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City of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.10
SCADA ASSESSMENT

REVISED FINAL DRAFT
September 2017

Engineers...Working Wonders With Water™

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PREFACE

The analysis and evaluations contained in these Project Memorandum (PM) are based on data and information available at the time of the original date of publication, December 2015. After development of the December 2015 Final Draft PMs, the City continued to move forward on two concurrent aspects: 1) advancing the facilities planning for the water, wastewater, recycled water, and stormwater facilities; and 2) developing Updated Cost of Service (COS) Studies (Carollo, 2017) for the wastewater/collection system and the water/distribution system. The updated 2017 COS studies contain the most recent near-term Capital Improvement Projects (CIP). **The complete updated CIP based on the near-term and long-term projects is contained in the Brief History and Overview of the City of Oxnard Public Works Department's Integrated Planning Efforts: May 2014 – August 2017 section.**

At the time of this Revised PWIMP, minor edits were also incorporated into the PMs. Minor edits included items such as table title changes and updating reports that were completed after the December 2015 original publication date.

City Of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.10
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SCADA ASSESSMENT

1.0 INTRODUCTION

The purpose of this Project Memo (PM) is to develop the list of projects to be included in the wastewater Capital Improvement Program (CIP) of the Public Works Integrated Master Plan (PWIMP) with associated project cost and drivers. The CIP is an estimate of the City's capital expenses over the next 25 years to address limitations, rehabilitation needs, and recommended improvements to the wastewater treatment plant. The CIP is intended to assist the City in planning future budgets and making financial decisions.

1.1 PMs Used for Reference

The recommendations outlined in this PM include recommendations from the following other PMs:

- PM 3.2 - Wastewater - Flow and Load Projections.
- PM 3.4 - Wastewater - Treatment Plant Performance and Capacity.
- PM 3.5 - Wastewater - Condition Assessment.
- PM 3.6 - Wastewater - Seismic Assessment.
- PM 3.9 - Wastewater - Arc Flash Assessment.
- PM 3.7 - Wastewater - Treatment Alternatives.

1.2 Other Reports Used for Reference

In developing this report, recommendations from other reports were incorporated to ensure a holistic and, un-biased approach. The followings reports are used in this PWIMP analysis:

- *Guide to Industrial Control Systems (ICS) Security,* National Institute of Standards and Technology, June 2011.

2.0 SUMMARY OF FINDINGS

2.1 Existing System

The City of Oxnard's Waste Water Treatment Plant SCADA System provides plant automation and operates on obsolete hardware and software. The Supervisory Control and Data Acquisition (SCADA) system is a computer system that monitors and controls the facility-based processes. The SCADA system consists of the following subsystems:

- SCADA-based Human Machine Interface (HMI), which is the apparatus that presents process data to the human operator; and through this the human operator monitors and controls the process.
- A SCADA computer system, acquiring and storing data on the process from the programmable logic controllers (PLCs) and controlling the process by sending commands to the PLC.
- Communication infrastructure connecting the SCADA system to the PLCs.

The Oxnard Waste Water Treatment Plant uses a Supervisory Control and Data Acquisition (SCADA) process control system to monitor and control processes at the facility. The automation hardware inside the WW facility was installed as an upgrade to the facility in approximately 1990. It consists primarily of SquareD SY/MAX PLCs interfaced over a RS422 Communication bus for Peer to Peer (PLC to PLC) and PLC to HMI communications. This uses a low bandwidth, ASCII based protocol. There is a Primary and a Secondary Kepware KEPServer that each function as an OPC bridge to provide data to the FactoryTalk View SE 6.0 HMI software platform.

The Lift Stations use an Allen Bradley CompactLogix L33E PLC with local I/O for control. These are interfaced into to the rest of the SCADA system through copper phone lines. The phone lines are operated and maintained by Verizon, the local phone provider. There were numerous discussions with plant personnel in regards to the copper lines being switched to fiber. Fiber optic cable provides would provide a much higher data bandwidth to the stations. However, this upgrade is being performed by Verizon and it is unclear when the upgrade would be performed.

