MISSOURI PUBLIC SERVICE COMMISSION

STAFF'S

CONSTRUCTION AUDIT AND PRUDENCE

REVIEW OF SIOUX WET FLUE GAS

DESULFURIZATION PROJECT FOR COSTS

REPORTED AS OF SEPTEMBER 30, 2010

UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri

FILE NO. ER-2011-0028

Jefferson City, Missouri
February 8, 2011

**** DENOTES HIGHLY CONFIDENTIAL INFORMATION****
DENOTES PROPRIETARY INFORMATION

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I. Background 1

Staff Expert/Witness: Roberta A. Grissum 2

II. Summary of Findings 2

Staff Expert/Witness: Roberta A. Grissum 3

III. Audit Objectives, Risk Assessment and Audit Scope 3

A. Audit Objective 3
Staff Expert/Witness: Roberta A. Grissum 3

B. Risk Assessment 4
Staff Expert/Witness: Roberta A. Grissum 4

C. Audit Scope 4
Staff Expert/Witness: Roberta A. Grissum 5

IV. Audit Procedures 6

Staff Expert/Witness: Roberta A. Grissum 6

V. Engineering Reviews 6

A. Scope 6
Staff Expert/Witness: Michael E. Taylor 7

B. Activities and Conclusions related to the Staff Engineering Review of Sioux Scrubbers7
Staff Expert/Witness: Michael E. Taylor 9

VI. Detailed Findings 9

A. Project Management Overview 9
1. Sargent & Lundy Engineering (S&L) 12
2. Allied Power Solutions (APS) 12
3. Ameren Missouri Personnel Assigned Field Responsibilities for the Sioux WFGD Project 13
Staff Expert/Witness: Roberta A. Grissum 13

B. Cost and Schedule Management 13
1. Monthly Status Reports to the Missouri Public Service Commission Staff 17
2. Monthly Status Reports APS Provided to Ameren Missouri 21
3. Monthly Progress and Cost Reports Provided to Ameren Missouri by S&L 22
Staff Expert/Witness: Roberta A. Grissum 26

C. Internal and External Audit Reviews 27
Staff Expert/Witness: Roberta A. Grissum 30
D. Lessons Learned for Project Management 30
Staff Expert/Witness: Roberta A. Grissum 31
E. Procurement and Payment Process 32
1. Engineering Service Agreements 32
2. Request for Bids 32
3. Staff Review of Procurement Process 33
4. Payment Processing 33
Staff Expert/Witness: Roberta A. Grissum 34
F. Capital Projects, Change Orders and Approval Process 35
1. Capital Projects and Approval Process 35
2. Change Orders and Approval Process 35
Staff Expert/Witness: Roberta Grissum 39
G. Allocation of Overhead Charges 39
Staff Expert/Witness: Roberta A. Grissum 39
H. Disallowances 40
1. Costs Related to Project Delays 41
2. Costs Related to Unresolved Backcharges 43
3. Audit Staff's Review of and Recommendations for Unexplained Invoices 43
Staff Expert/Witness: Roberta A. Grissum 44
I. Allowance for Funds Used During Construction 44
Staff Expert/Witness: Roberta A. Grissum 47

STAFF'S CONSTRUCTION AUDIT AND PRUDENCE REVIEW OF SIOUX WET FLUE GAS DESULFURIZATION PROJECT FOR COSTS REPORTED AS OF SEPTEMBER 30, 2010

I. Background

This Report is the Staff Construction Audit and Prudence Review relating to the Sioux Wet Flue Gas Desulfurization Project ("Sioux WFGD") of Ameren Missouri. Unlike the Iatan 1 scrubber project (air quality control system (AQCS) environmental enhancements) of Kansas City Power & Light Company (KCPL), the Sioux WFGD Project was not conducted under the parameters and benefits of a Regulatory Plan which is a contract among the signatory parties approved by the Commission which provided specific financial benefits to KCPL.

In response to the Environmental Protection Agency's Clean Air Interstate Rule (CAIR), Ameren Missouri undertook the Sioux WFGD Project. Under the general direction of Robert E. Schallenberg, Utility Services Division Director, Staff performed an audit of the WGDF Project. Other than the engineering review, Mr. Schallenberg provided direction regarding scope, procedures, and report format. He also determined the timing with regard to the results that would be provided in Staff's direct case filing on February 8, 2011, and true-up filing on May 16, 2011. Staff members Roberta A. Grissum from the Auditing Department and Michael E. Taylor from the Energy Department were assigned to the construction audit and prudence review.

The Audit Staff has been provided supporting documentation for approximately $521.8 million in charges incurred for the Sioux WFGD Project through September 30, 2010. The agreed to and ordered true-up cut-off date for charges to be considered for inclusion in rate base in this rate proceeding is December 31, 2010. Ameren Missouri is expected to provide additional documentation to support all charges incurred for the Sioux WFGD Project through December 31, 2010 no later than April 5, 2011.

As of this filing, Ameren Missouri reports that approximately 96% of the Sioux WFGD Project has been completed. To support this claim, Ameren Missouri provided the following status of the Sioux WFGD Project based upon information obtained from its General Contractor, Sargent & Lundy's (S&L), Monthly Cost Report dated November 2010:

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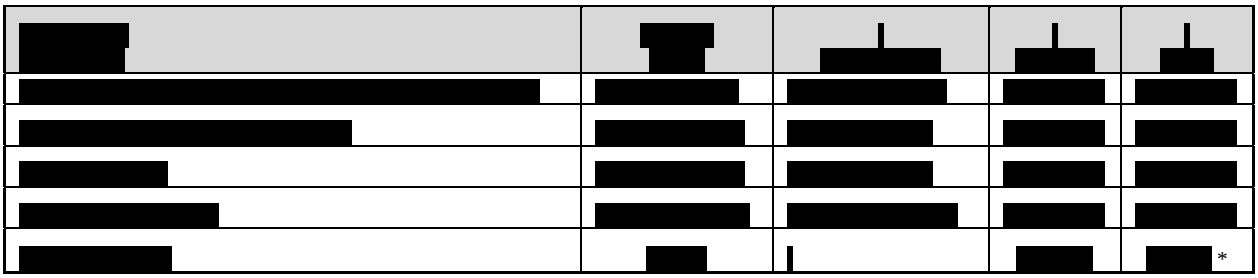

*

In this direct case filing, the Audit Staff will only be making a recommendation related to charges incurred through the direct case filing cut-off date of September 30, 2010. The Audit Staff had approximately 1,400 vouchers that were not supported by purchase order or engineering service agreement (ESA) documentation and, therefore, is conducting a more detailed review of these vouchers to determine if these charges are appropriate for recovery from Ameren Missouri ratepayers.

Staff Expert/Witness: Roberta A. Grissum

II. Summary of Findings

The following is a summary of the results of the Audit Staff's construction audit and prudence review for which a detailed explanation will be provided in the Audit Findings section of this Report. These findings are:

1. At this time, the Audit Staff is recommending the Commission exclude from rate base $31.6 million as a result of Ameren Missouri's decision to slowdown construction in November 2008 and for any unreimbursed backcharges due Ameren Missouri from its vendors, MC Industrial (MCI) and Sachs Electric (Sachs) as of November 2010. See pages 40 below.

2. Actions taken by Ameren Missouri to ensure quality control and success of the project are reasonable. However, the Audit Staff believes Ameren Missouri should have performed an analysis to quantify the increase in cost that it may have incurred due to this increased supervision. Failure to perform such an analysis does not ensure the work was performed in the most cost-effective and efficient manner. See pages 17 below.

3. Ameren Missouri's failure to perform detailed analysis of important decisions because "the commissioning process was completed per schedule and within its budget" does not ensure that the related work was performed in the most efficient and cost-

effective manner as well as being based on hindsight regarding after the fact results. See pages 20 below.

4. Although the actions taken by Ameren Missouri to address an issue once it was identified were reasonable, it appears that a rather critical component (i.e., the motor control center bucket overloads and/or breakers) was not designed properly in the original design process. As such, Ameren Missouri should have conducted an analysis to at least gain the benefit of a "lesson learned" for future coal plant retrofits as well as explore the possibility for a back charge opportunity to reduce overall project costs. See pages 31 below.

5. Actions taken by Ameren Missouri to mitigate potential scheduling delays, outside Ameren Missouri's decision to slowdown construction in November 2008, appear to be reasonable. See pages 29 below.

6. The Audit Staff found that Ameren Missouri implemented lessons learned from its affiliates at the Coffeen and Duck Creek power stations to improve the efficiency of the Sioux WFGD Project. Formal lesson learned documentation should be prepared before the Sioux WFGD Project is closed. See pages 30 below.

7. Ameren Missouri should develop a document to ensure that all large capital projects have all charges incurred appropriately supported by Ameren Missouri's purchase order process or the engineering service agreement (ESA) process or create documentation properly justifying the incurrence of a charge without an Ameren Missouri purchase order or ESA before the expenditure is paid. See pages 32 below.

Staff Expert/Witness: Roberta A. Grissum

III. Audit Objectives, Risk Assessment and Audit Scope

A. Audit Objective

Determine whether Ameren Missouri has incurred charges for the Sioux WFGD for recovery from Ameren Missouri ratepayers that are imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers, or are for investment that is not fully operational and used for service. If any such charges are found, develop recommended adjustments to the Commission to remove these costs from the cost of the Sioux WFGD project included in Ameren Missouri's rate base in this rate case.

Staff Expert/Witness: Roberta A. Grissum

B. Risk Assessment

The Audit Staff determined that there was a significant possibility that the Sioux WFGD Project had incurred imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayer charges. The Audit Staff's basis for this concern was spurred by Ameren's decision to slowdown construction in late 2008 and the Audit Staff's identification of approximately $127 million of charges incurred for the Sioux WFGD Project that were not supported by purchase orders or engineering service agreement (ESA) documentation. As such, Staff conducted an examination of the known problems identified by the Company, Allied Power Solutions (APS), internal and external auditors and Sargent & Lundy (S&L) in an attempt to identify such charges and make a determination about their prudence, reasonableness, appropriateness, and/or benefit to Missouri ratepayers. Details of the responsibilities of APS and S&L are discussed in section H of this report.

Staff Expert/Witness: Roberta A. Grissum

C. Audit Scope

The Staff's first step in determining the scope of its construction audit and prudence review of the appropriateness of Ameren Missouri's Sioux WFGD project costs for recovery from ratepayers was to determine the time period that would be reviewed. In the Commission's *Order Approving Procedural Schedule and Establishing Test Year* issued November 10, 2010 in Case No. ER-2011-0028, the Commission ordered a true-up cut-off date for the Audit Staff review of all charges associated with the Sioux WFGD Project through December 31, 2010. However, the latest information available to the Audit Staff for purposes of this filing includes costs incurred for the Sioux WFGD Project through September 30, 2010, the ordered cut-off date for the direct case filing. It has been ordered that Ameren Missouri provide updated costs related to the Sioux WFGD through the period ending December 31, 2010 to the Staff no later than April 5, 2011. Once the updated costs through December 31, 2010 are received, the Audit Staff will audit and review this data for prudence, reasonableness, appropriateness, and/or benefit to Missouri ratepayers of recovery from Ameren Missouri ratepayers.

