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Witness: Brent C. Davis
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Sponsoring Party: Kansas City Power & Light Company
KCP&L Greater Missouri Operations Company
Case No.: ER-2010-0355/ER-2010-0356
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: ER-2010-0355/ER-2010-0356

REBUTTAL TESTIMONY

OF

BRENT C. DAVIS

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY
KCP&L GREATER MISSOURI OPERATIONS COMPANY

Kansas City, Missouri
December 8, 2010

"[redacted]**" Designates "Highly Confidential" Information Has Been Removed.**
Certain Schedules Attached To This Testimony Designated "(HC)" Have Been Removed.
Pursuant To 4 CSR 240-2.135.

Davis Rebuttal 1 NP

REBUTTAL TESTIMONY

OF

BRENT C. DAVIS

Case No. ER-2010-0355/ER-2010-0356

Q: Are you the same Brent C. Davis who provided Direct Testimony in this proceeding?

A: Yes, I am.

Q: What is the purpose of your Rebuttal Testimony?

A: The purpose of my Rebuttal Testimony is to: (1) address in-service testing for Iatan Unit 2; (2) the scope of MPSC Engineering Group review of change orders; (3) address Burns & McDonnell's performance; (4) address project management staffing; (5) respond to Staff's proposed adjustment for the JLG Incident and Construction Resurfacing Project; (6) respond to Staff's proposed adjustment for the Campus Relocation Project; (6) respond to Staff's proposed adjustment associated with the liquidated damages as a part of the ALSTOM Unit 1 Settlement Agreement; (7) respond to Staff's proposed adjustment for AFUDC costs as a result of the Turbine Incident; (8) respond to Staff's proposed adjustment for Cushman costs; (9) respond to Staff's proposed adjustment for WSI costs; and (10) respond to allegations of Missouri Retailer's Association witness, Walter Drabinski.

Q: Please summarize your Rebuttal Testimony.

A: In my Direct Testimony, I testified regarding the complexity of KCP&L's undertaking in constructing the Iatan Project. Designing, procuring and constructing the Iatan Project involved the efforts of 4,000 individuals who worked close to 6 million man-hours.

KCP&L entered into approximately 150 contracts, issued 1100 Purchase Orders, and coordinated 55 separate on-site contractors. The amount of concrete that was poured on the Iatan Unit 2 Project would be sufficient to create a sidewalk that would stretch approximately 325 miles, or from Kansas City, Missouri to Little Rock, Arkansas. There are 25,000 tons of steel and 950 miles of electrical cable installed in Iatan Unit 2. While the Iatan Project was under construction, it was one of the largest projects in the United States; now that Iatan Unit 2 is on-line, the combined units' are providing over 1,500 mw of reliable, baseload power to KCP&L's customers.

While the Iatan Project was an immensely complex and difficult undertaking, KCP&L's processes and systems for controlling costs for a project of this magnitude were not. In my testimony today, I address Iatan Unit 2's completion of the in-service criteria. The MPSC confirmed that Iatan Unit 2 successfully completed the in-service criteria on August 26, 2010. With both Iatan Units 1 and 2 operational, KCP&L is producing more than twice the electricity and emitting less NO_X, SO_2, mercury, and particulate than the previous emissions of Iatan Unit 1.

I address the disallowances recommended in the Missouri Public Service Commission Staff's Report on Construction Audit and Prudence Review of Iatan Construction Project for Costs Reported as of June 30, 2010, filed on November 3, 2010 ("Staff's Report") from the Iatan Project's costs. Some of Staff's recommended disallowances are very general in nature, in part because Staff claims – wrongly – that KCP&L has neither identified nor explained the reasons that costs on the Iatan Project have increased. Company witnesses Mr. Forrest Archibald and Mr. Daniel Meyer explain the nuts and bolts of the cost systems that KCP&L put in place, and in Mr.

Meyer's case, he testifies that he has been able to make independent judgments regarding both the extent and the reasons for cost variances throughout the Iatan Project. My testimony will focus on specific processes we have utilized to manage the Iatan Project and factual responses to the sections of Staff's Report addressing specific recommended disallowances. I also address how the MPSC Utility Operations Staff reviewed nearly $200 million of change orders on both Iatan Unit 1 and Iatan Unit 2 and concluded that there were no engineering issues with any part of the construction of the Iatan Project.

Staff's Report claims that the Iatan Project "lost six months" by delaying its hiring of a project manager. I have been on the Iatan Project since May 2006 as the Project Director. I do not know, nor does Staff say, when this 6 months was allegedly "lost" and due to whom, but I can tell you that Staff's conclusion in this regard is baseless. Staff also asserts that KCP&L was imprudent in how it managed and performed the project on a fast-track basis, which is simply not true. In my Rebuttal Testimony, I discuss in detail the experienced staff we added and the schedule and project controls we utilized to manage the work on fast-track basis. Staff, in quoting a newspaper article that summarizes Mr. Drabinski's testimony in the Kansas rate case, claims that KCP&L was not ready for the Project at its start, which I also rebut.

Another of Staff's general allegations is that **[redacted]** I testify that Burns & McDonnell met the key deadlines for the foundations for Unit 2 and supported the procurement schedule. I also discuss how the audit program was helpful to the project management to facilitate improvement and risk mitigation.

I also respond to several of Staff's more specific proposed adjustments to the cost of the Iatan Project including Staff's proposed adjustments including:

- The context for the JLG Incident and the Construction Relocation Project and associated settlement agreement with ALSTOM. Staff's proposed disallowance is based on a one-sided view of the facts. I rebut Staff's position by describing the commercial concerns of the project management team and corporate executives at the time, and how the resolution of these issues tied into KCP&L's overall strategy to resolve the disputed issues with ALSTOM.
- The Campus Relocation was reasonable value engineering and Staff's proposed disallowance for the associated costs is inappropriate.
- Why KCP&L is not eligible for the amount of liquidated damages that Staff alleges should be deducted from the Project costs because the start-up of Unit 1 was delayed by no fault of ALSTOM by a latent defect in the economizer casing material and the turbine incident. As Company witness Ken Roberts explains in more detail, as a result of these events, KCP&L would not have an argument that it was entitled to liquidated damages under the contract.
- Why Staff's argument to adjust the Project costs to deduct AFUDC during the turbine incident delay is inappropriate because the turbine upgrade work was related to and necessary for the operation and maintenance of Iatan Unit 1.
- The costs for Cushman's professional services were within industry standards and his assistance to the Project team was a valuable contribution. Because Cushman's services were a reasonable business decision, these costs should not be adjusted.

