significant rate with each new power project announced. Pegasus-Global was not surprised that the management line items grew as the Iatan Project matured through its life cycle. Pegasus-Global found nothing in the project record which supports Mr. Drabinski's assertion that KCP&L significantly underestimated the management staffing or that the increases in the line items cited by Mr. Drabinski increased as a result of that alleged underestimation.

Q: Do you agree with Mr. Drabinski's opinion that KCP&L had high turnover in the Project Manager position during 2006 and 2007?

A: No. First, Mr. Drabinski offers no documentation or analysis which supports his opinion that turnover in the project management position during 2006 and 2007 "*was significant and one of the fundamental root causes for problems late in the project*" [Drabinski at page 59, lines 7 – 8]. In Pegasus-Global's experience, during complex mega-projects which extend over multiple years it is not at all unusual for there to be turnover in project staffing due to a variety of circumstances including promotion, reassignment, retirement, resignation, illness, etc. The Iatan project has been underway for over 6 years during which it one would expect changes in personnel for all of the reasons cited above. Pegasus-Global did not find what appeared to be any unusual level of turnover in critical project management or control positions during its examination of the project record. Mr. Drabinski provided no direct link between the turnover in any of the Project Management positions and any impact on the Iatan project cost or schedule. Mr. Drabinski failed to establish any link between changes in the project management positions and "problems late in the project" and certainly has not established that those changes were the "fundamental cause" for those alleged problems. Finally, Mr. Drabinski did not

demonstrate that any of the turnovers in management positions was a result of any imprudent decision or action by KCP&L.

B. PROJECT PLANNING AND APPROACH, INCLUDING CONTRACT METHODOLOGY AND ITS EVOLUTION

Q: What did you conclude with respect to KCP&L's decisions regarding the contracting approach taken for the Iatan Project?

A: Pegasus-Global found that KCP&L management followed a systematic process in selecting the project delivery methodologies and contracting approaches. In summary, KCP&L:

- Examined its project risks, goals and objectives;
- With the assistance of industry experts, examined the market and industry conditions and circumstances during its review of delivery methodologies and contracting approaches;
- Examined a wide range of project delivery alternatives with the assistance of industry experts engaged to provide advice and assistance relative to those alternatives; and,
- Made appropriate adjustments to the project delivery decisions as the Iatan Project unfolded during execution.

Q: Can you describe your evaluation?

A: Pegasus-Global has worked with and written extensively on project delivery methodologies and contracting formats over the course of many years. And there are

some critical points to understand before examination of the Iatan Project delivery methodologies and contracting formats[36] including:

- A project delivery methodology and a contract approach are not the same thing and those terms are not interchangeable. The project delivery methodology involves the allocation of the scope of work among the participants in the project. For example, an Engineer, Procure, Construct (EPC) delivery methodology implies that a single contractor (or joint venture) has the duty to complete the entire scope of a project (or a discrete subcomponent of a full project), while a Design-Bid-Build (DBB) delivery methodology implies that there are separate contractors, with one having the duty to design (engineer) the project and one having a duty to construct the project. There are a wide variety of project delivery methodologies, including:
  - Design-Bid-Build (DBB);
  - Engineer, Procure, Construct (EPC);
  - Design-Build (DB);
  - Multi-Prime (MP);
  - Construction Manager (CM);
  - Construction Manager at Risk (CMR); and
  - Various Hybrid Methodologies

[36] See for example: Nielsen, K.R., "Execution Risk Management in Design-Build Infrastructure Projects," *Proceeding of the Construction Institute Atlantic Coast Conference*, Tysons Corner, VA, May, 2004 and Nielsen, K.R., "Managing Risk on CM Projects," *Establishing Standards of Practice,* University of Wisconsin, Madison, May, 1984

- Contract approach on the other hand defines the documents specifically developed and negotiated terms and conditions which govern the execution of the scope of work identified by the parties. Contract approaches tend to be classified by the payment and schedule provisions drafted and not by the specific delivery methodology. For example, contract approaches include the following:
    - Fixed Price, Completion Date Certain;
    - Fixed Price, Milestone Target Schedule;
    - Firm Price, Completion Date Target;
    - Unit Price, Milestone Schedule;
    - Unit Price, Completion Date Certain;
    - Unit Price, To Project Schedule;
    - Time & Materials, To Project Schedule; and
    - Various other combinations.

One of the elements of a contract approach will be the identification of the delivery methodology. However there is in reality no such thing as a "standard" EPC contract approach as under that delivery methodology the price can be firm, can be fixed or can even be target and the schedule requirement can be date certain, milestone or progress based. Any contract approach may identify and include reference to any delivery methodology. It should also be understood that contract approaches are specifically driven by the owner's policies and standards and local, state and federal laws, statues and regulations. As a result, while there are a vast variety of "standard contract formats" globally (i.e., the FIDIC Red Book Contracts), there is no universally accepted contract

approach for the simple reason that a contract is a document negotiated between two (or more) parties.

All of those delivery methodologies, or combinations of those delivery methodologies, and all of those contract approaches, have been used within the power industry and no one of those delivery methodologies or contract approaches has been identified as the "best" method for construction of power generation facilities, and any of those methodologies (or combination of those methodologies) is an appropriate vehicle for the delivery of a major power project. Likewise all of those contracting approaches or combinations of those approaches have been used within the power industry and no one of those contract approaches has been identified as the "best" contract under which to execute a scope of work on a major power project. The goal is to formulate a reasonable and prudent approach based upon all information known or reasonably available to management at the time that the project delivery approach and contract methodology are developed.

The distinction between delivery methodology and contract approach is important because it is easy to confuse those two elements of a project. For example, to assert that the Iatan Project should have been executed under an EPC delivery system because it would reduce risk and eventual costs when compared to a multi-prime delivery system [Drabinski at page 43. Line 19, through page 44, Line 2] is mixing the benefits expected from a delivery system with the realistic elements of a contract approach. **[redacted]** The

construction industry maxim - that the more risk an owner sheds the greater the cost - has been proven repeatedly because a contractor bidding a fixed price for the total risk of the project cost is going to assure that it has not only covered the direct cost of that project, but has included in that fixed price a contingent amount to cover any and all potential impacts to that fixed price.[37] Even if the project is executed to perfection and none of that contingency is used, the owner, under those contract conditions must pay the contractor that contingent sum. It is overly simplistic to assert that any project delivery methodology or contract approach is more or less costly or has more or less risk to any of the parties involved in that project.

The selection of project delivery methodologies and the contract approaches is dependent upon a number of factors that must be taken into account during the development of the project plans, including:

- The specific project risk profile;
- Project size and complexity;
- Project cost, schedule and quality goals;
- Project ownership profile;
- Ownership risk tolerance;
- Investor risk tolerance;
- Local, state and federal laws and regulations;

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[37] "*A Contract Clause for Allocating Risks*", Dr. George F. Jergeas P.Eng. and Dr. Francis T. Hartman, P.Eng., American Association for the Advancement of Cost Engineering, 1996 AACE Transactions, D&RM1.1; "*Risk Sharing – Good Concept, Bad Name*", James G. Zack Jr., American Association for the Advancement of Cost Engineering, 1995 AACE Transactions, D&RM.6.1; "Coal-Fired Power Plant Construction Costs", Synapse Energy Economics, Inc., July 2008, David Schissel, Allison Smith and Rachel Wilson

- Industry conditions;
- Market conditions;
- Financing structure;
- Geographic location;
- Labor conditions; and
- Various other factors that should be known to management at the time of developing the project delivery methodology and contracting approach.

In short, myriad separate yet interrelated factors generally dictate the project delivery methodology (or combination of methodologies) and contracting approach (or combination of contract approaches) which best aligns with those factors. In the Iatan Unit 2 project example, during the early development of the Iatan Unit 2 project KCP&L followed a process which "defined" the crucial project factors which would be crucial to its selection of project delivery methodologies and contracting approaches. Those crucial factors were summarized in two documents produced by KCP&L, the Project Definition Report (PDR) initially prepared in August 2004 and the CEP, which placed the Iatan Unit 2 project within the context of the full KCP&L generation and supply plans for the near term. The PDR of August 2004, while fairly broad in nature, set the basic context within which the Iatan Project would be further developed and defined and provided KCP&L a set of project factors from which early project management decisions could be examined and based.

Q: Are there any additional considerations on very large and complex projects?

A: Yes. Earlier in this testimony, Pegasus-Global said there is one additional factor which influences projects such as the Iatan Project; the fact that the Iatan Project is, by

definition, what is considered to be a mega-project. A mega-project is generally defined as a construction project with a total execution cost of $1 billion or more, requiring several years to execute from initial planning to final operations, and which involves complex technologies and/or physical conditions. As a mega-project there are certain risk elements which are considered to be of heightened importance in the examination and formulation of execution plans and strategies, for example: The distribution of cost risk may become problematic as few contracting firms can assume the cost risk of one, let along multiple, mega-projects simultaneously. Although theoretically an EPC delivery methodology shifts cost risk to the contractor, it is very unlikely that any single contractor will agree to accept the entire cost risk for a mega-project, resulting in an EPC contract with a target price or a series of price conditions which offer the contractor with protection from cost increases which are not within its control. Likewise, most contractors would find it extremely difficult to secure bonding on a project in which it had agreed to assume the risk of cost. The distribution of schedule risk may become problematic as the extended time period required to execute a mega-project would involve "predicting" the future of the market, the industry, the general local, regional and international economic conditions, the impacts to various critical equipment being manufactured off shore, and the like. For example, regional conditions in Japan may impact the delivery of critical pieces of engineered equipment, delaying a project schedule. The choice of a project delivery and contracting method is dependent upon the identification and examination of hundreds or even thousands of project specific factors, as that delivery method and contracting approach must be tailored to the project factors. Within the industry it is generally considered unreasonable to attempt to force fit any

project, but in particular a mega-project, into a specific delivery methodology and contracting approach chosen in advance of having identified and examined all of the critical project factors. In the end, the delivery methodology and contracting strategy must align with the project factors as the project factors usually cannot be altered simply to fit a particular project delivery methodology or a preferred contracting approach.

Q: How was the selection of the Owner's Engineer made by KCP&L?

A: KCP&L utilized B&McD to perform Owners Engineer services for the Iatan Project during early evolution of the project definition for both the Iatan Unit 1 and Unit 2 projects. During that early project development phase B&McD worked under a "General Services Agreement (GSA)," which is common practice in the industry and was appropriate to the scope of work involved in this early phase of the project definition development process. As is also expected with complex mega-projects, B&McD's initial development work evolved and expanded as the project definition was refined and expanded and, in the case of the Iatan Unit 2 project, culminated in B&McD's preparation of the Iatan Unit 2 PDR in August 2004. However, B&McD was not released to proceed with any significant level of engineering on the Iatan Unit 2 project pending the further refinement and expansion of the project definition beyond that contained within the 2004 PDR.

In one action taken to refine and expand the project definition beyond that contained in the 2004 PDR, in 2005 KCP&L engaged Black &Veatch (B&V), another experienced power plant engineer, to prepare technical specifications for the Iatan Unit 2 engineered

boiler equipment and turbine generator.[38] The development of the boiler technical specification was arguably the most critical element to the completion of the Iatan Unit 2 project preliminary definition, establishing the basis from which the majority of basic and detailed engineering of the project would flow.

Specific to the Iatan Unit 2 project, by the fall of 2005 the project definition was sufficiently defined to the stage where the selection of an owner engineer under a formal commercial project engineering relationship was possible. To this point two experienced power project engineering firms, B&McD and B&V had participated in the development of the preliminary project definition.

Thus, reasonably, KCP&L solicited proposals from both of those qualified power engineering firms. The proposals were not limited to provision of engineering services, as each firm was free to propose for any scope of work from pure engineering, to engineering with construction management scope to full EPC scope. Likewise there was no restriction placed on the contracting approach proposed by the two engineering firms; the firms could propose on a fixed price, unit rate, time and materials or hybrid contracting approach. Ultimately each firm submitted proposals that were not limited to engineering, but also included some procurement and construction scopes of work.

Each of those proposals was subjected to a formal review process by KCP&L, with each of those two contractors given an opportunity to present their respective proposals and address issues and questions which arose during the formal KCP&L reviews. On the basis of the selection process, in November 2005, KCP&L formally awarded the

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[38] KCP&L Strategic Infrastructure Investment Status Report, First Quarter 2006, page 4, April 28, 2006

engineering scope of work for the Iatan Unit 2 project to B&McD. [Giles direct testimony, Kansas Corporation Commission Docket No. 10-KCPE-415-RTS, December 17, 2009, page 15, line 9 – page 16, line 2 and page 20, line 3 – page 21, line 23]

Q: Was the process through which KCP&L selected the Owner Engineer unusual within the industry?

A: Only in one respect; by having given B&V the work to develop the boiler technical specification, KCP&L was able to solicit proposals from two experienced power project engineering firms, both of whom had direct knowledge of the preliminary project definition. Normally one of the proposing engineering firms has that direct knowledge gained from the development of the PDR, while other proposing engineering firms must discern and digest the PDR from the Request for Proposal documents issued by the owner. In this aspect, KCP&L's decision relative to B&V's development of the boiler technical specification was extremely beneficial and reasonable on the selection process, resulting in two complete and competitive proposals from two qualified engineering firms. Then, with respect to the Iatan Unit 1 project, KCP&L released B&McD to proceed with the engineering for the Iatan Unit 1 AQCS in December 2005.