2.2 Condition

The life cycle of the SquareD SY/MAX PLC platform ended in the mid-1990s and the last hardware components became obsolete in 2002. Replacement parts are not widely available and would need to be sourced through a 3rd party vendor. These PLCs control nearly the entire WW facility, a PLC hardware failure could mean that an entire section of the facility would have to be operated in manual, with little to no process visualization by which to make process decisions. The current programs were uploaded by Pacific Rim Automation, and are undocumented. This makes any modification of the original code very labor intensive.

The overall wiring condition of the SCADA systems are fair to poor, which is to be expected for the age of the system(s). In discussions with staff that maintains the equipment, many of the repairs to the wiring have gone undocumented, and visual inspection of cabinets verified these reports. Much of the downtime related to the SCADA system stems from loose or failing wire connections, and tracing wires to their source to troubleshoot an outage.

There are also reports of communication faults within the system due to Electro-Magnetic Interference (EMI) that happen during regular system events, such as large motors starting and stopping. This is likely due to poor cable, non-isolated wiring, incorrect shielding, and terminating. These events compound themselves by causing SY/MAX nodes to try and re-establish themselves on the network, resulting in unscheduled messages that will lock-up the OPC server(s). This causes reduced process visualization and disruption of the control system for relatively short amounts of time.

3.0 SCADA SYSTEM NEEDS

3.1 Recommended Projects

3.1.1 PLC Cabinet Replacements

There is an immediate concern surrounding the age of PLCs and equipment used at the waste water treatment facility. It is highly recommended that installation of new PLCs and control cabinets should accompany any process equipment upgrades or replacements. This allows for the process controls to be optimized in a new system rather than conform to the footprint of the existing system, as the existing programs would be difficult and expensive to modify. Based on the city's desire to match the architecture used at the Advanced Water Purification Facility, any new PLC's should be in the Allen Bradley Logix 5000 family of controllers. In interviews with plant personnel, this preference was also expressed.

The present state of the panels is such that a field cleanup of the panels is less cost effective than a replacement of the panel in its entirety, given the wiring conditions and age of other equipment inside.

3.1.2 PLC System Standardization

A PLC is an industrialized computer used to automate process used for the treatment and/or conveyance of water. Typically, each major process will have its own PLC.

During interviews with city personnel and ProUsys, there was a preference expressed for the Allen Bradley ControlLogix platform. As this was the platform used in the newly constructed Recycled Water Processing Facility, it is recommended that any new PLCs should also be of the Allen Bradley ControlLogix or CompactLogix platform.

Each PLC processor should be sized to support the required input/output (I/O) plus 25 percent spare I/O capacity for each type of I/O signal at every PLC. All spare I/O points shall be wired to field terminal blocks in the PLC cabinet. The PLC backplane shall include three spare backplane slots or 25 percent additional slots, whichever is greater. Provide a minimum of 50 percent spare program volatile memory. Communication ports should be provided to support the necessary networking requirements of the specific project. Provide a minimum of one Ethernet/IP port for connection to the process communications network as well as uploading and downloading of PLC application programs.

3.1.3 HMI System Standardization

The HMI is defined as operator interface devices with a graphic display. These provide operations or maintenance staff access to control and monitor process activities, setpoints, equipment status, and alarms within the PLC. The City of Oxnard's Waste Water facility HMI application was built with Rockwell Automation's Factory Talk View SE 6.0 software. Any new PLC should interface with the existing application, and the existing application should be modified to accommodate the new PLC.

3.1.4 Typical Control Methodologies

3.1.4.1 Process Control Interface System (PCIS) Control

The PCIS system refers to the operator interface system consisting of both the HMI and the SCADA interface.

Where indicated, provide HAND-OFF-AUTO and START-STOP selections in the PCIS, accessed from an HMI or SCADA for operators with sufficient security, to provide the following operating modes:

1. PCIS AUTO: The normal, automatic control mode of the strategy, which allows full PLC control in response to process conditions and programmed sequences.

