Back to the Future: SCADA Master Plan

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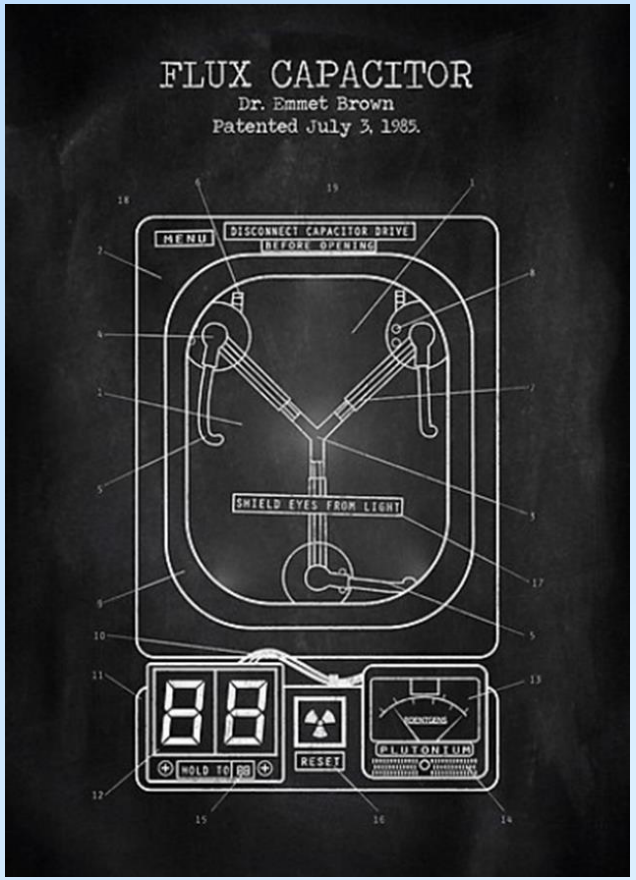
The problems

- **Developing RFPs**
- **Scoping**
- Limited Understanding
- Aging systems
- Staffing requirements
- Frequency of plans
- Technology evolves rapidly



Assessment of the current SCADA environment, and organizational structure; goals, metrics, and requirements for the SCADA system.

