IDEA2021
Powering the Future: District Energy/CHP/Microgrids
Sept. 27-29 | Austin Convention Center | Austin, Texas

Migrating Obsolete, Proprietary Generator Controls to Improve Support and Reliability

Jack Overly, RoviSys

IDEA2021
Powering the Future: District Energy/CHP/Microgrids
Sept. 27-29 | Austin Convention Center | Austin, Texas

ROVISYS®
Automation & Information Solutions

INTERNATIONAL DISTRICT ENERGY ASSOCIATION

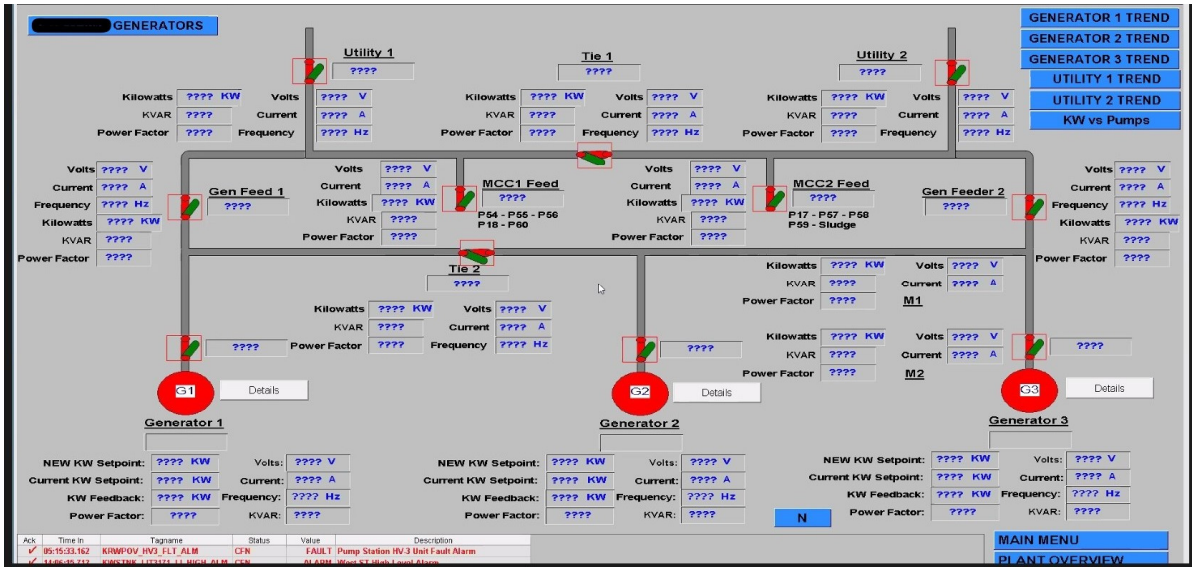
Water Department Pumping Stations

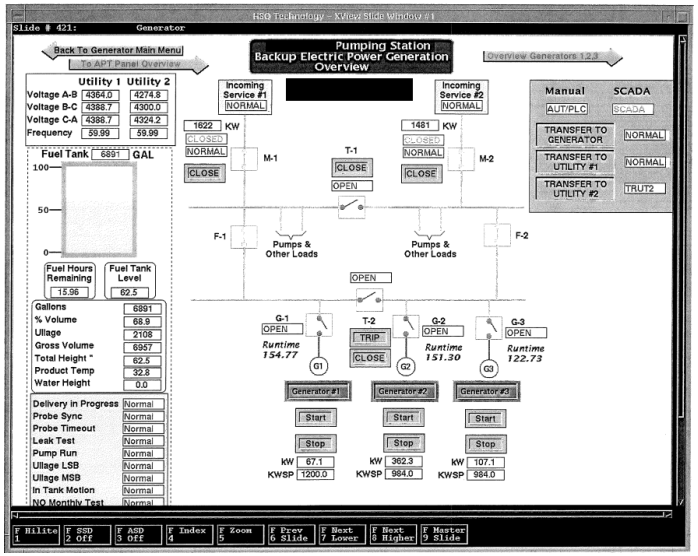
- 10+ Pumping Stations providing potable water to large city
- 26 Backup Caterpillar Diesel Generators
- 2 Different Utility Providers
- Unique Electrical Lineups
- Multiple Control Systems