2. PCIS HAND: Enables PCIS Manual control where control decisions are made by an operator through the PCIS START-STOP, OPEN/CLOSE, or other selections as indicated.

3. PCIS OFF: Automated PCIS control is disabled and PLC calls for all associated equipment to stop and valves to close or go to their identified safe state.

4. Program the PLC so that switching strategy between AUTO and HAND (either direction) occurs with a smooth transition. Keep running or position status unchanged when control is switched to HAND until a change is requested using the operator selections (START, STOP, OPEN, CLOSE). Keep running and position status unchanged when control is switched to AUTO until the control logic determines a change is required.

3.1.4.2 Motor Control

1. Provide local controls at each motor. The controls could be housed in a local control panel (LCP) at each motor or at the compartment containing the motor control hardware in the motor control center (MCC):
   a. LOCAL-OFF-REMOTE (LOR) selector switch.
   b. START pushbutton.
   c. STOP pushbutton.

2. Monitor the device's LOR switch to determine when the PLC has control of the associated equipment:
   a. Display current REMOTE status on the SCADA and HMI screens.
3. Monitor the device's running status from the starter auxiliary or run status input:
   a. Display the current status (running or stopped) on the SCADA and HMI screens.
   b. Use status to calculate total run time and daily run time, and to count total starts and daily starts.
   c. Provide time stamp for each start.
4. For motors 200 hp and greater, provide software to prevent exceeding the manufacturer's recommended maximum starts per hour.
5. When equipment control has been given to the PLC as reported by the LOCAL-OFF-REMOTE switch, allow selection of PCIS AUTO or PCIS HAND control modes based upon operator selection using the SCADA or HMI screens.
6. Starting, Stopping, and running when the device LOR is in LOCAL:
   a. With the LOR switch in the LOCAL position, the motor is controlled by the START and STOP pushbuttons.
   b. With the LOR switch in the OFF position, the motor is prohibited from running.
   c. With the LOR switch in the REMOTE position, the motor is controlled remotely.
7. Starting, stopping, and running when the device LOR is in REMOTE:
   a. When the motor is expected to be running (PLC has issued a START or RUN due to process conditions or operator selection), LOR is in REMOTE, and the device is not reported to be running, start an operator adjustable "Control Activation" time:
      1) Provide "Control Activation"{ timers for each piece of controlled equipment:
         a) If the LOR and required running status do not change, and the PLC does not receive running status within the "Control Activation" time period:
            (1) De-activate the output.
            (2) Place the device in a "Failed" state.
            (3) Generate a "Failed to Respond" alarm.
   b. When the motor is not expected to be running (PLC has issued a STOP or removed the RUN output, LOR is in REMOTE, and the device is reported to be running, start the "Control Activation" timer:
      1) If the LOR and required stopped status do not change, and the PLC does not lose the running status within the "Control Activation" timer period:
         a) Keep the RUN output off or the STOP output on.
         b) Place the device in a "Failed" state.
         c) Generate a "Failed to Respond" alarm.

c. Re-establish PLC control of a device in a “Failed” state only after operator turns the device’s LOR switch out of REMOTE, and back to REMOTE (i.e., REMOTE input to the PLC cycles off and back on).

8. Simultaneous starts:
   a. Prevent more than one motor-driven load 25 hp or larger in the same facility from starting concurrently:
      1) When starting one load, inhibit start logic for all other such equipment until the load being started is up to speed (reduced voltage solid state RVSS or variable frequency drive VFD, or after a setpoint time delay (full-voltage starters and miscellaneous equipment).
   b. Use the same logic to prevent multiple large devices from starting concurrently on restoration of power after a power outage, whether operating on generator or utility power.

