

December 22, 2000

Mr. Oliver D. Kingsley, President  
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Commonwealth Edison Company  
Executive Towers West III  
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SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT  
OF THE POWER UPRATE MODIFICATION AT BYRON STATION, UNITS 1  
AND 2 AND BRAIDWOOD STATION, UNITS 1 AND 2 - (TAC NOS. MA9428,  
MA9429, MA9426, AND MA9427)

Dear Mr. Kingsley:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for a License Amendment to Permit Up-rated Power Operations at Byron and Braidwood Stations, dated July 5, 2000, as supplemented on November 27, 2000, which provides the response to request for additional information. The proposed amendment would increase the licensed reactor power from 3411 Megawatts thermal (MWt) to 3586.6 MWt for Units 1 and 2 at each station.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

*/RA/*

George F. Dick, Jr., Project Manager, Section 2  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455, STN 50-456  
and STN 50-457

Enclosure: Environmental Assessment

cc w/encl: See next page

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George F. Dick, Jr., Project Manager, Section 2  
 Project Directorate III  
 Division of Licensing Project Management  
 Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455, STN 50-456  
 and STN 50-457

Enclosure: Environmental Assessment	<u>Distribution:</u>	PUBLIC	PD3-2 r/f
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cc w/encl: See next page	CCARPENTER	OGC	ACRS
	MJORDAN, RIII		

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
COMMONWEALTH EDISON COMPANY  
DOCKET NOS. STN 50-454, STN 50-455, STN 50-456 AND STN 50-457  
BYRON STATION, UNITS 1 AND 2  
BRAIDWOOD STATION, UNITS 1 AND 2  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of amendments to Facility Operating License Nos. NPF-37, NPF-66, NPF-72 and NPF-77; issued to Commonwealth Edison Company (ComEd or licensee), for operation of Byron Station, Units 1 and 2 (Byron), located in Ogle County, Illinois, and Braidwood Station, Units 1 and 2 (Braidwood), located in Will County, Illinois.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would allow ComEd to increase the maximum reactor core power level from 3411 megawatts thermal (MWt) to 3586.6 MWt, which is an increase of 5 percent of rated core thermal power for each unit at Byron Station, Units 1 and 2, and for each unit at Braidwood Station, Units 1 and 2. The proposed action is in accordance with the licensee's application for amendment dated July 5, 2000, as supplemented on November 27, 2000.

The Need for the Proposed Action:

The proposed action permits an increase in the licensed core thermal power from 3411 MWt to 3586.6 MWt and for each of the four units and provides the flexibility to increase the potential electrical output of Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2.

Environmental Impacts of the Proposed Action:

ComEd has submitted an environmental evaluation supporting the proposed power uprate and provided a summary of its conclusions concerning both the radiological and non-radiological environmental impacts of the proposed action.

Radiological Environmental Assessment:

Radwaste Systems

The reactor coolant contains activated corrosion products, which are the result of metallic materials entering the water and being activated in the reactor region. Under power uprate conditions, the feedwater flow increases with power and the activation rate in the reactor region increases with power. The net result may be an increase in the activated corrosion product production. However, the evaluation has shown that the power uprate will not cause a significant change in the types or a significant increase in the amounts of any radiological effluent that may be released offsite.

Non-condensable radioactive gas from the main condenser, along with air in-leakage, normally contains activation gases (principally N-16, O-19 and N-13) and fission product radioactive noble gases. This is the major source of radioactive gas (greater than all other sources combined). These non-condensable gases, along with non-radioactive air, are

continuously removed from the main condensers which discharge into the offgas system. The changes in gaseous effluents are small and are well within the uncertainty of the calculation of the original limits following implementation of the power uprate.

ComEd has concluded that there will be no significant change in the level of controls or methodology used for the processing of radioactive effluents; or handling of solid radioactive waste at Byron and Braidwood will not be impacted by operation at uprated power conditions, and the slight increase in effluents discharged would continue to meet the requirements of Part 20 of Title 10 of the *Code of Federal Regulations* (10 CFR) and 10 CFR Part 50, Appendix I. Therefore, the power uprate will not appreciably affect the ability to process liquid or gaseous radioactive effluents and there are no significant environmental effects from radiological releases.

#### Dose Consideration

ComEd evaluated the potential effects of power uprate conditions on the radiation sources within the plant and the radiation levels during normal and post-accident conditions. The original calculations for determining the normal operational doses and radiation shielding requirements were very conservative and had additional margin assumed in the calculations. It was determined that these margins are sufficient to accommodate any increases attributed to the five percent increase in rated thermal power. The power uprate has no significant effect on plant normal operation radiation zones and shielding requirements. In addition, the normal operation component of the total integrated dose used for radiological equipment qualification (EQ) is not affected by the power uprate.

The power uprate does not involve significant increases in the offsite doses to the public from noble gases, airborne particulates, iodine, tritium, or liquid effluents. An upper bound

analysis for the potential impact of the power uprate indicates that the increase in radiological releases and resultant dose impact is bounded by the percentage increase in the reactor core power. Therefore, the normal offsite doses are not significantly affected by operation at the uprated power level and remain below the limits of 10 CFR Part 20 and 10 CFR Part 50, Appendix I.