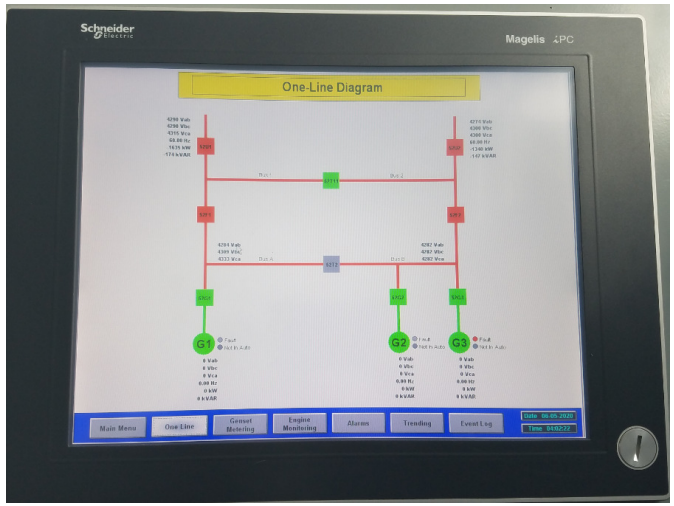
Existing Controls

- Commissioned 2009
- No Understanding of Controls
- Custom Panel HMI
- Incorrect Drawings
- Unstable Generator Control
- Failed Generator Tests

Multiple SCADA Systems







IDEA2021
Powering the Future: District Energy/CHP/Microgrids
Sept. 27-29 | Austin Convention Center | Austin, Texas

INTERNATIONAL DISTRICT ENERGY ASSOCIATION

Customer Pain Points

- Due to proprietary hardware and software customer engineering could not support the System
- OEM was a small company with limited support availability
- Support was expensive
- Replacement parts unavailable
- Expanded Generator control modes not available

Project Goals

- Utilize Off the Shelf Hardware
- Standardize controls between pumping stations
- Improve Control and Visibility of Generators
- Align multiple SCADA systems to have same functionality

Reverse Engineering

- Decode existing drawings
- Tag wires – Demo, Reuse, Replace
- Establish existing control method
- Engineer replacement controls
- Identify cutover plan

What Did We Find?

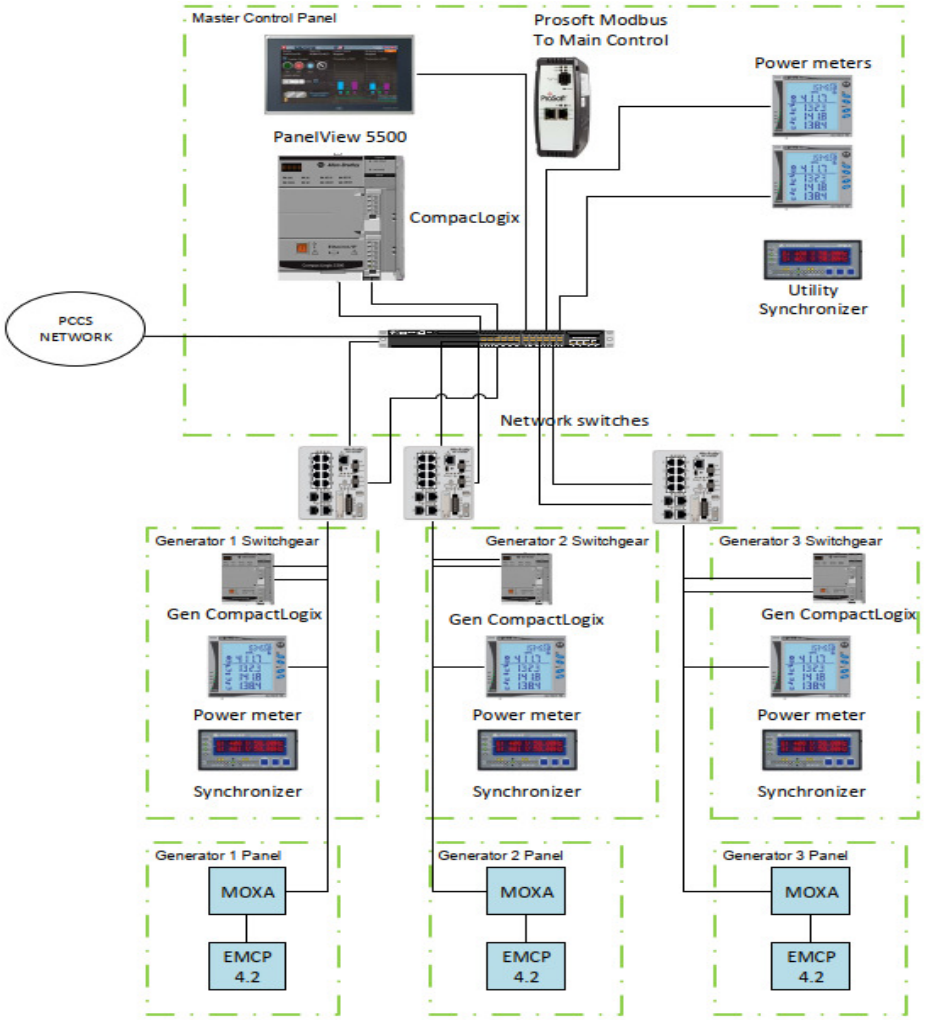
- Drawings didn’t match reality
- Standard Operating Procedures did not match operator experience
- Generator speed/voltage control was unreliable
- Plant iFix had not been commissioned
- HSQ SCADA was slow to update