- The costs paid to ALSTOM for WSI's specialty welding team (Schedule BCD2010-11) were well-spent considering the significantly increased efficiency and lower weld rejection rate WSI achieved over ALSTOM's average welding performance.
- The benefits to delaying the installation of the auxiliary boiler. Having the experience of the initial start-up using the temporary auxiliary boilers allowed us to better identify the overall auxiliary steam needs for the Plant and properly size the permanent auxiliary boiler system. Additionally, postponing the permanent auxiliary boiler installation provided a favorable installation location that was occupied by construction equipment earlier in the Project and also allowed us to minimize congestion and access issues to other contractors.

I also discuss the role of Schiff Hardin LLP ("Schiff Hardin") on the Iatan Project, particularly the work Schiff Hardin performed at the jobsite during my four and half years on the project. I have worked closely with Schiff Hardin's on-site team a daily basis and believe that the project team benefitted from their presence on the Iatan Project. Schiff Hardin has helped us set-up processes, identify risks, perform schedule and commercial analyses, assist with our very successful procurement efforts and assist in very difficult commercial negotiations. We have benefitted from Schiff's wide experience and capabilities.

I also respond to many allegations in Walter Drabinski's Direct Testimony on behalf of the Missouri Retailers Association regarding the following issues:

- The Project Execution Plan ("PEP") was implemented in a timely manner and did not have any impact on the Project.

- KCP&L's project management levels were appropriate. Mr. Drabinski both argues that the staffing improved in 2008, but proposes 50% of the total costs should be disallowed. He can't have it both ways.
- Regarding the STS Report, I respond to Mr. Drabinski's use of this document in conjunction with other audit reports as the smoking gun demonstrating KCP&L's alleged ineffective project management. The purpose of this report was to provide the corporate executives feedback and areas for improvement in the functioning of the project team. The result of this report was that the members did gel as a team and morale, cohesiveness, and team functioning all improved.
- I rebut Mr. Drabinski's allegations that management turnover had an impact to the Iatan Project. Similarly, the staffing levels did not influence KCP&L's decision to hire Kiewit. We constantly evaluated the appropriate staffing needs and would have reevaluated, if necessary, based on the procurement strategy.
- I explain how KCP&L effectively used the available management tools including earned value, cost control system, change management, and SKIRE.
- I rebut Mr. Drabinski's vague allegations regarding Burns & McDonnell performance. I explain that it is not unexpected that the project documentation in the early years of the Project focused on engineering status because that was the critical path. Mr. Drabinski misuses audit reports to support his concerns regarding engineering, so I explain the context for these report and how management used them to improve the contractor's performance and assure the quality of the work was within industry standards. I also respond to Mr.

Drabinski's claim that Burns & McDonnell had a conflict of interest in the performance of its work on the Project.

- I explain that despite Mr. Drabinski's reliance on claims submitted by contractors as evidence of a weather impact, in certain circumstances, extremely cold weather altered the means and methods that contractors.

COMPLETION OF IN-SERVICE TESTING

Q: How were the in-service criteria for Iatan Unit 2 created?

A: The Company worked with members of the Missouri Public Service Commission's Utility Operations Division ("Utility Operations Staff") to draft and reach mutual agreement regarding the in-service criteria for Iatan Unit 2.

Q: Who from Utility Operations Staff were involved in this process?

A: Mike Taylor and Dave Elliott.

Q: When did this process begin?

A: Discussions regarding the criteria began in June 2009.

Q: What was the basis for the definition of the in-service criteria?

A: The basis for in-service criteria included: (1) the requirements of Appendix H of KCP&L's Regulatory Plan (referred to as the "Stipulation") that the Missouri Public Service Commission approved in Case No. EO-2005-0329; and (2) the previously agreed in-service criteria for the Iatan Unit 1 AQCS equipment.

Q: Who was involved, on behalf of the Company, in the discussions with Staff regarding the in-service criteria?

A: Primarily myself and Brad Lutz.

Q: Describe the process to reach agreement between the Company and the Staff

regarding the Iatan Unit 2 in-service criteria.

A: The Company discussed the first draft of the in-service criteria with Dave Elliott and Mike Taylor in June 2009. We conducted further discussions and revisions of the criteria during subsequent meetings and site visits. Ultimately, an agreement was reached in mid-September 2009.

Q: Has the Company and Staff reached agreement regarding the successful completion of the in-service criteria?

A: Yes. Staff's Report concluded that the Iatan 2 generating unit successfully met all of the in-service criteria and was "fully operational and used for service" as of August 26, 2010.[1] *See* MPSC Staff Construction Audit and Prudence Review Report (November 3, 2010) ("Staff Report") at p. 32, lines 26-27 and Schedule 8.

Q: What are the benefits to completing the Iatan Projects?

A: The combined Iatan Generating Station Units 1 and 2 generate more than twice the electricity previously produced, however, as a result of the advanced equipment utilized, the combined units will simultaneously emit less SO_2, NO_X, mercury and particulate emissions than the existing Iatan Unit 1 produced in the years immediately preceding the start of the Regulatory Plan projects.

UTILITY OPERATIONS STAFF'S ENGINEERING REVIEW

Q: Are you familiar with the section of Staff's Report that discusses the "Engineering Reviews" that is authored by Mr. Elliott of the Utility Operations Staff?

A: Yes, I am.

[1] KCP&L notes that a section of the Staff Report drafted by Mr. Schallenburg erroneously states that Iatan Unit 2 "is not yet fully operational and used for service at the time of this Report." *See* MPSC Construction Audit and Prudence Review Report (November 3, 2010) at p. 2, lines 6-8.

Q: Were you aware that Utility Operations Staff was performing an audit of the Iatan Project?

A: Yes. I have had numerous discussions with Mr. Elliott and his colleagues from the Utility Operations Staff regarding the Engineering Audit they were performing.

Q: What did you understand to be the scope of the Utility Operations Staff's audit of the Iatan Project?

A: I believe that Mr. Elliott's section on page 28 of Staff's Report explains it well. The Utility Operations Staff was examining the Iatan Project's change orders to: (1) "understand the reason for the change at the point of time when the change order was issued"; (2) determine whether the change corrected an engineering-related problem, resulted in a better design, or improved the operation or construction of the plant"; and (3) "determine whether the change resulted in a safety concern, caused unnecessary construction, or caused unnecessary duplication of facilities or work." See Staff's Report at p. 28, ln. 18-24.

Q: What was your observation and involvement with Staff's engineering review?

A: Individual members of Utility Operations Staff visited the Iatan Site approximately twenty (20) times throughout the Project. I met with them during their visits, gave them Site tours, participated in the scheduled meetings to address specific issues and addressed questions that they had regarding project issues or documentation. I also invited other members of the Iatan Project team to meet with Utility Operations Staff as requested. I included certain project controls team members like Company witness Mr. Archibald and Mr. Terry Foster in the meetings so that they could each provide the Utility Operations Staff team an overview of the Iatan Project's status.