Q: What did Pegasus-Global conclude relative to the Iatan Unit 2 PDR having been prepared under a General Services Agreement?

A: Development of initial or preliminary project definition is usually done under an Owner's GSA, as the scope of work is actually defined during the execution of that work. In effect, as the definition is developed and refined the scope of work expands to a point that the remaining scope of work involves the basic or detailed engineering of the actual facility. Basic engineering is the preparation of technical specifications for engineered

equipment. Once these technical specifications have been drafted, work beyond that point ventures into facility basic engineering and detailed engineering. Pegasus-Global found that KCP&L employed its current "in house" engineer, B&McD, for the development of the initial PDR. This is a standard practice within the industry because using an engineer which is already familiar with an Owner's practices, preferences and procedures save both time and money during the preparation of that initial PDR. Pegasus-Global found the use of the GSA both reasonable and prudent.

Q: **[redacted]** [Drabinski at page 45, lines 15 – 21, and page 46, line 15 to page 47, line 13]

A: **[redacted]**

[redacted]

[redacted]**

Q: Did KCP&L retain the Owner Engineer in a timely fashion?

A: Yes. There is a difference between the formal process of negotiating and executing a contract on a project scope of work and the award and initiation of that scope of work by the engineer or contractor. On a mega-project a formal contract agreement will take much longer to negotiate and execute, and take a short period of time than it will take to initiate project work. Simply because the contract is not finalized does not mean that no work is done to advance that scope of work. It is routine for the two parties to initiate work under a detailed LNTP or a GSA that is necessary in order to advance work while the difficult process of negotiating a contract is pursued.

A contract document is a method by which risk is allocated among the two parties, and no experienced contractor or engineer would rush to execute a contract that it had not at a detailed level examined for every risk allocated to it, if for no other reason than to be sure that the contract price and schedule reflect that risk allocation. As of early 2006 there were still elements of the Iatan Unit 2 PDR that had not been fully settled, including the delivery method and contracting approach to be utilized for the BOP scope of work. That ultimate decision had a direct bearing on the scope of work to be contained within the B&McD contract, and thus the risk which would be allocated to and assumed by B&McD.

What was defined was primarily the procurement scope of engineering work and responsibility for that scope was retained by KCP&L. Therefore there was a scope of

engineering work available immediately for B&McD in support of that procurement effort and that scope of work could be adequately covered under the GSA already in place between KCP&L and B&McD. Continuing work under the GSA enabled KCP&L to initiate full activity on procurement of longer lead, engineered equipment supported by B&McD's, engineering forces, all while completing the project definition and risk allocation structure as the Iatan Unit 2 specific engineering agreement was negotiated and executed.

Pegasus-Global found that KCP&L's actions to continue to "retain" B&McD's engineering services under the GSA enabled KCP&L to move forward with critical procurement of long lead equipment both reasonable and prudent for a mega-project. Given that there was no delay in the initiation or delivery of B&McD's engineering services, there was merely a period when those services were controlled under the GSA until the project specific engineering agreement could be finalized and executed.

Q: What did Pegasus-Global conclude with respect to KCP&L's management of Burns & McDonnell?

A: On any project, and especially on a mega-project, no contractor is in isolation. As presented earlier in this testimony, mega-projects introduce a significant amount of stress among and between engineers, contractors, and suppliers, all of which the owner or its agent must manage. Pegasus-Global found that KCP&L was able to resolve all of those issues and stresses in a timely and efficient manner. Did B&McD perform flawlessly? No. But perfection is not the standard for prudent decisions or their execution. KCP&L management had to resolve the issues and stresses which arise throughout the entire execution of a mega-project.

Q: ** [redacted] ** [Drabinski at page 85, lines 7 through page 99, line 19]

A: ** [redacted]

[39] Iatan Construction Project B&McD Vendor Audit Report – FINAL

[redacted]

[40] BM Vendor Audit Follow-up 4-08

[redacted]

[redacted]

[redacted]

[redacted]**

Q: **[redacted]**

**[redacted]

[redacted]

[redacted]

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[redacted]

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Q: **[redacted]

[redacted]**

A: **[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]**

Q: **[redacted]**

[redacted]**

A: **[redacted]

[redacted]

[redacted]**

Q: Did Pegasus-Global evaluate Iatan Unit 2 engineering status throughout the project period, relative to Procurement and Construction?

A: Yes. Relative to procurement of the major equipment, including the Unit 2 Boiler, the Steam Turbine, other engineered long lead items and the major civil works contract for the foundation, and ultimately, contracting for the BOP construction. These contracts

were dependent on the engineering being adequately progressed to support the project. Pegasus-Global discussed KCP&L's contracting approach elsewhere in this testimony. Pegasus-Global concludes engineering progressed adequately to support all of these key project activities. As Steve Jones, KCP&L's Procurement Manager testified, by the end of 2006 B&McD had provided technical specifications and bid evaluations for the completion of 24 contracts with a combined value of almost $1billion and that did not have any delay impact on the Iatan Project [Direct Testimony of Steve Jones, Kansas Corporate Commission, Docket No. 10-KCPE-415-RTS, page 17, lines 1 – 11, December 17, 2009].

Q: How does the status of the Engineering impact on specific Contracts?

A: As noted earlier in this testimony, all mega-projects including the Iatan Project are executed on a fast-track sequence basis, the purpose of which is to reduce the overall time of project execution. This sequencing approach requires that both procurement and construction will start and progress before engineering is complete. As an example, as noted earlier, KCP&L authorized preparation of the Unit 2 boiler and turbine generator specifications in late 2005, recognizing that this major equipment must be committed before the plant layout can be finalized and foundation design can be started.

The Boiler contract for the Iatan Unit 2 project was awarded to Alstom on the basis of a performance specification to enable that scope of work to be executed under an EPC delivery method and fixed price contract, where Alstom had full responsibility for engineering, procurement and construction of the equipment purchased.

When a contract is awarded on an EPC basis very little detailed engineering is required from the Owner Engineer though performance specifications will need to be well

developed. The Turbine Generator scope of work was awarded as an "engineer and fabricate" delivery method and with a lump sum Purchase Order contract approach, where Toshiba was responsible for the engineering and fabrication of the Turbine Generator. Again, though minimum detailed engineering is required, well developed performance specifications are required to bid this work and award a contract. Little detailed engineering design can be started prior to having details of the equipment from these two primary project component equipment suppliers. As also noted earlier in this testimony KCP&L retained B&V to prepare these two technical performance specifications.

However, construction only contracts, such as the foundation contract with Kissick, require that the detailed engineering and design be complete and the KCP&L procured equipment and materials be available prior to the start of that work. This does not mean the designs are complete for the entire contract scope of work prior to award of the foundation contract, only that those foundation designs are completed and delivered to the foundation contractor as needed to support the planned completion of each foundation.

Based on Pegasus-Global's review of the Owner Engineer performance and the nature of the contracts awarded, the construction of the Iatan Project was not impeded by B&McD's engineering.

Q: **[redacted]**

A: **[redacted] ** [Drabinski at page 152, lines 7 - 8].

Q: **[redacted] ** **[Drabinski at page 85, lines 12 - 17].**

A: **[redacted]

[redacted]**

Q: **[redacted]**

[redacted]**

A: **[redacted]

[redacted]** [Drabinski at page 151, lines 12 through page 152 Table].

Q: **[redacted]

[redacted]** **[Drabinski at page 89, lines 4 – 7]**

A: **[redacted]

[redacted]**

Q: What was your ultimate conclusion relative to KCP&L's management of Burns & McDonnell?

A: Pegasus-Global found KCP&L's management of B&McD to be both reasonable and prudent.

Q: Will you explain why you found the initial Iatan Unit 1 project management and contract approach prudent?

A: In reviewing project delivery options, KCP&L found that demand for engineering and construction services had risen from what had existed in early 2004, forcing them to include a variety of options in their review. Strategically, KCP&L had a range of delivery method options, ranging from EPC (single source responsibility for engineering and construction) to separate contracts for engineering and various contracts for vendors and contractors (typically called a multi-contract approach). In analyzing this overall strategy

KCP&L management determined that the recently approved CEP program (by the Kansas and Missouri Commissions in mid 2005) would require enhanced project management personnel and staff, as previously discussed earlier in my testimony.

** [redacted] ** These results indicate that these companies were making decisions based on their own particular circumstances, including their evaluation of competitive options, and that there is no single "prudent" choice for project construction during this time period. (B&McD survey of coal plants 090207)

Pegasus-Global found that KCP&L not only solicited expert advice but also took this advice into account in evaluating project delivery options. KCP&L concluded that project completion could be accomplished within the approved CEP program schedule by engaging in a combination of EPC and multi contract delivery methods for the Iatan Unit 1 project.

Q: What project delivery methodology and contract approach was selected for the Iatan Unit 2 project?

A: Ultimately, KCP&L used a mixture of delivery methodologies and contract approaches for the execution of the Iatan Unit 2 project:

- KCP&L selected an EPC delivery methodology to execute the primary piece of engineered equipment – the boiler. That delivery methodology is typically used when the scope of work is based on operational specifications utilizing a fixed price contracting approach and involves both manufacture and erection/installation of that equipment on site.
- KCP&L selected a straight equipment procurement delivery methodology to execute another crucial piece of engineered equipment – the turbine generator. As a manufactured piece of equipment the use of a fixed price contract approach based on operational specifications for engineering and manufacture is typical.
- KCP&L contracted for engineering services under a time and materials contracting approach which is typical within the industry when the project involves design of a new facility predicated on several "operational specifications" supplied by the owner and the primary engineered equipment suppliers.
- KCP&L originally selected a multi-prime delivery method for the BOP scope of work, with KCP&L acting as its own Construction Manager. KCP&L later modified its multi-prime delivery method by engaging Kiewit as a General Contractor responsible to complete the BOP construction.

Pegasus-Global found that KCP&L followed a methodical process during the selection of each of its project delivery methodologies and contracting approaches, which resulted in decisions which were reasonable and prudent given the information available at the time those decisions were made.

Q: What was the basis for your examination of KCP&L's choice of project delivery methodology and contract approach?

A: A key consideration in selection of delivery method and contract approach is to align the delivery methodology and contracting approach with the risk profile of the project to be executed. One of the crucial decisions for an owner is to select a project delivery method and contract approach which enables it to allocate project risks appropriately while maximizing the ability to meet the project goals and objectives. The goal is not for the owner to attempt to shed all risk to a contractor; first of all it is simply not possible, even under an EPC delivery methodology and a Fixed Price, Date Certain, Turn Key contract approach for an owner to shed all project risk. Second, the more risk an owner sheds, the higher the contracting cost, as no contractor will knowingly accept a risk without assuring that the compensation to be received is as high or higher than the cumulative impact of those risks should they manifest on the project. A primary tenet of successful risk allocation is that a risk element should be allocated to the project party that is best able to manage and control the specific risk element in question. No owner, including a utility, should blindly select a delivery method simply because others appear to be using it.

To preliminarily judge whether KCP&L followed a management process that generally reflected the best industry practice to capture and appropriately allocate risk for the Iatan Unit 2 project, Pegasus-Global employed a table which Pegasus-Global has used for over ten years as a reference guide. The table is based on an approach presented by two senior Bechtel Corporation officers at an American Society of Civil Engineers (ASCE)

conference in 1997,[41] and employs various general project criteria which generally describe risk allocation conditions between project parties. Using the table enables an owner to identify the project delivery methodologies and contract approach which provide the best "fit" to the project risk profile for that project. An example of how the table is employed to match various criteria with delivery methods and contracting approaches has been provided below in **Table 1 – Project Execution Conditions and Risk Allocation Re: Iatan Unit 2 Alstom Contract** and **Table 2 – Project Execution Conditions and Risk Allocation Re: Iatan 2 Kiewit Contract in 2007**. Tables 1 and 2 provide an indication of which project delivery methods and contract approaches match the risk profile established for the project for the Boiler Island and BOP scopes of work.[42] Pegasus-Global uses the table to perform a general check as to whether the owner's processes met the general expectation at the time based upon what the owner knew or should have known.

Q: Can you explain your review and findings concerning the Alstom delivery method and contract approach selected by KCP&L?

A: Yes. An examination of the Iatan Project records showed KCP&L first completed its examinations of the future need for power and had developed a consolidated plan for addressing that future need, one element of which was to construct a second coal fired unit at the Iatan power station. Next Pegasus-Global found that KCP&L had engaged

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[41] "*Choosing the Right Delivery System*," By Charles M. Spink, P.E., F.ASCE, Construction Congress V, Managing Engineered Construction in Expanding Global Markets, Proceedings of the Congress, 1997, American Society of Civil Engineers

[42] Over the years, as risk management practices and programs have evolved, Pegasus-Global has adjusted the original table in order to reflect the latest industry thinking as to the best methods for allocation and management of specific risk elements.

consultants such as Schiff Hardin, B&V and B&McD to provide it with the information and data it needed to understand the current state of the power project industry. KCP&L management received advice relative to the general progress steps through which a power project proceeds, including identification of critical equipment decisions, timing of those decisions, and the interdependence of actions and decisions. Pegasus-Global then found that KCP&L used the information gained from its advisors to develop its project risk profile and prioritize the order of its actions and decisions for managing those risk elements.