For purposes of this filing, the Audit Staff is only proposing adjustments for charges it has identified as being imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers through the period ending September 30, 2010. After Ameren Missouri provides

costs through the period ending December 31, 2010, the Staff will update this report for any additional costs identified as being imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers.

As part of its audit scope, the Audit Staff reviewed the cost and schedule controls utilized by Ameren Missouri and its project managers in order to familiarize itself with the policies and procedures Ameren Missouri had in place to control costs and mitigate risks for the Sioux WFGD Project. The Audit Staff also reviewed the following documents during the audit process:

1. Sargent & Lundy (S&L) Monthly Cost Report
2. Allied Power Solutions (APS) Monthly Status Reports
3. Key vendor contracts and Engineering Service Agreements (ESAs)
4. Ameren Missouri Board of Directors Minutes
5. Change Order Requests (CORs) and Requests for Work Order Extensions
6. Purchase Order Summaries
7. Internal/External Audit Reports and Findings
8. Requests for Proposal Letters
9. Primavera Reports used for Project Scheduling
10. Cost and Schedule Performance Indices (CPI-SPI-CSI)
11. Direct Testimony of Ameren Missouri Witness Mr. Mark C. Birk
12. Direct Testimony Workpapers of Ameren Missouri Witness Mr. Mark C. Birk

The Audit Staff also:

1. Cross-referenced all charges with purchase orders and work packages, to the extent possible;
2. Identified unexplained charges that were not supported by purchase orders or purchase order line distribution amounts;
3. Reviewed approximately 1,400 invoices related to the unexplained charges identified in Item 2 above; and
4. Visited the construction site and conducted interviews with key project personnel regarding project status, cost controls and change order authorization processes. The specific individuals interviewed included: Bob Schweppe, Manager of Environment Projects for Project Operation Services (POS); Chris Maricic, Managing Supervisor of the Sioux WFGD Project; and Homer Clark, Supervising Engineer of the Sioux WFGD Project.

Staff Expert/Witness: Roberta A. Grissum

IV. Audit Procedures

Audit procedures performed by an independent auditor are intended to ensure a sufficient review of the available data to support the audit opinion and that the audit objectives are met. In this proceeding, the goal of the Audit Staff was to determine if costs Ameren Missouri charged to the Sioux WFGD Project are prudent, reasonable, appropriate, and/or of benefit to Missouri ratepayers for recovery from ratepayers; which includes that they be adequately identified, supported, and explained. The Staff's procedures for this audit goal included, but were not limited to: (1) Personnel Interviews; (2) Contract Evaluation; (3) Cost Evaluation; and (4) Invoice Evaluation. While Staff believes it has performed an adequate audit to uncover inappropriate costs, it makes no representation that the unadjusted costs consist of only prudent, reasonable, appropriate, and/or of benefit to Missouri ratepayers costs as of September 30, 2010.

Staff Expert/Witness: Roberta A. Grissum

V. Engineering Reviews

A. Scope

The Engineering Analysis Section of the Energy Department, Utility Operations Division, is responsible for and conducts Engineering Reviews of major electric utility construction projects. The Engineering Review consists of two activities--monitor project construction progress and review construction project change orders.

To monitor the progress of the project during construction, Engineering Staff makes periodic field visits to the site. Ideally, Engineering Staff begins making field visits at the on-set of the construction and continues visits until a project is determined to meet the criteria to be considered fully operational and used for service. During a field visit, Engineering Staff meets with company personnel to review the overall progress of construction, review documents related to changes affecting the project, including documents related to changes in the schedule, and to receive updates of safety-related aspects of the project.

Engineering Staff reviews construction project change orders associated with the project for the following:

- To understand the reason for the change at the point in time when the change order was issued;

- To determine whether the change corrected an engineering-related problem, resulted in a better design, or improved the operation or construction of the plant; and
- To determine whether the change resulted in a safety concern, caused unnecessary construction, or caused unnecessary duplication of facilities or work.

In any particular Engineering Review, the number of field visits to monitor construction progress, the number of meetings with construction and company personnel and the number of construction project change order reviews vary depending on a number of factors; including the project type, the project size, the project location, and the availability of Engineering Staff to perform the Engineering Review.

Other than as it relates to the foregoing list, the Engineering Staff's review of change orders does not include a review of events preceding issuance of a change order, any change in construction project costs due to a change order, or any other action or inaction by the company which resulted in a change order.

During an Engineering Review, the Engineering Staff discusses the change orders with company and construction project personnel to understand the reasons for the change orders. In addition, the Engineering Staff reviews contracts, agreements, purchase orders, drawings, and correspondences related to the change orders. If Engineering Staff determines there is an engineering concern with a change order, the Engineering Staff would share its concern with the Commission's Auditing Staff and consult with Staff management to determine the appropriate response to take to address the concern.

Staff Expert/Witness: Michael E. Taylor

B. Activities and Conclusions related to the Staff Engineering Review of Sioux Scrubbers

Based on its Engineering Review of Ameren Missouri's change orders, Engineering Staff found no engineering concerns with any of the Sioux scrubber change orders reviewed.

Engineering Staff visited the construction site on May 1, 2008; July 9, 2009; and January 7, 2011. The last visit, in January 2011, took place shortly after testing was completed to determine if the Sioux scrubbers met in-service criteria. During these site visits Engineering Staff toured the construction site, discussed construction progress and future milestones, and reviewed construction progress since the last plant visit. Additionally, Ameren Missouri

provided project updates for Engineering Staff and other Staff members on February 26, 2008; August 20, 2008; and May 22, 2009. Ameren also installed similar scrubbers on three Illinois generating units (Coffeen Units 1 and 2 and Duck Creek) during the timeframe of the Sioux installation. Lessons learned from the Illinois installations were incorporated at the Sioux Plant.

The Engineering Staff reviewed contractor/vendor contracts, purchase orders, drawings, and correspondences related to the change orders. To better understand the different types of circumstances for the change orders, Engineering Staff created six categories representing general reasons for a change order. The six categories are:

Type 1: Change Orders associated with final design changes or final engineering changes.

Ameren Missouri awarded some contracts before completion of final design. Therefore, there were changes due to work that started before the final design, or the final engineering was completed. Also during construction, additional work was added to the contractor/engineer/consultant contracts.

Type 2: Change Orders associated with changes made by Ameren Missouri

Ameren Missouri made changes for more efficient or safer operation and/or maintenance of the Sioux scrubbers and the associated plant equipment after construction started. This category also includes change orders due to the selection of a particular design by Ameren Missouri during construction.

Type 3: Change Orders associated with field design

This type of change was made due to final design decisions left to be worked out during actual construction, and design changes made in the field. This type also includes changes in the way work was to be done in order to avoid potential problems and moving work from one contractor's work scope to another contractor's work scope.

Type 4: Change Orders associated with field construction issues

These changes were made due to unforeseen problems or obstacles encountered during actual construction. This would include changing the design, making repairs, and/or modifying material/equipment to make it work as required. This category also includes changes due to moving contractors, or equipment, and adding equipment for easier access to work areas.

Type 5: Change Orders associated with contracts that specify the actual amounts and/or prices would be determined at time of the work.

Some contracts were written such that the final cost would be determined at a later date. Either the amount of work, or number of items purchased, or the prices were trued-up with change orders at some point during the construction project.

Type 6: Change Orders associated with changes to the type of contract

The type of contract changed, e.g., a time-and-material contract was converted to a fixed-price contract.

During the construction period there were numerous change orders for the Sioux scrubber construction project. Engineering Staff reviewed copies of change orders and supporting documentation that were available in an on-line database provided by Ameren Missouri. Engineering Staff that performed this specific review was Michael Taylor.

Staff Expert/Witness: Michael E. Taylor

VI. Detailed Findings

A. Project Management Overview

Project management "best practices" have been purported to define the following as key elements of a capital project plan:

- Scope of Work
- Safety Plan
- Quality Plan
- Roles & Responsibilities
- Project Controls Plan
    - Schedule
    - Costs & Performance Measurement
    - Management of Change
    - Payment Process
- Procurement Plan
- Contracts Plan
- Engineering Plan
- Construction Management Plan
- Facilities Commissioning Plan
- Interface Management Plan

- Project Reporting Plan
- Risk Management Plan
- Document Management
- Lessons Learned
- Current Pictures of Work In Progress
- Other Required Plans

[Source: Project Management for Utility Capital Projects Using Project Management Best Practices for Success, Presented by PMCC, Inc. (a consulting firm in Houston, TX) in association with EUCI.]

The Audit Staff reviewed Ameren Missouri's capital project plan that included many of these key elements. However, during internal and external audit reviews conducted by Ameren Services and Ernst & Young during the course of the construction project, they identified inefficiencies in Ameren Missouri's capital project plan. These inefficiencies will be discussed later in this Report.

For managing the Sioux WFGD Project, Ameren Missouri reviewed a number of approaches and decided to adopt an alliance approach to project management. An alliance is a team aligned to the same objectives as Ameren. Ameren Missouri reviewed similar approaches utilized by other utilities including: AEP, Cinergy, Duke, Dynergy, Southern Companies and Progress Energy (Source: Company response to Staff Data Request No. 144, Attachment 2). The Alliance team members were to be: Alberici, Graycor, MC Industrial (MCI), Sachs Electric ("Sachs") and S&L and to be known collectively as Allied Power Solutions, LLC (APS) for the duration of the Sioux WFGD Project. The team's objectives were to: (1) work safely; (2) meet budgets; (3) meet schedules; and (4) do more work. Responsibilities of the Alliance or APS were to include: (1) project management; (2) engineering management; (3) procurement management; (4) construction management including subcontractors, schedules, safety, budgets, quality assurance, quality control, inventory and deliveries; (5) manage checkout, commissioning and startup; and (6) provide status reports to Ameren Missouri. The Alliance also utilized a Project Execution Team whose primary focus was to validate and forecast budgets and schedules.

Reports Ameren Missouri was to receive from APS throughout the course of the construction project included:

- Program Costs Status – relating to estimated costs at completion
- Project Summary – relating to cost and schedule performance

- Bills of Materials Cost Management – relating to costs incurred, committed costs, and estimated costs at completion for specific work packages
- Variance Reports – intended to allow early detection of significant variances requiring corrective actions

On July 17, 2007, Ameren Missouri provided information to Mr. Robert E. Schallenberg explaining the rationale for Ameren's decision to implement an alliance approach to manage the Sioux WFGD Project. In its response to Staff Data Request No. 127, Ameren Missouri provided a copy of that information which follows:

** [redacted] **

** [redacted] **

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[redacted]

[redacted]

[redacted]

[redacted]

The Audit Staff has reviewed the presentation dated October 27, 2006, provided in response to Staff Data Request No. 144 in this proceeding. The Audit Staff also reviewed a presentation provided in response to Staff Data Request No. 144 prepared by S&L relating to the market demands and supply as of February 2006 for flue gas desulfurization systems. Review of these documents appears to be reflective of the above referenced response provided to the Audit Staff.

