Union Electric
Callaway Plant

PO Box 620
Fulton, MO 65251

October 25, 2002

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

ULNRC-04765

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
Operating License Appendix B Report
Unanticipated Cooling Tower Basin pH Excursion

The enclosed follow-up written reports are submitted in accordance with Operating License NPF-30, Appendix B, Section 5.4.2 to provide the NRC with copies of required written reports submitted to other Federal, State and Local agencies.

On October 10, 2002, Callaway Plant experienced an unanticipated pH excursion in the Cooling Tower Basin, which resulted in a violation of NPDES Permit No: MO-0098001. The event required telephone notification of offsite agencies, including the NRC (EN#39274), and written follow-up reports.

The enclosed letters dated October 17, 2002, and addressed to Ms. Kristine Ricketts, Missouri Department of Natural Resources and Mr. Ed Galbrath, Missouri Department of Natural Resources constitute the required NPDES Permit Exception Report and 40CFR355 written follow-up report, respectively.

Please contact Mr. Mark A. Reidmeyer, Regional Regulatory Affairs Supervisor at (573)676-4306, if you have any questions.

Warren A. Witt

Warren A. Witt
Manager, Callaway Plant

WAW/JWH/slk

Enclosure: 1) Letter to Ms. Kristine Ricketts dated 10/17/2002
2) Letter to Mr. Ed Galbrath dated 10/17/2002

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October 17, 2002

Ms. Kristine Ricketts
Missouri Department of Natural Resources
Jefferson City Regional Office
210 Hoover Drive
P.O. Box 176
Jefferson City, MO 65102-0176

Ameren

Dear Ms. Ricketts:

Re: AmerenUE Callaway Power Plant - Callaway County
NPDES Permit MO-0098001

Since early Friday morning, on October 11, the Callaway Plant staff has been responding to an upset to the plant's cooling water chemical control system, which resulted in violations of pH and copper limitations. The attached NPDES Permit Event Report provides the essential details regarding the excursion. This letter provides additional details including a basic chronology of events and the considerable efforts undertaken to mitigate potential impacts. Please note that aspects of the event have previously been reported to the DNR's Emergency Response Center. At this time, effluent from the cooling tower blowdown outfall (#002) is once again in full compliance with permitted limitations.

Event Chronology

Sometime on the afternoon of Thursday, October 10, a sulfuric acid feed system failed, resulting in excessive addition of acid into the cooling tower basin. Based on the continuous monitoring data recorder, the pH first dropped below the 6.0 limit at 4:23 PM Thursday. Unfortunately, this condition was not discovered until 12:45 AM Friday morning when a worker read the continuous monitor display. A grab sample was taken and when the low pH (3.01 s.u.) was confirmed the cooling tower blowdown (CTB) discharge was terminated.

Staff were concerned that the low pH may have affected other parameters and thus a sample was taken for metals analysis, however the total recoverable analysis requires approximately eight hours to run. Inadvertently, the sample was not preserved according to approved methods. This oversight, the unexpectedly high results, and similarity between dissolved and total recoverable forms, resulted in significant doubt as to the validity of the data.

By 7:45 AM Friday morning, the pH in the tower basin had been restored to within the permitted limits, and thus the CTB discharge was resumed. The restored

discharge was later sampled and when the results became available early Saturday morning (October 12th) the total recoverable copper concentration was 1.20 mg/l, well in excess of the 0.3 mg/l permit limit. Based on this data, the CTB discharge was again terminated, at 1:08 AM Saturday.

Without blowdown the plant can only maintain generation for a limited time before beginning to reduce power output and eventually shutting down. Over the next fifteen hours the plant worked to develop an overall solution to the dilemma focusing on how to restore compliance. Since no feasible treatment options were identified, to manage and correct the elevated copper concentration, plant staff initiated discussions with DNR through the State emergency response line, to determine whether temporary relief from the permit limitations could be granted. In the meantime, they developed a number of options to mitigate possible impacts if the discharge was restored. Special DNR authorization could not be obtained. Without other prudent options, plant management decided to resume discharging in order to regain control over the basin chemistry, relying on an optimum combination of blowdown and makeup water flows. At 4:35 PM Saturday evening, the CTB discharge was restored. A sample taken on Wednesday, October 16, at 8 AM confirmed that the copper concentration in the CTB discharge (at Outfall #002) was, once again, within permit limits.

Permit and Water Quality Implications

The initial discovery of the pH sag and excessive sulfuric acid feed, prompted AmerenUE's spill coordinator to report the incident to the National Response Center and the Missouri DNR on Friday afternoon, October 11th. At that time the copper excursion was unconfirmed. When the copper violation was indicated and the blowdown terminated the second time, DNR's Emergency Response Center was again notified.

As Callaway Plant monitors pH continuously, the NPDES permit allows limited monthly excursions, with allowances of both individual periods and a cumulative duration. As these were exceeded, the attached noncompliance report was triggered. While not initially recognized, the same event resulted in the exceedance of the copper limit as described above.