Specific to the boiler island project delivery and contract approach decisions Pegasus-Global examined the project conditions for the period during which KCP&L made its delivery method and contract approach selections. The boiler island is the project element which drives the majority of project detailed design, cost and schedule; as the design, manufacture of the boiler components and construction of the boiler island collectively take the longest time to perform. In addition the boiler island has the greatest influence on the completion of detailed design and construction for the BOP; simply, without the complete boiler design the detailed design of the BOP cannot be finalized, issued or bid.

In the latter half of 2005 and early into 2006, KCP&L was preparing to bid the boiler island, the first step in the long process which would ultimately result in the completion of the Iatan Unit 2 project. At that time the industry as a whole was in the midst of a construction boom which was quickly locking up what is known within the industry as the "manufacturing queue" for major engineered equipment such as boilers and turbine

generators.[43] Pegasus-Global found that KCP&L was cognizant of the need to secure a boiler contractor as early as possible in the project life cycle and acted quickly to have a performance specification prepared which could be expeditiously bid and awarded.

Because of the highly specialized nature of the equipment involved, utility owners do not take the risk of actually engineering or designing the boiler equipment, those risks are allocated to the manufacturer awarded the boiler equipment scope of work. To allocate the risk to the manufacturer, utility owners procure boiler island equipment using a performance specification; that is, the owner (through its engineer) develops the performance requirements for the boiler (such as pressure, temperature, flow rates, cooling and recapture characteristics, etc), but leaves all of the detailed engineering and design of the equipment and appurtenances (the boiler island), and therefore allocates the risk attached to that work, to the manufacturer.

The boiler components must be assembled and installed within the boundaries of the Boiler Island, a task which is again very specialized and complex, involving a significant level of project risk. Therefore, the utility owner will generally contract with the manufacturer to do the installation as part of its direct scope of work or contract with the manufacturer to directly oversee and manage a specialist contractor engaged to execute that scope of work.

Among the risk elements attached to the boiler island are the following:

- Defective design of the boiler island equipment;

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[43] KCP&L Strategic Infrastructure Investments– Quarterly Status Update Third Quarter 2006 and KCC Docket No. 04-KCPE-1025-GIE, page 9; Synapse Energy Economics, Inc., July 2008, David Schissel, Allison Smith and Rachel Wilson

- Defective installation/construction of the boiler island equipment;
- Cost overruns (design, procurement, manufacturing and/or installation);
- Schedule delays (design, procurement, manufacturing and/or installation);
- Failure of the completed boiler island to meet the performance specification set by the owner; and
- Failure to properly test and commission the boiler island.

Once the project conditions and risk profile had been established, Pegasus-Global examined the primary risks attached to the boiler island against the possible delivery methods and contract approaches using **Table 1** as discussed earlier above, with the following results:

TABLE 1
PROJECT EXECUTION CONDITIONS AND RISK ALLOCATION
RE: IATAN UNIT 2 ALSTOM CONTRACT

Choosing the Preferred Project Delivery Methodology, Contracting Approach and Resultant Risk Allocation Expectations[44]

	Project Delivery Methodology		Contracting Approach			KCP&L Choice Re: Iatan Unit 2
	Design Bid Build	EPC	Fixed Price	Unit Price	Cost Reimbursable	
Owner Considerations and Requirements						
Cost Control is Major Consideration		✓	✓	✓		*
Owner to Control Contingency		✓		✓	✓	
Bid Competition Required	✓	✓	✓	✓		*
Maximum Owner Involvement		✓			✓	*

[44] Modified by the author from "Choosing the Right Delivery System," by Charles M. Spink, P.E., F.ASCE, Construction Congress V, Managing Engineered Construction in Expanding Global Markets, Proceedings of the Congress, 1997, American Society of Civil Engineers, pages 663 – 671

TABLE 1
PROJECT EXECUTION CONDITIONS AND RISK ALLOCATION
RE: IATAN UNIT 2 ALSTOM CONTRACT

Choosing the Preferred Project Delivery Methodology, Contracting Approach and Resultant Risk Allocation Expectations[44]

	Project Delivery Methodology		Contracting Approach			KCP&L Choice Re: Iatan Unit 2
	Design Bid Build	EPC	Fixed Price	Unit Price	Cost Reimbursable	
Minimum Owner Involvement	✓		✓			
Owner Has No Oversight Capabilities	✓		✓			
Single Source Responsibility		✓	✓	✓	✓	*
Contractor In Part Provides Project Funding		✓	✓			N/A
Project Scope and Parameters						
Clear Scope Definition	✓	✓	✓	✓		*
Minimal Scope Definition	✓			✓	✓	
Scope/Complexity Defined, Quantities Uncertain	✓	✓	✓	✓		*
Minimal Scope Changes Expected	✓	✓	✓			*
Potential for Large Scope Changes		✓		✓	✓	
Tight Schedule		✓	✓	✓	✓	*
Volatile Project Environment		✓		✓	✓	*
Stable Project Environment	✓		✓			
Large Complex Project	✓	✓	✓	✓	✓	*
Primarily New Technology		✓		✓	✓	

As noted by the "tick marks" in **Table 1** above, both the Owner Considerations and Project Scope and Parameters significantly favor the use of an EPC delivery method (14 out of 18 total risk elements). Under the Contracting Approach both the Fixed Price and

Unit Price contract approaches appeared as the preferred contract approaches (12 out of 14 total risk elements). Using **Table 1**, Pegasus-Global confirmed that KCP&L's selection process accounted for those risk elements most crucial to the choice of delivery method and contract approach for the boiler island scope of work. KCP&L selected an EPC delivery methodology and a Fixed Price contract approach as shown in the last column of **Table 1**.

Pegasus-Global concluded that KCP&L's process for selection of delivery method and contracting approach for the boiler island scope of work was reasonable and prudent based on what was known, or reasonably could have been known by KCP&L relative to industry and project conditions as of late 2005 and early 2006 and the risk profile for the boiler island scope of work.

Q: Can you explain Pegasus-Global's review and findings concerning the Kiewit delivery method and contract approach selected by KCP&L?

A: Pegasus-Global followed exactly the same process in examining KCP&L's selection of delivery method and contract approach for the Kiewit contract that was used to examine the Alstom contract. The risk elements specific to this scope of work focused around execution of the BOP construction, as the risk for detailed design of the BOP had already been allocated to B&McD. The Iatan Project record shows that initial attempts to allocate this risk via either an EPC or GC delivery method, and a fixed price contracting approach, met with no interest within the contracting community when first tested by KCP&L in early 2006. As a result, KCP&L had no way in which to allocate that risk at that time and was taking actions which would enable it to manage and control those risk elements under a Multi-Prime methodology throughout 2006 and into 2007.

As often happens in mega-projects extending over several years, industry conditions change relatively quickly and in late 2006 and early 2007 Kiewit, who previously had declined to bid on the BOP scope of work under an EPC/GC methodology or fixed price contract approach, contacted KCP&L with an offer to assume the responsibility for the BOP scope of work as a GC, although it was unwilling to accept a fixed price contracting methodology. The decision to change delivery methodology for the BOP scope of work needed to be evaluated against the impact that change would have on the project's risk profile and, in particular, the reallocation of those risks from KCP&L to Kiewit.

The document record showed that KCP&L and its advisors carefully examined the impact to the Iatan Project's risk profile of changing the delivery method and ultimately determined that although the core elements would not change, the allocation of those risk elements could be improved; the project risk profile could be altered substantially by shifting certain of those risk elements to Kiewit, a party that at that time was better able to manage and control those risk elements which existed within the BOP scope of work.

Pegasus-Global again used the delivery method and contract approach table to examine KCP&L's decision making process relative to the selection of delivery method and contract approach, as shown in **Table 2** below:

TABLE 2
PROJECT EXECUTION CONDITIONS AND RISK ALLOCATION
RE: IATAN UNIT 2 KIEWIT CONTRACT IN 2007

Choosing the Preferred Project Delivery Methodology, Contracting Approach and Resultant Risk Allocation Expectations

	Project Delivery Methodology		Contracting Approach			KCP&L Choice: Re: Iatan Unit 2
	Design Bid Build	EPC	Fixed Price	Unit Price	Cost Reimbursable	
Owner Considerations and Requirements						
Cost Control is Major Consideration		✓	✓	✓		*
Owner to Control Contingency		✓		✓	✓	*
Bid Competition Required	✓	✓	✓	✓		
Maximum Owner Involvement		✓			✓	*
Minimum Owner Involvement	✓		✓			
Owner Has No Oversight Capabilities	✓		✓			
Single Source Responsibility		✓	✓	✓	✓	*
Contractor In Part Provides Project Funding		✓	✓			N/A
Project Scope and Parameters						
Clear Scope Definition	✓	✓	✓	✓		*
Minimal Scope Definition	✓			✓	✓	
Scope/Complexity Defined, Quantities Uncertain	✓	✓	✓	✓		*
Minimal Scope Changes Expected	✓	✓	✓			
Potential for Large Scope Changes		✓		✓	✓	
Tight Schedule		✓	✓	✓	✓	*
Volatile Project Environment		✓		✓	✓	*
Stable Project Environment	✓		✓			
Large Complex Project	✓	✓	✓	✓	✓	*
Primarily New Technology		✓		✓	✓	

As noted by the "tick marks" in **Table 2** above, both the Owner Considerations and Project Scope and Parameters significantly favor the use of an EPC delivery method (14 out of 18 total risk elements). Under the Contracting Approach both the Fixed Price and Unit Price contract approaches appeared as the preferred contract approaches (12 out of 14 total risk elements). Using **Table 2**, Pegasus-Global confirmed that KCP&L's selection process accounted for those risk elements most crucial to the choice of delivery method and contract approach for the BOP scope of work. KCP&L decided to revise its project execution plan for the BOP scope of work using an EPC type delivery methodology and a Unit Price contract approach as shown in the last column of **Table 2**.

As engineering and procurement were too far advanced to be fully re-allocated to Kiewit for the BOP scope of work, KCP&L ultimately selected a EPC delivery methodology under which Kiewit would assume full responsibility for the actual construction of the BOP scope of work, while providing input into engineering (i.e. construability reviews) and taking responsibility (and risk) of certain material and specialist subcontract procurement.

Because Kiewit was not involved in the initial BOP planning, engineering and procurement activities it was understandably unwilling to accept a Fixed Price contract approach; therefore KCP&L and Kiewit negotiated a Unit Price contract. That compromise contract approach was reasonable both from the perspective of the **Table 2** results shown above and in consideration of the status of the Iatan Project at the point in time when the decision was made to modify the delivery method for the BOP scope of work. Pegasus-Global concluded that KCP&L's process for selection of its initial

delivery method for the BOP scope of work and its revisions to that delivery method and contracting approach for the BOP scope of work were reasonable and prudent based on what was known or reasonably could have been known by KCP&L relative to industry and project conditions as of 2006 and 2007.

Q: Did Pegasus-Global examine Mr. Drabinski's testimony and conclusions relative to KCP&L's selection of the project delivery methodology in 2005?

A: Yes we did.

Q: **[redacted]**

A: **[redacted]**

[45] Direct Testimony of Walter P. Drabinski, Vantage Energy Consulting, LLC, on behalf of Missouri Retailers Association, Case No. ER-2010-0355/0356, Missouri Public Service Commission, November 17, 2010, page 43 line 10

[redacted]

- [redacted]**

Q: **[redacted]**

A: **[redacted]

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[46] Direct Testimony of Walter P. Drabinski, Vantage Energy Consulting, LLC, on behalf of Missouri Retailers Association, Case No. ER-2010-0355/0356, Missouri Public Service Commission, November 17, 2010, page 43 line 6

[47] Direct Testimony of Walter P. Drabinski, Vantage Energy Consulting, LLC, on behalf of Missouri Retailers Association, Case No. ER-2010-0355/0356, Missouri Public Service Commission, November 17, 2010, page 43 line 19

[redacted]

[redacted]

[redacted]

Q: What is the basis of Pegasus-Global's disagreement with Drabinski's assertion that KCP&L should have been seeking an EPC contractor in January 2005?

A: First, the project risk profile as of January 2005 still included significant "make or break" risk elements, each of which a prudent owner would attempt to resolve or mitigate prior to entering into any significant expenditure on a project such as the Iatan Unit 2 project.[48] The acceptance and approval of KCP&L's CEP by the Missouri and Kansas Commissions was a make or break risk element from the standpoint of securing investor/co-owner participation in the Iatan Unit 2 project. The approval of the CEP was

[48] A "make or break" risk element is one that on its own has the potential to completely stop a project from advancing beyond initial planning. For example, if sufficient financing cannot be secured to fund the execution of the project the project will either shelved until that risk element can be overcome or be abandon in total.

critical to assure investors and potential co-owners of the viability of the Iatan Unit 2 mega-project given that even at that early stage of development (January 2005) the mega-project was expected to cost well in excess of $1 billion and take five-plus years to execute. Had KCP&L incurred significant cost preparing a project for an EPC bid and award only to have the Missouri and/or Kansas Commissions reject the CEP, one could argue that initiating that project and incurring those costs without having secured that acceptance and approval was an imprudent management decision.

Second, as of January 2005 the project definition was not detailed to a level from which the primary engineered equipment specification (boiler and turbine generator) could be prepared, bid and selected. Searching and selecting an EPC contractor as of January 2005 would have meant entering the contractor market with a "blanked" Request for Proposal; that is soliciting response proposals from EPC contractors with the majority of the operating specifications and basic designs left "blank" or marked "to be determined." In a blanked solicitation, the experienced EPC contractor will either (1) refuse to bid, or (2) will caveat the entire bid response to avoid accepting any undefined scope risk attached to cost or schedule. There would be no "risk advantage" in soliciting, or awarding an EPC contract on such a response for the project, as contractors would be unwilling to accept cost or schedule risk on a blanked solicitation.