1. Sargent & Lundy Engineering (S&L)

S&L was hired to provide professional engineering and related support services as required by Ameren Missouri for the Sioux Wet Flue Gas Desulfurization Project (WFDG).

2. Allied Power Solutions (APS)

Ameren also utilized APS to provide cost and schedule performance indices for the Sioux WFGD Project. APS is a limited liability company consisting of five members: Alberici Constructors, Inc. Graycor Industrial Constructors Inc., MC Industrial, Inc. (MCI), Sachs Electric Company (Sachs) and Sargent & Lundy, LLC (S&L). Services provided by APS members are separate and apart from any other agreement between Ameren Missouri and the APS members. The role of APS for purposes of the Sioux WFGD Project was to

form an executive oversight committee to coordinate a project status reporting system to be utilized in reporting the status of numerous projects to Ameren Missouri.

3. Ameren Missouri Personnel Assigned Field Responsibilities for the Sioux WFGD Project

During 2005 and 2006, the following individuals were assigned field responsibilities for the Sioux WFGD Project: Tom Callahan, Project Manager; Chris Maricic, Strategic Sourcing; and Karl Blank, Plant Manager (Source: Company response to Staff Data Request No. 146).

From October 2007 through December 2007, Dan Wingbermuehle was assigned as the Project Manager for the Sioux WFGD Project. Others assigned during that time frame included, but are not limited to: Rick Smith, Project Sponsor; Tom Callahan, Project Supervisor; Karl Blank, Sioux Plant Manager; and Ken Beckman, Construction Supervisor (Source: Company response to Staff Data Request No. 146).

During the period December 2007 through the present individuals assigned to the project have included, but have not been limited to: Mark Birk, VP of Power Operations; Bob Meiners, Director of POS; Bob Schweppe, Manager of Environmental Projects; Karl Blank, Sioux Plant Manager; Chris Maricic, Manager Supervisor of Sioux WFGD; Homer Clark, Supervisor Engineering Sioux WFGD; Ken Beckmann, Manager Supervisor Construction; and Tom Pierie, Supervisor Engineering Commissioning (Source: Company response to Staff Data Request No. 146).

Staff Expert/Witness: Roberta A. Grissum

B. Cost and Schedule Management

Ameren Missouri utilized numerous methods for cost and schedule management during the course of the Sioux WFGD Project. The three primary sources of guidance utilized by Ameren Missouri for project management purposes included the internal management manuals governing General Technical Services' management of the project and later those governing project management provided by Ameren Missouri Power Operations Services (POS) as well as the Project Management and Reporting Manual governing the project management provided by the Allied Power Solutions (APS). The POS provides engineering and support services to all Ameren Missouri generating facilities, except nuclear. It was formed on January 1, 2008, and consists of employees and operations formerly assigned to Ameren Services Company Generation Technical Services (GTS) group. An additional source of guidance was provided by the Power Operation Services, Quality Management Services (QMS) Project Management Manual, GEN-ADM-2151. The purpose of this particular manual was to provide "standards and

expectations for managing projects to promote the consistent initiation, planning, execution, monitoring and control, and close-out of approved Ameren Energy Resources (AER) and AmerenUE (AUE) engineering and construction projects" according to a copy of the manual provided to the Audit Staff in response to Staff Data Request No. 302 (Source: Doc ID: MPSC 0302_ATTACH 00376). Copies of each of manuals and any subsequent revisions were provided to the Audit Staff in response to Staff Data Request Nos. 136 and 302. The QMS manual identified above includes, but is not limited to, the following and is based largely upon documents obtained from the U.S. Department of Energy according to a list of references and sources provided to Audit Staff in response to Staff Data Request No. 302 (Source: Doc ID: MPSC 0302_ATTACH 00362):

- Project Justification Process (Ameren Corporate Policy GTS-MAN001-PM, Section 2-1, Rev. 0, Rev. 1, Rev. 2, Rev. 3, Rev. 4) – purpose of this procedure was to provide instructions to document project justification including the means to describe projects, calculate costs, describe risks and calculate payback time (Source: Staff Data Request No. 302, Doc IDs: MPSC 0302_ATTACH 00001, MPSC 0302_ATTACH 00004, MPSC 0302_ATTACH 00007, MPSC 0302_ATTACH 00011, MPSC 0302_ATTACH 00016);
- NPV (EVA) and Write-up Guidelines for 2006 Budget Process – this process was required for all capital projects in excess of $*[redacted]* and operations & maintenance (O&M) project in excess of $*[redacted]*. NPV (EVA) analysis was required for efficiency or reliability improvements, capacity improvements, and outage projects (Source: Staff Data Request No. 302, Doc IDs: MPSC 0302_ATTACH 00010). This process required Ameren Missouri to identify project objectives, alternatives projects to consider, provide a full scope of project and estimated cost and identify the root cause to be addressed by the project;
- Work Order Processing (Ameren Corporate Policy GTS-MAN-001-PM, Section 2-2, Rev. 0, Rev. 1, Rev. 2) – the purpose of this procedure was to provide instructions for processing work orders using PowerPlant computer application (Source: Staff Data Request No. 302, Doc IDs: MPSC 0302_ATTACH 00022, MPSC 0302_ATTACH 00023, MPSC 0302_ATTACH 00024)
- Retaining Consultants/Vendors for Technical Services (Ameren Corporate Policy GTS-MAN-001-PM, Section 4-1) – the purpose of this process was to provide guidance for the request for proposal (RFP) and request for quote (RFQ) activities (Source: Staff Data Request No. 302, Doc ID: MPSC 0302, Doc ID: MPSC 0302_ATTACH 00125);
- Design Basis Control (Ameren Corporate Policy GTS-MAN-001-PM, Section 4-4, Rev. 1) – the objective of this process is to provide instructions for identifying,

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preparing, reviewing, approving, revising and controlling engineering design basis and the supporting design information (Source: Staff Data Request No. 302, Doc ID: MPSC 0302_ATTACH 00272); and

- Project Change Requests (Ameren Corporate Policy GTS-MAN-001-PM, Section 4-1, Rev.2) – the objective of this process is to "ensure change to Projects Baselines (scope, cost and schedule) are promptly identified, documents, managed following Outage Scope Control implementation" (Source: Staff Data Request No. 302, Doc ID: MPSC 0302_ATTACH 00299)

The Audit Staff also received information relating to mechanisms for project cost control utilized by Ameren Missouri in response to Staff Data Request No. 135. With regard to design control, the Company provided the following:

> Ameren performed internal design control analysis utilizing plant and engineering personnel in an effort to exercise quality control and influence cost. These internal design review efforts were headed up by Ameren engineers with years of design review experience, communicating with S&L and plant personnel as to operation needs of the plant. Operational and maintenance needs were communicated by plant personnel involvement through the entire project, beginning with design and continuing through construction, commissioning and start-up. In addition to Ameren's own design review efforts, Ameren relied on the S&L's ISO9001 certified QA/QC policies and procedures for QA/QC policies and procedures for design control.

According to the Company's response, the Quality Management System (QSM), which is ISO based, was initiated on September 30, 2008. ISO is the International Organization for Standardization, an international non-governmental organization. The ISO website states that ISO enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society. The standards and guidelines developed by this organization are purported to comprise an international consensus on good quality management practices. In Ameren's QSM policy, the Company defines its administrative controls, processes and procedures to be utilized by Ameren Missouri to control design, maintenance and operation of Ameren Missouri's non-nuclear fleet. However, Ameren Missouri indicated in its response to Staff Data Request No. 135 that it is not an ISO certified company for QSM. To be ISO certified, a Company must have its processes and procedures verified by an independent auditor to be in compliance with the ISO standards. Ameren Missouri has not pursued such certification.

However, Company personnel informed Staff on February 1, 2011 that Ameren Missouri has followed the QSM guidelines since the Taum Sauk breach in 2007.

According to its response to Staff Data Request No. 135, Ameren Missouri utilized the following for project management and cost control activities for the Sioux WFGD Project in addition to the involvement of Ameren personnel and S&L in the design process:

- Constructability Reviews – APS conducted these reviews looking for efficiencies to stage materials, deliver equipment and materials, stage equipment, apply lessons learned from prior projects similar to the Ameren project and select alternative material leading to lowest cost options;
- S&L Work Package Reviews – S&L reviewed all work package estimates submitted by the contractors and made recommendations which were ultimately approved by Ameren and became part of the Target Price for the work package. The work packages were then subject to audit by Burns & McDonnell as an additional measure of cost control. If any of these reviews identified a discrepancy outside of the acceptable variance of *[redacted]*% of the contract estimate based on the opinion of Burns & McDonnell, Ameren Missouri was to follow-up with the contractor in an effort to reconcile the two and ensure costs charged to the Company were fair and reasonable. The Audit Staff discusses the cost reviews conducted by Burns & McDonnell later in this report.
- S&L Monthly Cost Reports – S&L began providing these reports to Ameren Missouri in June 2007 for the Sioux WFGD Project. Items required by this monthly report included: forecast and actual costs for MCI, Sachs, Ameren Missouri and S&L. Items required by this monthly report were expanded as the project progressed to include: estimates, forecasts, committed costs, actual costs and variances.
- APS Monthly Report – The reports provided by APS included: monthly and project-to-date performance updates in the areas of safety, cost, schedule, labor productivity, project challenges, earned value analysis, and engineering and commissioning progress. In addition, APS met with Ameren Missouri on a monthly on a formal basis to review the findings reported in these reports. According to Company's response, "the meetings provide a forum for discussion of project progress, lessons learned, and cost-effective solutions to potential issues."
- Hitachi Monthly Meetings – Ameren Missouri and S&L personnel began conducting monthly meetings with its vendor, Hitachi, along with personnel from APS and Sachs. According to Ameren Missouri's response to Staff Data Request No. 135, these meetings "were focused on all aspects of the scrubber design and installation in an effort to identify impacts on project design, schedule and cost."
- Capital Project Oversight Committee (CPOC) Reports - The Company has indicated that monthly project status reports were submitted to the CPOC for review. Monthly

reporting began in April 2008 and continues to present. These reports include actual-to-date, forecast, work order approval amounts, and percent complete.

1. Monthly Status Reports to the Missouri Public Service Commission Staff

The Company provided the following response to Staff Data Request No. 286 to address contractor interferences identified in its monthly status report dated August 2009 to the Staff:

> Coordinating contractor work scopes continues to be a challenge; as expected, the coating work by Devcon in the absorber area has increased contractor interference issues. The coating work by Devcon on the absorber was expected to increase congestion in the absorber area; consequently, the report continues by noting that [s]trong cooperation between Contractors is being realized.
>
> Close monitoring of schedule by the Company and our General Contractor (MCI) allowed the Project Team to forecast potential interferences and revise work plans to avoid or minimize delays. One of the ways the Company accomplished this was to integrate project activities and work plans into one overall schedule to facilitate schedule management.