Q: Did Utility Operations Staff review change orders from the Iatan Project?

A: Yes. Utility Operations Staff had a standing request for any change orders over fifty thousand dollars ($50,000.00). As a matter of course, KCP&L sent Utility Operations Staff copies of any such change orders. During their site visits, Utility Operations Staff would ask questions concerning these change orders. We also provided Utility Operations Staff with any requested related or supporting documentation.

Q: In your discussions with the Utility Operations Staff regarding the Change Orders did they frequently have questions?

A: Yes. I would assist in providing answers to any questions that the Utility Operations Staff had regarding the scope of work, background or supporting documentation to the Change Orders. Mr. Elliott would often have some very specific questions for our team.

Q: What were some of the questions raised by Mr. Elliott and his team during the Site visits?

A: Some recent examples of the questions that the Utility Operations Staff asked and the additional information we provided is listed below. These questions are typical of the types of questions Mr. Elliott posed to our team:

- Why was Change Order number AP-03288 necessary? After consulting with the contract manager, we explained that this Change Order had two aspects. First, KCP&L transferred responsibility to ALSTOM for handling and disposal of the waste generated during Unit 2 Boiler chemical cleaning, which was KCP&L's responsibility pursuant to Contract Exhibit A2 "Steam Generator Technical Specification," Section 15052.3.23 "Chemical Cleaning." The second aspect of the Change Order

transferred a scope of supply for chemically cleaning two specific sections of KCP&L provided pipe. Overall, this Change Order was executed to eliminate interferences and potential delays associated with introducing another contractor to a congested area around the Unit 2 boiler during the chemical cleaning process, and to place responsibility of the Unit 2 boiler chemical cleaning process fully in ALSTOM's control.

- With respect to Change Order KW-02344, what did KCP&L get from ALSTOM on the interface? After consultation with the contract manager, we explained that KCP&L executed a deductive Change Order with ALSTOM (AP-01856) in the amount of **[redacted]** to remove the scope of work associated with siding column line G2, which adjoins the Unit 2 Turbine building and Boiler enclosure, from elevation 789' - 933' (including 8 doors) as well as a small portion of siding on the north side of the Unit 2 Boiler where the coal transfer tower adjoins the boiler enclosure.
- Concerning change order AP-03433, why did the Unit 2 side cost so much more than the Unit 1 side? After consulting with the contract manager, we explained that as the stack breeching and absorber outlet duct designs matured, KCP&L identified a discrepancy in tolerances between the stack breeching duct (provided by Pullman) and the Absorber outlet expansion joint (provided by ALSTOM). As a result, the as-built condition of the stack breeching flange, while acceptable pursuant to Pullman's technical specifications, did not mate up within the maximum allowable tolerances

of ALSTOM's absorber outlet expansion joint. Unfortunately, the quantity and extent of the gaps were more numerous and worse on the Unit 2 side than on Unit 1. In order to minimize material and labor costs and avoid schedule impacts, KCP&L supported ALSTOM's proposal to install a 15" wide expansion joint as opposed to modifying the 12" expansion joint ALSTOM originally supplied. **[redacted]** At the time this condition was identified and detailed, a majority of cranes were demobilized from site, so ALSTOM had to rent a 150' JLG and erect a significant amount of scaffolding around the stack breeching/absorber outlet expansion joint interface. ALSTOM executed similar work from a crane basket on the Unit 1 stack breeching.

- The Utility Operations Staff requested summary statistics of ALSTOM's field welding performance on the boiler including testing and failure rates as it compared to WSI. KCP&L provided two summary charts containing the requested information and answered a follow-up question that Mr. Elliott had to understand the information contained in the spreadsheets.

Q: When Mr. Elliot or other Utility Operations Staff made such requests, what did KCP&L do?

A: As is apparent from my last answer, we provided as much detail as we could in response.

Q: Did any of the individual members of the MPSC Audit Staff ever accompany the Utility Operations Staff for their on-site meetings?

A: On one occasion (April 16, 2010), Mr. Art Rice, an engineer that works with the MPSC Audit Staff accompanied the Utility Operations Staff to an on-site meeting. Other than that, no.

Q: Were members of the MPSC Audit Staff invited to the site?

A: Absolutely. In fact, we set up a trailer on site just for MPSC and KCC staff members so that they could hold meetings and have privacy as they reviewed documents.

Q. Did you provide the same information to Audit Staff as you provided to the Utility Operations Staff?

A: Yes. KCP&L's philosophy for both the MPSC Staff and the KCC Staff has been to be open and transparent and provide all information requested to assist the construction review and prudence audits. KCP&L has tried to keep Staff informed of its actions in a time frame and content that should have allowed Staff to make its own judgment regarding KCP&L's prudence.

Q: Did members of the Audit Staff ever come to the Iatan site?

A: Yes, but much less frequently. I recall Audit Staff coming to the site on three occasions. One of those occasions was to the meet with our team regarding the 2009 Cost Reforecast. Company witness Mr. Archibald recounts that meeting in his Rebuttal Testimony. The second was in the spring/summer of 2009 to review the status of "common" in relation to Unit #1 AQCS going in service. The third was a general tour of the plant conducted in September of 2010. Most of Audit Staff's time was spent at KCP&L's downtown corporate offices.

Q: Going back to Utility Operations Staff, have you had an opportunity to review Mr. Elliott's work papers that were produced as part of this rate case?

A: Yes, I have.

Q: What conclusions could you draw from both your meetings with Utility Operations Staff and your review of Mr. Elliott's work papers?

A: Company witness Mr. Giles testifies regarding the methodology Mr. Elliott used to review the Iatan Project change orders that were provided to him. Between the section of Staff's Report that Utility Operations Staff prepared, the work papers Mr. Elliott created and my recollection of the meetings and further correspondence we had, I believe that Mr. Elliott and his team knew and understood the origin of the change orders that they reviewed and took no exception to any of them. I note that between Iatan Unit 1 and Iatan Unit 2, it appears from his work papers that Mr. Elliott was able to review and catalogue each of the change orders he studied as part of his engineering audit.

Q: What is the basis for your conclusion?

A. In his section of Staff's Report, Mr. Elliott concluded that, "Based on its Engineering Review of KCP&L's change orders, Engineering Staff found no engineering concerns with any of the Iatan 2 or Iatan common plant change orders reviewed." *See* Staff's Report at p. 29, ln. 11-12. Mr. Elliott's analysis illustrates that cost variances to the Iatan Project's CBEs documented change orders are both identified and adequately explained.