This condition is exemplified by the presentation by B&V to KCP&L on November 8, 2005.[49] B&V refused to bid the Iatan Unit 2 project on an EPC fixed price contracting methodology because of the limited level of project definition in place as of November

[49] Black & Veatch November 8, 2005 Presentation to KCP&L

2005. Instead B&V offered to set a target price approximately one year after the initiation of full detailed project engineering. The refusal by B&V occurred eleven months after January 2005, the point at which Mr. Drabinski asserts that KCP&L should have been soliciting and securing an EPC contractor for the Iatan Project.

Finally, conditions in the EPC contractor market did not favor KCP&L securing a contractor willing to accept any significant amount of cost or schedule risk. This is for a number of reasons, including:

- There are a limited number of contractors that can successfully execute a mega-project as an EPC contractor. If the qualified EPC contractor pool is saturated with work, it would be difficult to find a contractor willing to bid additional work with the significant level of risk which accompanies every mega-project.
- There are a limited number of mega-projects that any one EPC contractor can take on at a time given the extremely high risk which accompany fixed price mega-projects. Even a Bechtel has an upper limit to the total amount of risk the corporation can place under contract and successfully execute.
- KCP&L's history with the EPC contractor market had been minimal for almost two decades. One way in which EPC contractors mitigate and control their risk exposure on mega-projects is by working for a very select group of owners, preferring to work for owners with whom they have had a long and successful relationship. It is doubtful that KCP&L could have generated any fixed price, fixed completion "date certain" responses from EPC contractors with which it had not worked before.

- The EPC contractor market was saturated in 2005 and 2006, particularly in the power industry.[50] As noted in its presentation to KCP&L in November 8, 2005, B&V believed that finding a qualified EPC contractor for either the total plant or even the BOP would be a constraint that would have to be overcome by KCP&L[51]

Based on Pegasus-Global's examination of normal contracting practices within the industry at the time and the actual status of the project definition as it existed in 2005, **[redacted]** Rather, Pegasus-Global found that KCP&L followed a systematic process which worked to match the project, industry and market conditions to project delivery methodologies and contract approaches which gave it the best opportunity to successfully meet this project's goals and objectives.

Q: **[redacted]**

A: Yes. The purpose of the 2004 PDR was to support:

- Development of project detail sufficient to support permitting requirements;

[50] Coal-Fired Power Plant Construction Costs, July 2008, Synapse Energy Economics, Inc., page 4
[51] Black & Veatch November 8, 2005 Presentation to KCP&L

- Evaluation of the economics of the major technology components expected to be used in the Iatan Unit 2 project; and
- Development of the project performance and financial data to be included in the KCP&L Integrated Resource Plan.[52]

B&McD had to establish certain assumptions upon which to base the Iatan Unit 2 project study in order to meet those goals. Among those assumptions was that the project delivery methodology employed for the Iatan Unit 2 project would be a mix of EPC (Boiler Island) and multi-prime (BOP).[53] That assumption, to use a mix of delivery methodologies, was reasonable as it provided B&McD with the ability to execute the study using the two most common methodologies used within the power industry, without limiting the study to a single methodology.

[redacted]

- The PDR was a study to be used for two primary purposes:
  - As a test of the viability of the project in terms of desired results, costs, timing and risk. As a test document the PDR was based on limited information and data and assumptions had to be made across all topical issues in order to enable KCP&L to make reasonable judgments as to the viability of the project as a whole.

[52] Iatan Unit 2 Project Definition Report for KCP&L, August 2004, rev. 0, page 1-1
[53] Iatan Unit 2 Project Definition Report for KCP&L, August 2004, rev. 0, page 1-3

- As preliminary guide for future project planning. As a planning guide the PDR established the elements of the project which had to be researched, analyzed and set in order to identify the full project risk profile, from which decisions would be made with the goal of achieving the project's desired results, at a reasonable cost and within the timeframe required.

- ** [redacted] ** Project Management by its definition involves the continuous examination of, and reaction to, changes to a project's risk profile over a project's full life cycle. With every decision made, action taken and unforeseen event which occurs a project's risk profile changes and with every change in a project's risk profile management must make decisions and take actions to adjust a project's course to meet and overcome those changes. Mega-project managers face exactly the same challenge, but with the added pressures which accompany projects which are technically complex, take thousands of people years to build and cost over $1 billion. To successfully manage and control a changing project risk profile over an extended period of time, mega-project managers must be prepared to adjust plans and decisions constantly over the life of that project.

One example of the dynamic nature of managing a changing risk profile on the Iatan Unit 2 project involves the evolution of the project delivery methodologies and contracting approaches managed by KCP&L. Throughout 2005 KCP&L sought advice relative to the project delivery methodology from at least three expert sources: Schiff Hardin, B&V and B&McD. In the fall of 2005 B&V and B&McD were requested by KCP&L to prepare

and submit proposals which addressed both of the EPC and the multi-prime delivery methodologies.

B&V's proposal, preferring the EPC approach, was conditioned in that it would assume neither the risk of a fixed price or a completion date certain under an EPC delivery methodology and contracting approach [Giles direct testimony, Missouri Commission Docket No. ER-2010-0355, June, 2010, page 9, line 22 through page 10, line 10]. Two of the primary reasons to utilize an EPC delivery methodology and contracting approach are to (1) shift cost and schedule risk to the EPC contractor and (2) to gain cost and schedule certainty for the ownership group and rate payers. B&V's EPC proposal provided neither of those two goals.

B&McD submitted a proposal with two delivery options; a hybrid EPC delivery methodology and a multi-prime delivery methodology. B&McD proposed putting certain work under an EPC structure (i.e. the primary engineered equipment) while executing the BOP under a multi-prime structure. The advantage to this methodology was that it shifted cost and schedule risk for a significant portion of the work – the Boiler Island and turbine generator equipment – to a single contract for a fixed price and a completion date certain. This was possible because the scope of work for those two critical elements of the project scope was strictly defined and could be founded on operational specifications. However, the BOP scope of work was unlikely to generate fixed price, date certain bids until the detailed engineering had been completed and issued for bid, which could not occur until the detailed engineering and design had been completed for the boiler island and the turbine generator equipment.

Because of that project flow the B&V EPC proposal actually gained none of the cost or schedule risk reduction generally sought by an owner provided by an EPC delivery methodology, KCP&L's first decision was to separate the Boiler Island from the BOP, immediately initiating action to enable solicitation of an EPC supplier/installer for that engineered equipment. This decision was completely in line with the required project flow (completion of detailed engineering for the primary boiler island and turbine generator equipment leading to initiation of detailed design of the BOP).

However, KCP&L did not finalize a decision relative to the delivery methodology for the BOP work at that same time. In early 2006 KCP&L's Steve Jones was surveying contractors in an effort to gauge whether or not there was any interest among the contracting community in bidding the BOP work under an EPC delivery methodology and contracting approach.[54] Among those firms contacted were the following:

- Kiewit;
- Washington Group;
- Fluor Daniels;
- Black & McDonald Power;
- EMCOR;
- PCL; and
- Shaw.

[54]E-mail string, Steve Jones to John Grimwade, et al, May 15, 2006 and Robert Reymond to Steve Jones, et al, May 17, 2006

In a May 24, 2006 memo, Steve Jones summarized his notes on one of those interviews, noting that the Washington Group had politely declined any interest at this time.[55] Similar answers were received from the other contractors that were contacted and interviewed by telephone [Direct Testimony of Steve Jones, Kansas Corporate Commission, Docket No. 10-KCPE-415-RTS, page 14, line 18 through page 16 line 8 December 17, 2009].

Through the summer of 2006 KCP&L continued to reasonably examine all of its options relative to the delivery methodologies for the BOP scope of work and did not discard any delivery options until mid-2006, at which time it committed to a multi-prime methodology.

Q: **[redacted]**

A: First, Pegasus-Global knows of no industry study which supports the contention that an EPC delivery methodology reduces costs when compared against a multi-prime delivery methodology. Mr. Drabinski provided no documented support for that assertion, and in fact that statement conflicts with the combined personal experience of the Pegasus-Global team and with what Pegasus-Global has observed as conventional wisdom in the construction industry. The EPC delivery methodology is primarily known within the industry as a way to shift cost and schedule risk to a contractor, and in return for accepting that risk, a contractor will bid a higher cost to cover the possible impact of that risk should costs increase or schedule lengthen. Second, the ability to shift that risk is

[55] Memo, Steve Jones to Terry Murphy, et al, May 24, 2006 (date on memo incorrect)

only true if the contractor agrees to accept that risk under the EPC contract. As discussed above, attempts by KCP&L to find a contractor willing to take on the cost or schedule risk of the Iatan Unit 2 project under an EPC contracting approach were unsuccessful. An EPC contract approach which leaves the cost unfixed and the scheduled completion date floating until sometime in the future has not shifted any of the cost or schedule risk from the owner.

Q: Did your examination lead to any disagreements with the Missouri Staff's analysis and testimony relative to KCP&L's selection of the project delivery methodology for the Iatan Unit 2 project?

A: Yes. The Missouri Staff report [pages 21-22] indicates that KCP&L's decision to choose a multi-prime contracting approach led to Iatan Project cost overruns and document control issues as the result of KCP&L's failure to employ a strong, capable and experienced Project Management or Construction Manager. However, it is my opinion that the Staff's finding is flawed for a number of reasons including:

- The Staff has not demonstrated any independent analysis as required under the GAAS standards, which it purported to have used, and instead simply relies on testimony by Kansas Commission Staff consultant testimony of Mr. Drabinski (deemed by the Kansas Commission November 22, 2010 Order to be unreliable and gave no weight to it), and "sound bites" taken from KCP&L internal audits.
- The Staff inappropriately used KCP&L internal audits to criticize KCP&L's multi-prime contracting approach decision ignoring the fact that the process of conducting on-going internal audits during a complex construction project is considered part of the prudent management decision-making process.

- As Pegasus-Global has described earlier in this testimony, KCP&L did staff an organization commensurate with the phase of the Iatan Project and the contracting approaches taken. KCP&L, using input from its advisors and the internal audits continued to improve its staffing and organization per the very same recommendations quoted by the Staff demonstrating reasonable and prudent management actions.

Q: What in summary are Pegasus-Global's findings relative to KCP&L's selection of the project delivery methodology during the period from 2005 through 2006?

A: Pegasus-Global found that KCP&L solicited expert advice and took this advice into account in evaluating project delivery options. Further, with the assistance of those experts and its own information sources, KCP&L continued to explore all of its project delivery options up until the point in time when a final decision had to be made in mid-2006. Ultimately KCP&L concluded that its project risks could be managed and its project goals and objectives could be achieved within the approved CEP program schedule by engaging in a combination of EPC and multi-prime delivery methods for the Iatan Unit 2 project. KCP&L's decision is consistent with Pegasus-Global's experience on mega-projects in all industry sectors for over four decades.

KCP&L's further recognized that such a strategy shifted the focus of some of the management elements of the project risk profile, the most significant of which required KCP&L to enhance and expand its internal project management staff and organization to assume the management responsibilities for the BOP scope of work under the multi-prime BOP delivery methodology. KCP&L delivery methodology decisions, and the decision making processes KCP&L followed, exhibited good management and fell within

a zone of reasonableness. Pegasus-Global concludes these decisions and the decision making processes were prudent.

Q: Pegasus-Global described the initial decisions regarding KCP&L. Did KCP&L evolve and alter this Delivery Methodology and Contract Approach during the Iatan Unit 2 project execution?

A: Yes. As Pegasus-Global noted earlier, with every decision made, action taken and unforeseen event which occurs a project's risk profile changes, and with every change in a project's risk profile management must make decisions and take actions to adjust a project's course to meet and overcome those changes. Mega-projects such as the Iatan Unit 2 project are confronted with an even greater range of issues which require adjustments to the project execution plans. Again, prudence is judged by the decisions and actions taken by management within the context of what was known or should have been known to management at a specific point in time. As the project environment evolves, management decisions and actions must evolve to meet those changing conditions. In evaluating prudence Pegasus-Global examines how management reacted to changes in the project environment as the project moves through its life cycle.

The speed with which the Iatan Unit 2 project was evolving increased throughout 2006 and 2007, as a myriad of decisions were made and actions were taken to solidify the project execution plan and to varying degrees each decision by KCP&L altered the project environment within which management was operating. The most critical decisions within the project environment involved early engineering to establish the operating specifications for the primary engineered equipment, soliciting proposals for that equipment and awarding that equipment. As described earlier, during 2006 the

turbine generator and boiler island engineered equipment were specified, solicited and awarded.[56] Those actions set the operational and to a large extent the physical parameters of the plant. Those decisions also began to shape the project execution environment for all subsequent work on the project. For example, the boiler island was awarded to Alstom on an EPC delivery and fixed price, date certain contract basis,[57] an action which produced certain elements of the project environment which now had to be factored into all subsequent decisions and actions by KCP&L management. For example, KCP&L's management structure, staffing and execution plans had to adjust to that element of the project's environment in order to insure that the decisions made and actions taken going forward with the project aligned with that change in the environment.

