partially filled. DNPS plans to fill the fifth cask using the inventory of assemblies from the spent fuel pool. At the EPU conditions, each refueling outage would also fill four casks and partially fill a fifth. Fewer assemblies from the spent fuel pool would be needed to complete the fifth dry storage cask. The net effect of the EPU would be to increase the number of dry storage casks needed by three to four every 5 years.

In summary, the solid radioactive waste burial volume is estimated to increase by approximately 8 percent, the volume of radioactive liquid release would not be expected to increase, and the volume of gaseous radioactive effluent releases would be expected to increase up to 17 percent as a result of the proposed EPU. The level of radioactivity of the liquid effluent releases would also be expected to increase up to 17 percent. The proposed EPU is not expected to have a significant impact on the volume or activity of radioactive solid wastes at DNPS.

Dose Impacts

The staff evaluated in-plant and offsite radiation as part of its review of environmental impacts of the proposed EPU.

In-Plant Radiation

Radiation levels and associated doses are controlled by the as low as reasonably achievable (ALARA) program, as required by 10 CFR part 20. The DNPS ALARA program manages exposure by minimizing the time personnel spend in radiation areas, maximizing the distance between personnel and radiation areas, and maximizing shielding to minimize radiation levels in routinely occupied plant areas and in the vicinity of plant equipment requiring attention. Exelon has determined that the current shielding designs are adequate for any dose increase that may occur due to the proposed EPU. Normal operation radiation levels would increase by no more than the percentage increase of the EPU. Many aspects of the plant were originally designed for higher-than-expected radiation sources. The increase in radiation level would not affect radiation zoning or shielding in the various areas of the plant because it is offset by conservatism in the original design, source term assumptions, and analytical techniques. The licensee states that no new dose reduction programs would be implemented and the ALARA program would continue in its current form.

A potential source of increased occupational radiation is the projected increase in moisture carryover from the reactor vessel steam dryer/separator to the main steam lines. To reduce moisture content under the EPU conditions, modifications to the steam dryer/separator would be required. The modifications are expected to result in a negligible increase in occupational exposure.

On the basis of the above information, the staff concludes that the expected in-plant radiation dose at DNPS following the proposed EPU would be bounded by the dose estimates in the FES.

Offsite Dose

The slight increase in normal operational gaseous activity levels under the EPU would not affect the large margin to the offsite dose limits established by 10 CFR part 20. Offsite dose from radioactive effluents are reported in the Annual Radiological Environmental Operating Reports. For the period from 1995 to 1999, the average annual whole body dose was 4.25E–3 millirem and the average annual dose to the critical organ was 6.16E–3 millirem. The highest percentage of 10 CFR part 50, Appendix I, regulatory limits for maximum dose resulting from liquid releases to an adult for the 5 year period occurred in 1999

and was 0.07 percent of the critical organ dose limit. For the period from 1995 to 1999, the average dose was 0.02 percent of the 10 CFR part 50, Appendix I, regulatory limits. No significant change in the volume of water treated and released is expected. The offsite dose from liquid effluents is projected to increase proportionally with the EPU due to an increase in the concentration of fission products and activation products in the reactor coolant. The licensee states that offsite dose would remain below the 10 CFR 50, Appendix I, regulatory limits.

Dose to individuals from gaseous releases are also reported in the Annual Radiological Environmental Report. The average annual total body dose during the period from 1995 to 1999 was 2.9E–3 millirem and the average annual dose to the critical organ was 2.23E–2 millirem. The highest percentage of 10 CFR part 50, appendix I, regulatory limits for maximum dose resulting from airborne releases to an adult during the period from 1995 to 1999 occurred in 1995 and was 0.14 percent of the critical organ dose limit. For the period from 1995 to 1999, the average dose was 0.09 percent of the 10 CFR part 50, Appendix I regulatory limits. Conservatively assuming a non-negligible amount of fuel leakage due to defects, gaseous effluents will increase proportionally to the 17 percent EPU; however, offsite dose will remain well below 10 CFR part 50, appendix I, regulatory limits.