9. Speed control:
   a. Modulate speed on VFD-driven motors using jog and hold, or process identification document (PID) control algorithms to maintain process conditions as described in the specific loop descriptions.
   b. Operate speed control within a pre-defined range:
      1) Minimum speed as determined by equipment manufacturer. The higher of:
         a) Minimum motor speed to maintain adequate cooling for the type of load driven (constant or variable torque).
         b) Minimum equipment speed, such as minimum speed to deliver flow or to deliver minimum flow for equipment cooling or lubrication.
      2) Maximum speed 100 percent (60 Hz) or as identified by equipment manufacturer.
   c. Where multiple equipment may operate together to maintain the same process condition:
      1) Provide an operator selection for starting sequence.
      2) Start the first equipment at a preset starting speed.
      3) When one or more equipment is running and the speed control algorithm reaches a preset “Start Nex” speed value (initially 95 percent of speed range) through a preset time delay:
         a) Start the next available equipment at the preset starting speed.
         b) Ramp speed of previously running equipment down to a preset value based on the number of items running. Determine preset values for each condition based on equipment and system characteristics to provide approximately the same flow or process condition with the new load running at the starting speed.

c) Once the previously running equipment reaches the preset speed, resume the speed control algorithm for that equipment.

d) Ramp the speed of the equipment that had just started until it reaches the speed of the previously running equipment.

e) Operate all equipment at the same speed following the output of the speed control algorithm.

4) When two or more pieces of equipment are running, monitor for a "Stop Next" condition:

a) Where flow rate is monitored, use a preset "Stop Next" flow rate for each possible number and combination of equipment:

(1) Determine initial "Stop Next" speed based on the flow that can be provided with one fewer piece of equipment running at a speed slightly below the "Start Next" speed.

b) When the "Stop Next" condition exists through a preset time delay:

(1) Ramp Speed of running equipment except for the equipment to be stopped up to a preset value based on the number of items running. Determine preset values for each condition based on equipment and system characteristics to provide approximately the same total flow or process condition with one fewer load running (typically slightly below the preset "Start Next" speed) while ramping speed of equipment to be stopped down to the preset minimum speed.

(2) Stop the load once it reaches minimum speed.

(3) Operate all remaining equipment at the same speed following the output of the speed control algorithm.

3.1.5 Facility SCADA and Control Communication Networking Standardization

For PLC and SCADA, networks will utilize a fiber optic backbone for Ethernet/IP communication throughout the facility. Managed Ethernet switches shall be located in each PLC or network panel for both the SCADA and PLC network. A connection port shall be provided on the front of all PLC cabinets to allow connection to the SCADA network. Switches shall utilize the IEEE Rapid Spanning Tree Protocol (RSTP) for network routing and optimization in a ring topology. In the event of a network switch failure, RSTP will automatically determine the most efficient way to re-route network traffic in order to re-establish communication throughout the network. Vendor PLCs and control panels will also comply with this design.

Appendix C contains a typical diagram for an Industrial Network with the architecture and security infrastructure recommended by the National Institute of Standards and Technology (NIST) and the Department of Homeland Security (DHS). Staff interviews indicate that the ability to view facility status throughout the City's Wide Area Network (WAN) is desired.

Further information can be found in NIST Special Publication (SP) 800-82, *Guide to Industrial Control Systems (ICS) Security*.

4.0 CAPITAL IMPROVEMENT PROGRAM

The purpose of this section is to summarize the estimated capital funding requirements for SCADA system projects. The costs presented here are based on direct replacement of equipment in layouts of the existing system. Project costs are estimated based on unit costs developed from estimates of similar facilities and configurations at other locations. Please see Project Memo (PM) 1.5 for a more detailed discussion on the Basis of Cost for the costs shown in Table 1.

Table 1 Recommended Capital Improvement Projects, Cost Estimates, and Phasing for OWTP SCADA(1)
Public Works Integrated Master Plan
City of Oxnard

Project Name	Driver	End Year	Start Year	Un-escalated Project Cost ($)
PLC Cabinet Replacements (12)	R&R	2018	2015	$4,601,000
SCADA Programming (12)	Performance	2021	2016	$4,989,000
Asset Management Software Package Installation	Performance	2022	2021	$104,000
Network Upgrades (12)	Performance	2022	2015	$776,000
Control Room Upgrades	Performance	2021	2016	$346,000
			TOTAL:	**$10,816,000**

Notes:
(1) Project costs, schedules, and phasing are based on data and information available at the time of the original date of preparation – December 2015. The updated CIP is contained in the Brief History section of the PMs, the Summary Report, and the Executive Summary.