Because KCP&L found no contractor interest in bidding the full project or even the BOP scope of work on an EPC basis, with a date certain completion or a fixed price, a reasonable option moving through 2006 was for KCP&L to execute the BOP under a multi-prime delivery structure for that scope of work acting as its own construction and project manager. One consequence of that choice was that the risk elements which accompany that scope of work would remain with KCP&L, with minimal risk allocation possible among the various prime contractors possible.

However, in December 2006, Kiewit approached KCP&L with an offer to assume responsibility for the BOP scope of work. According to Kiewit, one of its projects had been terminated, which freed an experienced management team and construction force

[56] KCP&L Strategic Infrastructure Investment Status Report First Quarter 2006, pages 27 & 28, April 28, 2006
[57] KCP&L Strategic Infrastructure Investment Status Report Second Quarter 2006, page 7, July 31, 2006, and KCP&L Strategic Infrastructure Investments – Quarterly Status Update, Third Quarter 2006, KCC Docket No. 04-KCPE-1025-GIE, page 34

for reassignment to another project. As noted earlier in this testimony, Kiewit had been approached by KCP&L in the spring of 2006 to determine any interest in the BOP scope of work but Kiewit had declined due in part to the fact that its forces were fully committed at that time. When this condition changed it was not at all unreasonable for Kiewit to contact KCP&L in an attempt to secure that work for its now unassigned management and construction forces.[58]

Q: What did Pegasus-Global find regarding KCP&L's examination of alternatives to its Multi-Prime delivery method to the BOP contracting methodology in early 2007?

A: The unsolicited proposal from Kiewit gave KCP&L an opportunity to reexamine its initial plans from a perspective which did not exist when the original decision was made to execute the BOP using multiple-prime contractors. The unsolicited proposal also offered KCP&L an opportunity to significantly change the project risk profile going forward, which meant that as any reasonable project manager (and owner) would do, KCP&L had to evaluate that opportunity. Among the factors which KCP&L took into account during that evaluation included the following:

- Kiewit was a large, well known contractor with an immediately available and experienced organization that had demonstrated its capability to manage and execute the complex BOP scope of work on a power project for many years.
- In late 2006 the Iatan Unit 2 project was poised to enter the construction phase of the project. Detailed engineering was being released for bid/construction, initial

[58] Status Report on Comprehensive Energy Plan Projects, Schiff Hardin, page 3, January 10, 2007

construction civil work had been bid and awarded and the procurement of the multi-prime contracts was scoped and was being prepared for solicitation.

- At this stage KCP&L had expanded its internal staff at the project management level; had drafted the primary contract administration policies, procedures, and processes; had identified and in some cases installed management and control systems; and, adopted a project control line item budget for the Iatan Unit 2 project,[59]
- KCP&L was in the process of recruiting and hiring its construction "line and support" staff; was preparing to solicit and procure the prime specialty contractors; was installing (activating) the project-specific management and control systems; and, had initiated Contract Administrative actions.
- KCP&L had utilized staff from both B&McD and Schiff Hardin to assist it in those tasks it had undertaken relative to cost estimating, procurement, permitting and very early construction (demolition and early site preparation), relying on existing project-control processes.

Kiewit's unsolicited proposal provided an opportunity to re-examine the BOP delivery methodology before KCP&L had to fully and finally commit to the multi-prime delivery methodology towards which it had been working. **[redacted]

[redacted]

[59] KCP&L Strategic Infrastructure Investment Status Report, Fourth Quarter 2006, pages 6 – 10 and Section 6, February 15, 2007

[redacted]

[redacted]**[60]

During its evaluation, KCP&L recognized that acceptance of the Kiewit proposal would, in effect, amount to a "sole source" award of a significant amount of the Iatan Unit 2 scope of work. KCP&L examined the various ramifications of that fact and found among other things that the process of holding a competitive bid for other possible General Contractors would have had a significant impact on the project execution schedule and likely would have taken between four and six months. Such a delay would affect the construction schedule and the procurement and engineering schedules. Ultimately the situation involved a judgment decision weighting the gains possible by allocating those risk elements arising from the execution of the BOP scope of work against the potential schedule delay impacts which would result from any attempt to solicit other bids. As the construction market conditions had not changed significantly, it was entirely possible that even had the BOP scope of work been bid, Kiewit may have been the only responsive bidder.

Working through its evaluation process KCP&L settled on only two practical choices:

- Reject the Kiewit proposal and continue with the original multi-prime execution methodology;
- Accept the Kiewit proposal and transition from the multi-prime methodology to a GC methodology.

[60] Schiff Hardin Report, January 10, 2007, page 17

This was a major decision which would significantly alter the projects risk profile and KCP&L gave it the time and attention which a decision of such magnitude must have. As the Iatan Unit 2 project was not at a place where work could simply be put on hold while KCP&L worked through this decision and the changes that such a change would entail in accepting the Kiewit propose, KCP&L continued its progress towards full implementation of the multi-prime methodology using its own forces (i.e. continuing to install project control systems and add additional technical specialist staff). Pegasus-Global found that KCP&L's reaction to the receipt of the Kiewit proposal were both reasonable and prudent when considered against the risk profile of the project at that time and the status of the project at that same time.

Q: How did the decision to change the execution methodology evolve into award of the BOP Scope of Work to Kiewit?

A: Pegasus-Global found that KCP&L adopted a strategy whereby it could take the time necessary to make a fully informed decision without having to make any immediate decision to accept or reject the Kiewit proposal. **[redacted]**

As noted above, KCP&L had to gain time to conduct and conclude its evaluation of the risks and opportunities afforded by the Kiewit proposal without halting progress on the project and while keeping the Kiewit option open. The opportunity to meet all three

[61] Schiff Hardin Report, February 28, 2007, page 4

conditions cited above presented itself in the form of the need to update project estimates as the amount of project detailed engineering increased. One of the tasks identified within the Kiewit proposal was the preparation of a detail construction cost estimate. ** [redacted] ** By February 16, 2007 Kiewit had submitted the BOP construction estimate proposal and the Memorandum of Understanding (MOU) was executed to enable Kiewit to execute that limited scope of work. The Kiewit BOP construction estimate was completed by mid-April 2007.

During that same period KCP&L continued to pursue its project work as planned under the original multi-prime execution methodology. KCP&L continued to prepare and release bid packages for equipment, materials and BOP construction work and continued to recruit line staff positions which were needed to perform both project management and contract administration functions for those procurement awards made during that period. Work which was underway on site was directly managed and controlled by KCP&L during that period of time.

As the estimate update was concluded, KCP&L's examination of the decision to change the BOP delivery methodology under the Kiewit proposal had been completed and KCP&L initiated focused negotiations with Kiewit for the award of the BOP scope of work. On May 17, 2007 Kiewit submitted a revised cost proposal for the BOP scope of work which in effect would place Kiewit in control of the majority of the BOP work

(thereby shifting a significant portion of the execution risk from KCP&L to Kiewit). **[redacted]**

Pegasus-Global found that KCP&L's actions and decisions in consideration of the Kiewit proposal were based in a thorough examination of the contemporaneous information and project status and were ultimately both reasonable and prudent.

C. CONTRACT MANAGEMENT AND ADMINISTRATION PROCESSES AND DECISION MAKING, INCLUDING PROJECT CONTROL SYSTEMS AND CHANGE MANAGEMENT

Q: As part of your review did you evaluate KCP&L's contract management and administration processes and decision-making?

A: Yes.

Q: Can you define what you mean by Contract Administration as you have applied it in your testimony?

A: Yes. Contract Administration is simply ensuring that a contractor complies with the terms and conditions of its contract under the facts and circumstances at the time and that the final product of that contract is fit for its intended purpose. As the Contract Administrator

[62] Schiff Hardin Report, May 23, 2007, pages 1-3

KCP&L was solely responsible to ensure that the engineer/designer, construction contractors, equipment vendors, and material suppliers engaged to execute a scope of work met the conditions of their contract agreement and that the ultimate product of that contract agreement was fit for its intended purpose. In short, KCP&L as the Contract Administrator of the Iatan Project was responsible to (1) make sure that the engineer, construction contractors, vendors and suppliers did what they had been paid to do and (2) to make sure that the engineer, contractors, vendors and suppliers are paid for the work completed per the terms and conditions of the contract. KCP&L's responsibility cannot ensure that each of these parties will live up to their obligations but can mitigate the consequences consistent with the project's needs and the facts and circumstances as I explained earlier in **Section III** of this testimony.

Q: What are the primary functions of a Contract Administrator?

A: A Contract Administrator is directly responsible for, among other things, the following:

- Contract Enforcement;
- Waivers of Provisions and Conditions;
- Specification Interpretation;
- Budget Development and Cost Management;
- Schedule Management;
- Quality Assurance;
- Production Surveillance;
- Change Management;
- Payment Management;

- Penalty Management (i.e. imposition of liquidated damages);
- Warranty Enforcement;
- Subcontractor Management;
- Contract Breach;
- Resolution of Disputes;
- Project Termination; and
- Project Closeout.

Q: Why was KCP&L the Contract Administrator on the Iatan Project?

A: Because KCP&L "held" all of the contracts and procurement agreements directly, with no allocation of its responsibilities to a third party, such as, an independent Project Manager, Construction Manager or General Contractor. Because all contracts and procurement agreements were by and between KCP&L and the respective engineer, vendor, supplier or contractor, KCP&L was solely responsible to ensure that those parties all lived up to the terms and conditions of their respective agreements.

Q: When did KCP&L's Contract Administration Responsibilities begin?

A: In the summer of 2004 when B&McD was engaged to work with KCP&L to develop the first PDR for the Iatan Unit 2 project and throughout 2005 as B&McD began preparation of the critical long lead procurement specifications for the turbine generator and boiler systems. The first major equipment award was made to Toshiba for the turbine generator on March 16, 2006, with the formal contract agreement executed on April 14, 2006. That contract represented one of the first major contracts awarded on the project. The next major equipment award was made for the boiler island equipment to Alstom on April 28, 2006 under a LNTP as the formal contract was not executed until August 11, 2006. In

essence, with those two awards KCP&L's major contract administration responsibilities began in earnest. **[redacted]**

Q: Did KCP&L have the policies, procedures and personnel in place to discharge those Contract Administration functions in 2006?

A: Yes. KCP&L solicited, awarded and administered the first contracts executed in 2006 following its corporate level supply chain policies, procedures and processes. As the initial procurements were all for long lead equipment, the KCP&L Corporate supply chain policies, procedures and processes were appropriate for awarding and administering the work awarded and contracted for at that time. KCP&L was actively recruiting and adding project specific staff positions beginning in February 2006 and continuing into 2007. KCP&L utililzed staffing support from both B&McD and Schiff Hardin to assist in both the development and execution of project plans and the procurement efforts which were the dominant contract administration tasks during 2006, and during the actual execution phases of the project which continued throughout the entire project life cycle. The flow and pace of procurement through 2006 increased, as would be expected, with the majority of major equipment procured prior to the end of the first quarter of 2007. The initiation of construction procurement began in the last quarter of 2006.

Beginning in the summer of 2006, with increasing project specific staffing on board, KCP&L began drafting project specific policies, procedures and processes, building upon the Supply Chain contract procurement and administration policies, procedures and process already in place. Pegasus-Global found that by the first quarter of 2007 all of the major contract administrative policies, procedures and processes were in place to enable KCP&L to effectively and efficiently administer the contracts awarded for the execution of the Project.

KCP&L was actively recruiting for the line staff positions necessary to use those policies, procedures and processes in administering the project contracts throughout 2006 and into 2007. Pegasus-Global found that the staffing was keeping up with the contract administrative needs through 2006; however, by the end of 2006 as procurement of major construction contract work was being initiated, a full complement of line staff had not been hired to administer all of the construction contracts contemplated. KCP&L's efforts to recruit that line staff were underway; however, the market conditions for qualified and experienced staff were extremely tight at that time. This difficulty, in part led to KCP&L's decision to change its BOP construction execution methodology from multi-prime contractors to a GC, Kiewit, as indicated earlier in this testimony. That decision relieved KCP&L of the burden and risk of administering multiple construction contractors during the execution of the Project.

Q: Did KCP&L administer those contracts awarded reasonably?

A: Yes. Pegasus-Global found that KCP&L actively monitored execution under each contract awarded per the terms and conditions of those contracts. For example:

- Toshiba submitted their second invoice for payment on June 30, 2006. However, KCP&L's review of that invoice and the contract revealed that Toshiba had failed to meet the payment conditions of the contract that required certain submittals be made to trigger that payment. KCP&L notified Toshiba that the invoice would not be paid but would be held until the required submittals had been received. Once the required submittals were received KCP&L made the scheduled payment (August 2006).
- In late July 2006 Toshiba notified KCP&L that the engineering of the turbine generator would take longer than specified within the contract agreement. **[redacted]**
- **[redacted]**

In every instance examined KCP&L acted as Pegasus-Global would expect a Contract Administrator to act. Specifically, KCP&L always responded in writing to any submittal or notification by a contractor; KCP&L always cited to the contract conditions and provisions in formulating its response; and, KCP&L always took allowable actions

commensurate with the situation without automatically resorting to the default position of rejecting outright a contractors position or request. This latter KCP&L practice was beneficial to the project as a whole and the relationship would continue. These actions by KCP&L are an example of KCP&L using the best of industry practices in their contract administration.

Q: Did KCP&L's Contract Administration role change once Kiewit was awarded the BOP Scope of Work as a General Contractor?