Monthly status reports submitted to the Staff included forecast information produced by Ameren Missouri's CompetiSoft Budget System (CBS), its construction budgeting system, and was primarily used by the Company as a means to track costs and monitor cash flows for the project (Source: Company response to Staff Data Request No. 287). This internal controls process allowed Ameren Missouri to identify risks and potential scheduling issues early in the project. These reports were submitted to Audit Staff only after Audit Staff was informed they existed during meetings held with Ameren Missouri personnel relating to the environmental upgrades being pursued by the Company.

One particular concern that was identified early in the project involved one of its key contracts with Devcon. The Company specifically cited in its September 2009 status report: "Devcon project management continues to be a concern; close monitoring/coaching from AmerenUE needed to avoid schedule delays." As a result, Ameren Missouri was required to exercise increased project supervision over Devcon by assigning a specific Project Engineer to monitor its activities and progress. In response to Staff Data Request No. 288, Ameren Missouri provided the following description of these monitoring/coaching activities:

> Initially, the Company, as it does for all contractors, monitored Devcon's progress through weekly progress reports and weekly progress meetings, which were held with Devcon to review progress and planned activities.

> When any specific issue was identified, the Project Engineer would hold daily planning meetings with Devcon and its subcontractors to more closely track the identified issue. The Company's Construction Supervisors and Safety Supervisors also provided additional monitoring of this vendor.
>
> In part because of project management concerns and because of the importance of this aspect of the project to its overall success, the Company utilized third party Quality Control (QC) to monitor application of Devcon coatings to ensure QC compliance. Third party QC included the monitoring of ambient conditions; surface preparation, coating thickness, workmanship, and compliance with recoat time limits.
>
> While the amount of oversight required by Ameren over this contractor was more than anticipated, the coating system received met the requirements of the contract. Consequently, there was no "non-performance" by Devcon on the Project.
>
> Because there was no non-performance by Devcon, there was no impact on the overall cost of the Sioux WFGD Project.

While the Audit Staff believes the actions taken by Ameren Missouri to ensure quality control and success of the project appear reasonable, Ameren Missouri failed to quantify the increase in cost that may have been incurred due to this increased supervision. The simple fact that Devcon did perform under the terms of its contract agreement does not necessarily translate to the work being performed in a cost effective and efficient manner. Therefore, it is the Audit Staff's belief that Ameren Missouri should have quantified any costs it may have incurred due to this increased supervision. Failure to perform such an analysis does not ensure the work was performed in the most cost-effective and efficient manner.

Another area of concern raised in the Company's monthly status report to the Staff dated November 2009, involves its electrical contractor, Sachs. In response to Staff Data Request No. 389, the Company provided the following information:

> Issues related to incomplete electrical design were raised by our electrical contractor (Sachs Electric). The concern was that Sachs field staff was spending more time than originally anticipated reviewing electrical design information. As stated under "Issues", this issue was primarily addressed by having the Project Team (Sachs and S&L) meeting twice a week to discuss design issues and status, giving emphasis to the priority items, so as to minimize construction impacts. Several measures were implemented to address this issue, including the following: (1) weekly conference calls were held with field staff (included Ameren and Sachs)

> and Sargent & Lundy Electrical Engineers to ensure field concerns were understood and addressed in a timely manner; (2) Sargent & Lundy added additional electrical staff based on field issues; (3) additional Sargent & Lundy management staff was added to support electrical design; (4) a Sargent & Lundy electrical engineer was assigned full time to the project site to act on priority field concerns; and (5) the Company added a supervising engineer to the site staff; this individual was an electrical engineer.
>
> No determination was made whether this risk would result in a cost impact to the Project, and no particular calculation was performed at the time to quantify the impact of this potential risk to the Project.

The Staff believes the actions taken by Ameren Missouri to ensure quality control and success of the project are reasonable. However, the Audit Staff believes Ameren Missouri should have quantified any increase in cost that it may have incurred due to this increased supervision. Failure to perform such an analysis does not ensure the work was performed in the most cost-effective and efficient manner.

In its Monthly Status Report to the Audit Staff dated April 2010, Ameren Missouri identified issues relating to training of inexperienced field resources and inexperienced commissioning resources. Ameren Missouri also identified an issue relating to design and installation discovered during the commissioning process. In response to Staff Data Request No. 292, Ameren Missouri provided the following explanation of actions taken by Ameren Missouri to mitigate the risk associated with these issues:

- Commissioning Procedure GEN-ADM-2155 was utilized by the project team. The procedure clearly defines the commissioning process and standardized the commissioning process for all commissioning team members.
- Utilization of a detailed Commissioning Schedule to manage the commissioning effort, record progress, and measure schedule compliance.
- Experienced Ameren Missouri Scheduling resources were assigned full time to the project and supported the commissioning effort; and
- Utilization of more experienced Ameren Missouri Commissioning and Engineering staff to support the commissioning effort.

As a result of the Company's efforts to mitigate the risk posed by less experienced engineers in the commissioning effort, no concerns were identified during the commissioning process as the result of the involvement of less experienced engineering staff.

With regard to the design and installation issue, Ameren Missouri provided the following explanation of the actions it took:

> Issues discovered as part of the commissioning effort were documented in "Deficiency Logs". A deficiency log was created for each system and each issue was subsequently addressed by the design engineering staff. The issues were prioritized based on potential impact to schedule, and engineering efforts were managed to mitigate these issues. The Project Team effectively addressed design issues allowing the commissioning effort to be completed per schedule and on budget. Due to the numerous plant systems, there are multiple logs.

Ameren Missouri provided an example of a deficiency logs in response to Staff Data Request No. 292. The deficiency logs Ameren Missouri maintained during the Sioux WFGD Project appear to be reasonable. Ameren Missouri asserts in its response that "because any costs associated with this issue were accounted for in the commissioning budget and the commissioning process was completed per schedule and within its budget no calculation quantifying the specific cost impact discussed in the DR exists." The Audit Staff maintains that Ameren Missouri's failure to perform such an analysis because "the commissioning process was completed per schedule and within its budget" does not ensure that the related work was performed in the most efficient and cost effective manner.

In the Monthly Status Report provided to the Audit Staff dated May 2010, Ameren Missouri identified an issue with undersized motor starters and breakers discovered during the commissioning process. Ameren Missouri provided the following explanation of actions it took to mitigate the impact of this issue on the Sioux WFGD Project in its response to Staff Data Request No. 293:

> Ameren Missouri Commissioning identified that approximately 110 out of 813 480V motor control center (MCC) bucket overloads and/or breakers did not satisfy the required circuit protection for the designed electrical load. The problem was corrected by relocating buckets, utilizing spare buckets, or replacing the overloads and/or breakers within the buckets.
>
> The contractor labor to rework or relocate the buckets was covered under Commissioning Work Authorization (CWA) STP#108-1. Two dedicated electricians were assigned to the CWA, and this effort required approximately 200 man-hours to complete. Man-hours were tracked using company timesheets and logged onto a spreadsheet. The CWA was funded by the commissioning budget.

> A Commissioning Engineer was also assigned to manage the relocations, replacements, testing, and documentation. The assigned Commissioning Engineer required approximately 100 man-hours to complete these tasks.
>
> The required overloads and breakers were procured under several Electronic Bills of Material (EBOMS) and Purchase Orders (PO's).

Ameren Missouri provided the Staff with copies of the Commissioning Work Authorization and supporting spreadsheet tracking the additional man-hours incurred as a result of this issue. The Company also provided copies of the EBOMs and PO's prepared to secure the materials and supplies necessary to correct this design flaw. Although the actions taken by Ameren Missouri to address this issue once it was identified appear to be reasonable, the indication is that a rather critical component was not designed properly in the original design process. As such, Ameren Missouri should have conducted an analysis to at least gain the benefit of a "lesson learned" for future coal plant retrofits.

2. Monthly Status Reports APS Provided to Ameren Missouri

In the area of cost and schedule management, APS was to develop a consistent method to monitor project schedule and budget performance and analyze areas of proficiency and deficiency and make recommendations for improvements. APS began providing such reports to Ameren Missouri in March 2007 and continued to do so at milestones, in status of work packages, in status of work package budgets, and in budget variances. In addition, APS provided project management measurements for two key Ameren Missouri contractorsMCI and Sachs. These project management measurements included Cost Performance Index (CPI), Schedule Performance Index (SPI) and Cost Schedule Index (CSI). CPI measures the cents performance out of every dollar spent. If CPI is less than 1.0, then the project is over budget. Conversely, if CPI is greater than 1.0, then the project is under budget. SPI measures the rate of progress as a percentage of the originally planned schedule progression. If SPI is less than 1.0, then the project is behind schedule. Conversely, if SPI is greater than 1.0, then the project is ahead of schedule. CSI measures the overall efficiency of the project and the likelihood of recovery for a project that is behind schedule and over budget. The further CSI is from 1.0, the more difficult it will be for the project to get back on track with project schedule and budget As with CPI and SPI, if CSI is less than one, then the project is both over budget and behind schedule. Conversely, if CSI is great than one, then the project is both under budget and ahead of schedule.

It is important to note that these indices are only as good as the cost budget data upon which they are based. If the underlying cost budget data is flawed, then the resulting cost and performance indices will be flawed and provide inaccurate indications of project cost and performance status. (Sources: Measure Project Performance, http://www.projectmanagementdocs.com, Project Management Body of Knowledge (PMBOK), https://certifiedpmp.wordpress.com/category/pmbok/ and http://kpilibrary.com/categories/pmbok?tag=performance.)

In the APS monthly reports, schedule and cost performance was monitored through the use of commodity curves (February 2007 through present), work package budget reports (March 2007 through September 2007), field productivity status reports (April 2008 through August 2008) and labor productivity tracking reports (June 2008 through present). Commodity curves were used to monitor progress and performance of cable, piping, steel erection, concrete and manpower. APS work package budget reports provided a breakdown that compared invoiced amounts, estimate at completion and percent complete by work package. APS was to prepare these reports in compliance with APS Project Controls Guideline, PCP-2, Cost Control, and included information obtained from MCI and Sachs who were responsible for developing, monitoring and reporting cost and efficiency indices associated with construction activities and reporting such information by individual work package. (Source: Company response to Staff Data Request No. 138). APS field productivity status reports were used to report earned quantities and productivity information relating to multiple commodities within the work scopes. APS labor productivity tracking reports provided an overview of productivity relating to multiple commodities within the work scopes. (Source: Company response to Staff Data Request No. 137).

The Audit Staff reviewed these monthly reports in the process of identifying unexplained costs that would require further examination by the Audit Staff. The purpose of this examination was to identify any charges related to the Sioux WFGD Project that should be classified as imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers and to recommend that the Commission disallow the costs from recovery in this proceeding.