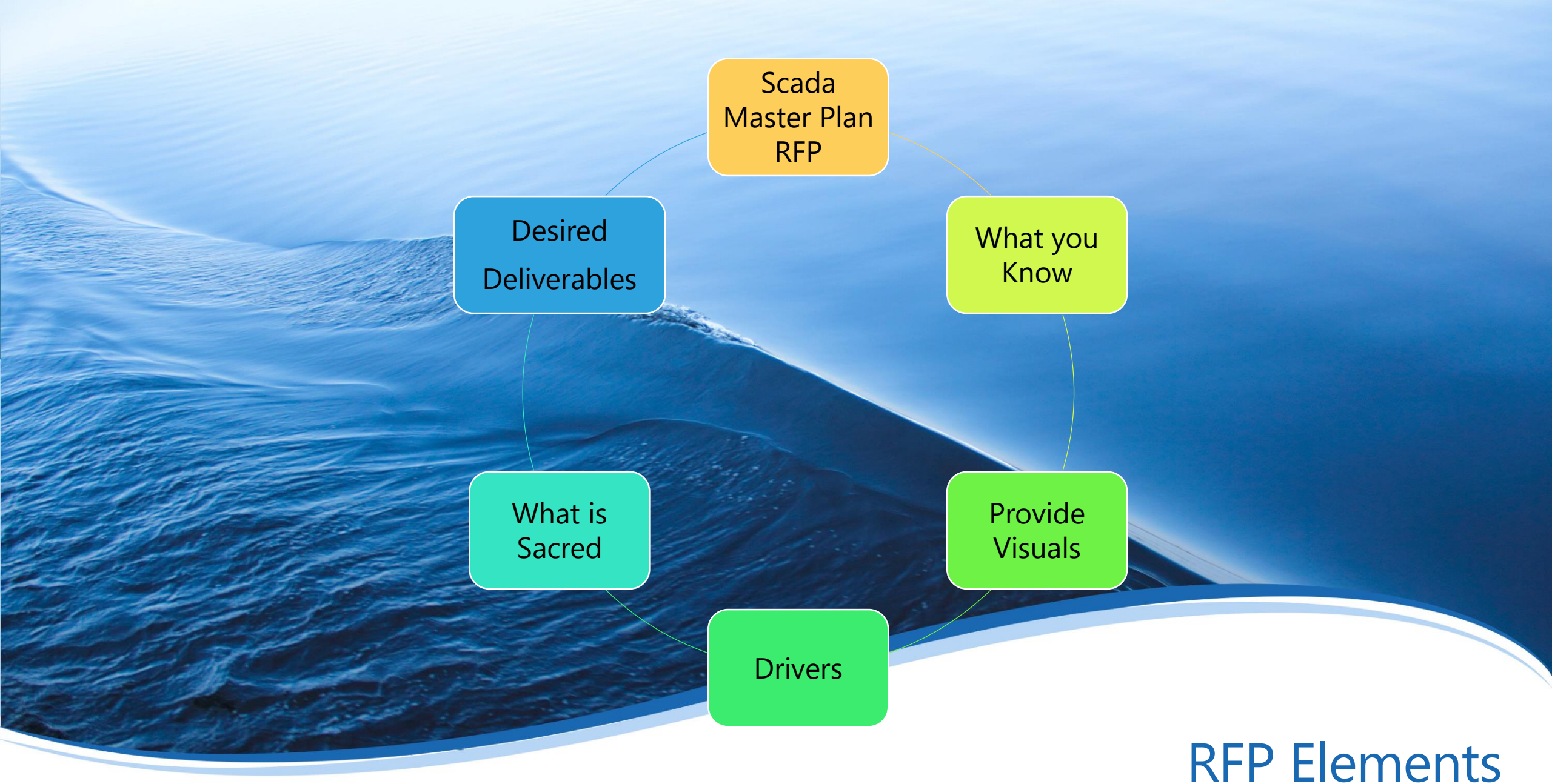
Scada Master Plans

Today

- User: Operations
- Hardware
- Software
- Communications
- Standards

Future

- Multiple Groups
- Hardware and Software
- Connectivity to other systems
- Communications
- Data Sharing
- Standards – more encompassing



RFP Elements

Need help with RFP development

- Resources:
  - Service techs to inventory infrastructure
  - System Integrators and Consultants can provide valuable information on industry trends
  - Consultants typically have access to example RFP or will assist with development

Defining your requirements of qualified proposer

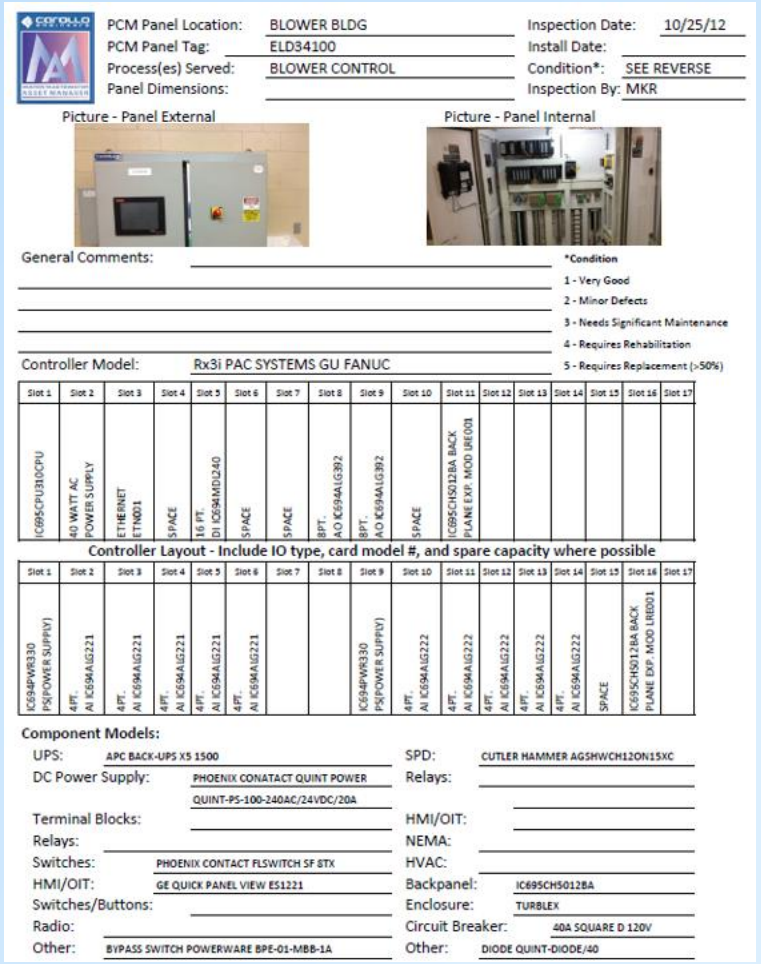
- Determine qualification requirements of the responders
  - Previous Master Plan work
  - A mix of staff (many skill sets are required)
- Have they responded to all of your requests?
- Is the approach to the project detailed
- Do they take the staff into consideration?
- Consider a mandatory pre-bid.
- Define Scoring Criteria


