



New System Requirements

Hardware and Software

The SCADA system must be installed on 2 separate, redundant, physical servers. Virtualization is an option, as long as the 2 SCADA hosts are on separate, physical servers. These servers must run on the most recent operating systems supported by the SCADA vendor, ideally Windows Server 2022. The system should be installed on new hardware that meets the minimum required specifications specified by the SCADA vendor. The installation should utilize the latest version of the SCADA software. To ensure proper synchronization, both servers must be configured to utilize the GPS clock, and thorough validation of time syncing between the servers is essential. Cuyahoga Falls would like to re-use the newer existing server for this upgrade if possible.

The SCADA system must be accessible from the existing workstations, repurposed to connect to the new SCADA system by installing the most recent version of the SCADA software. To ensure accurate time synchronization, the workstations must be configured to utilize the GPS clock, and accurate time synchronization must be validated.

The implementor shall come on-site to install and test the new system, as well as to provide training for the new system.

Remote Terminal Units (RTUs) and other Intelligent Electronic Devices (IEDs)

Cuyahoga Falls wants to re-use their existing 14 RTUs, so the implementor must convert them to utilize DNP3 rather than the existing proprietary protocol. Initial testing of the RTUs showed that these RTUs do support DNP3. The implementor must conduct testing of all points, including analogs, binary inputs, binary outputs, and DNP3 points. At project completion, all system points should operate seamlessly without delays or inconsistent communication.

Unless otherwise directed by Cuyahoga Falls, the new SCADA system should perform time-synchronization of the existing RTUs using DNP3, and those RTUs should perform time-synchronization of the IEDs they read using DNP3.

Screens

Unless otherwise directed by Cuyahoga Falls, all currently used screens, views, and trends must be recreated in the new system and updated to include any new devices that are not on the existing system.

Cuyahoga Falls currently utilizes 1 main one-line display with 119 navigable views, 17 of which are dedicated to monitoring the status of RTUs, including virtual RTUs used only by the system. In addition to the main one-line display, Cuyahoga Falls has 17 alarm views, 31 station summary screens, and 2 operator summary screens. Cuyahoga Falls also has 24 other one-line displays, but they all appear to be test displays / unused displays that have been absorbed by the main one-line display.

The operator summary screens include information on changes within the system including:

- Values passing thresholds
- States changing
- User log in / log out

The new system must include an "alarms" screen that displays both active and inactive alarms. This screen should provide the functionality to exhibit acknowledged alarms, along with the corresponding time of acknowledgement and the responsible personnel who acknowledged the alarms.

The new system should have the ability to show historical data via configured pop-up line graphs so operators can view data trends.

In addition to the requirements above, a summary screen should be created that shows the daily, weekly, monthly, and yearly peak value, and time of peak value for each feeder and for the total system.

Points

For systems with aggregated point counts (analog, binary inputs, binary outputs, and counters are all grouped into the same point count) Cuyahoga Falls requires a minimum of 6,000 points. For systems with split point quantities, Cuyahoga Falls requires a minimum of 2,500 analog points, 2,500 binary inputs, 500 binary outputs, and 500 counters.

All points that exist in the current system must be configured and tested in the new system. In the current system, Cuyahoga Falls utilizes 79 calculations and 16 command sequences that produce calculated values. These calculations mainly involve basic operations such as addition, multiplication, and counting. All existing calculations must be replicated in the new SCADA system to ensure their continued functionality.

Cuyahoga Falls has not observed any issues with limits and reasonability thresholds for any existing SCADA points, so the existing point limits and thresholds should be used on the new system.

All control points present in the existing system must be configured and thoroughly tested to ensure proper functionality in the new system.

To maintain a standardized and secure control process, all controls should operate on a two-click basis. Operators will be required to click on the button and confirm the action before any controls are dispatched. This approach ensures precision and prevents unintended or accidental control actions.

The existing system points are currently configured as follows:

	Analog Points	Status Points
Total	1,141	1,379

Notes:

- Of the 1,379 status points noted above, 92 of them appear to be configured as control points.

Archiving

The existing archiving groups must be re-created and must meet the minimum archival duration detailed below:

Data Sets with these parameters	Sample Duration	Sample Interval	Averaging Interval	Points Archived
16	7 days	1 hour	1 minute	718
1	3 days	1 hour	1 minute	32

13	3 days	1 hour	15 seconds	533
1	1 day	15 minutes	5 seconds	20
1	365 days	1 day	5 minutes	16
1	12 days	1 hour	15 minutes	12
2	7 days	15 minutes	5 seconds	109
1	7 days	30 minutes	10 seconds	36
2	4 days	15 minutes	5 seconds	12
2	30 days	1 hour	5 seconds	1
1	30 days	1 hour	15 minutes	60
1	3 days	1 hour	5 minutes	31
1	30 days	10 minutes	1 minute	60
1	12 days	1 hour	15 minutes	12
44 total Data Sets	N/A	N/A	N/A	1,652

Additionally, historical data on the existing system must be migrated to the new system.

Reports

The new SCADA system should allow Cuyahoga Falls to pull the same set of on-demand and scheduled reports that exist on the current system and should allow for direct Excel integration to query archived data.