Q: Do you know how many change orders Mr. Elliott reviewed on the Iatan Project?

A: I have attached as Schedule BCD2010-12 KCP&L's log of all change orders that were transmitted to Utility Operations Staff and Audit Staff during the course of the Iatan Project. Mr. Elliott's work papers show that of those we sent him, on Unit 1, he reviewed

227 change orders and on Iatan Unit 2, he reviewed 647 change orders. Mr. Elliott described to me on multiple occasions that he only studied change orders related to "engineering issues" which he defined as scope related in some manner. Mr. Elliott did not intensely review change orders for indirect costs once he determined their cause.

Q: What was the value of the change orders Mr. Elliott reviewed?

A: On Iatan Unit 1, it appears that Mr. Elliott reviewed and classified $53,471,153 of change orders and $28,602,672 of credits, for a net value of $24,602,672. On Iatan Unit 2, Mr. Elliott appears to have reviewed $247,417,576 in change orders, and ($72,196,684) in credits for a net value of $175,220,892.

Q: Staff alleges that "KCPL has not even identified or . . . explained the cost overruns, nor did it manage them or even demonstrate that it took positive steps to mitigate them." What is your response to this claim?

A: This is simply not true. As Company witness Mr. Meyer explains in his testimony, KCP&L has provided sufficient documentation to track, identify and explain all costs to the original CBE. Additionally, the Quarterly Reports identify risks and the actions KCP&L was taking to mitigate the risks throughout the Project. I believe that KCP&L has provided all requested information regarding the underlying facts associated with any cost on the Project.

BURNS & MCDONNELL PERFORMANCE

Q: [redacted]

A: [redacted]

Q: Were the audit reports from KCP&L's Internal Audit team useful to you in management of the Iatan Unit 2 Project?

A: Yes. KCP&L's management wanted the project team to have significant oversight of our work, and these audits were able to provide us with both confirmation of what we were doing well and suggestions for how to make improvements.

Q: Were the audits performed timely?

A: I believe so, yes. We were able to make changes to incorporate Internal Audit's suggestions before the problems they foresaw impacted the Iatan Project.

Q: When audits were issued with negative findings, what did the project team do?

A: Each audit finding was assigned to an accountable project team member or corporate manager. That manager would develop a written response and an action plan to mitigate and eliminate the identified risk. I should note that the project team action plans adequately addressed each and every audit finding and senior management and internal audit consider all findings as satisfactorily closed and the associated risk(s) mitigated.

Q: Are you aware of the audits that KCP&L's Internal Audit team and E&Y performed regarding Burns & McDonnell?

A: Yes, I am. Burns & McDonnell was the source of three separate audits.

Q: How would you characterize Burns & McDonnell's overall performance on the Iatan Project?

A: I believe that Burns & McDonnell has been an asset to KCP&L and to the Iatan Project. Their team's commitment to the Iatan Project cannot be challenged, and the fact that the Iatan Unit 2 is in-service and functioning well to this point shows that the quality of their work was very good.

Q: In the section of its Staff's Report discussing the Project history, Staff quotes from an internal KCP&L audit report that states that ** [redacted] ** (Staff's Report at p. 22) Do you agree that ** [redacted] **?

A: No. At the beginning of the Project, Burns & McDonnell worked under a General Services Agreement and not a project-specific contract with KCP&L on Iatan Unit 2 until the first quarter of 2007. The form of the contract document during this period of time had no effect on Burns & McDonnell's performance. Burns & McDonnell performed all the work that KCP&L asked of them in the period from their initial involvement to the execution of the contract. Company witness Bill Downey testifies in his Rebuttal Testimony that there was no impact to Burns & McDonnell's performance from not having a project-specific contract, and I agree with that testimony.

Q: **[redacted]

[redacted]**

A: **[redacted]

[redacted]

Q: **[redacted]**

A: **[redacted]**

[redacted]

[redacted]

Q: **[redacted]**

A: **[redacted]**

[redacted]

[redacted]

[redacted]

[redacted]

Q: **[redacted]**

[redacted]

A: **[redacted]**

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Q: Did Burns & McDonnell's engineering work support the procurement of the project?

A: Yes. The project team actively managed the T-45 procurement schedule on a daily basis and reported on a weekly basis. The buyers, the legal representatives, and the engineers met weekly at Burns & McDonnell's offices to discuss the status of each procurement and ensure that all critical dates were met. As discussed in Company witness Steve Jones' Direct Testimony, KCP&L timely procured all necessary material and equipment to support the construction schedule.

Q: What did KCP&L do to manage disagreements and conflicts between Burns & McDonnell and the other contractors on site?

A: KCP&L actively managed these types of issues. For example, some communication problems between ALSTOM and Burns & McDonnell existed in late 2006. When we learned of this issue, the project team brought the issue to the attention of KCP&L's executive management. The executive management teams got involved and coordinated a meeting of KCP&L executives and ALSTOM's management in February of 2007. *See* Downey Direct Testimony at pp. 13 -15. This meeting occurred in Knoxville, Tennessee (referred to as the "Knoxville Meeting") and included an executive level discussion regarding how to resolve the key issues that had arisen between or among ALSTOM, Burns & McDonnell, and KCP&L. Specifically, **[redacted]**

PROJECT MANAGEMENT STAFFING

Q: Staff refers to an AP article regarding Kansas testimony alleging that KCP&L's management was not ready or able to begin this project with the resources, assets

and systems needed to ensure success and should have hired a construction manager. (See Staff's Report at p. 13, lines 29-32) Do you agree with this assertion?

A: No. I don't agree because these conclusions are not based on a full understanding of the facts. As I explained to the Kansas Corporation Commission in my rebuttal testimony in that docket, that opinion by Mr. Drabinski is supported with very little actual information from the Project's records and essentially ignored or disregarded KCP&L's testimony that has been filed in this case.

Q: Staff also quotes a KCP&L Internal Audit report concern that the Hawthorn project did not prepare KCP&L to manage the Iatan Project. (See Staff's Report at p. 22) Do you agree with the conclusion reached by Internal Audit?

A: I agreed to one narrow aspect of their finding, that because Hawthorn 5 was funded by insurance, KCP&L did not have significant cost pressures on that project, thus there were some limits to the applicability of Hawthorn 5 to the Iatan Project. However, I do believe that our project team learned a considerable amount about these large, multi-year and multi-phase projects because of the scope and complexity of the Hawthorn project.

Q: Will you please explain the scope and complexity of the Hawthorn project?