Scoping
Information Gathering
Business Drivers
Support
Deliverables

Scoping

Inventory of current approach provides foundation to build future scenarios

- Existing system evaluations
- Universal Control philosophies (not specific equipment strategies)
- Current Alarm Status (philosophy, states, qty)
- Visibility of the system
- Access to the system



PCM Panel Location: BLOWER BLDG
PCM Panel Tag: ELD34100
Process(es) Served: BLOWER CONTROL
Panel Dimensions:
Inspection Date: 10/25/12
Install Date:
Condition*: SEE REVERSE
Inspection By: MKR

Picture - Panel External

Picture - Panel Internal

General Comments:

*Condition
1 - Very Good
2 - Minor Defects
3 - Needs Significant Maintenance
4 - Requires Rehabilitation
5 - Requires Replacement (>50%)

Controller Model: Rx3i PAC SYSTEMS GU FANUC

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15	Slot 16	Slot 17
IC695CPU310CPU	40 WATT AC POWER SUPPLY	ETHERNET ETN001	SPACE	16 PT. DI IC694MDL240	SPACE	SPACE	8PT. AO IC694ALG392	8PT. AO IC694ALG392	SPACE	IC695CHS012BA BACK PLANE EXP. MOD LRE001						

Controller Layout - Include IO type, card model #, and spare capacity where possible

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15	Slot 16	Slot 17
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Component Models:

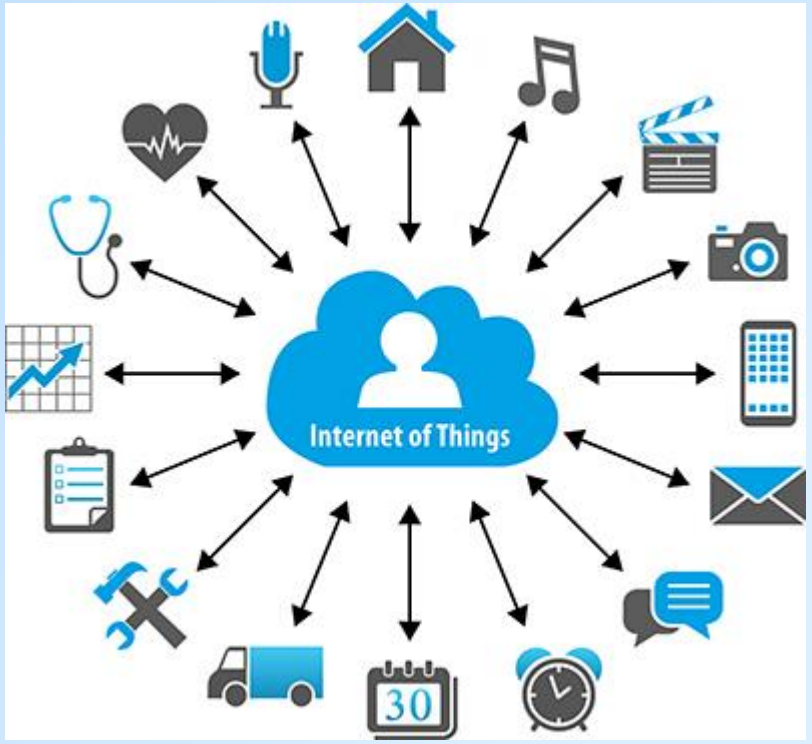
UPS: APC BACK-UPS X5 1500
DC Power Supply: PHOENIX CONATACT QUINT POWER QUINT-PS-100-240AC/24VDC/20A
Terminal Blocks:
Relays:
Switches: PHOENIX CONTACT FLSWITCH SF 8TX
HMI/OIT: GE QUICK PANEL VIEW ES1221
Switches/Buttons:
Radio:
Other: BYPASS SWITCH POWERWARE BPE-01-MBB-1A