3. Monthly Progress and Cost Reports Provided to Ameren Missouri by S&L

As part of their commitment to Ameren Missouri, S&L provided monthly progress reports to Ameren Missouri from March 2006 through February 2009. During this

time frame, the reports S&L provided included status of designs, engineering, electrical/mechanical/structural work package schedules, permitting, and drawings. In addition to these progress reports, S&L provided monthly cost reports to Ameren Missouri from March 2006 through November 2010, in which it reported a comparison of the cost performance of the project against the approved construction budget. Through May 2009, the Sioux WFGD Project operated under a construction budget of $*[redacted]* million, which was based upon approximately 76% of the overall project design completed at the time the cost baseline was established. The total project design did not reach 100% completion until May 2009, at which time Ameren Missouri adjusted the Sioux WFGD Project construction budget to $*[redacted]* million to reflect this design completion. These cost budgets were utilized by S&L as cost baselines against which to measure and control the cost performance of the project.

The Sioux WFGD Project Cost Baseline breakdowns are as follows:

*[redacted]						
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]				[redacted] *		

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Budgets for operations and maintenance expense related to the Sioux WFGD Project that Ameren Missouri included in its cost of service in this proceeding were developed, reviewed and approved by the following individuals who also made recommendations regarding the level to be capitalized: Karl Blank, Sioux Plant Manager, with responsibility to review and approve; Pat Weir, Superintendent Tech Support, with responsibility to review and make recommendations; Keith Stuckmeyer, Superintendent Operations, with responsibility to review and make recommendations regarding the budget. Additional management personnel responsible for the Sioux WFGD O&M budget development, review and approval included: Clyde Frey, General Executive Fuel Department, with responsibility to develop a limestone budget based on fuel pattern as well as develop and manage limestone delivery contracts (Source: Company response to Staff Data Request No. 158).

Ameren Missouri constructed the Sioux WFGD Project outside the parameters and benefits of a Regulatory Plan prescribing specific objectives that must be met to satisfy Regulatory Plan requirements, as was the case respecting the Iatan 1 air quality control system environmental enhancements construction project for Kansas City Power & Light Company (KCPL). In addition, Ameren Missouri customers did not pay higher rates during the construction period for the Sioux WFGD Project, thereby, establishing a lower threshold for the

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identification and explanation of imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayer costs for the Project than those identified for Kansas City Power & Light's Iatan 1 Project.

The cost baseline utilized from August 2008 through May 2009 was identified by Ameren Missouri in its response to Staff Data Request No. 134 as being "based on the first definitive estimate." In response to Staff Data Request No. 151, Ameren Missouri defined a "definitive estimate" as follows:

> A definitive estimate is an approximation of the total costs of resources needed to complete a project which at the time of the estimate is expected to be within an accuracy range of +10%/-5%. What we call a definitive estimate is also generally considered to be a Class 1 estimate (where engineering is between 50% and 100% complete) under the Association for Advancement of Cost Engineering (AACE) Recommended Practices, which are provided with the response to MPSC 0153.
>
> Key inputs to a definitive estimate include scope, schedule, assessment of risks, and enterprise environmental factors. Post-estimate-preparation changes to these key inputs caused by, for example, unforeseen events, can significantly impact how accurate the definitive estimate turns out to be.

The Audit Staff's review of the Company's response to Staff Data Request No. 153 reveals that the AACE International, Recommended Practice No. 17R-97, Cost Estimate Classification System, TCM Framework: 7.3 – Cost Estimating and Budgeting copyrighted in 2003, defines a Class 1 estimate as follows: "A Class 1 estimate is closest to full project definition and maturity" and confirms the parameters for a Class 1 designation as reflected in Ameren Missouri's response to Staff Data Request No. 151 above.

In addition to utilizing these cost baselines to measure cost performance of the Sioux WFGD Project, S&L also tracked the performance of individual work packages. The general contractor component of the cost baseline consisted of approximately 97 work packages. In addition to these specifically identified work packages, there were certain items within the scope of the project that were unassigned and anticipated to be reallocated to other work packages related to the general contractor during the course of the project. There were also dollars estimated for contingency to cover unanticipated costs expected to be incurred by the general contractor, MCI, as well as a *[redacted]*% general contractor maximum fee adjustment.

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The electrical contractor component of the cost baseline consisted of approximately 66 work packages. In addition to these specifically identified work packages, there were certain items within the scope of the work that were unassigned and anticipated to be reallocated to other work packages related to the electrical contractor during the course of the project. There were also dollars estimated for contingency to cover unanticipated costs expected to be incurred by the electrical contractor, Sachs, as well as a *[redacted]*% electrical contractor maximum fee adjustment.

The Audit Staff reviewed these monthly progress and cost reports in the process of identifying unexplained costs that would require further examination by the Audit Staff. The purpose of this examination was to identify any charges related to the Sioux WFGD Project that should be classified as imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers. Staff also reviewed the construction budgets approved and utilized by AmerenUE from the inception of the Sioux WFGD Project to its date of completion that were provided in response to Staff Data Request No. 160.

According to Ameren Missouri's response to Staff Data Request No. 138, MCI was responsible for maintaining the Sioux WFGD Project schedule. MCI was also responsible for preparing the construction schedule as well as tracking, monitoring, and reporting on the construction schedule. This schedule included: equipment deliveries, Hitachi deliveries, Sachs activities, and various other subcontractor and Ameren Missouri direct contracts including contracts with Karrena, Devcon, Howden, ABB, Whalco Metroflex, Papco, Stebbins, and Sega. S&L was responsible for developing, monitoring and reporting cost information. S&L was also responsible for scheduling, tracking, monitoring and reporting engineering, significant equipment procurement, manufacturing and delivery status in addition to assisting Ameren Missouri with any scheduling conflicts that might arise due to late deliveries of equipment caused by constraints in the market. (Source: Company response to Staff Data Request No. 138).

Monitoring of the project was to be done in accordance with the APS Project Controls Guideline, PCP-1 Scheduling and an agreement from the Book of Decisions 3.1 dated April 12, 2007. When the Project Operations Services (POS) was organized, the POS developed the Process Overview and Objections for the Process Area: Capital Construction Schedule Management. To further assist with schedule control, Ameren Missouri employed the services of KPMG to evaluate the schedule process and techniques.

Staff Expert/Witness: Roberta A. Grissum

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C. Internal and External Audit Reviews

Ameren Missouri employed Burns & McDonnell to review the reasonableness of the cost estimates vendors provided for select work packages. In most cases, a "blind cost review" was utilized, given only general work scope definitions. The blind cost reviews were then followed-up by a second review and incorporated the entire scope of work for the particular work package. In most instances, the results of the Burns & McDonnell reviews fell within a zone of reasonableness established by Burns & McDonnell that was acceptable and did not require further review by its work package reviewers. Ameren Missouri also employed the services of Ernst & Young to perform an audit of the adequacy and effectiveness of the Ameren Missouri's internal controls. Ernst & Young identified certain items that required a response from Ameren Missouri. Those identified items included: design drawings, equipment pricing, defined roles and responsibilities, formal risk management process, contingency management, incorrect labor rates, charges ineligible for reimbursement under contract, and procurement procedures.

Ameren Services also performed internal audits of Ameren Missouri's project management policies and procedures. One audit finding was that Ameren Missouri lacked an organizational chart defining roles and responsibilities of key individuals for the Sioux WFGD Project that were correlated with specific functional roles and it did not have a lead assignment list documenting project roles and responsibilities. As a result of this audit finding, the Project Management Team (PMT) developed such an organizational chart and a Sioux WFGD Environmental Project Engineering (EPE) Lead Assignment List. The EPE is a department within Project Operation Services (POS).

Another item identified as a result of Ameren Services' internal audits was Ameren Missouri's lack of a structured and formalized risk management process that included the development and maintenance of a comprehensive risk matrix, assignment of resources to manage identified risks, performance of cost-risk analysis (i.e., Monte-Carlo simulation) and schedule-risk analysis. Ameren Services auditors believed that "without a formalized risk management process, the PMT may not be able to control risks that can result in significant cost growth beyond the authorized Work Order for the project." According to Ameren Missouri's response to Staff Data Request No. 306, the PMT responded to this audit finding by developing a project-specific risk management process and associated process flow diagrams. As a backup, the PMT maintained a duplicate copy in Prolog. Prolog was the construction management

software utilized primarily by Ameren Missouri's general contractor MCI and its electrical contractor Sachs during the Sioux Project beginning in 2007. Prolog is construction project management software developed by Meridian Systems. During the Sioux project, it was used primarily by MCI and Sachs (per T. Callahan, used since 2007 for Sioux project) to manage the construction project. On its web site, Meridian Systems purports that the software was designed for use by general contractors for document management, cost control, field administration of tasks and processes from project design to close-out. Information found on Meridian's website indicates the software is essential for all publicly funded projects (Source: http://www.meridiansystems.com). However, Ameren Missouri abandoned the process of entering risk register information into Prolog when Allied Power Solutions (APS) resources were reduced. To compensate for this reduction in APS resources, Ameren Missouri began managing the risk information in accordance with Ameren Missouri's risk management procedure. The Audit Staff reviewed a copy of this policy provided in Ameren Missouri's response to Staff Data Request No. 135 as Attachment 206. Ameren Missouri also maintained a log of backcharges containing a summary of all claims issues for the Sioux WFGD Project. ** [redacted] ** according to the Company's response to Staff Data Request No. 306.

In the early stages of the Sioux WFGD Project, Ameren Services internal audit review discovered that Ameren Missouri was not proactively managing and controlling the Project contingency funds. A contingency fund is described, in general, as a budgeted amount that is set aside in a separate fund and used to cover costs incurred for parts of the project that cannot be fully predicted at the start of a project. In response to that audit finding, Ameren Missouri's PMT, with the assistance of S&L developed a contingency management process and approval process. The primary purpose of the procedure was to identify levels of authority for amounts transferred in and out of the contingency fund and to record contingency fund transactions in the project record. The purpose of the procedure was also to provide a recurring and transparent view of the contingency status. Contingency transfers of less than $* [redacted] * required only the approval of the Managing Supervisor – Sioux WFGD. Contingency transfers greater than $* [redacted] * required the approval of the Manager – Environmental Project Engineering. All

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contingency transactions were recorded, approved and reported in the monthly S&L Cost Reports. (Source: Company response to Staff Data Request No. 308).

To further monitor the effectiveness of its project management processes for the Sioux WFGD Project, Ameren Missouri engaged the services of Ernst & Young (E&Y) "to analyze certain amounts invoiced to the Company by the Contractors/Engineer during the period from January 1, 2007 through June 30, 2007 with field work for this audit occurring during the period October 1, 2007 through December 15, 2007. The scope of the analysis included expenses such as per diem and subsistence rates and charges by the Contractor's/Engineer's and billed to the Company." This particular audit focused on the five members of the Alliance (Allied Power System aka APS): Alberici, Graycor, MCI, Sachs and S&L.