4.1 Unit Costs

The unit cost multiplier used was based upon replacement of the existing twelve RTU and “MUX” control panels. For incremental replacements based on the process improvements identified in PM 3.7, the costs can be used proportionally.

APPENDIX A – WASTEWATER PCM EVALUATION

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Plant Control Center
Equipment Name: SYMAX OPC Servers
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____
Cabinet Location: PCC
Process(es) Served: Multiple
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **4** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : N/A

Component Models

Enclosure
Model Number: N/A
NEMA: None
Mounting: _____
Thermal Management: Ambient A/C
Accessories: _____
Side Panels: _____

PLC
Manufacturer: Dell
Processor: KEPServer
Communications: SY/COMM to OPC
Accessories: _____
Redundant Processors: Yes

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

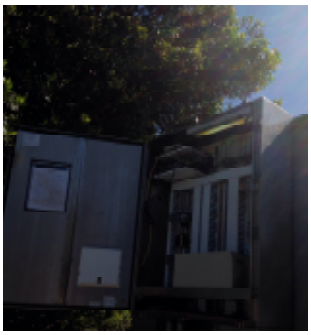
Facility: Waste Water
Equipment Location: Lift Station 2
Equipment Name: Harbor rd
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: Lift Station 2
Cabinet Location:
Process(es) Served: Lift Station 2
Panel Dimensions:
GPS Location: 34.151856 , -119.180149

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **3** out of 5

Picture – Panel External



Picture – Panel Internal

General Comments:

Manual Pump Controls on Front Cabinet which has pump controls.
Rear cabinet houses Control System hardware.

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

Controller Model : AB Compact Logix

Component Models

Enclosure
Model Number:
NEMA: 4X
Mounting: Flange
Thermal Management: Forced Air
Accessories:
Side Panels: No

PLC
Manufacturer: Allen Bradley
Processor: L34E
Communications: Ethernet / Modem
Accessories:
Redundant Processors: No

UPS
Model: Yes
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet: 1 Switch
Radio:
DC Power Supply:
Switches:
Amount of I/O: 7
Other: Cabinets Built by FluidIQs

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water
Equipment Location: Lift Station 4
Equipment Name:
Discipline: Electrical / Instrumentation

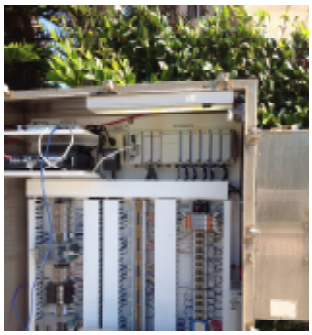
Equipment Information

Cabinet ID: Lift Station 4
Cabinet Location:
Process(es) Served: Lift Station 4
Panel Dimensions:
GPS Location: 34.190296 , -119.242545

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal



General Comments:

Manual Pump Controls on Front Cabinet which has pump controls.
Rear cabinet houses Control System hardware.

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

Controller Model : AB Compact Logix

Component Models

Enclosure
Model Number:
NEMA: 4X
Mounting: Flange
Thermal Management: Forced Air
Accessories:
Side Panels: No

PLC
Manufacturer: Allen Bradley
Processor: L34E
Communications: Ethernet / Modem
Accessories:
Redundant Processors: No

UPS
Model: Yes
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet: 1 Switch
Radio:
DC Power Supply:
Switches:
Amount of I/O: 7
Other: Cabinets Built by FluidIQs

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Lift Station 8
Equipment Name:
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: Lift Station 8
Cabinet Location:
Process(es) Served: Lift Station 8
Panel Dimensions:
GPS Location: 34.188542 , -119.224652

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

Manual Pump Controls on Front Cabinet which has pump controls.
Rear cabinet houses Control System hardware.