A: KCP&L's contract administration role relative to any equipment, material or construction contract not assigned to Kiewit under the BOP General Contractor contract remained the same. Kiewit was responsible under its contract to coordinate the work of all of the BOP contractors, including those with contracts directly with KCP&L; however, KCP&L remained responsible for the contract administration of those contracts which it held directly.

Q: What does Pegasus-Global conclude regarding KCP&L's Contract Administration?

A: KCP&L was prudent and their decision making process functioned as required.

Q: As part of KCP&L's contract administration processes and decision making, did you evaluate the Project Control Systems that were in place on the Iatan Project?

A: Yes.

Q: What are project controls?

A: "Project Controls" is a general term of art within the construction industry which denote those systems used by management to enable it to measure progress toward a project objective, evaluating the work remaining to be completed to achieve that project objective and reporting the status information gathered to project management in a timely

manner enabling project management to take necessary corrective action to achieve the project objective. There are three steps to project control processes; measuring, evaluating and correcting/modifying.[63] Within the construction industry the three predominant project objectives which are measured are cost, schedule/progress and quality. Other control systems exist for other project management process responsibilities, such as, contract administration (i.e. invoice review and approval), regulatory compliance (i.e. safety), materials management, etc. However, those control systems are focused on the administrative process elements of the project and not the primary project cost, schedule/progress, and quality objectives of the project. For the purposes of Pegasus-Global's prudency evaluation of Iatan Project, Pegasus-Global examined the following project control processes:

- Cost Control;
- Schedule/Progress Control;
- Change Control; and
- Quality Management.

Each of these four project elements and the development and use of the respective control processes and systems are examined in greater detail elsewhere within this testimony. The key elements of any project control system is that it enables project management to monitor/measure current project conditions against a set plan, it enables project management to evaluate that data within the context of future plans, and it provides project management with contextual information from which corrective actions can be

[63] Project Management, Kerzner, Wiley & Sons, Sixth Edition, 1998, Chapter 5.1, page 226

formulated by project management. While there are various "packaged control systems" available within the industry, project control systems are, to lesser or greater extents, always customized to conform to the project conditions, and to meet the project manager's and project owner's needs.

Q: Please discuss the Project Controls in effect for the Iatan Project?

A: The project control systems used to manage the Iatan Project in the initial stages were existing KCP&L systems and internal controls. Where it was determined that existing systems and internal controls had to be improved to reduce potential risk for specific projects, KCP&L enhanced those systems and internal controls to function appropriately for the Iatan Project as needed. Project controls consists of three major components, cost controls, scheduling, and reporting. The purpose of cost controls is to identify, trend, analyze, and report the status of project costs in a timely manner to support corrective actions by management as appropriate to the existent facts and circumstances. The purpose of the scheduling function is to prepare a schedule showing the major sequence of activities required to complete the project, assure adequate planning and execution of the project by the contractors and assure coordination of the project by all vendors. In addition, the schedule provides management with information necessary to manage the project and make necessary adjustments to meet the CEP program goals. The reporting function is necessary to create various documents to effectively manage the project.

Q: Did KCP&L have project control systems in place for cost, schedule/progress, and quality management during the Iatan Project?

A: Yes. As with project delivery methodologies, project controls are developed to meet the conditions of the project and the needs of project management. To develop controls

systems before setting the project conditions or defining the management needs at both the corporate and project levels often leads to disconnects between the output of those control systems and the input required by project and corporate management. This is particularly true of mega-projects during which project management faces some unique challenges, such as, off-shore procurements, long lead equipment purchase, transport and installation, multiple contracting entities, multiple construction contractors and engineering input sources, and the like. In early 2006, when the project delivery methodology was clarified, KCP&L and its advisor Schiff Hardin initiated an examination of KCP&L's needed control systems. That examination noted that the development of the controls systems and staffing of the senior project management positions were linked; as the team which would rely on those systems to manage and control the Iatan Project, that senior project management staff needed to be directly involved in the development of those project control systems; in other words, customize the project controls consistent with the changing project circumstances which would enable the PMT to assure reasonable maintenance of the project's goals.

By October 2006, KCP&L had secured the experienced staff necessary to develop and implement project specific control systems and process for the Iatan Project. That staff immediately worked to enhance the KCP&L Iatan Project control systems for cost, schedule/progress, and quality management. By December 2006, those enhanced control systems had been completed and installed within the Iatan Project. In January 2007, the first Monthly Progress Report was issued using those systems as a basis for the Iatan Project progress reporting.

Q: Does Pegasus-Global believe that KCP&L was slow in implementing key project control systems?

A: No. In the case of KCP&L, as with many other utilities in the country, there had not been significant generation construction for a number of years. As a result, an advanced and mature project control system for complex projects was not maintained as would have been done in previous periods when a number of complex projects were initiated over a compressed time period. When the Iatan Units 1 and 2 projects were started, the use of existing project controls was reasonable as a starting point. By mid 2006, KCP&L had issued the CEP Construction Projects Cost Control System and was developing metrics for tracking engineering status and procurement.[64] Weekly Project team meetings had commenced during this time as well as the development of contract administration functions and the KCP&L Project Controls team. Further enhancement of the project control tools were developed in response to the E&Y risk analysis performed in late 2006, such as, Plan-of-the-Day meetings and establishing the Change Order process. Earned value metrics were agreed upon with B&McD in November 2006, approximately the same time the CEP EOC Committee Monthly meetings started, which further allowed weekly reporting to management in order to provide it with information from which decisions could be made, again consistent with reasonable and prudent decision making. With the Project Controls team in place and the base tracking tools established, KCP&L was then positioned to finish the development of the Level 3 schedule. This was a

[64] ** [redacted] **

reasonable and prudent ramp up of systems and personnel based on the status of the Iatan Project at the time.

As the Iatan Project progressed the need for changes and enhancements was recognized, and necessary changes were made. For example, in 2007, project controls data from B&McD was provided through the project Document Locator System, thus ensuring transparency in the information that was shared all across the Iatan Project parties. In this regard, KCP&L's PMT began development of the Project Execution Plan (PEP) in January 2007, involving all the Iatan Project team participants, including contractors. Software was being assessed to track contract administration and cost management with the Project Controls team establishing protocol for policing contractor schedule updates against the detailed level 3 schedule by February 2007. KCP&L expanded its earned value reporting to other contractors at this time, including, for example, Kissick. Accordingly, with more project controls tools in place, KCP&L also during this time began reconciling actual costs and accruals with its project tracking.

KCP&L, in its oversight role of the Iatan Project, continued to refine how the earned value information was reported, and requested additional data from B&McD and its contractors in order to verify the data being reported in the earned value reports. By the first quarter of 2008, after a detailed evaluation of the various control systems and tracking, KCP&L had implemented the selected Skire software system to track Requests for Information (RFIs) and changes for the Iatan Unit 2 project. KCP&L had also begun to track performance through the use of Cost Performance Indices (CPI) and Schedule Performance Indices (SPI). A risk matrix had also been developed which tracked various

risks including schedule, labor availability, potential interferences, and potential for discovery work, startup risks, and technology risks.

Q: **[redacted]**

A: **[redacted]** For example, a number of process controls were refined and/or adapted from what was learned on the Iatan Unit 1 project outage including the methodology to validate Project Schedule status with Plan of the Day meetings, refinement of the earned value and schedule tracking and to have the

Iatan Unit 2 project start-up team replicate the Iatan Unit 1 project process for the Iatan Unit 2 project CTO packages.

In summary, Pegasus-Global found that the evolution of the project controls for the Iatan Project and the decision making processes were reasonable and prudent.

Q: What did Pegasus-Global find in 2006 regarding project control systems in place to manage the Iatan Project?

A: As noted earlier, KCP&L at a corporate level had various control systems in place which encompassed all four of those project control elements examined by Pegasus-Global. While those control systems were not sufficient to manage the Iatan Project through its entire life, those systems were sufficient to enable KCP&L to manage and control the Iatan Project work underway during 2006. Pegasus-Global examined the work in progress in 2006 and developed the following contextual history for that year:

- **Planning and organization**. Throughout 2006 KCP&L was finalizing its project execution plans, which generally included:
  - setting the project delivery methodologies, development of the contract approaches;
  - working with advisors to formulate the project organization structure and staffing plans;
  - working with advisors to enhance project management, control and reporting processes and systems;
  - recruiting and hiring experienced staff to fill both project and construction management roles identified with the assistance of its advisors; and

- identifying the critical data interface points between project management and corporate level within KCP&L.

- **Procurement**. Early in 2006, based on operational specifications, KCP&L with the assistance of B&McD and Schiff Hardin, identified and initiated procurement of long lead engineered equipment, such as, the turbine generator (awarded to Toshiba) and boiler island (awarded to Alstom). Pegasus-Global found that KCP&L had strong, comprehensive procurement processes, systems and staff in place at a corporate level to execute procurement which enabled it to execute those procurement functions effectively and efficiently throughout 2006. The procurement management and control systems in place enabled KCP&L to effectively monitor, evaluate and control the procurement activities executed throughout 2006 and beyond.

- **Engineering**. B&McD was awarded the Owner's Engineer scope of work and continued working on the development of the primary project operational specifications in support of long lead procurement of engineered equipment. The initial scope and schedule for detailed engineering was developed and limited detailed engineering was initiated and partially for foundation work in part based on equipment load and size data supplied by the engineered equipment suppliers, Toshiba and Alstom. KCP&L was monitoring the progress of engineering based on B&McD's internal controls reporting system (see additional detail of these control systems elsewhere in this testimony).

- **Construction**. Actual construction on site for the Iatan Project was initiated at the beginning of September, 2006[65] when Kissick mobilized to site to execute foundation work. While there was other site preparation work (i.e. demolition, site grading, facility preparation) initiated in the latter half of 2006, Kissick represented the primary project construction activity on the project at that time. Pegasus-Global determined that the project control systems in place at KCP&L at the corporate level were adequate to monitor and control Kissick's work and the work being done in preparation of the site for full scale construction.

In summary, Pegasus-Global determined that during 2006 KCP&L had sufficient project control processes and systems in place to manage and control the scope of project work that was underway during that period. Pegasus-Global also determined that those project control processes and systems were not sufficient to manage the full scope of the Iatan Project, which coincides with the opinion of KCP&L and its advisors at the time. The fact that KCP&L recognized and moved expeditiously to correct the gaps in those control systems is exactly what Pegasus-Global would expect a reasonable and prudent utility to do. As noted above, additional details relative to Pegasus-Global's examination of each of the four control processes and systems examined is presented elsewhere in this testimony.

Q: Can you explain the process that KCP&L used in reporting the information gained through its project controls on the Iatan Project?

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[65] ** [redacted] **

A: From a process standpoint, KCP&L project control staff managed the day-to-day inputs, which it maintained in a repository of project control information, updating it on a daily basis to ensure it was constantly tracking every opportunity or risk associated with the project. The rest of the Project Team and its staff also had inputs on a daily basis and would provide those inputs to one central repository within the Project Controls area. Monthly project control information was gathered, reviewed, evaluated, trended, analyzed and then summarized into a monthly Project Status Report. The purpose of the Iatan Project Status Reports was to document activities or potential project issues, overall project progress, and progress on the various phases of the project, engineering, procurement and construction. The Project Status Reports were prepared with the input of a number of project personnel, including the engineering leads, procurement personnel, and cost and schedule personnel.

The CEP EOC was the primary recipient of the Project Status Reports, although they were shared with the Joint Owners and senior management. Monthly cost reports were also provided to the CEP EOC and the Joint Owners that provided information on contingency status, cash flow, accruals, budget transfers, project to date costs and Estimate at Completion (EAC).[66] KCP&L provided information in its quarterly reports to both the Missouri and Kansas Commissions that included contractor earned value man-hours, trends against the Provisional Acceptance Date, engineering complete, construction complete, safety incidents, CPI, SPI, contingency use, procurement, budget

[66] ** [redacted] **

and other events including the hire of new personnel, Tiger Team efforts, and facilitation efforts with Contractors.

Q: What was your general finding relative to KCP&L's project control systems?

A: Pegasus-Global found that the project controls in use during the execution of the Iatan Project were reasonable within the context of the project status during which those controls were used and enhanced by KCP&L. Pegasus-Global would expect prudent project management to initiate a review of the project control processes and systems in place as soon as possible once the project definition was advanced to the level that the review could provide specific data as to the control systems and processes needed to effectively and efficiently manage and control the Iatan Project. Pegasus-Global found that KCP&L, with detailed input from its advisors, assessed its then-current project control processes and systems in a timely and through manner, then initiated efforts specifically intended to address the enhancements needed to those control processes and systems. Pegasus-Global found KCP&L's actions and decisions relative to the development and installation of project control processes and systems during 2006 and into 2007 to be prudent.

Q: **[redacted]**

A: **[redacted]**

[redacted]

[redacted]** This is evidence of appropriate management attention to changing conditions. Pegasus-Global finds the evolution of the project controls for the Iatan Project, and the decision making process and the decisions themselves fell within a zone of reasonableness and was prudent.

Q: What did you conclude with respect to Iatan Unit 2 project Cost Management?

A: Pegasus-Global found the evolution of the Iatan Unit 2 project cost management decisions and the decision making process was reasonable and prudent for the reasons described below.

Q: Please describe the development of the Project Budget for the Iatan Unit 1 project.