E&Y conducted an operational assessment of Ameren Missouri's project engineer for the Sioux WFGD Project, S&L, for the period ending October 2007, based upon invoices and performance data. Field work for this audit occurred during the period December 2007 through January 2008, and the audit findings were presented to Ameren Missouri in July 2008. One concern identified by this audit review was S&L's delays in reviewing design drawings. Although S&L's contract agreement with Ameren Missouri did not specify specific dates for completing design drawing reviews, a goal for review of design drawings was set at a 20-day turnaround. Specific language provided by Ameren Missouri in response to Staff Data Request No. 324 indicates that *[redacted]* According to Ameren Missouri's response to Staff Data Request No. 324, *[redacted].* This was confirmed by the Audit Staff during a site visit and discussion with the Project Manager at the Sioux power plant on January 7, 2011. Ameren Missouri's response to Staff Data Request No. 324 also indicates *[redacted]* Actions taken by Ameren Missouri to mitigate potential scheduling delays appear to be reasonable.

*[redacted]

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[redacted]*

Audit findings were discussed with contractors on December 6, 20007 during a meeting of APS members. According to Ameren Missouri's response to Staff Data Request No. 309, Ameren Missouri directed its contractors to provide more transparency of how rates were established and assigned to classes of personnel.

Staff Expert/Witness: Roberta A. Grissum

D. Lessons Learned for Project Management

Several issues occurred during the construction of the Sioux WFGD Project and/or the Coffeen Project in Illinois that provided Ameren with an opportunity for lessons learned. The 950 MW Coffeen power station is an Ameren Energy Generating non-regulated facility in Illinois comprised of two coal-fired units that had scrubbers added. The issues that occurred during the construction of the Sioux WFGD Project and/or the Coffeen Project included, but were not limited to:

- Switch from wet grinding on-site facility that would provide limestone slurry to the WFGD system to a dry grinding facility with limestone supplied in powdered form from an off-site grinding facility;
- Avoidance of Falk manufactured gearbox failures; and
- Undersized motor starters and breakers discovered during commissioning of the Sioux WFGD

The original scope of the Sioux WFGD called for Ameren Missouri to install an on-site wet grinding facility that would provide the limestone slurry for the Sioux WFGD. As the project progressed, however, Ameren Missouri performed an economic analysis that demonstrated the Company could benefit from a design change calling for a dry grinding facility with limestone provided in powdered form from an off-site grinding facility resulting in a significant cost savings and provide a system that would be easier to operate and maintain. According to Ameren's response to Staff Data Request No. 290, *[redacted]

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[redacted]* (Source: Company response to Staff Data Request No. 290).

Following the retrofit of Ameren's Coffeen power station, the Company experienced 13 gearbox failures during the first three months of operation. In response to these failures, Ameren communicated with Coffeen start-up engineers followed by conference calls with Falk, the gearbox manufacturer, and Hitachi, affording the Sioux WFGD Project personnel with an opportunity to identify potential risks and modify the start-up testing procedures as deemed appropriate for the Sioux WFGD Project. This lesson learned at Ameren's non-regulated facility at Coffeen provided Ameren the opportunity to avoid similar failures at the Sioux WFGD Project. According to Company's response to Staff Data Request No. 291.1, the Sioux WFGD has not experienced any failure of the Falk gearboxes.

According to Company's response to Staff Data Request No. 293, Ameren Missouri Commissioning found 110 out of 813 480V motor control center bucket overloads and/or breakers did not meet assigned electrical load requirements. Ameren Missouri informed the Audit Staff that this problem has since been corrected. It is the Audit Staff's opinion that this provided Ameren Missouri with a lesson learned that could provide cost savings on future retrofit projects planned for the Rush Island and Labadie power plants.

An additional lesson learned for the Sioux WFGD Project occurred in March 2009 when Ameren Missouri was made aware of a problem with the flakeglass absorber lining installed at Ameren's non-regulated Illinois Duck Creek power station. Quality concerns observed at the Duck Creek Station along with long-term reliability and maintenance concerns provided Ameren Missouri with an opportunity to use this lesson learned and avoid similar concerns from developing during the Sioux WFGD Project.

The Audit Staff found that Ameren Missouri implemented lessons learned from its affiliates to improve the efficiency of the Sioux WFGD Project.

Staff Expert/Witness: Roberta A. Grissum

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E. Procurement and Payment Process

1. Engineering Service Agreements

In the early stages of the Sioux WFGD Project, Ameren Missouri secured services either through engineering service agreements (ESA) or through contracts released on an on-task basis. The ESAs were typically a time and material cost type agreement. Costs charged to the Sioux WFGD Project, Work Order 15433, under these forms of agreement included: Aerotek, Allied Power Services, Burns & McDonnell, CDG Engineering Arch, CDS Engineering, Catalyst Inc., D Michael Engineering, Digi Reprographic, EPSCO International, Fields & Son, Kuhlmann Design Group, RBF Interiors, Reitz & Jens Inc., Sargent & Lundy, Sega Inc., and Stephen Richard & Associates.

In response to Staff Data Request No. 127, Ameren Missouri provided the following explanation of the process utilized to secure the services of Allied Power Solutions:

** [redacted] **

Contracts for APS, MCI, and Sachs were not the result of a bidding process. As stated earlier in this report, APS is a limited liability company consisting of five members: Alberici, Graycor Industrial Constructors Inc. (Graycor), MCI, Sachs, and S&L. Alberici and Graycor, however, did not have any responsibility related to the Sioux WFGD Project.

2. Request for Bids

After procuring engineering services during the next phase of the project, Ameren Missouri moved to a formal procurement process requiring purchase orders. Contracts for the Sioux WFGD Project that resulted from request for bid letters were: Corrigan, Karrena, Devcon and Titan National. Corrigan provided mechanical equipment and piping installation as a subcontractor to MCI. Karrena was the chimney contractor. Devcon provided interior and exterior coatings systems and Titan National worked as a subcontractor for MCI erecting the

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absorber vessels for the Sioux WFGD Project. (Source: Company response to Staff Data Request No. 127).

3. Staff Review of Procurement Process

To the extent possible, the Audit Staff reviewed charges provided in Doc ID: *INTIIAL PROD ATTACH 01288*, All Charges through 9/17/2010, and confirmed that a purchase order did in fact exist for a large number of charges Ameren Missouri incurred for the Sioux WFGD Project. However, the Audit Staff identified approximately $**[redacted]** million in charges that did not utilize the purchase order process, i.e., they were handled outside the purchase order process, since a purchase order number was not referenced for the charges recorded in the Company's accounting system. The processing of these charges handled outside the purchase order process was first discussed with Ameren Missouri personnel during a teleconference conducted on January 6, 2011. During that teleconference, the Audit Staff learned of the ESAs and task basis agreements. The Staff identified approximately 1,400 vouchers that were not supported by purchase order or ESA documentation and, therefore, conducted a more detailed review of these vouchers to determine if these charges could be supported by a purchase order or ESA. Ameren Missouri provided copies of these agreements for Audit Staff review as a supplement to its response to Staff Data Request No. 348. In response to Staff Data Request Nos. 348.1 and 348.2, Ameren Missouri also provided the Audit Staff with copies of the underlying invoices related to the 1,400 vouchers. The Audit Staff is in the process of reviewing this documentation in an attempt to determine if the charges incurred are prudently / reasonably / appropriately supported by Ameren Missouri's purchase order process or the ESAs Ameren Missouri provided to the Staff.

4. Payment Processing

Ameren Missouri's response to Staff Data Request No. 135 indicates Ameren Missouri utilized an invoice auditing process as a cost control mechanism. This process is defined in greater detail in Ameren Missouri's response to Staff Data Request No. 138 as follows:

> Initially, all invoice applications made by APS and the General Contractors to the Company were reviewed by full-time Company personnel and/or contractors hired specifically as agents of the Company. Each payment request was reviewed to verify that the following was included: required lien waiver attachment, documentary evidence of the

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> expenditure or payment application (as was the case with advance payments), time sheets or certified payroll where labor was involved, material acceptance receipt, or other evidence as required by the contract.
>
> Other monitoring and verification action taken by Ameren regarding invoicing from the contracts, APS and S&L included weekly invoice teleconferences set up by Ameren and led by Ameren personnel and contractors hired by Ameren as invoice surveillance specialist. These calls dealt with improper invoicing from the contractors, reporting requirements for the contractors regarding submittal of invoices, inadequate documentation submitted with invoices, lien waiver attainment for payments to be made to contractors and APS, best practices that may be utilized by one contractor that Ameren suggested would be a requirement for all contractors, other issues as warranted per each teleconference. E&Y and Ameren Internal Audit would regularly monitor these teleconferences, looking for: improvement opportunities within the process, potential audit targets or insight into audit target specifics, contractual compliance with payment processing, new or evidentiary audit issues and practices or issues outside industry norms.

Post-organization of the Project Operations Services (POS), Ameren Missouri provided the Audit Staff with the following explanation of how its payment processing procedures evolved:

> Subsequent to the POS organization creation, depending on monthly invoice volume, 1-2 full-time positions in the Company continued to audit invoices from APS contractors and some of their major subcontractors, spanning roughly (25) Purchase Orders. Disputed items are recorded in an Invoice Review Sheet file, with comments noting action required to resolve the dispute. When necessary, disputes are elevated to the appropriate organizational levels to achieve resolution. The invoice auditor is to ensure the costs incurred by the project were allowable per the contract. The process included, but was not limited to, an audit of staff and craft labor, materials, equipment, subcontractors, travel and other expenses. A detailed outline of the items reviewed, verified, confirmed, validated and/or compared for each invoice is included in the "AUDIT PROGAM" tab of each Invoice Review Sheet file.

Ameren Missouri provided copies of Invoice Review Sheets to the Audit Staff in response to Staff Data Request No. 138. The Staff is in the process of reviewing these documents and will present the results of its examination at a future date in conjunction with its report on its sample audit of the individual invoices unsupported by a purchase order or ESA submitted to Ameren Missouri for payment and paid by Ameren Missouri.

Staff Expert/Witness: Roberta A. Grissum

F. Capital Projects, Change Orders and Approval Process

1. Capital Projects and Approval Process

In response to Staff Data Request No. 142, the Ameren Missouri provided the following information regarding the process required for it to initiate a capital project:

> The Sioux WFGD Project was first presented to the Project Review Board in September 2005, which consisted of senior management from AmerenUE as well as representatives from other Ameren Services organizations including: Legal, Purchasing and Corporate Planning. The project was then approved by Company management via approval of the work order (and subsequent work order extensions). The Board of Directors approved Project expenditures by approving annual construction budgets (which are included in the Company's overall annual budget).

In response to Staff Data Request No. 143, the Company provided the following information regarding the nature of the management approval process for the construction of the Sioux WFGD Project:

> The management approval process necessary for the construction of the Sioux WFGD project is the Ameren Work Order process. Ameren Corporation Project Policy and Procedure Effective 1/1/01 was in effect during the initiation of the WFGD Project. Ameren Corporation Project Policy and Procedure Effective 1/1/06 superseded the 1/1/01 Policy and was in effect from 1/1/06 through 11/1/08 for the WFGD Project. Ameren Work Order Policy AMN-08-03 effective November 1, 2008 is in force since that time for the WFGD Project. Ameren Work Order Procedure AMN-ADM-4003 effective November 1, 2008 is in force since that time for the WFGD Project.