SPD: CUTLER HAMMER AG5HWCH12ON15XC
Relays:
HMI/OIT:
NEMA:
HVAC:
Backpanel: IC695CHS012BA
Enclosure: TURBLEX
Circuit Breaker: 40A SQUARE D 120V
Other: DIODE QUINT-DIODE/40

Condition assessment forms can be used to gather critical data for existing system

Business Drivers define future SCADA and IT infrastructure improvements

- Strategic Vision
- Future vision for IT, staffing, data, operations
- IT Support capabilities
- Security levels and access
- System reliability levels
- Communications issues
- Control Issues



Staff Interviews drive organizational participation and buy-in

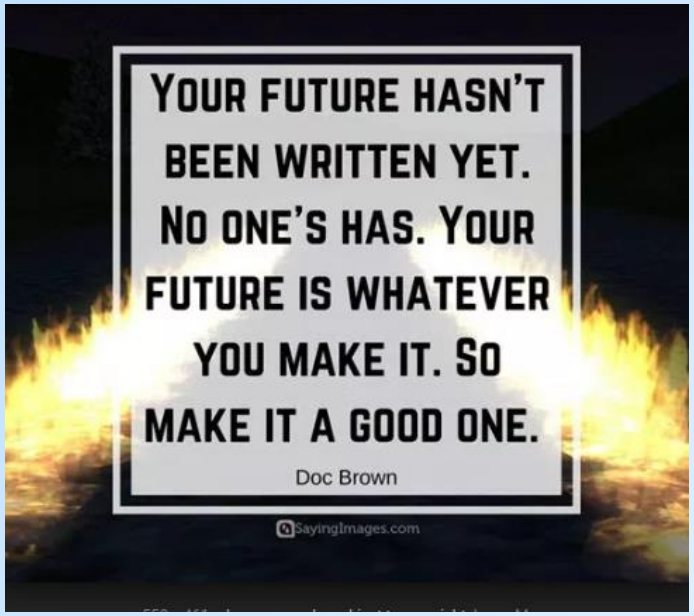
- SCADA is for everyone not just Ops
- Interviews with staff at multiple levels (small groups)
  - Operations
  - E&I Staff
  - Maintenance
  - Laboratory Services
  - Management
- What would be nice? (Visioning)

Support needs to be identified to implement recommendations

- What assets are available to maintain/grow the system
- Technology levels w. staffing resources
- Training requirements
- Additional staffing needs?
- Expand role of IT skills
- SCADA Governance Team

Deliverables create framework for implementation with consistency

- System evaluation
- Control philosophies
- Standards
- Gap analysis
- Project list with costs
- Procurement approach

