

Commonwealth Edison Company  
Byron Generating Station  
4450 North German Church Road  
Byron, IL 61010-9794  
Tel 815-234-5441



April 7, 1997

LTR: BYRON 97-0079  
FILE: 2.01.0301

Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Attention: Document Control Desk

SUBJECT: Application for Amendment to Appendix A, Technical Specifications,  
for Facility Operating Licenses

Byron Nuclear Power Station Units 1 and 2  
Facility Operating Licenses NPF-37 and NPF-66  
NRC Docket Nos. 50-454 and 50-455

"Electrical Power Systems, D.C. Sources"

- REFERENCES: 1. Letter from G. Stanley and K. Graesser (ComEd) to NRC Document Control Desk, dated December 13, 1996.
2. Letter from R. Assa (NRC) to D. Farrar (ComEd) Issuing Amendments 59 and 47 to Byron and Braidwood, respectively, to allow replacement of the 125 volt dc Gould batteries with 125 volt dc AT&T batteries, dated March 4, 1994.

Pursuant to 10 CFR50.90, Commonwealth Edison Company (ComEd) proposes to amend Appendix A, Technical Specifications of Facility Operating Licenses NPF-37 and NPF-66 for Byron Nuclear Power Station, Units 1 and 2. ComEd proposes to revise Technical Specifications Section 3/4.8.2, D.C. Sources, and its bases to allow replacement of the 125 volt dc Gould batteries with new C&D Charter Power Systems, Inc. (C&D) batteries. In addition, the crosstie loading limitation is revised to reflect the larger capacity of the C&D batteries.

In Reference 1, ComEd submitted an application for conversion to the Improved Standard Technical Specifications (ITS). Corresponding changes are provided on the draft ITS pages, in addition to the current Technical Specifications pages, in order to incorporate license amendments for requests submitted after the ITS application.

The amendment request consists of the following:

Attachment A: Description and Safety Analysis of the Proposed Changes

Attachment B-1: Proposed Changes to the Current Technical Specifications Pages

Attachment B-2: Proposed Changes to the Draft ITS Pages

Attachment C: Evaluation of No Significant Hazards Consideration

Attachment D: Environmental Assessment

9704150162 970407  
PDR ADOCK 05000454  
P PDR



The proposed changes have been reviewed and approved by the On-site and Off-site Review Committees in accordance with ComEd procedures. ComEd has reviewed this proposed amendment in accordance with 10 CFR 50.92(c) and has determined that no significant hazards consideration exists.

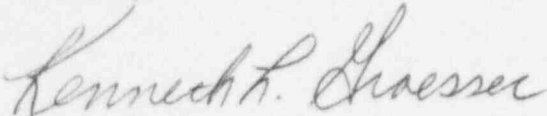
ComEd is notifying the State of Illinois of our application for this amendment by transmitting a copy of this letter and the associated attachments to the designated State Official.

ComEd requests that the NRC Staff review and approve this amendment request by October 7, 1997 to support replacement of the battery during the Unit 1 refueling outage scheduled to begin on November 7, 1997. The NRC approved an amendment to support replacement of the Gould batteries with AT&T batteries in Reference 2. However, ComEd did not install the AT&T batteries at Byron due to operational problems at other plants. Since the Gould batteries are near the end of their qualified life, ComEd would like to replace them during each unit's upcoming refueling outage.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects, these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

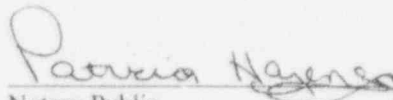
Please address any comments or questions regarding this matter to Marcia Lesniak, Nuclear Licensing Administrator, at (630) 663-6484.

Sincerely,



K. L. Graesser  
Site Vice President  
Byron Nuclear Power Station

Subscribed and sworn to before me, a Notary Public, this 7<sup>th</sup> day of April, 1997.