Alarms

The SCADA system shall possess the capability to transmit alarms through text messages and emails. Additionally, it shall allow for editable alarm formats to facilitate clear and unambiguous communication. Acknowledgment of alarms via text must be supported as well. Text alarms should be transmitted without relying on sending an email to a phone number, as that may result in carrier delays and introduces the City SMTP server as a point of failure.

The existing alarms should be configured and tested in the new system and should repeat if left unacknowledged at a frequency and on points defined by Cuyahoga Falls.

Cybersecurity and Disaster Recovery

The implementor must comply with the provided secure procurement language as a part of the contract. The implementor must assist with performing a vulnerability scan of the system, including patching to remediate vulnerabilities, during the implementation but prior to commissioning the system. The implementor must lock down all servers, workstations, and devices to remove any unnecessary services in accordance with the CIS best practices. Additionally, the implementor must disable all removable media ports except where absolutely necessary. The implementor must comply with the provided secure procurement language as a part of the contract.

Implementor must provide:

- A process to backup configurations of all RTUs.
- An image-based backup solution for servers and workstations.
- A process to patch the SCADA servers, workstations, and RTUs.
- An anti-malware solution with system and provide instructions on how to update definitions files on a no-less-than monthly basis.
- Information about their remote access solution as it relates to support.
 - A method to disable this access when it is not needed.
- The hardware and software bill of materials (HBOM and SBOM).
 - The SBOM should show any third party / open-source software components that are part of the system.

Training

Cuyahoga Falls requires a minimum of 3 days of comprehensive training to become proficient in using the new system and RTUs, as well as understanding how to maintain them. The training will encompass the following topics:

1. Basic system training detailing how to navigate and use the system.
2. How to perform administrative and cybersecurity tasks such as patching, database maintenance, backups, etc.
3. Adding New Points to the SCADA System and RTUs:
 - Instruction on adding analog, binary, and counter points to the SCADA system and RTUs.
 - Guidance on configuring point properties and setting appropriate limits and thresholds.
4. Adding New Screens to the SCADA System:
 - Training on creating new screens within the SCADA system to display relevant data.
 - Explanation on best practices to be followed when modifying or creating a screen.
5. Adding a New Site to the SCADA System:
 - Detailed steps on integrating a new site into the SCADA system.
 - Understanding the necessary configurations to ensure seamless communication with the new site.

Throughout the training, hands-on exercises and practical examples must be provided. The aim of the training is to equip Cuyahoga Falls personnel with the necessary skills to operate, maintain, and expand the SCADA system and RTUs effectively.

Additional Requirements

In addition to replacing the existing main SCADA system Cuyahoga Falls wants to integrate the functionality of another existing system that reads data from Siemens reclosers using the 61850 GOOSE protocol and can send manual controls to the reclosers. By the conclusion of the implementation, the new SCADA system should replace the core functionality of this recloser-reading system, in addition to replacing the existing SCADA system.

The new SCADA system should include a secure view-only mobile client compatible with Apple and Android phones and tablets, enabling operators and users to securely access and monitor data across multiple devices. The client should provide intuitive navigation and interaction capabilities, adapting its layout, font sizes, and functionality to accommodate various screen sizes and resolutions.

Employing responsive design and mobile optimization techniques, the screens of the view-only client will offer an optimal and seamless viewing experience across desktop computers, tablets, and mobile phones, promoting enhanced usability and accessibility.

The view-only client in the SCADA system should prioritize cybersecurity and not introduce any additional risks to Cuyahoga Falls. It should employ secure communication protocols, strong authentication mechanisms, and adhere to cybersecurity best practices to protect against unauthorized access and data breaches. Regular security updates and testing should be conducted to address vulnerabilities promptly and ensure the system's integrity, confidentiality, and availability.

Documentation

Cuyahoga Falls requires comprehensive documentation covering the training topics described above. The training documentation should include step-by-step instructions, screenshots, and detailed explanations for each aspect of training.

Additionally, upon project completion, the implementor should update the network diagram to reflect the current system architecture accurately. Furthermore, comprehensive documentation should be provided for any calculations, processes, and procedures within the SCADA system.

This documentation should include clear explanations, methodologies, and rationale behind the calculations and processes to ensure easy understanding and future reference.

Ongoing Support

Following the implementation of the system, Cuyahoga Falls will require technical support with a phone number that can be called to assist in resolving issues that may arise, and a 24x7 technical support on-call number for urgent issues. Additionally, Cuyahoga Falls will also require a quote for an annual block of 40 hours to be used in assisting with the management of the system. This support should be quoted as both 3-year and 5-year options.

Proposal

Proposal from prospective implementors must include a line-item breakdown of costs using the format in the following table, Cuyahoga Falls reserves the right to purchase any hardware, servers, etc. that are not proprietary:

Category	Item	Quantity	Cost Per Unit	Total Cost
Hardware				
	Servers			\$ -
	GPS Clock (optional)			\$ -
	Backup Storage System			\$ -
	Misc RTU Replacement			\$ -
Software				
	SCADA System			\$ -
	Historian			\$ -
	Anti-Malware			\$ -
	Backup Storage System			\$ -
Labor				
	Implementation (Design, Configure, Document, Test)			\$ -
	Training			\$ -
Support				
	Annual Costs			\$ -
Travel				
	Travel Expenses			\$ -
Total				\$ -