2. Change Orders and Approval Process

The Audit Staff reviewed policies and procedures utilized by Ameren Missouri for managing change orders that occurred during the Sioux WFGD Project along with the necessary approvals required for those change orders to become part of the Project's cost baseline. The Audit Staff also reviewed all change orders/work order extensions that occurred during the course of the Sioux WFGD Project. A summary of activities added to the Project and their associated costs based upon the Work Order Extension approved by Ameren Missouri in May 2009 appear below and describe how the Cost Baseline of $*[redacted]* million established in May 2008 increased to $*[redacted]* million in June 2009 (Source: Company response to Staff Data Request No. 139):

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The total amount requested by Ameren Missouri for the change order illustrated in the chart located above is approximately $*[redacted]*. The major drivers of the change order approved in May 2009 include, but is not limited to: (1) change in absorber interior lining change; (2) change to dry grind system; (3) construction slowdown changes; (3) change in scope for engineered equipment needed for the change in absorber interior lining; (4) Hitachi Power Systems change of scope; (5) change in scope for engineered equipment needed for the change to powdered limestone for dry grind system; (6) increased scope for Ameren Engineering and Site Management; and (7) additional AFUDC related to construction slowdown.

In its monthly status report to the Staff dated December 2009, Ameren Missouri identified removal of the wet grind for the Sioux Project to a separate work order thus reducing the CBS Forecast Amount by approximately $*[redacted]*. In response to Staff Data Request No. 290, Ameren Missouri provided the following information pertaining to this work scope change:

> The original scope in the Sioux WFGD project was to install an on-site wet grinding facility to provide the limestone slurry to the WFGD system. It was later decided to have the limestone supplied in powdered form from an off-site grinding facility. The Company made this decision to change from wet to dry grinding because (1) an economic analysis demonstrated that a cost savings would be realized from the use of a dry grind system, and (2) the dry grind system is simpler to operate and maintain…
>
> Direct costs for the wet grinding equipment totaled $*[redacted]*. These costs were removed from the Sioux FGD Work Order and transferred to a separate work order. Actual indirect overhead and AFUDC charges are calculated by CBS and charged to the project monthly based on total spending. As such, the actual indirect overhead and AFUDC charges related to these direct costs are not explicitly quantified in CBS, but were estimated to be $*[redacted]* and $*[redacted]*, respectively. Because these costs were removed from the Project, the total impact to the Sioux FGD project was a reduction in cost of $*[redacted]*.

In Ameren Missouri's response to Staff Data Request No. 135, Ameren Missouri described its Project Change Request as "one of the most important cost and scope control mechanisms used by the Company during construction." The Company went on to describe this process in detail as follows:

> In this process, PCRs are generated by Ameren, APS or S&L personnel to propose a change to the project. PCR documents include a description of the proposed change, estimate cost, schedule, and safety impacts related to the proposed change, risk analysis and supporting documentation. PCRs are presented to a Screening Committee which reviews and recommends

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approval or rejection of the proposed change. PCRs that receive approval recommendation from the Screening Committee are subjected to further review/approval from appropriate levels of Ameren management (based on expenditure amount). This process assisted in controlling costs by establishing a formal process to review, discuss and refine changes to project scope and an approval process that ensured the appropriate levels of Ameren management reviewed and approved the proposed changes.

In Ameren Missouri's response to Staff Data Request No. 138, Ameren Missouri provided additional information regarding its efforts to manage such changes:

(c) Management of Change

Change order were developed, tracked, monitored and reported through the Project Change Request (PCR) process and in the Purchase Order (PO) system. All PCR's were documented for orderly and timely submittal to the Company for either approval or rejection, and ultimate outcome of the request. In the initial stage of the project, project changes were developed, tracked, monitored and reported in the "Value Engineering and Cost Reduction Tracking Log." The PCR process and the PCR log evolved from and supplanted the Value Engineering and Cost Reduction Tracking Log.

<u>Large Project Change Request</u>

The PCR process would be initiated by a change request. If the request would be approved for consideration by the Company, S&L would be given the responsibility for the design work and development of drawings to be submitted to the contractor. The contractor would develop a target price for the proposed work from the design and drawings submitted by S&L. This target price would be presented to the Company and S&L for review. If approved by the Company, the change would be formalized by approval of the target price for work to be accomplished per design and drawings developed by S&L.

<u>Small Project Change Request</u>

These project change requests would not require design effort. The Company and S&L would review the change request and the cost estimate, and either approve or reject the request. In some instances on small or minor change orders, a specific PO would be issued to the contractor after the change request was approved by the Company without the formal PCR process.

Each PCR, by inclusion in the PO system, formally tracked cost impact to the original budget if the PCR was approved. PCR's included cost increases/decreases, priority rank, reason requested, options considered,

and review by Ameren and S&L. These cost impacts would then be represented in the update to budget on a monthly basis in the APS monthly reports supplied in the Initial Production to Staff for MCI and Sachs.

Staff Expert/Witness: Roberta Grissum

G. Allocation of Overhead Charges

In response to Staff Data Request No. 284, Ameren Missouri defines indirect overheads and addresses how they were handled stating:

> Indirect overheads are capital costs incurred but are not directly charged to capital projects (specific or blanket project types) as these charges are normally coming from support operations. The indirect overheads are collected monthly in pool projects: (1) UEC01 Energy Delivery; (2) UEC02 Nuclear; (3) UEC03 Generation – Non-nuclear; and (4) UEC05 Corporate. These indirect overhead pool projects are cleared to zero during this process. The allocation is based upon current month's capital expenditures to standing blanket and specific projects, excluding: (1) Contributions in Aid of Construction (CIAC); (2) overheads (Electric Majors 374-379 and Gas Majors 324-329); and Nuclear Fuel projects that start with 0N)

Ameren Missouri further states in response to Staff Data Request No. 284 regarding Ameren Missouri's overhead loading procedure that respecting the monthly allocation of indirect overheads, the clearing of standing and specific projects for Corporate are based upon all capital expenditures within the corporation (the project overhead pool project is UEC05). Clearing to standing and specific projects for Departmental is allocated based upon capital expenditures within Department organization (the overhead pool projects are UEC01 and UEC03) and clearing to standing and specific projects for Functional allocates all costs not allocated by the Departmental process based upon total expenditures within the function (the overhead pool projects are UEC01, UEC02 and UEC03). There are three indirect overhead allocations calculated within the PowerPlant Cost Repository each month. The Company bases these allocations each month by taking the total direct charges assigned to a specific project and dividing by the total capital spent for all projects. This percentage is then applied to all capital indirect overhead charges to derive the indirect overhead for specific projects.

Staff Expert/Witness: Roberta A. Grissum

H. Disallowances

At February 4, 2011 based upon the costs Ameren Missouri incurred for the Sioux WFGD Project through the period ending September 30, 2010, the Audit Staff is recommending the Commission disallow the recovery of $** [redacted] ** of those costs from ratepayers. This disallowance recommendation is explained in detail in the following paragraphs. Once Ameren Missouri provides its support for the costs it has incurred for the Sioux WFGD Project through the period ending December 31, 2010, the Staff will make any appropriate adjustments to this recommended disallowance based upon the Staff's thorough review of the documentation Ameren Missouri provides.

Staff began its review of the Sioux WFGD project by identifying the cost baselines utilized by Ameren Missouri for purposes of monitoring the project costs. From August 2008 through May 2009, Ameren Missouri utilized a cost baseline of approximately $* [redacted] * based upon Ameren's first definitive estimate, which is previously defined in this report. From June 2009 through present, Ameren Missouri is utilizing a cost baseline of $* [redacted] *. The Audit Staff then reviewed all the charges through September 30, 2010 Ameren Missouri provided to the Staff in an attempt to identify charges that may be imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers. In an effort to identify work packages that have incurred costs in excess of the cost baseline established by Ameren Missouri for monitoring projects costs, the Staff also reviewed all monthly progress reports APS and S&L submitted to Ameren Missouri. The Staff is either waiting for information from Ameren Missouri or in the process of reviewing Ameren Missouri's response where it explains why certain work packages have exceeded budget amounts Ameren Missouri assigned to them for the Sioux WFGD Project. Once Ameren Missouri has provided to the Staff all charges through December 31, 2010 for the Sioux WFGD Project, the Audit Staff will complete its review of all work packages exceeding budget levels and complete its recommendations as it deems appropriate for charges incurred by Ameren Missouri that are imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers for disallowance from recovery from ratepayers.

The disallowances Staff recommends as of this report filing will be described in greater detail in the following paragraphs.

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1. Costs Related to Project Delays

The Sioux WFGD Project experienced some delays due to the financial crisis that occurred in late 2008 and early 2009 time period. When questioned by the Audit Staff, the Company provided the following information regarding the impact these delays had on the overall cost of the Project in response to Staff Data Request No. 139:

> Due to the extreme volatility and disruption in the global financial markets in 2008, Ameren Missouri was very concerned about whether it would have access to the capital it needed during 2009 and perhaps beyond, and was also concerned about the cost of that capital if it was available, all of which depended on the duration of the financial crisis (which was very uncertain) that began in the third or fourth quarter of 2008. In response to the financial crisis, Ameren Missouri's 2008 and 2009 capital expenditures were reduced by $*[redacted]* and $*[redacted]*million. Given that the Sioux WFGD was one of the most significant ongoing capital projects for Ameren Missouri at the time, it was necessary to consider to what extent capital expenditures on the project could be reduced in the near or intermediate term. Different scenarios for reducing Sioux WFGD-related cash needs in the 2008/2009 timeframe were explored, as follows: (1) leaving the then-expected in-service dates where they were (fall 2009); (2) extending the then-expected in-service date 1 yr.; and (3) extending the then-expected in-service date 2-3 yrs.
>
> After examining the options, it was decided to slow down construction and ultimately shift the in-service dates to fall 2010 from fall 2009 because of this delay and to coordinate the in-service with scheduled outages at the Sioux plant.
>
> In making that decision, the Company met with the main contractors to discuss the need to reduce cash outlays and asked the contractors to evaluate how to minimize the overall impact on the projected associated with reducing cash outlays and extending the completion date of the project. Specifically, the Company gave priority to continuing work that was necessary for the critical path of the project to progress and/or work that, if delayed, would result in a duplicative expense. Examples of areas where work continued in the 2008/2009 timeframe were mechanical completion of the induced draft fans, completion of the powdered limestone dome shells, and completion of the oxidation blower building.
>
> Cost impacts associated with the construction slow down and delay included an increase of $*[redacted]* M, and the impact on AFUDC was $*[redacted]* M. These costs impacts (as well as the switch to Stebbins tile for the absorber lining system and the powered limestone equipment) were included but not limited to the work included in the June 17, 2009 Work

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Order Extension that was a part of the initial submittal (Attachment – *INITIAL_PROD_ATTACH 01286*).