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

Controller Model : AB Compact Logix

Component Models

Enclosure
Model Number:
NEMA: 4X
Mounting: Flange
Thermal Management: Forced Air
Accessories:
Side Panels: No

PLC
Manufacturer: Allen Bradley
Processor: L34E
Communications: Ethernet / Modem
Accessories:
Redundant Processors: No

UPS
Model: Yes
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet: 1 Switch
Radio:
DC Power Supply:
Switches:
Amount of I/O: 7
Other: Cabinets Built by FluidIQs

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: MCC DP1A
Equipment Name: _____
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC DP1A
Cabinet Location: Sedimentation Bldg
Process(es) Served: Sedimentation
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: N/A
NEMA: 12
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: N/A
Processor: N/A
Communications: Hardwired
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Sedimentation
Equipment Name: MCC DP1B
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC DP1B
Cabinet Location: Sedimentation
Process(es) Served: Sedimentation
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: _____
Processor: _____
Communications: _____
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

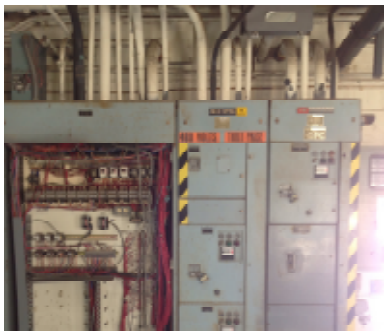
Facility: Waste Water Campus
Equipment Location: Influent Pump Station
Equipment Name: MCC DP2A
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC DP2A
Cabinet Location: Influent PS
Process(es) Served: Influent
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **2** out of 5

Picture – Panel External



Picture – Panel Internal

General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors:

UPS
Model:
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: MCC DP3C
Equipment Name: MCC DP3C
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC DP3C
Cabinet Location: MCC DP3C
Process(es) Served: _____
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Sedimentation
Equipment Name: MCC EDP1A
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____
Cabinet Location: _____
Process(es) Served: _____
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **3** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Old Headworks
Equipment Name: MCC EDP1B
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC EDP1B
Cabinet Location: Old Headworks
Process(es) Served: _____
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **5** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: _____
Processor: _____
Communications: _____
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Old Headworks
Equipment Name: MCC EDP1B-1
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC EDP1B-1
Cabinet Location: Old Headworks
Process(es) Served: _____
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **4** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

All but one breaker in MCC was locked out.

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: Hardwired
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Digesters
Equipment Name: MCC GF
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____ Inspection Date: 8/6/2014
Cabinet Location: _____ Inspection By: K. Pepler
Process(es) Served: _____ Install Date: _____
Panel Dimensions: _____ Condition*: **5** out of 5
GPS Location:

Picture – Panel External

Picture – Panel External 2

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: SquareD
Processor: SY/MAX
Communications: Hardwired
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: North Control Center
Equipment Name: MCC NC
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MCC NC
Cabinet Location: North Control Area
Process(es) Served: _____
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **2** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: _____
Processor: _____
Communications: _____
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Influent Pump Station
Equipment Name: MUX 20
Discipline: Electrical / Instrumentation

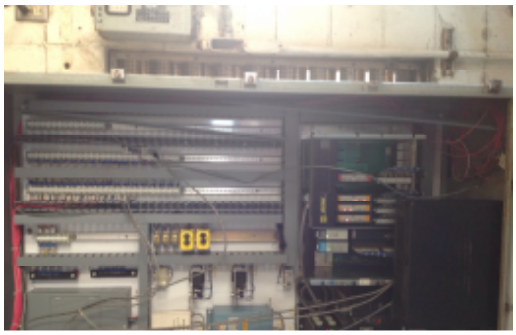
Equipment Information

Cabinet ID: MUX 20
Cabinet Location: Influent PS
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External