A: The Hawthorn 5 rebuild project occurred between 1999-2002. I was the plant manager and was in charge of operations and involved in the overall construction of the rebuild of the unit. Hawthorn 5 was a large, complex, multi-year project that included start-up of four different units over a three (3) year period including the following activities: (1) rebuilding the Hawthorn 5 which is a 550 megawatt coal unit; (2) adding new environmental emissions control equipment and upgrading and refurbishing the turbine generator on the Hawthorn 5 Unit; (3) construction and commissioning of a new 265

megawatt combined cycle unit; (4) construction and commissioning 2 – 70 megawatt simple cycle units; and (5) rebuilding the fuel yard including the addition of a new rotary car dumper.

Q: From scope and complexity, how does Hawthorn compare to Iatan?

A: The Hawthorn Project was similar to Iatan with the exception of construction of the turbine building. All of the component projects I described above were executed concurrently on a very small site with numerous contractors involved. The skills and logistics required to manage this work were very similar to those required to manage the Iatan Construction Project. Both KCP&L and Burns & McDonnell, who was the owner's engineer on that project as well, involved many of the members of the Hawthorn project management team on the Iatan project at various times through the life of the project. The main contributors to the Iatan Project who also worked on Hawthorn 5 include from KCP&L: Steve Easley; John Grimwade; Mack Hargis; Jeffery Fleenor; George Burnett; Stan Prenger; and myself, from Burns & McDonnell: Dan Froelich; Rodney Robertson; Bob Heina; Steve Bjorklund; Chet Stumpf; and Randy Sedlacek.

Q: Describe how KCP&L created its staffing plan for the Iatan Unit 2 Project.

A: The initial work in developing the Project's staffing plan began before my involvement with the Project. It is my understanding that KCP&L with the assistance of Burns & McDonnell began developing a staffing strategy for the Iatan Project in the first quarter of 2006 simultaneously with the development of the Project's estimate. I saw a later version of this estimate when I joined the Project in June 2006. The initial basis for this estimate of manpower, man-hours and associated costs was developed by Burns & McDonnell on the basis of its experience with other large utility plants and our mutual

experience with the rebuild of Hawthorn Unit 5. This initial, preliminary plan was subject to vetting along with the remaining elements of the estimate at that time.

The project team, Burns & McDonnell and Schiff Hardin, who was also engaged in review of the estimate, continued to evaluate this plan after my arrival in the spring of 2006. In the meantime, we added resources as necessary to manage the work that was ongoing at that time.

Q: When you started work on the Iatan Project in June of 2006, did you think the project team was understaffed?

A: No. At that time, we had all the personnel we needed for the work that was available at the time.

Q: What resources were added in the spring and summer of 2006?

A: Because the primary focus of the Project at that time was engineering and procurement, we focused on those areas first. Company witness Steven Jones started in March 2006 and began building the team he needed for procurement. We had already engaged in-house KCP&L engineering staff to manage Burns & McDonnell's work to facilitate the support of the procurement effort and the vetting and negotiation of the ALSTOM contract. By the summer of 2006, we recognized the need to begin work on the Project's integrated schedule, so we hired Terry Foster as the director of project controls. Mr. Foster quickly added the resources he needed in both the schedule and cost control areas, including Forrest Archibald for our cost department. Also by that time, we hired Mac Hargis as the construction manager. Mr. Hargis had worked for KCP&L on Hawthorn Unit 5 and was well respected within our organization. As we completed procurements of engineered materials, we started assigning our KCP&L engineering

leads to administer these contracts, which included evaluating the contractors' compliance with submittal of design information. We also hired Mr. Michael Hermsen as our director of safety. By August 2006, we reported that we had staffed all departmental lead management positions on the project team except the start-up manager, which is a position you typically do not fill until later in a project.

Q: Why would you wait to hire the start-up manager, or for that matter, any key personnel you need on the Project?

A: Good management practice dictates that you should not add personnel until they are needed because of the budget implications. KCP&L also recognized that because the management demands would shift and change over the life of the Project, it was not necessary or appropriate to have the entire staff hired and in place when the first shovel hit the ground. Instead, KCP&L prioritized the more immediate staffing needs and took proactive steps to recruit experienced construction industry professionals to fill key positions that would have a significant role in the early project development. We also identified the positions that would be appropriate to fill in subsequent hiring stages as the construction progressed.

The start-up manager position is a perfect example. There is no reason to hire a start-up manager until the design is sufficiently mature for that individual to begin planning the start-up sequence and details. As it was, we took the initiative to hire a start-up manager in the summer of 2007, which was well in advance of what is typical, because of the combined complexity of the Iatan Unit 1 and Unit 2 Project. We made careful evaluations of this kind for each individual we added to the Project. The broad outline of our plan for hiring was developed and subsequently refined though the summer

and fall of 2006.

Q: Is the staffing plan documented?

A: Yes. The project team under my direction developed an initial staffing plan in summer of 2006. In October 2006, this plan was presented to and vetted by Mr. Steven Easley, who was accountable for the Project at the executive level. Mr. Easley made certain adjustments to the staffing plan based on his experience. This plan was the basis for our Control Budget Estimate that was approved by the Executive Oversight Committee ("EOC") and KCP&L's Board of Directors in December 2006. That staffing plan is memorialized in the Project Execution Plan ("PEP") which was adopted in June 2007.

Q: How did KCP&L's staffing level change over the course of the Iatan Project?

A: The project team's staffing level gradually increased until October 2008 and remained relatively constant at the peak through April 2010 at which time the project team staffing started to decrease as the contractors started demobilizing from the Project. The attached chart generated from gate log records shows the number of KCP&L staff working at the Iatan site throughout the Project, which was consistent with the needs of the Project itself. (Schedule BCD2010-13).

Prior to October 2008, Kiewit and ALSTOM would have been largely working in distinct and independent areas of the Iatan site. There was a steady increase in the amount of owner management and coordination activities directly resulting from the contractor's work required during this period, warranting a steady increase in staffing. The point at which the work on Iatan Unit 1 was nearing completion in the fall of 2008 marked the beginning of KCP&L's increased need for contractor coordination and management on Iatan Unit 2. As a result, KCP&L's peak manpower, shown between

October 2008 and April 2010, is consistent with the nature of the construction occurring in the field.

Q: The chart shows that KCP&L doubled its project management personnel between February 2007 to December 2007. What was the cause of this increase?

A: In general, this change reflects adding staff as the work on site increased, which was always contemplated. In addition, when Dave Price joined the Project in May 2007, he made his own assessment of the Project's planned staffing levels and believed that there were certain areas that needed to be expanded to meet the then-existing Project challenges.

Q: The chart shows a second significant increase in KCP&L's project management personnel between April 2008 and October 2008. What was the basis for this increase?