Although Ameren and Ameren Missouri were limited in their access to the commercial paper market during the fall of 2008, due to both a Moody's downgrade of their short-term credit ratings in August 2008 and the credit crisis in the fall of 2008, Ameren and Ameren Missouri (formerly Union Electric Company, d/b/a AmerenUE) both had liquidity available to them through short-term credit facilities. As of December 31, 2008, Ameren and Ameren Missouri had approximately $*[redacted]* available to them under the credit facility dedicated to the needs of Ameren, Ameren Missouri and Ameren Energy Generating Company (Genco), a subsidiary of Ameren Energy Resources Company that operates a merchant electric generation business in Illinois and Missouri. (Source: Ameren 10Q Report to the SEC). Although further draws on this facility would have reduced the credit available for other needs, Ameren and Ameren Missouri demonstrated their ability to issue long-term capital to refinance short-term capital when Ameren issued $*[redacted]* in common equity in September 2009 and Ameren Missouri issued $*[redacted]* of *[redacted]*% 30-year First Mortgage Bonds in March 2009 (Source: Analysis of David Murray, MoPSC Staff).

It is, therefore, the Audit Staff's recommendation that costs in the amount of $**[redacted]** associated with Ameren Missouri's decision to "slow down construction and ultimately shift the in-service dates to fall 2010 from fall 2009 because of this delay and to coordinate the in-service with scheduled outages at the Sioux plant" be disallowed. Staff conducted a teleconference with Ameren Missouri personnel on January 6, 2011 to acquire a better understanding of the methodology used by Ameren Missouri to calculate the Allowance for Funds Used during Construction (AFUDC) for the Sioux WFGD Project. During that teleconference, the Audit Staff learned that Ameren Missouri was calculating its AFUDC on a monthly basis in contrast to the methodology prescribed by the FERC which allows for AFUDC to be calculated on an annualized basis. As a result of that meeting, Ameren Missouri agreed to provide a supplemental response to Staff Data Request No. 280 that would provide the following information: (1) source of long-term debt cost and rate; (2) source of the common equity rate; (3) a copy of FERC Order 561 that outlines AFUDC methodology; (4) a copy of Code of Federal Regulation, CFR – Title 18 – Conservation of Power and Water Resources – Electric Plant, Instruction 17a that provides additional guidance for AFUDC; (5) confirmation of special approval received by

Ameren Missouri to calculate AFUDC on a monthly basis; (6) a description of any special financing utilized by Ameren Missouri for environmental projects; and (7) a detailed explanation of the methodology utilized by Ameren Missouri to calculate AFUDC for the Sioux WFGD Project. This information was not provided to Staff until February 4, 2011. However, Ameren Missouri has not provided confirmation of any special approval received to calculate AFUDC on a monthly basis in contract to FERC methodology. Therefore, the Audit Staff is still researching the appropriate methodology for determining the appropriate allowance for funds used during construction (AFUDC) for the Sioux WFGD Project delay and may recommend additional disallowances once its research is complete.

2. Costs Related to Unresolved Backcharges

Approximately $* * in claim issues related to charges invoiced by Sachs and MCI remain unresolved according to S&L's Monthly Status Report dated November 2010. The Staff has also reviewed Ameren Missouri's response to Staff Data Request No. 306 relating to unresolved backcharge amounts for Sachs and MCI. Based on this review, the Audit Staff is recommending a disallowance of unresolved backcharge amounts of $* * and $* *, respectively for MCI and Sachs, for a total disallowance of $** **.

3. Audit Staff's Review of and Recommendations for Unexplained Invoices

The Staff identified approximately 1,400 vouchers that were not supported by purchase order or ESA documentation and, therefore, conducted a more detailed review of these vouchers to determine if these charges were appropriate for recovery from Ameren Missouri ratepayers. The Audit Staff received copies of approximately 1,400 invoices requested from Ameren Missouri on January 19, 2011. As of this filing, the Audit Staff has reviewed approximately 700 of the 1,400 invoices identified for charges incurred outside of the purchase order process through September 30, 2010 for the Sioux WFGD Project. Furthermore, Ameren Missouri has not yet provided an accounting of all charges incurred for the Sioux WFGD Project through the ordered cut-off date of December 31, 2010. As such, it is premature for the Audit Staff to make any recommendations about the appropriateness of charges for which Ameren Missouri is seeking to include in rate base in this proceeding. Once Ameren Missouri provides all charges incurred for the Sioux WFGD Project through the ordered cut-off date of

December 31, 2010 to the Audit Staff for review and examination, the Audit Staff may find it necessary to request additional invoices to review for prudence, reasonableness, appropriateness, and/or benefit to Missouri ratepayers. If imprudent, unreasonable, inappropriate, and/or not of benefit to Missouri ratepayers charges are found, the Audit Staff will develop recommended adjustments to the Commission at that time to remove these costs from the cost of the Sioux WFGD project included in Ameren Missouri's rate base in this rate case.

Staff Expert/Witness: Roberta A. Grissum

I. Allowance for Funds Used During Construction

Ameren Missouri used FERC Order No. 561, as Amended, and FERC Uniform System of Accounts (USOA), Instruction No. 17(a) as the basis for its AFUDC calculations for the Sioux WFGD Project. Instruction Rule 17(a) states: "AFUDC includes the net cost for the period when so used, not to exceed, without prior approval of the Commission, allowances computed in accordance with the formula prescribed in paragraph (a) of this subparagraph. No allowance for funds used during construction charges shall be included in these accounts upon expenditures for construction projects which have been abandoned."

Ameren Missouri's Corporate Finance Department provided inputs relating to capital costs and capital structure. Ameren Missouri's Corporate Modeling Department provided to Ameren Missouri's Accounting Department data related to Construction Work in Progress (CWIP). The Staff submitted Data Request No. 357 requesting information about Ameren Missouri's modeling process and is in the process of reviewing Ameren Missouri's response. The formula Ameren Missouri used to calculate AFUDC is as follows:

$A_i = s\,(S/W) + d\,(D/D + P + C)\,(1 - S/W)$

Where,

A_i = Gross allowance for borrowed funds used during construction rate
s = Short-term debt interest rate
S – Average short-term debt amount
W = Average balance of Construction Work in Progress (CWIP)
d = Long-term debt interest rate
D = Long-term debt amount
P = Preferred stock amount
C = Common equity amount

$A_e = [1 – S/W][p (P/D + P + C) + c (C/D + P + C)]$ Where,

A_e = Gross allowance for borrowed funds used during construction rate
S = Average short-term debt amount
W = Average balance of Construction Work in Progress (CWIP)
p = Preferred stock cost rate
P = Preferred stock amount
D = Long-term debt amount
c = Common equity cost rate
C = Common equity amount

During the accrual process, Ameren Missouri charged AFUDC to FERC Accounts 419.1 – Allowance for other funds used during construction and 432 – Allowance for borrowed funds used during construction – Credit. Both accounts are to include concurrent credits for AFUDC not to exceed the amounts computed in accordance with the formula prescribed in Electric Plant, Instruction No. 3 (17) – Components of construction cost, AFUDC.

Ameren Missouri revises its AFUDC rates monthly based on information available at the time of the accrual. FERC requires electric utilities to utilize Annual AFUDC Rates. An electric utility must request a waiver of this portion of the FERC Instruction 3 (17) through FERC. In a supplemental response to Staff Data Request No. 280 received from Ameren Missouri on February 4, 2011, the Company states that, "we are still in the process of retrieving documentation and will supplement this response when the information is available" to confirm or deny that such approval has been granted by the FERC.

Ameren Missouri personnel indicated to Staff on January 6, 2011 that the Company calculates AFUDC on an accrued cost basis rather than an actual cash basis. Ameren Missouri's supplemental response to Staff Data Request No. 280 goes on to state: "the Company uses the accrual-basis method to match revenues and expenses in the appropriate financial period. The Company calculates monthly AFUDC on the appropriate project cost balance as posted to any given project." All accruals are reviewed by Ameren Missouri's Accounting Department and AFUDC is estimated by the PowerPlant Accounting System based upon inputs determined by Ameren Missouri's Corporate Finance Department and the Corporate Modeling Department on a monthly basis. Ameren Missouri's supplemental response to Staff Data Request No. 280 confirms that Ameren Missouri does make corrections to account for errors in AFUDC rates as deemed appropriate.

According to Ameren Missouri personnel who participated in the teleconference that was conducted by the Audit Staff on January 6, 2011, no special financing is utilized for environmental upgrades. Based on Ameren Missouri's supplemental response to Staff Data Request No. 280, however, the Company states:

> By "special financing", the Company assumes the Staff means "tax-exempt" financing. Ameren Missouri has the ability to apply for tax-exempt financing for a portion (perhaps 30-40%, because not all project expenses are eligible) of certain environmental projects. In cases where this financing has been utilized in the past, the Company does not use the tax-exempt financing during construction, but rather, uses available cash or short-term debt during project construction to meet the project's cash flow needs. This is because of various challenges and difficulties of financing using tax-exempt debt as a source of cash during construction. In the Sioux scrubber case, the Company did complete the necessary steps to preserve the option to finance eligible expenses on a tax-exempt basis upon the project's completion so that it could utilize it upon completion for a part of the cost if it made sense at that time to do so. However, this financing was not used for the Sioux scrubber project because as of the time of project completion (November 2010), Ameren Missouri had sufficient cash on hand, which eliminated the need for debt financing. Even if debt financing had been needed at that time, there was no guarantee that it could be obtained because the volume cap is often limited and the Company would have to compete against other issuers seeking to use tax-exempt debt. Even more importantly for the Sioux scrubber, at that time there existed some concerns in accessing the tax-exempt market due to a number of factors. At that time, the taxable debt market actually had more attractive rates than the tax-exempt market, and tax-exempt issuances also carry greater expense. In fact, the tax-exempt market was at the time and continues to be less attractive than the taxable market.

Short-term debt included in the amount utilized for AFUDC calculations include: T-bills, treasury notes, commercial paper and other short-term debt instruments that are part of Ameren Missouri's capitalization. Short-term debt utilized for AFUDC calculation purposes does not include customer deposits based upon information provide by Ameren Missouri in its supplemental response to Staff Data Request No. 280. Long-term debt included in the amount utilized for AFUDC calculations includes all long-term debt instruments that are part of Ameren Missouri's capitalization. Ameren Missouri compounds AFUDC on a six-month cycle, but compounding is not implicit in the AFUDC rates utilized by its Accounting Department for calculation of the monthly AFUDC accruals. In its supplemental response to Staff Data Request No. 280, Ameren Missouri indicates "AFUDC compounding occurs in January and July on a

semi-annual basis as allowed in FERC Order 561. This compounding process adds previously calculated AFUDC to the beginning AFUDC base used for calculating monthly AFUDC."

Ameren Missouri did not forego accrual of AFUDC during the construction slowdown, however, the AFUDC accrued during this time period did diminish as the monthly charges accrued diminished. Based upon a discussion with Ameren Missouri POS personnel on January 7, 2011, the Audit Staff was informed that Ameren Missouri moved all AFUDC to plant-in service on or about November 23, 2010 presumably when the Sioux WFGD Units 1 and 2 met the in-service requirement of Initiative Proposition No. 1, adopted November 2, 1976, Section 393.135 RSMo 2000, and the criteria agreed to by the Staff and Ameren Missouri.

Staff Expert/Witness: Roberta A. Grissum