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October 2016

CCR Rule Report: Initial Safety Factor Assessment

For

Kincaid Ash Pond

At Kincaid Power Station

1 Introduction

This Coal Combustion Residual (CCR) Rule Report documents that the Kincaid Ash Pond at the Kincaid Generation, LLC Kincaid Power Station meets the safety factor assessment requirements specified in 40 Code of Federal Regulations (CFR) §257.73(e). The Kincaid Ash Pond is located near Kincaid, Illinois in Christian County, approximately 0.1 miles northeast of the Kincaid Power Station. The Kincaid Ash Pond serves as the wet impoundment basin for CCR produced by the Kincaid Power Station.

The Kincaid Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the initial safety factor assessment for an existing CCR surface impoundment be completed by October 17, 2016.

The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial safety factor assessment meets the requirements of 40 CFR § 257.73(e). The owner or operator must prepare a safety factor assessment every five years.

2 Initial Safety Factor Assessment

40 CFR §257.73(e)(1)

The owner or operator must conduct initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in (e)(1)(i) through (iv) of this section for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

(i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.

(ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

(iii) The calculated seismic factor of safety must equal or exceed 1.00.

(iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

A geotechnical investigation program and stability analyses were performed to evaluate the design, performance, and condition of the earthen dikes of the Kincaid Ash Pond. The exploration consisted of hollow-stem auger borings, cone penetration tests, installation of piezometers, and laboratory program including strength, hydraulic conductivity, consolidation, and index testing. Data collected from the geotechnical investigation, available design drawings, construction records, inspection reports, previous engineering investigations, and other pertinent historic documents were utilized to perform the safety factor assessment and geotechnical analyses.

In general, the subsurface conditions at the Kincaid Ash Pond consist of medium stiff to very stiff embankment fill (clay) overlying soft to very stiff clay foundation soils, which in turn overlies hard glacial till (clay). Phreatic water is typically at or slightly above the embankment/foundation interface.

Five (5) representative cross sections were analyzed using limit equilibrium slope stability analysis software to evaluate stability of the perimeter dike system and foundations. The cross sections were located to represent critical surface geometry, subsurface stratigraphy, and phreatic conditions across the site. Each cross section was evaluated for each of the loading conditions stipulated in §257.73(e)(1).

The Soils Susceptible to Liquefaction loading condition, §257.73(e)(1)(iv), was not evaluated because a liquefaction susceptibility evaluation did not find soils susceptible to liquefaction within the Kincaid Ash Pond dikes. As a result, this loading condition is not applicable to the Kincaid Ash Pond.

Results of the Initial Safety Factor Assessments for the critical cross-section for each loading condition are listed in Table 1 (i.e. the table identifies the lowest calculated safety of factor calculated for any one of the five analyzed cross sections for each loading condition).

Table 1 – Summary of Initial Safety Factor Assessments

Loading Conditions	§257.73(e)(1) Subsection	Minimum Factor of Safety	Calculated Factor of Safety
Maximum Storage Pool Loading	(i)	1.50	1.57
Maximum Surcharge Pool Loading	(ii)	1.40	1.57
Seismic	(iii)	1.00	1.27
Soils Susceptible to Liquefaction	(iv)	1.20	Not Applicable

Based on this evaluation, the Kincaid Ash Pond meets the requirements in §257.73(e)(1).

3 Certification Statement

CCR Unit: Kincaid Generation, LLC; Kincaid Power Station; Kincaid Ash Pond

I, Victor A. Modeer, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this CCR Rule Report, and the underlying data in the operating record, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the initial safety factor assessment dated October 13, 2016 meets the requirements of 40 CFR §257.73(e).

VICTOR A MODEER
Printed Name

10/13/16
Date



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