The uprate program included a reanalysis or evaluation of all other aspects of large-break loss-of-coolant accident (LBLOCA), small-break loss-of-coolant accidents (SBLOCA), non-LOCA accidents, and Nuclear Steam Supply System (NSSS) and balance-of-plant (BOP) structures, systems, and components. Major NSSS components (e.g., reactor pressure vessel, pressurizer, reactor coolant pumps, and steam generators); BOP components (e.g., turbine, generator, and condensate and feedwater pumps); and major systems and sub-systems (e.g., safety injection, auxiliary feedwater, residual heat removal, electrical distribution, emergency diesel generators, containment cooling, and the ultimate heat sink) have been assessed with respect to the bounding conditions expected for operation at the uprated power level. Control systems (e.g., rod control, pressurizer pressure and level, turbine overspeed, steam generator level, and steam dump) have been evaluated for operation at uprated power conditions. Reactor trip and Engineered Safety Feature (ESF) actuation setpoints have been assessed and no needed changes were identified as a result of uprated power operations. The results of all of the above analyses and evaluations have yielded acceptable results and demonstrate that all design basis acceptance criteria will continue to be met during uprated power operations.

For post-accident conditions, the existing post-accident dose rate maps are adequate for power uprate conditions, and variances from existing calculated values are insignificant. The resulting radiation levels were determined to be within current regulatory limits, and

there would be no effect on the plant equipment, access to vital areas, or habitability of the control room envelope and the Technical Support Center. The licensee has determined that access to areas requiring post-accident occupancy will not be significantly affected by the power uprate.

The calculated whole body and thyroid doses at the exclusion area boundary that might result from a postulated design basis LOCA were evaluated. All offsite doses evaluated at uprated power conditions remain below established regulatory limits. Therefore, the results of the radiological analyses remain below the 10 CFR Part 100 guidelines and all radiological safety margins are maintained.

#### Non-Radiological Environmental Assessment:

The licensee reviewed the non-radiological environmental impacts of the power uprate based on information submitted in the Environmental Report, Operating License Stage, the NRC Final Environmental Statement (FES), and the requirements of the Environmental Protection Plan. Based on this review, the licensee concluded that the proposed power uprate has no significant effect on the non-radiological elements of concern and the plant will be operated in an environmentally acceptable manner as established by the FES. In addition, the licensee states that existing Federal, State, and local regulatory permits presently in effect accommodate the power uprate without modification.

#### Byron Station Effluent Analysis and Evaluation

The Circulating Water (CW) System at Byron Station is a closed loop cooling system designed to dissipate waste heat from the turbine cycle to the atmosphere using natural draft

cooling towers; one tower for each unit. Tower blowdown is accomplished by diverting flow from the circulating water system downstream of the CW pumps and upstream of the condenser and tower and discharging it to the Rock River.

The increase in heat associated with the power uprate will primarily affect the CW system and will be approximately 5 percent higher than the heat at the present power level. This will result in a 1 ° F CW temperature increase. The current CW temperature rise is approximately 22 ° F at 100 percent power. Although the National Pollutant Discharge Elimination System (NPDES) Permit does not specify a maximum cooling tower blowdown temperature, it controls temperature at the edge of the mixing zone in the river. It has been determined that under a worst-case scenario, the tower blowdown temperature would be approximately 120 ° F and has set this value as the administrative limit. Assuming a nominal summer river supply temperature of 70 ° F - 90 ° F and a cooling tower blowdown temperature of 96 ° F, the proposed power uprate will not impact the 120 ° F administrative limit.

#### Braidwood Station Effluent Analysis and Evaluation

The CW system at Braidwood Station is a closed loop cooling system similar to that at the Byron Station, except that waste heat is rejected from the turbine cycle to a cooling lake. Three CW pumps per unit pump cooling water from the lake to the main condenser. Discharge from the condenser is returned to the lake, where it is separated from the intake supply by a dike. The heat duty increase associated with power uprate is mainly associated with the CW System and will be approximately 5 percent higher than at the present power level. This will result in a 1 ° F increase to the CW temperature rise, which is now approximately 21.8 ° F at 100 percent power. The increase will nominally increase the lake temperature as the lake temperature is primarily influenced by climatic conditions.

Byron and Braidwood operate in compliance with a NPDES Permit, which requires all effluents to be closely monitored to assure compliance with the permit levels. There is no significant change in the types or a significant increase in the amounts of non-radiological effluents that may be released offsite due to the power uprate of each of the units at Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2.

#### Noise Evaluation

The noise effects due to operation of Byron Station and Braidwood Station at uprated power conditions were reviewed. No increase in noise from the turbine or reactor building will result due to uprated power operations. In addition, the turbine and the reactor building supply and exhaust fans will continue to operate at current speeds, and the associated noise levels will also be unaffected by uprated power operations. In summary, the overall noise levels at Byron Station and Braidwood Station will not increase due to the power uprate.

The non-radiological environmental impacts related to the proposed power uprate at Byron Station and Braidwood Station have been reviewed and there are no adverse impacts or significant changes required to the current NPDES Permits or other plant administrative limits. No changes to land use would result and the proposed action does not involve any historic sites. Therefore, no new or different types of non-radiological environmental impacts are expected.

#### Summary

The proposed action will not significantly increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released off site, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the

proposed action. With regard to potential nonradiological impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action. Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action.

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, but would reduce the operational flexibility that would be afforded by the proposed change. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the Byron Station, Units 1 and 2, and in the Final Environmental Statement for Braidwood Station, Units 1 and 2.

Agencies and Persons Consulted:

In accordance with its stated policy, on December 18, 2000, 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 letter dated July 5, 2000, as supplemented on November 27, 2000. Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room, located 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).

Dated at Rockville, Maryland, this 22nd day of December 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

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