Decisions Made

- Remove all propriety hardware and controls
- Standardize
  - Platforms
  - Communications
  - Control methods

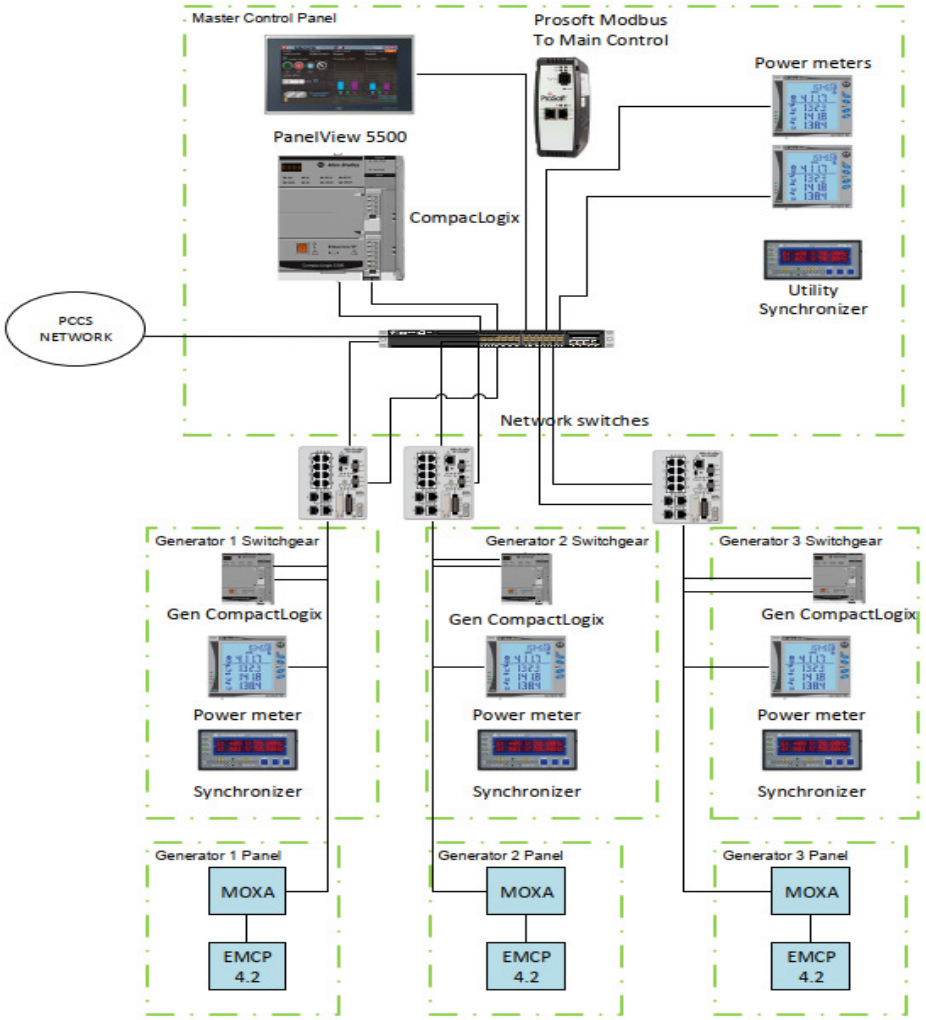
Standard Platforms

- Why Standardize?
  - Less platforms to learn how to support
  - Easier to apply fixes
- Hardware
  - CompactLogix 5069-L306ER
  - Woodward SPM-D-10 Synchronizer
  - ProSoft Modbus Gateway
  - MOXA Gateway
  - PanelView 5510