  
Notary Public

KLG/LL

Attachments

cc: A.B. Beach, NRC Regional Administrator - RIII  
G.F. Dick, Jr., Byron Project Manager - NRR  
S. D. Burgess, Senior Resident Inspector - Byron  
Office of Nuclear Safety - IDNS

# **ATTACHMENT A**

## **DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGES TO APPENDIX A TECHNICAL SPECIFICATIONS OF FACILITY OPERATING LICENSES NPF-37 AND NPF-66**

### **A. SUMMARY DESCRIPTION OF THE PROPOSED CHANGES**

Commonwealth Edison (ComEd) proposes to revise Section 3/4.8.2, D.C. Sources, and its Bases Section of the Technical Specifications for Byron Station. Corresponding changes are also proposed for the Improved Technical Specifications, which are currently in the review process with the NRC. The proposed changes allow for the replacement of the installed 125 volt dc Gould batteries with new 125 volt dc C&D Charter Power Systems, Inc. (C&D) batteries, since the installed batteries are near 85% of qualified life. In addition, the crosstie loading limitation is revised to reflect the increased capacity of the replacement C&D batteries. The marked up Technical Specification pages are provided in Attachment B-1 for the current Technical Specifications, and in Attachment B-2 for the draft Improved Technical Specifications.

### **B. DESCRIPTION AND BASES OF THE CURRENT REQUIREMENTS**

Technical Specification Section 3/4.8.2, D.C. Sources, provides parameters for Gould and AT&T batteries, including total battery terminal voltage. Table 4.8-2 provides battery surveillance requirements for both the Gould and AT&T batteries, including specific gravity and battery charging current. These requirements provide assurance that the batteries are capable of performing their design function.

Surveillance Requirement 4.8.2.1.2.e describes the modified performance discharge test for the AT&T batteries to demonstrate battery capacity. This test is described in the April 24, 1992 draft revision to IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

In addition, Technical Specification Actions 3.8.2.1.c and 3.8.2.2.b provide a load restriction while a battery is crosstied to the opposite unit. Verifying the crosstie loading limits ensures that the operable battery will have sufficient capacity to energize the design basis loads of its DC bus while maintaining the limited DC loads of the inoperable DC bus on a shutdown unit.

The DC electrical power system provides the DC emergency power system with control power. During plant operation, the operability of the AC and DC power sources and associated distribution systems ensures sufficient power will be available to supply the safety-related equipment required for: (1) the safe shutdown of the facility; and (2) the mitigation

and control of accident conditions within the facility. These conditions are consistent with the initial condition assumptions of the safety analyses and are based on maintaining at least one division of AC and DC power sources and associated distribution systems operational during accident conditions coincident with an assumed loss of offsite power (LOOP) event and single failure of the redundant division.

During shutdown and refueling, the operability of the AC and DC power sources and associated distribution systems ensures that: (1) the facility can be maintained in the shutdown or refueling condition for extended time periods; and (2) sufficient instrumentation and control capability are available for monitoring and maintaining the unit status.

### **C. DESCRIPTION AND BASES OF THE REQUESTED REVISIONS**

ComEd plans to replace the installed 125 volt dc Gould batteries with new 125 volt dc C&D batteries because the Gould batteries are near 85% of their qualified life. In Amendment 59, the NRC approved changes to allow installation of AT&T round cell batteries to replace the original Gould batteries. However, the AT&T batteries were not installed at Byron due to operational problems at Braidwood, Palo Verde, and McGuire. Therefore, it is necessary to request a similar amendment for the C&D replacement batteries.

#### **1. Changes to the Current Technical Specifications**

All of the references to the AT&T batteries are deleted, since the AT&T batteries will not be installed. These include load restriction provisions in Specification 3.8.2.1, Action c.1 and 3.8.2.2 Action b.1, along with the page of Table 4.8-2 that provides surveillance requirements for the AT&T batteries. AT&T references are also removed from Surveillance Requirements 4.8.2.1.2.a.2, 4.8.2.1.2.e, 4.8.2.1.2.f, and in a footnote to 4.8.2.1.2.b.2 and 4.8.2.1.2.c.3. The Bases are revised to delete the voltage values for the AT&T batteries. These changes are editorial because the batteries were not installed and there are other requirements that ensure the installed (Gould) batteries are capable of performing their design function.

