



**ROCKY MOUNTAIN  
POWER**  
A DIVISION OF PACIFICORP

Customer & Regulatory Liaison

1407 West North Temple  
Salt Lake City, Utah 84116

UTAH PUBLIC  
SERVICE COMMISSION

2007 OCT 31 A 11:06

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October 30, 2007

Utah Public Service Commission  
Heber M. Wells Building  
160 East 300 South, Suite 400  
Salt Lake City, Utah 84111

RECEIVED

Attention: Steven F. Goodwill  
Administrative Law Judge

Re: Utah Docket No. 06-035-148  
Formal Complaint of Tim Vetere

The attached report, detailing the findings of the visit to Complainant's pump site on September 13, 2007 by Brian Andrews, P.E., of Hansen, Allen, & Luce (HAL) Engineers, is being submitted for review by all parties. The report includes an analysis and recommendations for improving the performance of Complainant's pumping system.

According to the HAL Engineers report, the booster pump's efficiency was 60% when tested in September. The report cautions that apparent upstream pipe leakage could cause booster pump stress and possible damage due to cavitation. For such conditions, the report suggests that the booster pump stress could be relieved somewhat by increasing the frequency of the variable frequency drive (VFD) that drives the lower pump.

The submission of this report concludes the follow up information that Rocky Mountain Power was asked to provide in this docket. The report further demonstrates that Rocky Mountain Power is not responsible for nor has contributed to Complainant's alleged pump problems. Rocky Mountain Power has not violated any tariff, regulation or statute in connection with service provided to the Complainant and again reiterates the Company's request that the Commission act on Rocky Mountain Power's motion to dismiss this case in its entirety with prejudice.

Sincerely,

  
Carole Rockney, Director  
Customer & Regulatory Liaison

cc: Ms. Rea Petersen, Division of Public Utilities  
Mr. Dennis Miller, Division of Public Utilities  
Mr. Tim Vetere

HAL report attached



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Mr. Dennis Hansen  
Rocky Mountain Power  
1407 West North Temple, Suite 270  
Salt Lake City, Utah 84116

October 23, 2007

RE: Tim Vetere Pump Evaluation

Dear Mr. Hansen:

We have completed our investigation into the Tim Vetere Pump in near Green River, Utah. The following summarizes our investigation including the recent retest of the pump with the new pressure gauges installed. Background, system layout and other site information have been documented previously in other reports. Key locations are summarized as follows:

Lower Pump            200hp pump with variable frequency drive located near canal. This is the start of Mr. Vetere's pressurized irrigation system.  
Booster Pump        50 hp Cornell booster pump. This is the primary pump under investigation.  
Center Pivot        Center pivot irrigation system operated by Mr. Vetere. This is the largest of the pivots operated by Mr. Vetere and is supplied solely by the booster pumped line.

**September 13, 2007 - Site Visit**

Brian Andrew (HAL) and Dennis Hansen (RMP) visited the Tim Vetere pump site. New pressure gauges had been installed at the Lower Pump, Booster Pump and Center Pivot locations. Flow readings were taken at each site along with the corresponding pressure readings at the measured flow. The following table summarizes the testing results.

**Table 1. Pump Flow Test Results**

| LOCATION     | AVERAGE FLOWRATE | PRESSURE READING |
|--------------|------------------|------------------|
| Booster Pump | 1192 gpm         | 39 psi           |
| Center Pivot | 1142 gpm         | 24 psi           |
| Lower Pump   | 2402 gpm         | 67 psi           |

Following the conclusion of the pumping tests, the irrigation system was drained and the pump dismantled to allow inspection of the booster pump impeller. Photos of the impeller are enclosed.

Mr. Dennis Hansen  
Tim Vetere Pump Evaluation  
October 8, 2007  
Page 2 of 2

## **ANALYSIS & CALCULATIONS**

HAL performed a hydraulic analysis of the Booster Pump based on supplied information. The friction and minor losses, and pressures were calculated to determine the total dynamic head provided by the Booster Pump to the system. Calculations show that the Booster Pump was supplying 38 psi (88 feet) to the system. The calculated pressure at the pivot point with this information is 28 psi. These results are supported by the gauge information observed during the testing. The measured gauge readings were lower than the calculated pressure at the pivot point due to a control valve installed at the pivot point.

## **CONCLUSIONS & RECOMMENDATIONS**

Based on the information previously reviewed, the Booster Pump is operating at approximately 60% efficiency. The pump should be operating above 80% efficiency at its design head. Inspection of the impeller shows two causes of concern. One is a groove around smaller brass ring. This will allow water to leak around the impeller vanes. There are also indications of pitting and cavitation damage around the vanes of the impeller. Both of these conditions will reduce the efficiency of the pump.

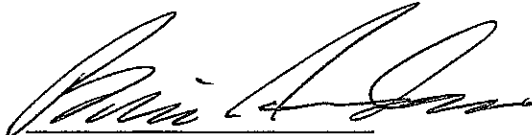
However, a greater cause of concern was the water pooling upstream from the pump. If the system pipeline is leaking then air can enter the system immediately upstream from the pump. Any air entering through the system through leakage will significantly reduce the pump performance. This leak should be located and repaired.

Mr. Vetere's system operation is varied and a variety of flow and pressure conditions can exist. In certain instances the Booster Pump may be attempting to "pull" more water than is available from the main pump. In this instance cavitation damage can occur as well as a reduction in efficiency from the pump. When this situation occurs, the frequency at the Lower Pump motor can be increased with the variable frequency drive to supply more water to the Booster Pump and reduce the stress on the pump.

Please call if you have any questions.

Sincerely,

**HANSEN, ALLEN & LUCE, INC.**



Brian J. Andrew, P.E.  
Project Engineer

Enclosure



Groove which can allow pressure loss and reduce pump performance

Pitting and vane damage from cavitation and wear





FIGURE  
1

TIM VETERE IRRIGATION SYSTEM