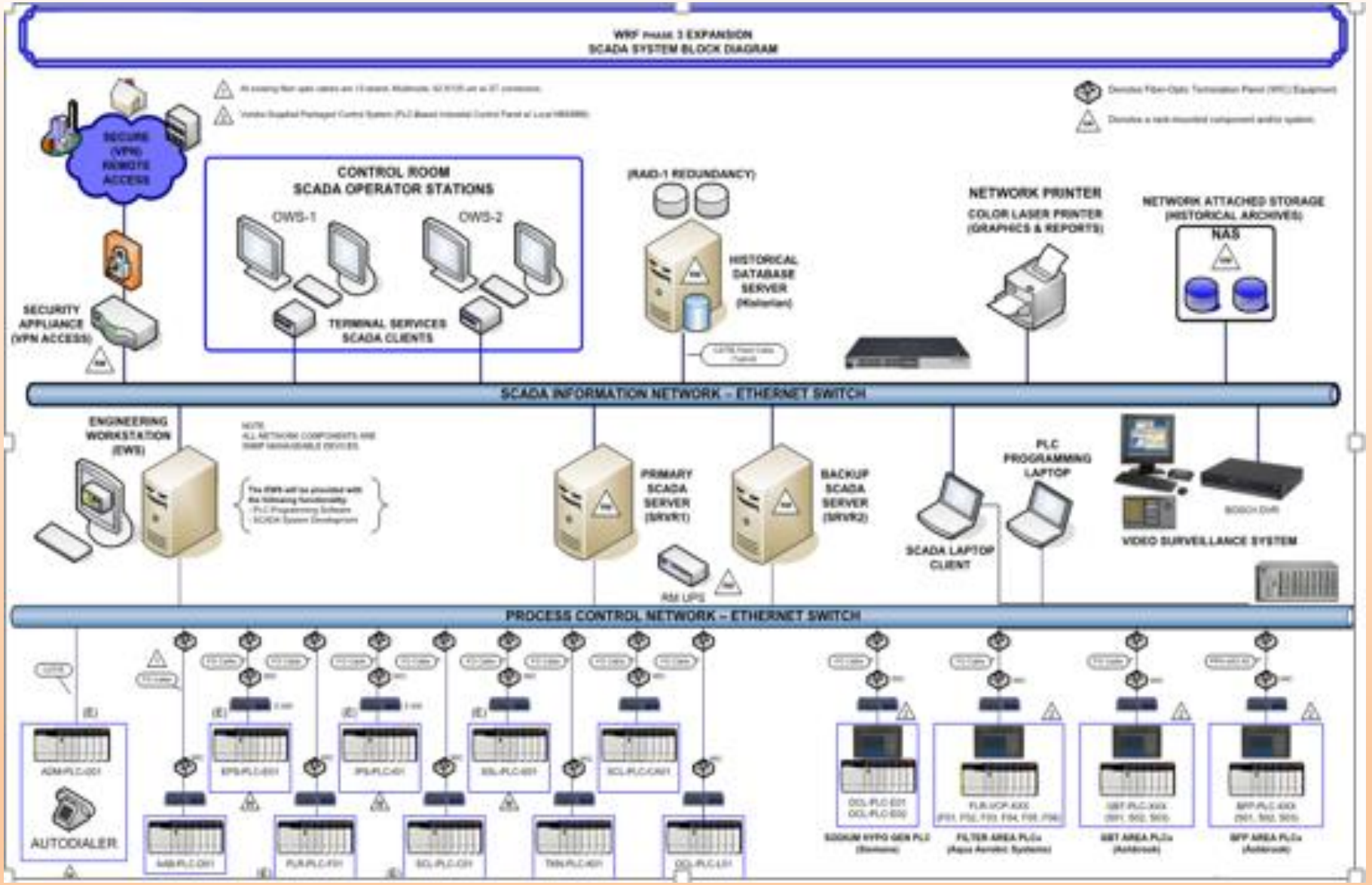


- How solutions achieve business drivers and align with organizational goals.

