New Braunfels Utilities Lift Station SCADA Requirements

1. Design engineer must include a radio path study in the lift station engineering report. Study report must show a communication solution from lift station to New Braunfels Utilities (NBU) Supervisory Control and Data Acquisition (SCADA). If clear radio signal is not achieved, developer must provide new site for clear communication. Ethernet radio located within SCADA panel, and must be two-way communication type. GPS for radio path study must utilize NAD 83 State Conversions.

2. Tower used to mount antenna must withstand wind gusts in accordance with NEC 820. The antenna tower should follow the TIA REV G and TIA-222-G / TIA-1019-A design standards. Grounding must be bonded together with the site grid, and dedicated 8' grounding rods for antenna tower as well as lightening arresters. Tower height is to be determined by radio path study. Tower will be located within lift station facility and have vehicular access. Minimum separation between tower and OH electric lines must be forty feet. Ground resistance shall not exceed 5 Ohms. Bollards must be present around tower. Utilize NEC 820 design specifications for tower transient voltage surge suppression, lightning arrestors, and grounding requirements.

3. Tower transient voltage surge suppression, lightning arrestors, and grounding requirements as found within NEC 820 tower requirements.

4. SCADA controller and associated equipment (Radio, Power supply, Battery backup) should be housed within Nema4x enclosure, and separate from the pump panel. SCADA enclosure minimum dimensions must be 36" Width-48" High-16" Deep.

5. SCADA panel is to be sheltered and shaded from all sun angles. SCADA must be climate controlled. Climate control panel is required if motor controls VFD are in design plans. Power monitors and VFD should have network interface card installed so devices can be monitored from system wide SCADA (Onspec). NBU must have the ability to monitor SCADA panel internal temperature via NBU SCADA. SCADA panel must have uninterruptable power supply of 24 V DC. SCADA panel must have uninterruptable power supply of 24 V DC, and must provide at least 2 hours of reliable power. Install din rail mounted transient voltage surge protector and lightning arrestor inside SCADA panel. Interposing or isolation diode protected relays within SCADA panel. Isolation relays must be located within SCADA panel to in accordance with NEC 820 guidelines.

6. PMC Engineering LLC model VL2112 to be utilized for submersible pressure transmitters and ultrasonic level transmitters. If applicable, Siemens LR 200 to be utilized with large wet well radar unit.

7. At a minimum, SCADA system shall monitor for each pump all of the following:
   - Pump hands off/auto status SCADA system monitoring and control
   - Pump run SCADA system monitoring
   - Pump station leak SCADA system monitoring
   - Motor fail alarm SCADA system monitoring
   - Pump Fail Delays Alarm and system monitoring
   - Pump overload Alarm and system monitoring (if applicable to pumps)
   - Pump high temp Alarm and system monitoring (if applicable to pumps)
   - Seal Failure, Delays Alarm and system monitoring (if applicable to pumps)
   - Phase current, Delays Alarm and system monitoring (if applicable to pumps)
   - Phase current, Delays Alarm and system monitoring (if applicable to pumps)
   - Pump run signals, required status, Pump ready back to SCADA
   - Hand, off, auto software switches to start and stop pumps remotely. Indication of physical HOA pump panel position (Local or Remote)
   - Alternation of pumps. Set points from SCADA include:
     - Elapsed runtime
     - Alternate on all stop
     - Time of Day alternate
     - Day of week set point

8. At a minimum, SCADA system shall monitor all of the following:
   - Low level alarm SCADA system monitoring
   - High level alarm SCADA system monitoring
   - Utility power on SCADA system monitoring
   - Generator power on SCADA and system monitoring (if applicable)
   - Generator run and run time signal system monitoring (if applicable)
   - Transfer fail SCADA system monitoring (if applicable)
   - A/C Power fail indication
   - Secured default set point toggle from SCADA to load default set points

9. At a minimum, SCADA audiovisual alarms and system monitoring shall include all of the following:
   - Horn and light should be installed to indicate High-High wet well levels.
   - Wet well High-High Alarm
   - Wet well High Alarm
   - Wet well Low Alarm
   - Wet well Low-Low Alarm
   - Wet Well Stage(s) Start Alarm
   - Wet Well Alarm Delays Before Low Level Alarm and system monitoring
   - Delay set points for alarms Alarm and system monitoring
   - Phase Failure, Delays Alarm and system monitoring (if applicable)
   - Health status of controller- Minor PLC fault, Major PLC fault, PLC energy device (battery)
   - Drywell float switch. This alarm should latch in and be required to reset via operator acknowledgement.

10. Lift stations should have a backup high and low float system to turn pumps on and off in case of PLC failure. Primary pump operation will be PLC, and will operate pumps off of ultrasonic/Radar or pressure sensor indicating wet well level. NBU must have the ability to switch both remotely and automatically from primary PLC control to backup float system. NBU must have the ability to set the PLC real time clock remotely.

11. NBU SCADA Electronics and Controls Requirements:
    - Allen Bradley Compact logix PLC- Modular I/O consisting of 20 % spare ratio, Version 28
    - Local Station HMI- Maple display and/ or Allen Bradley Panelview Electronic Control series. Station controlled through HMI should be controlled through SCADA
    - Managed network switch; preferably Ruggedcom RS900. Minimum 7" Display
    - NBU approved integrators are as follows: TracNTrol, Prime Controls, MPC (Municipal Pump Controls), and Alterman

12. NBU SCADA Software Requirements:
    - Studio 5000. HMI FactoryTalk® View Machine Edition (ME) for PanelView, EZWare Plus for Maple HMI's, EzWarePlus, EzWare5000

13. Warranty/Post Installation Requirements:
    - Once utility acceptance has been made, all software project files become NBU property
    - No proprietary coding or program lockout will be accepted by NBU
    - Full coordination of testing and resolution must occur as directed by NBU SCADA personnel
    - NBU reserves the right to withhold final utility acceptance pending all resolution of SCADA issues and site functionality