Picture – Panel Internal



General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model: APC
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Sedimentation
Equipment Name: MUX 30
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____ Inspection Date: 8/6/2014
Cabinet Location: _____ Inspection By: K. Pepler
Process(es) Served: _____ Install Date: _____
Panel Dimensions: _____ Condition*: **5** out of 5
GPS Location:

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories: _____
Redundant Processors: N

UPS
Model: APC
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Digesters Bldg
Equipment Name: MUX 60
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: MUX 60
Cabinet Location: Digesters Bldg
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model: None Found
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

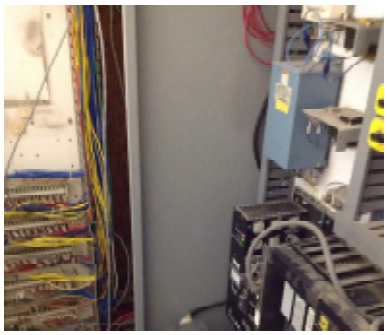
Facility: Waste Water Campus
Equipment Location: Old Influent Pump Station
Equipment Name: MUX 70
Discipline: Electrical / Instrumentation

Equipment Information

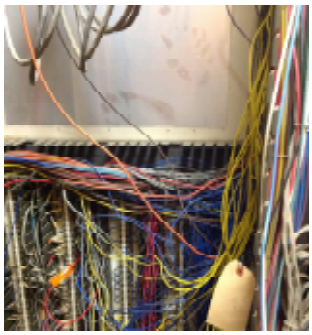
Cabinet ID: MUX 70
Cabinet Location: Old Influent PS
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External



Picture – Panel Internal



General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model: None Found
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Landscaping Bldg
Equipment Name: New SCADA Server Rack
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____
Cabinet Location: Landscaping Bldg
Process(es) Served: Multiple
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **2** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

Server Rack is in isolated large "closet" with locked door in building that stores landscaping equipment.

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

Controller Model : Dell Poweredge

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: Dell
Processor: _____
Communications: _____
Accessories: KVM
Redundant Processors: N

UPS
Model: APC
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

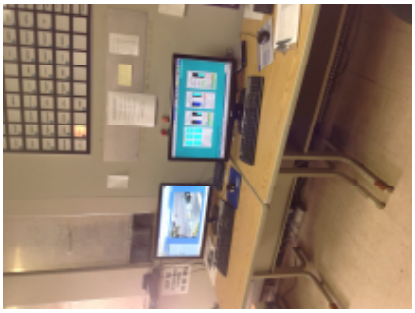
Facility: Waste Water Campus
Equipment Location: Plant Control Center
Equipment Name: HMI Computers/Console
Discipline: Electrical / Instrumentation

Equipment Information

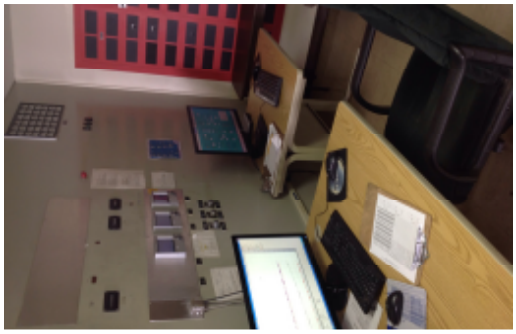
Cabinet ID: _____
Cabinet Location: PCC
Process(es) Served: Multiple
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **3** out of 5

Picture – Panel External



Picture – Panel Internal



General Comments:

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: _____
Processor: _____
Communications: _____
Accessories: _____
Redundant Processors: _____

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

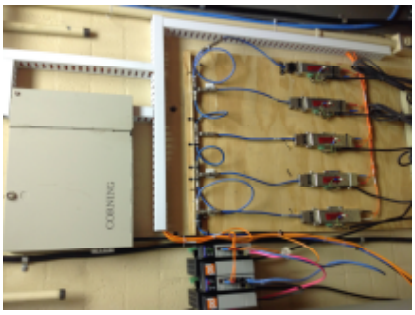
Facility: Waste Water Campus
Equipment Location: PCC
Equipment Name: RTU Network Panel
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: _____
Cabinet Location: PCC
Process(es) Served: Multiple
Panel Dimensions: _____
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date: _____
Condition*: **4** out of 5