Many of the C&D battery parameters are the same as those for the Gould batteries. In these cases, references to Gould are deleted, since the parameters are no longer manufacturer specific. Changes are proposed to Technical Specification Section 3/4.8.2, D.C. Sources, and its Bases to reflect those parameters that are different. The required changes are as follows:

A proposed change to Surveillance Requirement 4.8.2.1.2.a.2 adds a total battery terminal float charge voltage limit of  $\geq 127.6$  volts for the C&D battery. This surveillance ensures the effectiveness of the battery charger to float charge the battery. Float charge is the condition when the charger is energizing the battery to overcome the internal cell losses and to maintain the battery in a fully charged state. The proposed limit for the C&D battery represents the minimum value of the manufacturer's recommended total battery float charge voltage range of 2.20 to 2.25 volts per cell.

$$(2.20 \text{ to } 2.25 \text{ volts per cell}) \times (58 \text{ cells}) = 127.6 \text{ to } 130.5 \text{ volts.}$$

Table 4.8-2 is revised so that it applies to both the Gould and C&D batteries. This is done by clarifying that Table Notation (4), which states that the battery specific gravity is corrected for electrolyte temperature and level, applies to the Gould batteries only. A proposed change adds that specific gravity is corrected for electrolyte temperature for the C&D batteries. The manufacturer for the C&D batteries recommends correcting for actual electrolyte temperature but not for level. This is consistent with Annex A of IEEE Standard 450-1995 "IEEE Recommended Practice Maintenance, Testing, and Replacement of Vented Lead - Acid Batteries for Stationary Applications." Another change is proposed for Notation (5) to require the battery charging current be less than 3 amps for the C&D battery when it is on charge in accordance with the battery manufacturer's recommendation. The charging current for the Gould battery remains at less than 2 amps. The increased charging current is appropriate since the C&D batteries are larger than the Gould batteries.

Surveillance Requirements 4.8.2.1.2.e and 4.8.2.1.2.f state that a modified performance discharge test can be performed in lieu of either the normal performance discharge test or the service test. The proposed change would allow the modified test for the C&D batteries. The modified performance discharge test is appropriate since it reflects the current standard for testing replacement batteries - IEEE Standard 450-1995. This test is a simulated duty cycle consisting of just two rates - the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a rated one-minute discharge represent a very small portion of the battery's capacity, the test rate can be changed to that for the performance test without compromising the results of that performance discharge test. The battery terminal voltage for the modified performance discharge test should remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test. A modified performance discharge test is a test of the battery's capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rate capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test.

Surveillance Requirements 4.8.2.1.2.e and 4.8.2.1.2.f also provide acceptance criteria for the battery capacity and degradation. The values for the C&D batteries are the same as those for the Gould batteries. Specifically, the 60 month surveillance verifies that the capacity is at least 80% of the manufacturer's rating; the 18 month surveillance verifies degradation of less than 10% from its capacity on the previous test, and capacity of at least 90% of the manufacturer's rating.

The reference to draft IEEE Standard 450 in the Bases, which describes the modified performance discharge test, is changed to IEEE Standard 450-1995 to reflect the



current document. The details of the test are unchanged. The testing requirements for the Gould batteries remain the same.

Specification 3.8.2.1, Action c.1 and 3.8.2.2 Action b.1 specify a crosstie loading limit of 63 amps. As described above, the AT&T provision is deleted. A crosstie loading limit of 200 amps is proposed for the C&D batteries to reflect the larger capacity. The 63 amp crosstie limit is retained for the Gould batteries.

## 2. Changes to Improved Technical Specifications

ComEd submitted an application for conversion to the Improved Technical Specifications (ITS) in a letter from G. Stanley and K. Graesser to the NRC dated December 13, 1996. In order to incorporate license amendments for requests submitted after this date into the ITS, markups have been provided on the Draft Improved Technical Specifications in addition to the current Technical Specifications. The proposed changes to the draft ITS are as follows:

The ITS do not address AT&T batteries; battery information is for Gould only. Many of the C&D battery parameters are the same as those for the Gould batteries. Changes are proposed to reflect those parameters that are different, and notations are added to clarify which requirements apply to Gould batteries, and which apply to C&D batteries.

A proposed change to Surveillance Requirement (SR) 3.8.4.1 adds a total battery terminal float charge voltage limit of  $\geq 127.6$  volts for the C&D battery. Derivation of this value is provided above.

