State of Utah

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ADDENDUM NO. 2

Date: August 7, 2008

To: Commissioning Consultants

From: Bill Bowen, Project Manager, DFCM

Reference: University of Utah
David Eccles School of Business Replacement & Expansion
DFCM Project No. 06272750

Subject: **Addendum No. 2**

Pages	Addendum Cover Sheet	1	page
	RMP FinAnswer Cx Requirements (generic)	2	pages
	Total	3	pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.

While we contend that SB220 should only be potentially applicable to a contract issued after the effective date of said bill, this is to clarify that for purposes of this contract, regardless of the execution or effective dates of this contract, the status of Utah Law and remedies available to the State of Utah and DFCM, as it relates to any matter referred to or affected by said SB220, shall be the Utah law in effect at the time of the issuance of this Addendum.

2.1 **SCHEDULE CHANGES:** None

2.2 **GENERAL ITEMS**:

2.2.1 In addition to the seven (7) hard copies of the CxA Proposal, please submit one (1) electronic copy in pdf format.

ROCKY MOUNTAIN POWER FINANSWER COMMISSIONING REQUIREMENTS

What is commissioning?

The purpose of commissioning (Cx) is to maximize savings through review and experimentation with setpoints, control algorithms, and operator behavior. The goal is to ensure the system is working as intended/designed from an energy savings perspective.

Commissioning normally includes collecting trend log data to prove that a system or piece of equipment is operating in accordance with the measure and/or design intent. If a key variable is supposed to be at a specific value, the commissioning report needs to include recorded data for a significant period of time to show the system can and will maintain that value or range of values on a sustainable basis. In general four weeks or more is recommended where all four weeks show the specified value, not, for example, three weeks getting there and one week on target.

Commissioning is part of the process required by Rocky Mountain Power for full incentive eligibility, and the customer pays for it as part of the eligible project costs. Note that site inspection, cost review, and recalculation of savings (if necessary) are done by the energy consultant, paid for by Rocky Mountain Power.

References: There are numerous commissioning guidelines available that can help guide the commissioning process, providing forms, checklists and suggested functional test plans. The Cx agent is encouraged to familiarize themselves with these resources and use them when appropriate. Two locations are the Energy Design Resources web site and the Portland Energy Conservation, Inc. (PECI) website, both listed below.

www.energydesignresources.com

www.peci.org

Commissioning requirements

For each measure listed below, the Cx agent should convince themselves that the systems operate as intended and in the most efficient manner possible. While the following guides are intended to assist in this process it is the Cx agent's responsibility to verify their operation. Given the multiple interactions between the measures, commissioning must be approached as a integrated process focusing on maximizing the efficiency of the entire plant, as demonstrated by lowest achievable kW/ton across the expected range of plant operation.

Guidance

The points listed and suggestion under each measure below are for guidance only. Critical points and their settings have been identified in the Measure Descriptions in Section 2 and must be included. It is the Cx agent's responsibility to include all points and conduct all tests needed to establish correct operation of the system or equipment.

Sampling

Test all primary and packaged equipment. For zone level and terminal equipment test 10% (but no fewer than 10) of the total number controlled under the measure description. If deficiencies are found in more than 10% of the samples then all zone and terminal equipment shall be tested.

Criteria for Acceptance

The actual control sequence must be consistent with the description and intent of the listed measures as described and calculated in the energy study. Acceptance is based on thorough documented verification of each control mode

Documentation

Provide a written report summarizing the commissioning process, including dates and key personnel, and documenting, at a minimum, the following information for each measure:

- Provide a written sequence of controls and compare the sequence to the Measure intent as described in Section 2, identifying and commenting on any differences. Sequences should document all final setpoints including maximum and minimum limits, operating limits such as minimum/maximum speeds, reset schedule values, etc.
- Provide documentation of all minimum and maximum operating conditions as recommended by various equipment manufacturers. For example – chiller manufacturer's minimum condensing water temperature, as a function of load of chilled water temperature is appropriate.
- Calibration, with documentation, of trended control points is required. Verify, through calibration efforts or by visual inspection of operation that any logged variables accurately reflect the actual operation. Control system output signals are only acceptable as proof of operation with documented verification that the output signals accurately represent actual operation.
- Provide sufficient recorded data, typically four weeks of graphed trend logs, to demonstrate that the sequence is being met. Provide written comments on the logs that explicitly point out how they demonstrate key operational features of the written sequences.
- If conditions prevent timely monitoring of system performance over a suitable range of conditions (for example a chilled water system during non-cooling months), it is permissible to adjust the programmed schedules and/or set points for testing. If this is done, reprogram to the original schedules and set points, or as directed by the building operator, at the conclusion of testing. Provide a narrative of the test describing what parameters were changes on note on the logs the resulting action.

Measure requiring commissioning:

The following measure require commissioning. Refer to the measure descriptions for guidance on setpoint and control algorithms for each measure.

(Project Specific Equipment listed here)

Trended Control Points: other points should be included as necessary to demonstrate the sequence is being followed.

- (Project specific equipment listed here)

Provide manufacturer's final chiller submittal documenting certified performance and minimum and maximum operating conditions for temperatures and flow.