The calculated offsite dose resulting from direct radiation due to radiation levels in plant components, such as sky shine, will increase up to 17 percent because the Offsite Dose Calculation Manual conservatively adjusts offsite dose to power generation level. Because sky shine is the dominant contributor to total offsite dose, the calculated total offsite dose, based on calculations from the Offsite Dose Calculation Manual, will increase up to 17 percent. Actual offsite dose from sky shine is not expected to increase significantly because the decreased transit time is expected to result in a minimal change in concentration through reduced decay time and because expected activity concentration in the steam will remain constant due to the dilution effect of a 19 percent increase in steaming rate. The expected dose at the EPU conditions will remain below the limits of 10 CFR part 50, appendix I, 10 CFR part 20, and 40 CFR part 190 standards.

The EPU would not create new or different sources of offsite dose from DNPS operation, and radiation levels under the proposed EPU conditions would be within the regulatory limits. The staff concludes that the estimated offsite doses under the EPU conditions would meet the design objectives specified by 10 CFR part 50, Appendix I, and be within the limits of 10 CFR part 20.

Accident Analysis Impacts

The staff reviewed the assumptions, inputs, and methods used by Exelon to assess the radiological impacts of the proposed EPU at DNPS. In doing this review, the staff relied upon information placed on the docket by Exelon, staff experience in doing similar reviews, and the staff-accepted ELTR1 and ELTR2 topical reports. The staff finds that Exelon used analysis methods and assumptions consistent with the conservative guidance of ELTR1 and ELTR2. The staff compared the doses estimated by Exelon to the applicable criteria. The staff finds, with reasonable assurance, that the licensee's estimates of the EAB, LPZ, and control room doses will continue to comply with 10 CFR part 100 and 10 CFR part 50, Appendix A, GDC–19, as clarified in NUREG–0800 Sections 6.4 and 15. Therefore, DNPS operation at the proposed EPU rated thermal power is acceptable with regard to the radiological consequences of postulated design basis accidents.

Fuel Cycle and Transportation Impacts

The environmental impact of the uranium fuel cycle has been generically evaluated by the staff for a 1000 MWe reference reactor and is described by Table S–3 of 10 CFR 51.51. The DNPS reactors are 912 MWe and Table S–3 reasonably bounds the environmental impacts of the uranium fuel cycle for each DNPS reactor. The radiological effects presented in Table S–3 are small and would not be expected to change due to the implementation of the EPU.

The environmental impacts of the transportation of nuclear fuel and wastes are described in Table S–4 of 10 CFR 51.52. The table lists heat and weight per irradiated fuel cask in transit, traffic density, and individual and cumulative dose to workers and the general population under normal circumstances. The regulations require that environmental reports contain either (a) a statement that the reactor meets specified criteria, in which case its environmental effects would be bounded by Table S–4; or (b) further analysis of the environmental effects of transportation of fuel and waste to and from the reactor site.

The NRC published an environmental assessment and finding of no significant impact (65 FR 56604) regarding an increase in fuel enrichment at DNPS from 4 to 5 weight percent uranium-235 and an increase in burnup to 60,000 megawatt-days per metric ton of uranium. The staff concluded that the extended burnup would slightly change the mix of radionuclides that might be released in the event of an accident; however, no significant adverse environmental impacts were expected. An NRC assessment (53 FR 30355, dated August 11, 1988, as corrected by 53 FR 32322, dated August 24, 1988) evaluated the applicability of Tables S–3 and S–4 to higher burnup cycles and concluded that there would be no significant change in environmental impacts for fuel cycles with uranium enrichments up to 5 weight percent uranium-235 and burnups less than 60,000 megawatt-days per metric ton of uranium (MWd/MTU) from the parameters evaluated in Tables S–3 and S–4. Because the fuel enrichment for the EPU would not exceed 5 weight percent uranium-235 and the rod average discharge exposure would not exceed 60,000 MWd/MTU, the environmental impacts of the proposed EPU at DNPS would remain bounded by these conclusions and would not be significant.

Summary

The proposed EPU would not significantly increase the probability or consequences of accidents, would not introduce new radiological release pathways, would not result in a significant increase in occupational or public radiation exposures, and would not result in significant additional fuel cycle environmental impacts. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action. Table 2 summarizes the radiological environmental impacts of the EPU at DNPS.

