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## July 25, Site Visit Report

### Alpensee Water District/Farmers Korner Pump Station

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#### Attendees:

Andy Williams – Golder Associates  
Bryan McCarty – M&M Consultants  
Gary Probst – Triangle Electric  
Shay Sims – AAA Operations

#### Pump Station Summary

Site has a Siemens S7 PLC that is controlling 5 pumps (1 jockey pump, 2 service water pumps, and 2 fire water pumps). There is Siemens 6" touch screen used for displaying system status and inputting setpoints. The relevant part numbers are as follows:

- Siemens PLC: 6ES7-212-1BD30-0XB0
- Siemens HMI : 6AV6647-0AD11-3AX0
- Jockey Pump ABB VFD: ACS355-03U-12A5-4
- Endress & Hauser Flow Meter: 30FU80-MD1ED11D31B

#### Reported Issues:

- Jockey Pump is required to run to maintain a pressure setpoint (180 PSI). When the pressure drops too low, then the Service Water Pump will turn on to assist in maintaining the pressure setpoint. In reality what happens is that the Jockey Pump does not maintain the pressure setpoint and the Service water pump keeps turning on and off.
  - The system was designed to vary the speed of the Jockey Pump (ABB drive) to maintain the setpoint. An analog output from the PLC is wired to the Jockey pump drive. However, not only is this signal is not varying but it also seems that it was not even setup (if the signal was setup, then at least 4 mA would be seen, as it was 0 mA was being seen). To overcome this, the Jockey Pump drive was set for "Local" speed reference. To change the speed of the drive someone needs to physically change the speed at the drive. This issue was also observed with the Service water pumps.
  - The Siemens PLC program needs to be inspected/updated to get the signal to the Jockey Pump drive working.
- The call-out system is continually calling out and the personnel do not know why.
  - There are two inputs to the call-out system, relay CR-20 and CR-11. These relays are outputs from the Siemens PLC.
  - The Siemens PLC program needs to be inspected to find the functionality of these two relays.
- The Siemens PLC program needs to be uploaded for inspection/modifications.
  - Simatic Step 7 software version 11 was used for connecting to the PLC which had an IP address of 192.168.0.1. The software was able to see the PLC and recognize the PLC. However, it was unable to upload the program. Suspect that it was because the firmware version of the PLC is older (Firmware 1.0.1) and the software does not support connecting to it.
  - Need an older software version.
- The influent flow meter does not accurately measure the water coming in from the remote wells. Some days the flow totalizer numbers are reasonable (10,000 gallons), on other days its outlandish (400,000 gallons).

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## June 5, Site Report

### City of Victor and Cripple Creek Water/Waste Water Plant

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- The type of flow meter does not require calibrating. Calibration is not an issue.
- The flow meter spends a lot of time with an empty pipe. Experience has shown that these types of flow meters do not like empty pipes and may start generating an erratic flow signal.
- Need to setup the flow meter to recognize an empty pipe and shut itself off in that case.

#### Recommendations:

- If able to find the Siemens software that will retrieve and inspect PLC program for running the pump station, then another site visit should be made to address first three issues.
- Research how to set up the flow meter to address an empty pipe situation. If a solution could be found, then address this issue at the same time as the other three issue.
- Approximate additional time on site: 1 day