Example information in the following slides

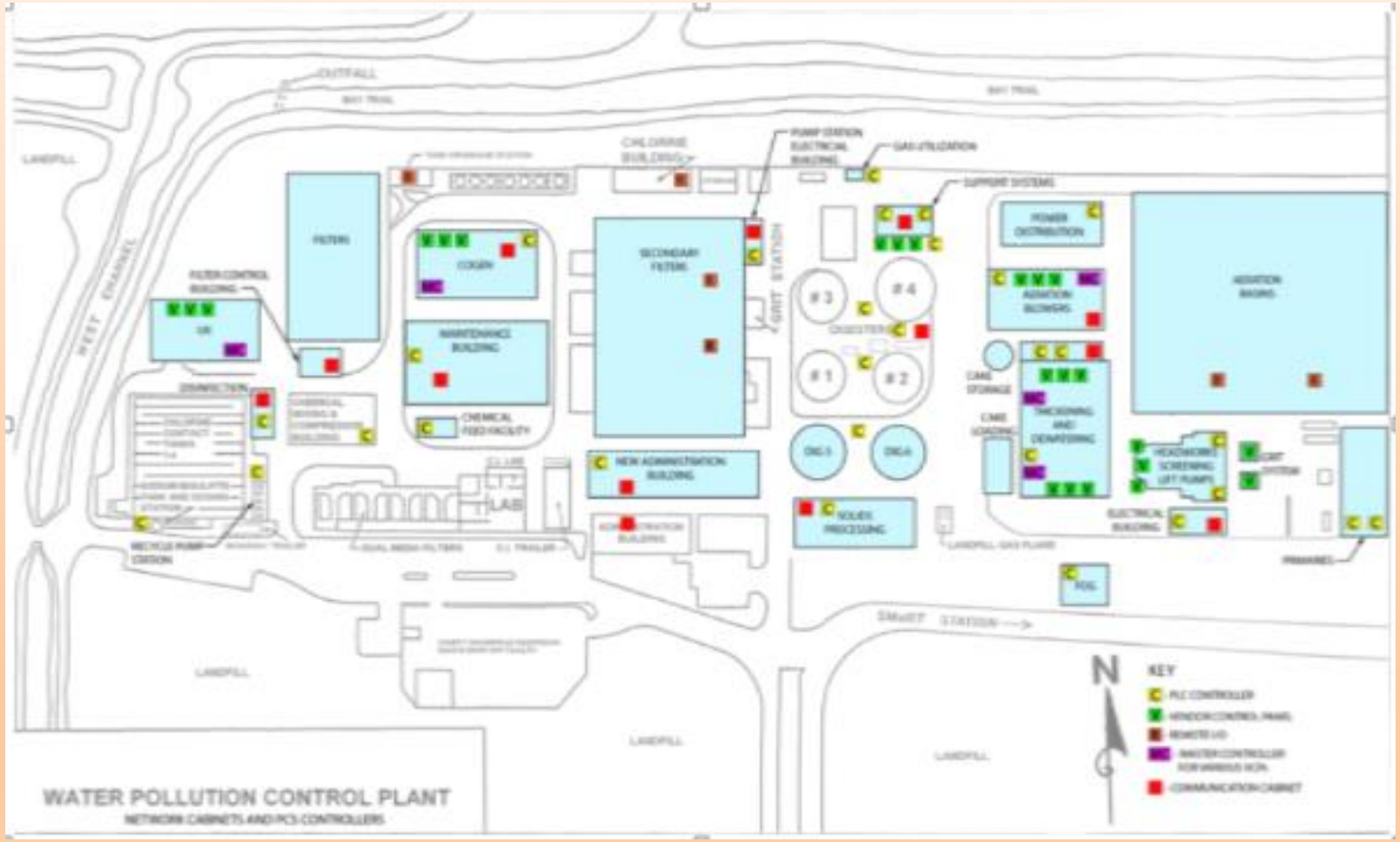
RFP Requirements

- What you know - Describe the basics of your system
  - Wonderware redundant servers 10,000 tags
  - 1 plant with 4 lift stations 800 discrete and analog I/O
  - Rockwell SLC500s on DH+
  - Unlicensed 900mz radios at each lift station
- Add visual elements
  - A map of the services sites
  - Overview of facility:
    - PLC cabinet locations
    - Control Room
    - SCADA Room
  - Control block diagram
  - Some basic photos of the control panels
  - State what you have to share once under contract
- What you need
  - Replacement of Rockwell SLC504 controllers
  - PLC Platform evaluation
  - Robust communication to wells
  - Better understanding of problems at remote stations before staff arrives
- What is sacred
  - Wonderware upgrade – no evaluations
  - PLC network enhancements move away from serial communications
  - Minor instrumentation changes at Lift stations is acceptable
- What are you looking for (deliverables)
  - Recommendations
  - Costs
  - Cutover plans



Network Architecture

Example list of scoping elements



Example list of scoping elements

- Current System evaluations and observations
- Technology Evaluation
- Controller Hardware and Software Evaluations/Selection
- HMI Evaluations/Selection
- Network Architecture
  - Network standards
    - Communication/Network Racks and Cabinets
    - Server architecture
    - Monitoring requirements (hardware and software)
- Control Network Standards
  - Controller Communication Standards
  - Control Cabinets
  - Software (SLAs) Patching
  - Controller Programming Standards
  - Graphical Standards
  - Instrument Standards
  - Tagging
  - Monitoring requirements (hardware and software)
- Security
  - Physical Security
  - Cyber Security
    - PEN Testing
    - Policy implementation
    - Patching
- Alarming
    - Philosophy
    - Alarm Management
- Reporting
  - Daily
  - Laboratory
- Disaster Recovery
- Gap Analysis

Example Condition Assessment Form

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