A: The development of the budget for the Iatan Unit 1 project progressed from an initial high level estimate in the 2002 time frame to a detailed estimate first developed in spring 2006 and updated as necessary in following periods. This development is consistent with other projects I am familiar with and shows that KCP&L was diligent in updating cost estimates as the project progressed. The initial high level estimate for Iatan Unit 1 was developed in 2002 and targeted total project costs (excluding financing costs) of $210.7 million. This high level estimate was revised in conjunction with the development and negotiation of the CEP program with the Missouri and Kansas Commissions. This new

plan was based on estimates and schedules that were developed in late 2004 and reflected some of the changes that occurred in early 2005 to reflect permit application revisions.

The first detailed estimate for Iatan Unit 1 project was provided to management on May 15, 2006. This detailed estimate reflected significantly more information about the project based on actual contract values and more information about commodity costs that could not have been known at the time the high level estimates were prepared.

Q: What were the reasons for the cost increases from the high level estimates to the Control Budget Estimate?

A: The major changes were caused by increases in escalation resulting from commodity cost increases, permit limits likely to require additions to Low NOx Burners, and demolition of the existing electrostatic precipitators.

Q: How does the Iatan Unit 1 project cost changes compare with cost changes on other utility projects being completed during this time frame?

A: The Iatan Unit 1 project budget was affected, in large part, by commercial and economic conditions that were impacting a wide range of other utility projects that were under construction during this time frame.

Pegasus-Global has reviewed specific industry reports and publications published during this same time period. For instance, the Edison Foundation commissioned the Brattle Group to study the costs of building infrastructure in the 2000-2007 timeframe.[67] In addition to their Edison Foundation report,[68] the study authors also published their

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[67] Chupla, Marc W. and Basheda, Gregory, Rising Utility Construction Costs, Sources and Impacts, Edison Foundation, 2007

[68] Chupla, Marc W. and Basheda, Gregory, Rising Utility Construction Costs, Sources and Impacts, Edison Foundation, 2007

findings in *"Sticker Shock"*, Public Utility Fortnightly.[69], December, 2007, pages 56-61. Among the findings reported:

- The rapid rise in construction costs was not predicted and not predictable. The U.S. Energy Information Administration "2007 Annual Energy Outlook" contained projected cost assumptions dramatically under actual costs incurred.[70]
- A surge in demand for construction services, coupled with constraints in component manufacturing capacity, engineering, material procurement and construction EPC services all "exacerbate cost pressure".[71]
- Between January 2004 and January 2007 costs for steam generation equipment, transmission facilities and distribution equipment rose by 23 to 35 percent while inflation rose only 8 percent.[72]
- For one class of plants, combined cycle, the data shows that average costs increased gradually from 2000 to 2003, with significant increases in 2004 and a very significant escalation in 2006.[73]
- Four factors have driven costs for all utility projects (1) material costs including both manufactured components and commodities like steel and cement; (2) limited shop and fabrication capacity; (3) costs for construction field labor; and (4) a competitive market for large construction project management and EPC services.[74]

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[69] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, pages 56 - 61
[70] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, page 57
[71] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, page 57
[72] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, page 57
[73] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, page 59
[74] *"Sticker Shock"*, Public Utilities Fortnightly, December, 2007, page 59

These common elements were identified in the B&McD study, the PUF article, and also identified by Pegasus-Global at other projects where we were engaged.

Pegasus-Global observes that these types of comparisons with other projects are collaborative in evaluating the prudence of KCP&L management. The fact that costs increased is not, again, in and of itself, evidence of imprudence. In this situation, reasonable and prudent managers on scores of projects were making the same or similar decisions based on the same knowledge, facts and conditions and incurring similar results – cost escalation that could not be avoided and had to be reflected in revised budgets.

Q: Have there been revisions to the Iatan Project estimate since the May 2006 presentation?

A: Yes, there were additional estimates required as a result of ongoing reviews of the cost to complete the Iatan Unit 1 project. This process was evidence of prudent management of the project to insure that responsible management was aware of the progress of the plant and could make necessary changes to address changed conditions, such as described above.

Q: What was the relationship of schedule and cost impacts impacting Iatan Unit 1 project with activities on the Iatan Unit 2 project?

A: The Iatan Unit 1 project activities were integrated into the Iatan Unit 2 project schedule since these projects are managed in an integrated fashion. However, the only hard constraints on Iatan Unit 1 project completion dealt with the tie-in outage and the Iatan Unit 2 project start up activities.

Q: Please describe the development of the Project Budget for Iatan Unit 2 project over the life of the Project.

A: The development of the budget for the Iatan Unit 2 project progressed from an initial high level conceptual estimate in 2004 based on the 2004 PDR conceptual project to a detailed definitive CBE in 2006 which was updated with design maturation in 2008. In July 2009 the Cost Reforecast Validation was conducted to review the CBE and it was determined that the estimate was accurate in total, but adjustments were made within the budget details. **[redacted]** This budget development process is consistent with other projects Pegasus-Global has evaluated and shows that KCP&L was diligent in updating cost estimates as the Iatan Project progressed. It is important to understand the development of the budget for the Iatan Unit 2 project in light of the evolution of the permitting events and market conditions surrounding the Iatan Unit 2 project, in light of the economic conditions affecting all utility projects during this period of time.

Q: What did Pegasus-Global find regarding the use of the manual process discussed in the E&Y CEP Risk Assessment Report?

A: Pegasus-Global reviewed the process implemented on the project and finds it to be reasonable. In late 2006 and early 2007 KCP&L transitioned to cost reports as discussed above. These cost reports were developed utilizing project costs recorded in the General Ledger of the utility and reported through an Excel work sheet to the project cost system. While there was manual processing necessary at the project level the practice was not

[75] **[redacted]**

unique to KCP&L. In June 2007 a presentation was made to the CEP EOC regarding the Cost Tracking System in response to the audit findings. In that presentation the CEP EOC was informed that a survey of other Edison Electric Industry (EEI) members had confirmed that other large utilities, including America Electric Power and Pacific Gas and Electric, utilized Excel or similar programs to report costs of the project contained in the General Ledger to the project management group.[76]

Q: What information was available to KCP&L when it was considering the design and construction of the Iatan Project, how did KCP&L use this information in its decision making process, how did this information change over time and how did KCP&L use this information in its decision making over the course of the Project as it relates to the increased cost of the Iatan Project?

A: In its initial decision making process of whether to build the Iatan Unit 2 project, KCP&L retained B&McD in 2004 to prepare a Project Definition Report (PDR), regarding the feasibility of building a new Iatan Unit 2 facility on the same site with the existing Iatan Unit 1 facility. The intent for the PDR was to provide preliminary engineering and cost estimates, contracting approach and other early development information so that KCP&L could begin scoping and provide feasibility inputs for use by KCP&L in its production cost modeling. The PDR provided KCP&L some gross information for what it was going to build and how the costs would translate to the equipment that would be installed. The PDR was also used to provide some sense to KCP&L on how it was going to construct the project and the type of packages that would be involved. An understanding of the

[76] **[redacted]**

various technology options and the framework from which to evaluate those options was also an important aspect of the PDR's function. It allowed KCP&L to work through the various options with economic and technology analysis to arrive at a base assumption for what the Iatan Unit 2 project would eventually look like. The PDR was only considered to be a conceptual estimate based on a "generic" schedule and several assumptions regarding the plant design to provide KCP&L management with the sufficient information to make an informed decision at the time as to whether to proceed with the project, and if so, in what context. While the PDR did contain certain performance parameters for the Iatan Unit 2 project, the PDR did not identify any detailed level of design as having been completed as of the PDR.

As so stated in the PDR, the purpose of the study was to define preferred design parameters of major components of the project and provide adequate information to support the following activities:

- Development of adequate detail to support permitting requirements;
- Integration of project design and financial data into KCP&L's IRP;
- Discussion within KCP&L management; and
- Internal budget appropriations.

Risks were also identified in the PDR including:

- Planning, design and construction for a project of this size to take between 5-6 years.
- This 5+ year time span provides a significant amount of time for labor and material pricing and market conditions to change from that originally anticipated.

- The risk is heightened by the fact that the skilled workforce that constructed coal plants in the 1970s and 1980s has aged without a significant influx of younger workers with similar specialized skills and experience.
- Recent significant increases in natural gas prices have led to a number of utilities looking at coal as an alternative and economic fuel source.
- Proposed new emission requirements could have impacts to the project.
- All projects anticipated in the market would be competing for a limited labor force.

A review of the PDR demonstrated that B&McD followed standard industry practices during the development of the conceptual estimate, clearly establishing the limited basis of that estimate and citing the intended management purpose for that estimate (i.e. to assist in decision making relative to the basic technical parameters of the project to ultimately be executed).

Since the original PDR based on an 800 MW unit, KCP&L evaluated alternatives and proceeded with the Iatan Unit 2 project as an 850 MW unit. In addition, KCP&L decided to prepare a comprehensive emissions permit application for both Iatan Unit 1 and Unit 2 projects to reduce net emissions from the existing plant site.

Q: What were the permitting issues that impacted the cost estimate during and after this period?

A: **[redacted]

[redacted]

[redacted]**[77]

The environmental permitting process implementing emissions netting resulted in KCP&L receiving a permit, but the permit requirements were more stringent on both the Iatan Unit 1 project and the overall site operation, including the Iatan Unit 2 project, than had been initially anticipated. These more stringent requirements required changes to both the then current operations of the Iatan Unit 1 project, as well as the need to modify the scope of the emissions equipment. These changes were necessary to ensure long term compliance once the permit takes full effect for each of the units. Any increases to cost due to "netting" decisions are not, in and of itself, evidence of imprudent management. To the contrary, KCP&L management evaluated options and made a decision which produced more energy and lower emissions. This type of decision by management is within a prudent zone of reasonableness.

Q: Was the process for estimating the Iatan Project reasonable and prudent for a coal utility in the industry contemplating a similar project?

A: Yes. First, the Iatan Project was a "fast-track" mega project as presented earlier in this testimony which essentially means that engineering would not be fully completed prior to the initiation of major procurement or construction of the project; rather engineering would "pace the project" by being just ahead of procurement and construction needs rather than fully completed prior to the initiation and construction of the project. A fast-track project reduces the total time for project execution by essentially overlapping the

[77]** [redacted] **

engineering, procurement and construction phases sequentially; in volatile market conditions, such time savings can have a significant cost benefit for the owner. As discussed more fully below, KCP&L acted reasonably in its decision to fast-track the project based on market conditions and KCP&L's Iatan Unit 1 joint owner's generation needs forecasts.

The Iatan Unit 2 project produced a number of iterative estimates between its initial definitions in the summer of 2004 through to the current status as of July 2010, which is fully anticipated in any project on a fast-track execution profile. In addition, KCP&L relied upon industry experts to provide input and review of the cost estimating process.

When engineering was approximately 25% complete, KCP&L prepared its Control Budget for the Iatan Project which served as a starting point from which KCP&L could evaluate all changes as it proceeded with the project. As the Alstom contract was in place by August 2006 and KCP&L had some specifics around some of the major components of the Plant, given the fast-track approach, the timing and basis of the Control Budget was reasonable. **[redacted]

[redacted]** Pegasus-Global confirmed that KCP&L has maintained the Control Budget Estimate exactly as frozen in November 2006 and that any changes to that estimate have been reported directly against that CBE. This is in keeping with accepted industry practice for control estimating of mega-projects. It is common practice for procurement and construction to be initiated prior to the design engineering achieving 30% on fast track mega-projects as it is critical that the project establish a detailed Control Budget Estimate as soon as significant procurement and construction activity is initiated. Pegasus-Global found that the CBE produced by B&McD and adopted by KCP&L in late 2006 was developed following generally accepted estimating practices used for a fast-track, mega-project execution plan. The development of the Iatan Project estimates into the Project CBE for management and control of the Iatan Project costs during execution was also done following generally accepted estimating practices.

KCP&L acted prudently in its development and use of project control metrics and data to identify trends in project cost or schedule which would either threaten the projects costs or schedule or provide it with the possibility of improving the project's cost or schedule. KCP&L's decision to initiate trend based estimate forecasts is representative of an industry best practice as it provides KCP&L with the optimum number of responses and actions to address any overruns which might occur on the Iatan Project, including increasing the Iatan Project total budget, adjusting Iatan Project scope, shifting money between line items, etc.

**[redacted]

[redacted]

[redacted] ** Further, the Kansas Commission in its November 22, 2010 Order found that: "*It is factually undisputed that KCP&L executed the Regulatory Plan and constructed Iatan 2 in a difficult economic environment. We find that KCP&L knew the risks Iatan 2 represented to its customers, took steps to mitigate those risks, and developed tools for further mitigating, reporting and managing those risks*" [Kansas Commission November 22, 2010 Order, page 31].

Q: Can you please define a Risk and Opportunity analysis?

A: A Risk and Opportunity analysis is a repetitive function on mega-projects during which the risk profile is upgraded to reflect the status of the project as it exists and as it continues forward through the remaining execution. At certain points in a project life cycle the risk profile is analyzed to remove risk elements which no longer confront the project and add risk elements which may be new to the project. For example: once a major milestone has been achieved then any risk elements which were linked to a failure to meet that milestone date can be removed from the project risk profile.

The "opportunity" element of a Risk and Opportunity analysis identifies situations which have arisen that offer management an opportunity to advance goals ahead of their risk element probable impact point. For example: assume that a major milestone it achieved one month ahead of schedule with two additional major milestones linked to that accomplishment. By finishing early management may have an opportunity to accelerate one (or both) of those successor milestones thereby reducing any risk elements attached to the inability to complete those milestones on time. An opportunity analysis is the somewhat more complex portion of a risk and opportunity report as it requires management to analyze the potential benefits possible against any possible risk or cost impact for taking advantage of an opportunity.