TABLE 2.—SUMMARY OF RADIOLOGICAL ENVIRONMENTAL IMPACTS OF THE EPU AT DNPS

Impacts	Impacts of the EPU at DNPS
Radiological Waste Stream Impacts	The gaseous radioactive release volume would increase proportionally with the power increase. The liquid radioactive release volume is not expected to increase; however, activity levels would increase proportionally with the power increase. Solid radioactive waste will increase approximately 8 percent. Releases would be within regulatory limits.
Dose Impacts	In-plant radiation levels would increase by 17 percent and dose would be maintained ALARA. Offsite dose from liquid and gaseous effluents may increase up to 17 percent. Calculated dose from sky shine will increase up to 17 percent. In-plant and offsite dose would remain within the regulatory limits.
Accident Analysis Impacts	No significant increase in probability or consequences of accident.
Fuel Cycle and Transportation Impacts	No significant increase. Impacts would remain within the conclusions of Table S–3 and S–4 of 10 CFR Part 51.

Environmental Impacts of the Alternatives to the Proposed Action

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., ''the no-action'' alternative). Denial of the application would result in no change in current environmental impacts; however, in the DNPS vicinity other generating facilities using nuclear or other alternative energy sources, such as coal or gas, would be built in order to supply generating capacity and power needs. Construction and operation of a coal plant would create impacts to air quality, land use and waste management. Construction and operation of a gas plant would also impact air quality and land use. Implementation of the EPU would have less of an impact on the environment than the construction and operation of a new generating facility and does not involve new environmental impacts that are significantly different from those presented in the FES. Therefore, the staff concludes that increasing DNPS capacity is an acceptable option for increasing power supply. Furthermore, unlike fossil fuel plants, DNPS does not routinely emit sulfur dioxide, nitrogen oxides, carbon dioxide, or other atmospheric pollutants that contribute to greenhouse gases or acid rain.

Alternative Use of Resources

This action does not involve the use of any different resources than those not previously considered in the DNPS FES, dated 1973.

Agencies and Persons Consulted

In accordance with its stated policy, on November 9, 2001, prior to issuance of this environmental assessment, the staff consulted with the Illinois State official, Frank Niziolek, of the Illinois Department of Nuclear Safety, regarding the environmental impact of the proposed action. The State official had no comments.

Finding of No Significant Impact

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's application dated December 27, 2000, as supplemented by letters dated February 12, April 6 and 13, May 3, 18, and 29, June 5, 7, and 15, July 6 and 23, August 7, 8, 9, 13 (two letters), 14 (two letters), 29, and 31 (two letters), September 5 (two letters), 14, 19, 25, 26, and 27 (two letters), November 2, 16, and 30, and December 10, 2001. Documents may be examined and/or copied for a fee, at the NRC's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the ADAMS Public Library component on the NRC Web site, http://www.nrc.gov (the Electronic Reading Room). If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC Public Document Room (PDR) Reference staff at 1–800–397–4209, or 301–415–4737, or by e-mail at *pdr@nrc.gov.*

Dated at Rockville, Maryland, this 17th day of December 2001.

For the Nuclear Regulatory Commission

Anthony J. Mendiola,

Chief, Section 2, Project Directorate III, Division of Licensing Project Management, Office of Nuclear Reactor Regulation.

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50–254 and 50–265]

Exelon Generation Company, LLC, Quad Cities Nuclear Power Station, Units 1 and 2; Environmental Assessment and Finding of No Significant Impact Related to a Proposed License Amendment To Increase the Maximum Thermal Power Level

The NRC is considering issuance of an amendment to Facility Operating Licenses Nos. DPR–29 and DPR–30, issued to Exelon for the operation of QCNPS, Units 1 and 2, located on the Mississippi River in Rock Island County, Illinois. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

Environmental Assessment

Identification of the Proposed Action

The proposed action would allow Exelon, the operator of QCNPS, to increase its electrical generating capacity at QCNPS by raising the maximum reactor core power level from 2511 MWt to 2957 MWt. This change is approximately 17.8 percent above the current maximum licensed power level for QCNPS. The change is considered an extended power uprate (EPU) because it would raise the reactor core power level more than 7 percent above the original licensed maximum power level. QCNPS has not submitted a previous power uprate application. A power uprate increases the heat output of the reactor to support increased turbine inlet steam flow requirements and increases the heat dissipated by the condenser to support increased turbine exhaust steam flow requirements.

The proposed action is in accordance with the licensee's application for amendments dated December 27, 2000, and supplemental information dated