Proposed changes to the Bases for SRs 3.8.6.1 and 3.8.6.3 add that specific gravity is corrected for electrolyte temperature only for the C&D batteries. Specific gravity correction is described in detail above.

Limiting Condition for Operation (LCO) 3.8.6 Condition B and Required Action B.1, SR 3.8.6.2, and the Bases for 3.8.6 Action B.1 are revised to require the allowable float battery charging current be less than 3 amps for a fully charged C&D battery when it is on charge, in accordance with the battery manufacturer's recommendation.

A note in SR 3.8.4.3, SR 3.8.4.4, and the Bases for SRs 3.8.4.3 and 3.8.4.4 are revised to allow the modified performance discharge test to be performed in lieu of either the normal performance discharge test or the service test for the C&D battery. The modified performance discharge test is described in IEEE Standard 450-1995, and the justification for its use is provided above.

The proposed crosstie loading provisions described previously are incorporated into LCO 3.8.4 Required Action C.1, LCO 3.8.5 Required Action B.1, Bases for 3.8.4 Background, Bases for 3.8.4 Actions C.1 and C.2, and Bases for 3.8.5 Actions B.1 and B.2.

Additionally, there are two changes for the ITS that were not described in the current Technical Specifications changes. The Basis for 3.8.4 Background is revised to add the ampere-hour rating for the C&D battery, and that the standard for battery sizing is IEEE 485-1983, which is the current battery sizing standard. The IEEE standard is added to the references in the Basis for Section 3.8.4.

An editorial change is proposed for Specification 3.8.2.2, Action b(1). "Opposite Bus" is changed to "Opposite Unit" for consistency with Specification 3.8.2.1, Action c(1).

#### **D. IMPACT OF THE CHANGES**

The proposed changes will not alter the safety functions of the DC system or its equipment.

The proposed change allowing for the replacement of the batteries introduces new limits for the C&D battery because some of its parameters differ from the Gould battery. The limits for the Gould battery are retained to allow for the transition period needed to install the C&D batteries. The C&D batteries meet or exceed the design, functional, and qualification requirements of the installed Gould batteries. Replacing the Gould batteries will not impact the function of the DC system. The operational performance of the C&D batteries is expected to be comparable to the Gould batteries.

The proposed crosstie loading limit of 200 amps for the C&D batteries takes credit for the larger capacity of the C&D batteries. The C&D batteries were sized to have sufficient capacity to energize the design basis DC loads for an operating unit with the IEEE-485 design margin of 10-15% while maintaining the desired limited DC load current for the other unit. The sizing of the C&D battery is conservative compared to the sizing of the Gould battery because the crosstie load limit of 63 amps for the Gould battery utilizes a portion of the IEEE-485 10-15% design margin. The crosstie loading requirement for the Gould battery is retained to allow for the transition period needed to install the C&D batteries.

#### **E. SCHEDULE REQUIREMENTS**

Commonwealth Edison requests that the review and approval of the proposed amendment be completed by October 7, 1997 to support replacement of the battery during the Unit 1 refueling outage scheduled to begin on November 7, 1997.

#### **F. IDENTIFICATION AND DISCUSSION OF ANY IRREVERSIBLE CONSEQUENCES**

The Gould batteries were installed in 1979. The batteries need to be replaced during refueling outages B1R08, scheduled for November 1997 and B2R07, scheduled for April 1998, to avoid exceeding the 20 year qualified life during the subsequent fuel cycle. The batteries are not qualified for a longer service life; after 20 years the batteries are expected to

have decreased capacity. Therefore, the Gould batteries should be replaced in upcoming refueling outages.



# **ATTACHMENT B-1**

MARKED UP PAGES FOR  
PROPOSED CHANGES TO APPENDIX A,  
TECHNICAL SPECIFICATIONS, OF  
FACILITY OPERATING LICENSES  
NFF-37 AND NPF-66

CURRENT TECHNICAL SPECIFICATIONS

REVISED PAGES:

3/4 8-10  
3/4 8-11  
3/4 8-11a  
3/4 8-12  
3/4 8-12a  
3/4 8-13

B 3/4 8-2