A: This increase brought the on-site construction management staffing to the level that the project management team thought necessary to monitor and manage the peak construction phase of the Project. All contractors achieved their peak craft numbers between September and December 2008 during the Unit 1 outage and maintained a similarly high level of craft labor on site through September 2009, which was the point when construction work started ramping down. KCP&L's staffing level increase prior to October 2008 directly coincides with the preparation to manage the height of the construction activity on site. This was always contemplated by the project team and is consistent with my previous experience on other projects and what you would expect to see on a project with this number of years in duration.

Q: Did adding personnel increase the Iatan Project's cost?

A: Yes. As noted, we had a variance to our original Control Budget Estimate. However, we determined the need for those additional people and we added them in a timely manner without any premiums, so the only cost incurred or underestimated was the number of people and their hourly pay rate. And, once we saw that we had underestimated the size of the team, we were able to quickly ramp up to meet the Project's needs.

Q: How has KCP&L documented these changes?

A: As Company witness Meyer testified, after the completion of the Control Budget Estimate in December 2006, the KCP&L project team started identifying risk and opportunity ("R&O") items. These R&O items mostly resulted from the continued maturation of the Iatan Project's design. Mr. Meyer identifies that he was asked to present the R&Os to the Executive Oversight Committee on July 11, 2007. (Meyer Direct Testimony at pp. 16-18). One of the early R&O items identified in 2007 was additional increases to the construction management staffing levels on the Project (R&O No. 009, Schedule FA2010-4). This R&O was updated as even more definition was given to the project team we needed to manage the work, and was part of the increase that in the budget as of the May 2008 Reforecast. This R&O as updated resulted in an increase of **[redacted]**. The supporting documentation for KCP&L's analysis of the appropriate staffing level based on the information available at the time is included in Schedule FA2010-4. This increase to the budget included both costs already incurred as a result of additions to staff as well as the projected future costs of additional project management personnel.

Q: Were these changes to the Iatan Project clearly identified in the Iatan Project's cost reports?

A: Yes. It is very easy to see from the cost reports that project team generates that there is a cost variance in Project staffing. Company witness Mr. Archibald discusses how the Project's Cost Portfolio includes details like these.

Q: Were KCP&L's staffing increases timely?

A: Yes. The Project's department managers constantly evaluate the staffing needs within their areas and during each of the cost reforecasts we have performed, we have asked for detailed projections of staffing needs and we make judgments based on those types of assessments. For example, the construction management organization constantly evaluated its staff based on a variety of factors, including: the number of different contractors on site at a given time; the number of craft labor personnel on site; and whether the craft is working overtime or double shifts. Similarly, the procurement organization bases its needs on the level and intensity of contract administration activity, including: the volume of monthly invoices received; the volume and nature of the commercial correspondence received on a weekly basis; the velocity of change order requests submitted by contractors; and the volume and nature of procurement activities.

Q: You said that Mr. Price initiated some changes to the Project's staffing plan. Did you agree with Mr. Price about those changes?

A: Yes. Mr. Price and I were in agreement that we needed to increase our staffing level and our budget to meet the challenges at the time. We recognized that the complexity of the Unit 1 rehabilitation work had grown, and that we needed both more people and certain individuals with specialized experience at an earlier stage. As discussed, one of the

individuals that Mr. Price wanted to add at a very early stage was an experienced start-up and commissioning manager, who started on the Project in July 2007. As I explained in my Rebuttal Testimony in Docket No. ER-2009-0089 (the "0089 Docket"), the addition of the start-up and commissioning manager at this time allowed the project management team the opportunity to plan the work and identify and resolve potential outage start-up and commissioning problems well in advance of the actual Unit 1 outage period. In addition, the start-up manager was able to revise the start-up sequencing of certain common facilities to prevent additional costs and coordination difficulties that would have otherwise developed. (See Davis Rebuttal Testimony in 0089 Docket at pp. 3-4). Mr. Price and I also agreed that Iatan Unit 1 needed additional leadership, which is why Iatan Unit 1 was my primary responsibility from the fall of 2007 until Iatan Unit 1 was returned to service in April 2009.

Q: Based on your experience, did KCP&L employ appropriate numbers of qualified project personnel throughout the Project?

A: Yes, based on my experience, the project team members individually and collectively had appropriate experience and qualifications for their position. **[redacted]** (See Schedule BCD2010-14 at p. 6.)

Q: Did you observe any adverse impact to the Project due to the absence of a Project Manager or during the transition periods between the individuals who were accountable for management of the Iatan Unit 2 Project?

A: No. I didn't get involved in the Project until June 2006, but Company Witnesses Downey and Giles describe the activity during that time. I can tell you that from the time I started on the project through the rest of 2006, there was significant planning, engineering, and procurement activity by the project team. Staff must have ignored the Project's significant accomplishments during 2005-07, as discussed throughout KCP&L's Direct Testimony, including: (1) contracted with ALSTOM for an EPC of the boiler and AQCS; (2) established all of our control systems and major processes; (3) established the Control Budget for the Project; (4) completed all of the Project's major foundations on time for turn-over; and (5) received the estimate from Kiewit, resulting in the execution of the Kiewit contract.

Staff argues that KCP&L's failure to hire a Project Manager caused a six month time loss on the Project and that a personnel matter caused further delay. *See* Staff's Report at p. 12. There is no evidence to support this conclusion.

Q: Staff also alleges that "[p]roject control was stalemated, causing a degree of paralysis of the Iatan project team, which contributed to the failure to meet several project commitments regarding documentation and planning." Do you agree with Staff's conclusion?

A: No. I frankly have no idea on what Staff bases this conclusion. While I don't know what Staff is referring to, as I stated above, there was significant project activity in 2005-07. Since the beginning of the Project, KCP&L has sought to establish processes and procedures to govern all important aspects of the Project, particularly when there was a potential for cost and/or schedule impact. In July 2006, KCP&L provided the Staff with the Cost Control guidance document (See Direct Testimony of Company witness Steve

Jones, Schedule SJ2010-1) which provided guidance for preparation of the Project's major processes and procedures, and as I previously testified, those essential processes and procedures were in place in time to govern the Project. Company witnesses Mr. Jones and Mr. Roberts testify as to the effectiveness of these procedures.

In addition, as noted, we were able to bring key people on board early and a number of the Project's key managers and directors have been on the Project for extended periods. Having the team largely intact has provided continuity even when changes at the Senior Management level have occurred. In addition to me, there is Terry Foster, who has led the project controls effort since August 2006, and Forrest Archibald, our Manager of Cost Controls, started soon thereafter. Russ Finkle, our recently retired Construction Manager, has been on the Project since the site mobilization in August 2006. Denise Schumacher, our Compliance Manager, has been on the Project since its inception. Michael Hermsen, the Safety Manager, has held his current position since the summer of 2006. We have also been fortunate to have virtually the same construction management team out in the field and most of our key lead engineers in place since the start of significant site activity. Given the length of the Project and the number of individuals who are here on a temporary basis, it is expected that there will be turnover. We have been fortunate that so many talented individuals have been with us from virtually the start of the work.