Numerous steps were taken to minimize the impacts of the elevated copper concentration within the cooling tower basin while isolated and following restoration of the discharge. They included:

1. Diversion of approximately one million gallons of CTB water to the Ultimate Heat Sink (without discharge) to allow additional makeup water to be added to the tower.
2. Addition of makeup water to raise the level (to the maximum operating depth) within the tower; which in conjunction with item 1 above reduced the copper concentration by approximately fifteen percent.
3. Limiting the CTB discharge flow rate, once resumed, and utilizing the CT bypass outfall (Outfall #016) to dilute the discharge - in an attempt to keep the copper concentration, at the point of discharge to the Missouri River, below the Outfall 002 limitation.

4. A commitment to sample the discharge every eight hours and adjust discharge conditions until the copper excursion was eliminated.

Summary

Note that we are confident that the elevated copper did not result in a significant environmental impact on the receiving water. Mixing zone calculations based on river/CTB flows and copper monitoring results, indicate the concentration at the edge of the "zone of initial dilution" was well below all applicable copper water quality standards, throughout the entire excursion period.

In addition to the attached report, a complete listing of CTB effluent samples and analytical data will be provided with the next Discharge Monitoring Report. We believe our actions resulted in the necessary steps to minimize any adverse impact to waters of the state. If you have any questions or need additional information please call.

Sincerely,

Michael F. Bollinger

Michael F. Bollinger
Consulting Environmental Scientist

Ameren UE
NPDES PERMIT EVENT REPORT

Callaway Plant

Permit No. MO-0098001

Date: October 17, 2002

1. Chemical Analysis:

Outfall No.	TSS (mg/l)	O&G (mg/l)	pH	Cl (mg/l)	Ni (mg/l)	Temp (°F)	Cu (mg/l)
002	138	6.6 (Note 1)	3.01	<0.01	0.1	78	1.2

Note 1: Sample taken in plastic bottle.

2. Description of Discharge: Cooling Tower Blowdown, Outfall 002, discharge of pH 3.01 water with 1.2 ppm total recoverable copper.

3. Cause of Permit Event: A flow control valve is used to control the flow of acid into the Cooling Tower Basin. The flow control valve is controlled by a PLC (Programmable Logic Controller) and is designed to use PID (Proportional, Integral, Derivative) control to adjust acid flow to match the Circulating Water pH setpoint of 8.5. The PLC failed in a "no flow" loop that modulates the valve full open and then back closed in order to clear any obstructions in the acid line. As a result of the PLC failing, the acid valve cycled between full open and full closed continuously until discovery of the low pH

4. Period of Permit Event (Dates/Times): pH: From 10-10-02 @ 1623 to 10-11-02 @ 0050. Cu: From 10-12-02 @ 1635 to 10-16-02 @ 0800.

5. Corrective Action Being Taken: Cooling Tower Blowdown was isolated upon discovery of low pH effluent and again upon discovery of high copper results. Outfall 002 was blended with Outfall 016, Cooling Tower Bypass, to reduce the total recoverable copper at the point of discharge into the Missouri River to less than 0.3 ppm. The PLC program that automatically controls the acid flow control valve to the cooling tower basin has been disabled. Manual control of the acid flow control valve will be maintained until plant engineering staff have corrected the problem.

APPROVED BY: Warren A. Witt
Plant Manager

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October 17, 2002

Mr. Ed Galbrath
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Ameren

Dear Mr. Galbrath:

This letter is a written report per 40CFR Part 355 regarding a release of acidic water reported on October 11, 2002 at the Ameren Callaway Nuclear Plant.

(i) The chemical name or identity of any substance involved in the release.
The product released was acidic water with a pH of 3 resulting from an over injection of 93% sulfuric acid in the cooling tower water system.

(ii) An indication of whether the substance is an extremely hazardous substance.
Sulfuric acid is an extremely hazardous substance per 40CFR 355 Appendix A.

(iii) An estimate of the quantity of any such substance that was released into the environment.
Based on the pH measured at the outfall to the Missouri River and the estimated duration and flow, a maximum of 19,000 pounds was released.

(iv) The time and duration of the release.
The release was discovered on 10/11/02 at 0045. The cooling tower blowdown was isolated five minutes later.

(v) The medium or media into which the release occurred.
The release was into the Missouri River at river mile 115.5.

(vi) Any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals.
There were no known or anticipated health risks associated with this release.

(vii) Proper precautions taken as a result of the release, including evacuation (unless such information is readily available to the community emergency coordination pursuant to the emergency plan).
The cooling tower blow down discharge valve was closed approximately five minutes after discovery. The cooling tower basin water was neutralized by normal addition of alkaline river water to make up for evaporation, and normal cycling of the cooling tower basin water with the blowdown valve isolated. Discharge of cooling tower basin water resumed around 0745 on 10-11-02 when pH was greater than 6.

(viii) The names and telephone number of the person or persons to be contacted for further information.
Charlie Riggs 573-676-8365

(ix) Actions taken to respond to and contain the release.
The cooling tower blow down discharge valve was closed approximately five minutes after discovery. The cooling tower basin water was neutralized until a pH greater than 6 was achieved and discharge resumed around 0745.

(x) Any known or anticipated acute or chronic health risks associated with the release.
None

(xi) Where appropriate, advice regarding medical attention necessary for exposed individuals.
None

If you have any questions, please contact me at (314) 554-3063 or Charlie Riggs at (573) 676-8365.

Sincerely,

Warren M. Mueller
Supervisor
Property Remediation & Emergency Response

cc: Callaway County LEPC
Mr. Tim Diemler
P.O. Box 817
Fulton, MO 65251