By conducting periodic risk and opportunity analyses during the life cycle of a mega-project management can ensure that it is focused on the "real time risks" facing the project and taking advantage of opportunities to reduce the future risk elements that still have the potential to impact project goals and objectives.

Q: Can you describe the Iatan Project Cost Reforecast Process?

A: A reforecast is a comprehensive process that occurs periodically during the course of a large complex construction project that involves getting input from a variety of sources, including contractors involved in the marketplace, and then taking that input and making a determination from that point to the end of the project what would be appropriate action from a cost standpoint, a schedule standpoint, and from a contractor relations standpoint to complete the project in the original time, the optimal schedule. It involves looking at every work function and requires involvement from all stakeholders. The reforecast was a look at the assumptions used in the CBE established back in 2006 and reviewing and analyzing the changes from that point to assist in forecasting where the costs would be going in the future. As knowledge is gained through a project, more information is gained around the type of project being built. Given that better information, it is prudent to evaluate that additional information and to determine how that information affects the cost and schedule of the project. At that time and consistently throughout all of KCP&L's quarterly reporting to the commissions, KCP&L has stated that the marketplace is dynamic and changes to the original estimate would continue to be tracked, documented and explained. The reason for the reforecast is to explain where the Iatan Unit 2 project was currently and where it would likely end up. A cost reforecast is one of the project trending tools used by management throughout the execution of a mega-project.

Q: Can you explain project trending?

A: Yes, it is a term of art within the construction industry used to describe the process and tools used by project management to precisely identify where a project is and how it got there, and, using that data establish trend patterns and lines that can be projected into the future of the project to conclusion. A project can trend any number of project elements,

including costs, schedule, bulk commodity installation, procurement milestones, etc. For example, a reforecast trending analysis uses four sets of data:

- The planned cost of an element of work;
- The actual cost of that element of work to date;
- The progress gained against that total element of work to date; and
- The future trend of that element of work assuming that the work is executed at the same consistent rate and at the same consistent cost experienced to date.

A trend analysis enables project management to identify elements that are ahead of their planned trends and elements of work that are behind their trends. Using that data management can then make necessary adjustments to either bring those elements "back on line" (the planned trend line) or adjust the planned line to reflect the actual conditions which need to be addressed relative to that particular work elements or the relationship of that work element with other, interrelated work elements. A detailed trend analysis enables project management to make necessary mid-project adjustments in the project execution plans, which is crucial during the execution of any mega-project.

Q: What was the result of the Reforecast Process?

A: Two findings made early in the process and consistent with the potential risks that KCP&L had identified in its Business Planning Process involved the discovery that (1) the bulk commodities (i.e. electrical cable and wire, pulling, etc.) quantities installed were trending greater than the commodity quantities used within the Control Budget Estimate, and (2) that the current market pricing by contractors was trending higher than assumed in the Control Budget Estimate, as discussed later in this testimony regarding plant comparisons. Thus, KCP&L acted prudently in its decision to address both of these

impact issues in its re-estimate of the total project cost. The May 2008 cost reforecast was presented to the CEP EOC, the Board of Directors, the Missouri and Kansas Commissions and the Project Joint Owners. **[redacted]** Pegasus-Global's review of KCP&L's actions concluded that KCP&L's actions were consistent with best industry practice and the decisions regarding the reforecast estimate were deemed to have been prudently made based on the following findings:

1. KCP&L had converted the project control estimate into a project control line item budget, which enabled it to monitor and trend commitments, spending, changes and contingency allocation on a monthly basis.
2. KCP&L was monitoring costs closely on a monthly basis, providing snapshot reports of cash flow, commitments, spending, changes and contingency allocation and on an aggregate basis, which enabled KCP&L to discern patterns and trends which threatened specific estimate and budget line item cost limits. This enabled KCP&L to identify trends at a very early point in time rather than picking up trends only when line items "went negative".
3. KCP&L used trend data to forecast probable impacts; for example, the fact that several contracts came in higher than assumed within the Control Budget Estimate was treated as a holistic trend in the industry marketplace and not a series of isolated contract pricing events. By combining trend data from multiple

perspectives, KCP&L was able to forecast probable cost impacts at a very early point in the execution of the Iatan Project.

4. In industries, the earlier in the project one identifies potential impacts the more alternatives the project team has to address and overcome those impacts. Early identification of trends by KCP&L enabled it to not simply increase the project total estimated budget but to examine and employ several actions aimed at managing and controlling project costs through to completion. For example: KCP&L examined the budget estimate by line item, and using the same trend data, moved money from line items trending under the control budget into line items which were trending over the control budget.
5. KCP&L appropriately took the time to examine the "root cause" for the trends it had detected in order to ensure that its responsive actions not only addressed the cost impact, but also enabled project management to address the underlying causes to the extent those causes were within its control (for example, market conditions are not within the project's control but scope creep is, to some extent, within the control of the PMT). This action by KCP&L would represent a "best practice" within the industry.
6. KCP&L acted well before the Iatan Unit 2 project cost control budget "went negative", that is reflected an actual overrun in the total cost of the project. It is easy in a fast-track project to lose sight of the future when attempting to address the pressures to coordinate multiple activities (engineering, procurement and multiple construction efforts). By acting proactively, KCP&L avoided having to make a series of "budget increase requests", without being able to understand or

explain why those budget increases were necessary. These actions evidence good and prudent management decision making.

Q: Did Pegasus-Global review the Iatan Unit 2 project Cost Revalidation Process?

A: Yes. As engineering neared completion, 90% complete by September 2008, KCP&L again acted as a reasonable and prudent utility in its decision to move forward with a revalidation of the May 2008 Iatan Project reforecast to gauge the accuracy of the original reforecast and measure how the Iatan Project was tracking against the revised project budget, including evaluating the current known schedule to complete the work, current trends on additions to the project's scope and the velocity of those changes in light of the status of design completion. KCP&L specifically included the following evaluations in its revalidation of the May 2008 reforecast:

- Review of schedule and any post-effect of any changed milestones to the completion date;
- Evaluation of all cost trends;
- Determination of any unknowns from design maturation;
- Quantity growth in the BOP contract to determine velocity and timing of Change Orders emanating from design maturation; and
- Vetting of the contingency assumptions.

** [redacted] ** The revalidation work performed by KCP&L enabled it to weigh

the benefit of accelerating the work to maintain the original schedule versus the cost of the acceleration effort required to maintain the schedule. Based on changed market conditions and a drop in demand, Pegasus-Global concluded that KCP&L's decision was prudent in light of the information available to it at the time and based on the analysis KCP&L conducted to consider the alternatives before making its decision. Pegasus-Global found that the cost reforecast revalidation effort has enabled KCP&L to again stay ahead of critical issues and cost drivers, making decisions in a timely and reasoned manner.

Q: **[redacted]**

A: As described in the Supplement 2 to the PDR issued on June 28, 2007, there were several changes to the Iatan Unit 2 project's base assumptions and refinements that were made to the PDR based on additional information that became available to KCP&L after August 2004, as well as changes to market conditions from what was known in 2004. **[redacted]** The original Iatan Unit 2 project PDR was based on many assumptions and excluded several owner-furnished costs. Subsequently, the cost estimate was modified to include all expected costs, including owner costs pending refinement during the budgeting phase of the project development and indirect costs that have now been included in the current budget. These changes and refinements included:

- Steam generator and turbine generator technology upgrades;
- Unit generating capacity increase from 800 MW to 850 MW;
- Postponement of the in-service date:
    - Additional time required for the completion of the regulatory plan reduced the amount of time available in the Project Schedule for contingency.
- Scope refinements of the facility (as so detailed in an Appendix to Supplement 2 of the PDR);
- Market escalation;
- Risk assessments to establish project contingency; and
- Permitted emission requirements finalized.

In addition, while the Iatan Unit 2 project PDR suggested a contracting approach of a combination of EPC and multiple contracts with a single EPC for the boiler and air pollution control equipment and multiple contracts for the BOP, the contracting strategy was only an assumption for purposes of the study. As discussed elsewhere, several options have been considered over the course of the Iatan Project to consolidate multiple construction contracts into one of two general construction contracts.

Both the unit size and schedule changed from the original PDR and influenced the project costs. Meanwhile, the market shifted to become more volatile generally trending toward higher costs. During 2005 and 2006, the market for engineered equipment and material was volatile as niche market suppliers became constrained; steel based products were subject to price and availability pressures and the price and availability of other commodities, like copper, also exhibited significant volatility. The major drivers to the cost increases include:

- Base labor costs which have increased since the original PDR Union rates used for conceptual estimating purposes;
- Labor availability;
- Incentives to attract labor;
- Major equipment increases;
- [redacted]**
- [redacted]**
    - The volume of the power house building (steam turbine-generator building) increased substantially from the expected size during the detailed design layout based on the purchased equipment.) Bids for the structural steel supply contract were received in October 2006 and when the bid-to-estimated steel quantities were compared, it became obvious that the Powerhouse building required about twice the volume as originally expected.
- Owner site management costs;
- The Substation & Interconnect costs that were originally carried independently by KCP&L (an Iatan Unit 2 PDR assumption) are included with each estimate revision;
- Refined Risk Assessment:
    - The initial Iatan Unit 2 project PDR and the subsequent cost estimate updates that were made in January 2006 maintained a consistent 8% cost estimate contingency.

- A more sophisticated Monte Carlo analysis of the remaining expected costs and schedule variations were performed during the period after January 2006 and continued into November 2006. The objective was to predict the contingency necessary to achieve 80% confidence that the project would be within budget and on or ahead of schedule. ** [redacted] ** Multiple evaluations were performed during the course of procurement as pricing information provided feedback regarding estimated versus actual values for procurement.
- In addition to the Monte Carlo analyses performed by B&McD, ** [redacted] ** Risk was a significant concern and specifically the impact that could occur due to a low probability-high impact event. A low probability – high impact event is defined as a specific risk issue that has a low probability of actually occurring during the execution of the project but if that risk event does occur the impact on the project goals and objectives would be very high. For example, a the probability of there being a 500 year flood on the Missouri River during the execution of the Iatan Unit 2 project would be classified as a low probability risk event; however, the impact of

that event should it occur would have a very high impact on the ultimate cost and schedule of the project.

- **[redacted]**

- Commodity cost increases.

Q: Please describe the changes in commodity costs that impacted the Iatan Project estimate?

A: KCP&L found that there had been a major shift in the construction market from the conceptual estimate to the detailed estimates. In 2005 the Environmental Protection Agency (EPA) issued both the Clean Air Institute Rule (CAIR) and the Clean Air Mercury Rule (CAMR) that required all coal fired plants in the Eastern half of the United States to install a SCR, Wet Scrubber and a Bag house by 2009 or buy credits. These new requirements caused a flurry of projects across the country, all of which are on the same general timeline. In turn, this increase in demand stressed the material and labor supplies, thus causing pricing to increase and lead-times to extend. **[redacted]**

[redacted]

[redacted]**[78]

Q: Was the information collection and analysis done by KCP&L in making its Reforecast of the Iatan Unit 2 project reasonable?

A: Yes. In Pegasus-Global's review of the KCP&L Business Plans for 2006-2009, and the quarterly reports that were issued by KCP&L, Pegasus-Global found that KCP&L based its decisions and conducted its decision making process through analysis of several key factors and risks, which it continued to and still continues to review and evaluate through the project execution.

KCP&L recognized in its 2006 Business Plan that execution success was influenced by several key factors including:

- Clear understanding of drivers for each project;
- Construction strategy;
- Dedicated team with proper experience (KCP&L, Engineer and Contractors);
- Effective Project Controls and reporting systems; and
- Decision making process and documentation to support.

KCP&L continued to recognize and evaluate several market drivers, as so noted in its Business Plans from 2006-2009. Although some of the risks were identified in the original August 2004 PDR, the impact of those risks manifesting themselves could not be quantified based on the information available at the time. In addition, other risks

[78] Iatan Projects Cost Estimate and Schedule, July 17, 2006, page 6

emerged.[79] KCP&L further recognized that it understood its risks, and developed and implemented prudent management techniques to mitigate them, as discussed later in this testimony regarding the Corporate and Project risk management and project control processes that were established.

Both known and emerging risks impacted the project's cost and schedule including:[80]

- Labor and Manufacturing Capacity:
  - Strong market demand for new coal units as well as environmental retrofits for existing units to comply with CAIR and CAMR had put several other projects out for bid at the same time as the Iatan Unit 2 project resulting in additional demand on supplier's engineering and manufacturing resources. Construction of new facilities and retrofitting existing facilities constrained the available construction resources, resulting in significant higher prices and long lead times; and
  - Labor productivity.
- Supplier failures;
- Ability to attract and retain talent:
  - Changing workforce demographics;
  - Changing workforce expectations;
  - Changing Business Environment regarding employee culture; and

[79] An emerging risk is a risk element or condition which was not present or identified at any earlier stage in the project's risk management profile. Emerging risks often arise as a consequence of the long duration and complexity of mega-projects, especially for elements which are outside the control of, but impact upon, the execution of a mega-project. For example, sudden changes in the global economy such as those which impacted in the last 3 years would be an example of an emergent risk.

[80] Congressional Research Service Report for Congress, Power Plants: Characteristics and Costs, November 13, 2008; Black & Veatch, MMEA Presentation, Building New Baseload Generation in the Midwest, May 11, 2006