Q: Did you observe any adverse impact to the Project during the transition periods between the individuals who were accountable for management of the Iatan Unit 2 Project?

A: No. Company witness Mr. Downey testified as to the hand-offs that occurred at various transitions and I agree with that testimony.

Q: What else contributed to KCP&L's ability to manage the Project during project leadership transitions?

A: There has been consistency at the KCP&L Executive Management level and on the EOC, and the key decisions affecting the Project have been timely. Additionally, the processes and procedures for the Project enable consistent administration of project functions during leadership transitions.

SCHEDULE DEVELOPMENT & EARLY PROJECT TEAM ACTIVITY

Q: In Staff's Report, Staff alleges that KCP&L did not identify or explain its cost overruns "nor did it manage them or even demonstrate that it took positive steps to mitigate them." (Staff's Report p. 37) Do you agree with Staff's assertions?

A: Absolutely not. The Iatan Project was well managed and took steps every day to mitigate risks. Company witnesses Mr. Meyer and Mr. Archibald explain in their testimony how the Iatan Project identified and explained costs, and I agree with their testimony. My focus in responding to Staff's incorrect allegation is to detail for the Commission the tools that project team put into place and used on a daily basis to actively manage the work of the contractors in the field. These tools included scheduling and cost tracking metrics as well as other information-based data collection and reporting that I will describe below. I note that KCP&L has provided Staff with all of these tools so that it can make its own independent judgment regarding KCP&L's management. However, since Staff's Report is not specific regarding how we allegedly mismanaged the Iatan Project, I can only assume that Staff did not look at the materials we have provided.

Q: Please describe the scheduling tools that the project team utilizes for management of the Iatan Unit 2 Project.

A: As an initial point, I should say that there is only one true Project schedule that contains all of the details for the over 15,000 logically linked tasks that we use for managing and tracking the work. For ease of reference, I will refer to the fully integrated schedule that includes all of the contractors' work and its weekly updates in the "live" schedule network as the "Level 3 Project Schedule." We summarize the data in summary fashion from the Level 3 Project Schedule into a high-level overview of the Project's progress in what is called the "Level 1 Schedule." In my Direct Testimony, I described the creation and purpose of the Project's Level 1 Schedule. As I noted in that testimony, this schedule was developed to provide a high-level overview of the Project's major work in a critical path format. It shows the key sequences of work on a sub-project basis for the following areas: (1) Boiler/Steam Generator/Selective Catalytic Reduction System ("SCR")/Pulverizer & Air Heater (the "Boiler Path"), which was primarily ALSTOM's scope of work; (2) Powerhouse/Turbine (the "Turbine Generator Building Path"), which was primarily Kiewit's scope of work; (3) Air Quality Control Systems ("AQCS") including the absorber, fabric filter and ID fans (the "AQCS Path"), for which ALSTOM had the primary responsibility; and (4) the Unit 2 BOP, which is a series of ancillary systems such as the Coal and Limestone Handling, Water Treatment, Cooling Tower and miscellaneous other structures (the "Ancillary BOP Path"), which were procured and constructed from a number of different vendors. The Level 1 Schedule summarizes the Project's detailed activities through its series of yellow, blue and red arrows on the Schedule. The flags that are shown in the Level 1 Schedule signify key milestones or

events that occurred throughout the Iatan Unit 2 Project. These bars and flags on the Level 1 Schedule also include reference to two sets of dates: the "planned" dates for an activity and the "actual" dates for an activity. The "actual" dates referenced, or the dates that reflect when actual events occurred, are accompanied by an "A".

Q: What is the genesis of the Level 1 Schedule?

A: Company witness Chris Giles testifies that during the first quarter of 2006, Burns & McDonnell, the project team and Schiff jointly collaborated on and developed a strategic schedule for the work that identified the key procurement dates needed for planning purposes. (Giles Direct Testimony p. 14) Company witness Mr. Giles discusses the creation of the strategic schedule in his Rebuttal Testimony, and attaches a copy of the initial strategic schedule as Schedule CBG2010-5. That strategic schedule was developed to provide a guideline to the project team for the major procurements and is now the Level 1 Schedule. That strategic schedule was used as the outline for developing the Level 3 Project Schedule in use today. Nonetheless, we continue to use the Level 1 Schedule as a planning tool and for providing information to Staff and to our partners regarding the Project's status. We continue to update the information monthly to reflect the actual dates, update the color coding and record milestones as they occur.

Q: Please describe the detailed Level 3 Project Schedule.

A: As I noted in my Direct Testimony, the Level 3 Project Schedule is one of the essential management tools on the Iatan Unit 2 Project. It encompasses all of the activities for the work by all of the contractors on site, who contributed their planned schedules at the outset of their work so that these individual schedules could be integrated. Our Project Controls Team worked with the contractors to develop the Level 3 Project Schedule so

that it reflects the proper sequence and duration for all of the work. The Level 3 Project Schedule is used in every discussion KCP&L has with the contractors on the Project. It was developed after the execution of the contract with ALSTOM in August 2006.

Q: Did KCP&L have ongoing work in engineering, procurement and even some site work in the summer of 2006?

A: Yes, we did. We were aggressively pursuing the procurement of long lead materials and engineered equipment, and by early August 2006, we began some of the site preparation work. By the fourth quarter, we had engaged Kissick for the foundations and underground and Pullman Construction Company ("Pullman") for the chimney.

Q: How did you track the schedule of that ongoing work while you developed the Level 3 Project Schedule?

A: With respect to engineering, as Company witness Mr. Jones testified, the procurement effort including the associated engineering work was ongoing, and was working in accordance of what Mr. Jones refers to as the "T-45 Schedule." (Jones Direct Testimony at p. 10-13.) In addition, both Kissick and Pullman submitted detailed schedules for their work which, as I will explain further, were merged into the integrated schedule in April 2007. In the meantime, we had enough data and key information to manage the Burns & McDonnell, Kissick and Pullman work that was ongoing at that time.

Q: Staff quotes an audit report stating in part **[redacted] (See Staff's Report at p. 24). Why did the project team wait until the ALSTOM contract was executed to begin preparation of the Level 3 Project Schedule?**

A: There were multiple reasons, the most notable of which are: (1) because the Project's critical path and so much of the critical work scope of the Project were tied to the ALSTOM contract, it would have been premature to begin preparation of a detailed schedule without ALSTOM's contribution; (2) ALSTOM's work was part of an EPC contract in which ALSTOM is fully in control of its work sequences and means and methods; and (3) the remainder of the Project's schedule, including most of the BOP work, was largely built around ALSTOM's scope. Without ALSTOM's schedule, there was no integration possible or necessary.