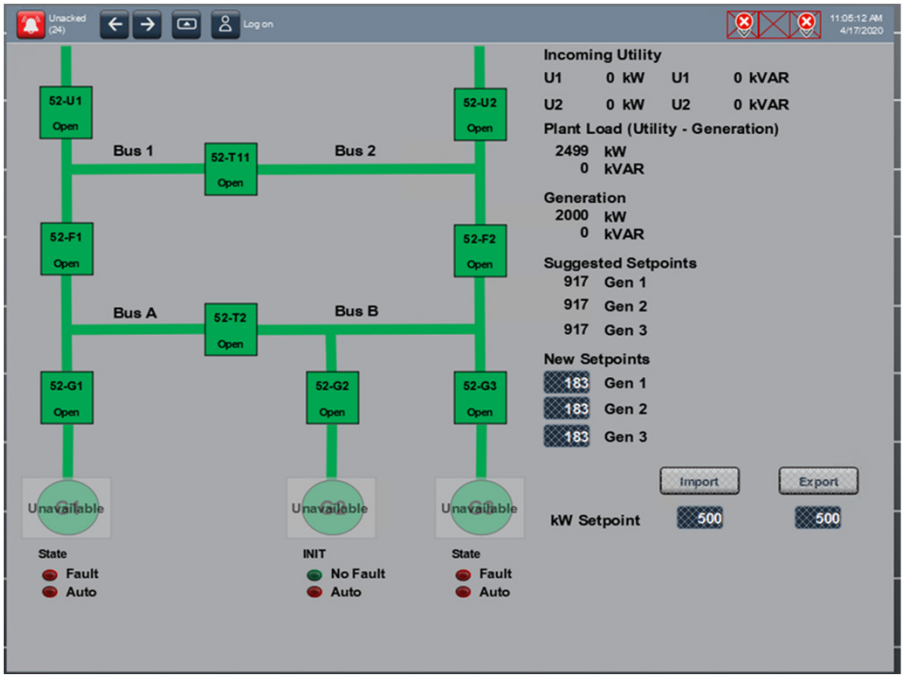
Distributed Controls

- Low cost
- Module
- Functional independent from each other
- Maintenance Impact



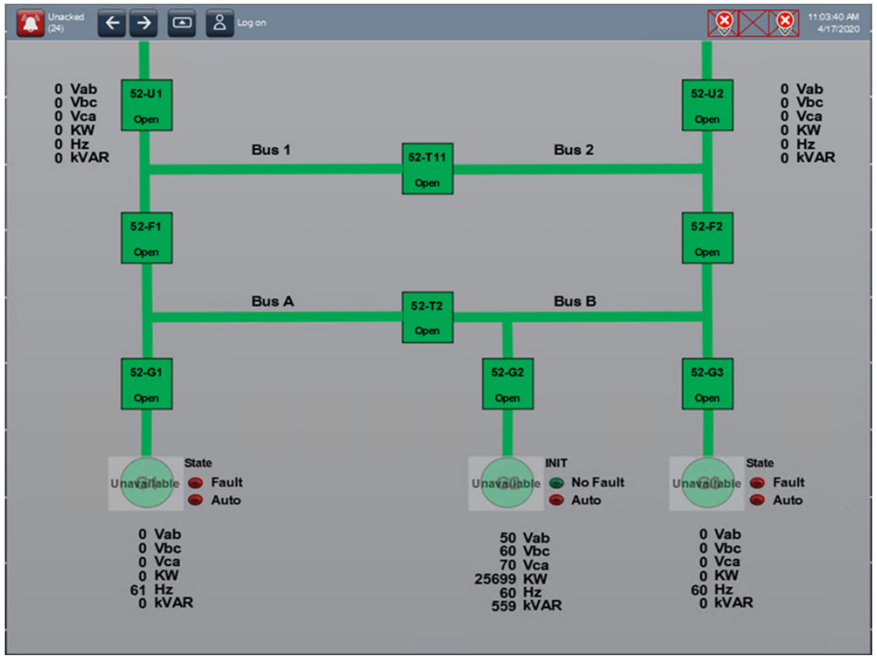
Generator Control modes

- Existing
  - Base Load
  - Island Operation
  - Load & No-Load Testing
- Added
  - Import Control
  - Export Control (Future)
- Each Station was slightly different
  - Topology
  - Critical loads
  - Utility intertie agreement



Results

- Off the shelf hardware easy to support
- Same control and visibility in all SCADAs
- Standard control methods
- Documentation matches reality
- Increased generator functionality



Design Considerations

- Review of existing drawings – Identify discrepancies
- Witness and Document existing system operation
  - Multiple perspectives
- What is being reused– is it in good condition?

Implementation Considerations

- Identify paths of communication early on
- Detailed documentation - 1,000+ documents
  - Drawings
  - Cutover plans
  - Test plans
- Flexibility in Design

Q&A

Jack Overly

Mobile: 216.316.2344

Email: Jack.Overly@RoviSys.com

ROVISYS®

Automation & Information Solutions