Q: Can you define the term "Baseline Schedule" as you used the term on the Iatan Unit 2 Project?

A: Yes. The Iatan Unit 2 Project's Baseline Schedule is the initial version of the Level 3 Project Schedule that was produced when we had enough information to show in the essential logic and duration of detailed activities and enough detailed activities to begin tracking the integrated work on site. The Baseline Schedule is used as a basis for measuring progress for the remainder of the Project. As an example, on the Iatan Unit 2 Project, the Level 1 Schedule reflects the key dates that we track against are the same dates as determined by the Project's Baseline Schedule.

Q: When was the Project's Baseline Schedule established?

A: April 9, 2007.

Q: Was the development of the Level 3 schedule timely?

A: Yes, based on my experience, it was timely.

Q: In general, what activities were included in the Project's Baseline Schedule?

A: The Baseline Schedule included all activities from ALSTOM as well as all the BOP work that was known at the time. As of that date, KCP&L had contracted with Kissick to perform the early foundation and substructure work. In addition, the Baseline Schedule included a detailed schedule from Pullman, who was constructing the Iatan Unit 1 and Unit 2 chimney. The Baseline Schedule also included all engineering work and procurement of major engineered materials that KCP&L was purchasing. The Baseline Schedule also included placeholders for the remaining BOP work that could be approximated at that time.

Q: How many activities were represented by the Baseline Schedule?

A: The Baseline Schedule, also referred to as the "Integrated Schedule," contained over 20,000 total activities, representing construction as well as procurement and engineering tasks.

Q: Why was the remaining BOP work not included in detail in the Baseline Schedule?

A: Because we had not procured the remaining BOP work as of that time. During this period, Kiewit was preparing its estimate for our review, which was not presented until April 13, 2007. However, including placeholders for this work allowed us to better understand Kiewit's estimate and the time of performance we would need for the BOP work.

Q: **[redacted]**

A: **[redacted]**

[redacted]

[redacted]**

Q: **[redacted]**

[redacted]**

A: **[redacted]

[redacted]**

Q: Since it was re-baselined, how has the Level 3 Project Schedule been maintained?

A: KCP&L's Project Controls team acts as the repository for all of the schedule information that is used in the Level 3 Project Schedule. The schedule itself is compiled in a software package commonly used in the industry called Primavera 5, or "P5". Each contractor maintains and updates its own portion of the schedule and, on a weekly basis, submits its updates to KCP&L. These updates include details of how many man-hours each contractor earned, which activities in the schedule were started and which were

completed, and the contractors' assessments of how much effort it will take to complete its remaining work. Occasionally, contractors also make minor adjustments to their logic if they identify a better, more efficient way of doing the work or if an activity, for one reason or another, cannot be completed within the planned window of time. KCP&L's Project Controls has been maintaining this Level 3 Project Schedule since work started on the site, utilizing input from the contractors on a weekly basis to update as the work is completed. Project Controls also monitors the input to the Level 3 Project Schedule from all contractors and monitors it for any variances or incorrect changes by the contractors. The Level 3 Project Schedule also forms the basis for the Iatan Unit 2 Project's earned value system that is used for tracking the progress and productivity of the contractors.

Q: How often is the Level 3 Project Schedule updated?

A: The full Level 3 Project Schedule is typically updated on a weekly basis to include the contractors' assessments of their own progress and the remaining work, both near term and in the future. The schedule was baselined on April 9, 2007. Since then, the contractors report weekly updates to KCP&L and KCP&L has updated the Integrated Schedule and reported the schedule status and other metrics at regular intervals throughout the project.

Q: Does the Level 3 Project Schedule record variances to scheduled dates?

A: Yes. The Level 3 Project Schedule would show when activities were late or early. The Level 3 Project Schedule is also logic-driven, so when an activity that is on the critical path completes, the Schedule keeps adjusting to the next item on the critical path. The detailed Level 3 Project Schedule also is updated with the actual dates that activities start

and stop, so once the work is completed, it is possible to measure any variances on each Schedule line item.

Q: From a management perspective, why is it important to identify variances in a schedule?

A: Schedules such as the Level 3 Project Schedule are the most important management tool on a construction project. When the schedule identifies variances, often this is an early warning sign that there could be issues that require resolution or mitigation. The Level 3 Project Schedule gave our team and me accurate information to use in our management of the work.

Q: Do all variances in a schedule mean that the project is delayed?

A: No. If an activity is not on the critical path, which is defined as the string of activities that comprise the logical duration for the Project to complete, then a variance may not have actual impact on the schedule for the work or result in any additional costs to the owner.

Q: How can you verify if there was a delay to an activity that impacted the Level 3 Project Schedule?

A: The Level 3 Project Schedule shows which activities had an impact when the contractors submit their actual schedule status on a per-line item basis. However, the real impact is when an activity finishes later than planned and it is a critical activity. The Level 3 Project Schedule has so much information at the detail level, it takes someone who has experience with scheduling to identify the impact any one activity or set of activities may have. We were very fortunate to have an experienced Project Controls team under Terry Foster's direction and constant assistance from Schiff and its scheduling team under Jim

Wilson, who reviewed the schedule constantly to help us get ahead of potential problems. In addition, the Project's earned value system has been critical in pointing out problems.

Q: What is earned value?

A. As stated by KCP&L's Cost Control System: "earned value . . . is an industry-standard measurement of cost and schedule progress as compared to the Project's original plan." (Jones Direct Testimony, Schedule SJ2010-1) Company witness Ken Roberts explained in his Direct Testimony on page 11-12:

> [T]he results of the comparison [of the original plan to actual progress] are then expressed in the form of ratios over time. As work is completed, man-hours are "earned" and compared against the original plan for both the amount of work completed and its timeliness. The ratio of earned hours to planned hours is known as the Schedule Performance Index ("SPI"). Cost Performance Index ("CPI") is the ratio of a contractor's actual, or expended, man-hours as compared to the hours it has earned. This is a measure of the contractor's productivity.
>
> As an example of SPI and CPI, if a scheduled task was planned to take 100 man-hours over a one week period, and the contractor earns 100 hours for the week, its SPI would equal 1.0. However, if the contractor earns 20 hours less than its plan, it will have an SPI of 0.80. If the same contractor spends 100 man-hours to earn 100 hours in that week, its CPI is 1.0. If it expends 120 hours and earns 100 man-hours, its CPI will be