Picture – Panel External



Picture – Panel Internal

General Comments:

This is a recently "remade" panel for securing the Serial/BNC connections to the SY/MAX PLC controllers to the OPC Gateway PC's

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

Controller Model : _____

Component Models

Enclosure
Model Number: _____
NEMA: _____
Mounting: _____
Thermal Management: _____
Accessories: _____
Side Panels: _____

PLC
Manufacturer: _____
Processor: _____
Communications: _____
Accessories: _____
Redundant Processors: N

UPS
Model: _____
Size: _____
Communication: _____
Condition*: out of 5

Components
Circuit Breaker: _____
SPD: _____
Relays: _____
HMI/OIT: _____
Ethernet: _____
Radio: _____
DC Power Supply: _____
Switches: _____
Amount of I/O: _____
Other: _____

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location:
Equipment Name: RTU 2
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID:
Cabinet Location:
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model:
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

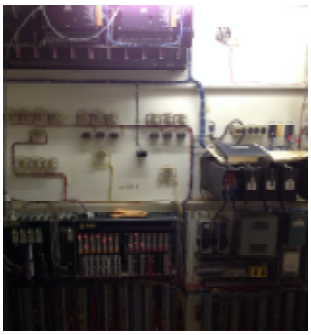
Facility: Waste Water Campus
Equipment Location: North Area Control Center
Equipment Name: RTU 5
Discipline: Electrical / Instrumentation

Equipment Information

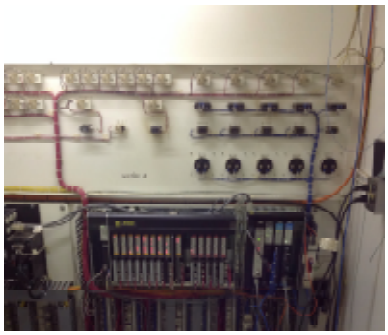
Cabinet ID: RTU 5
Cabinet Location: North Area CC
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External



Picture – Panel Internal



General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model:
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Interstage PS
Equipment Name: RTU 6
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: LCP-P
Cabinet Location: Interstage PS
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **4** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model: None Seen
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Main Electrical Bldg
Equipment Name: RTU 9
Discipline: Electrical / Instrumentation

Equipment Information

Cabinet ID: RTU-9
Cabinet Location:
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **5** out of 5

Picture – Panel External

Picture – Panel Internal

General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA:
Mounting:
Thermal Management:
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: sy/max 400
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model: Best ME
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

City of Oxnard WWTP
Condition Assessment Form

Facility: Waste Water Campus
Equipment Location: Gallery
Equipment Name: RTU 4
Discipline: Electrical / Instrumentation

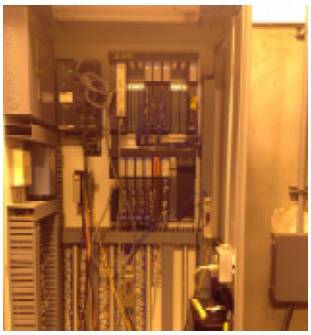
Equipment Information

Cabinet ID: RTU-4
Cabinet Location:
Process(es) Served:
Panel Dimensions:
GPS Location:

Inspection Date: 8/6/2014
Inspection By: K. Pepler
Install Date:
Condition*: **4** out of 5

Picture – Panel External

Picture – Panel Internal



General Comments:

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

Controller Model : SquareD SY/MAX

Component Models

Enclosure
Model Number:
NEMA: 4X
Mounting: Floor Mount
Thermal Management: FA
Accessories:
Side Panels:

PLC
Manufacturer: SquareD
Processor: SY/MAX
Communications: SY/COMM
Accessories:
Redundant Processors: N

UPS
Model:
Size:
Communication:
Condition*: out of 5

Components
Circuit Breaker:
SPD:
Relays:
HMI/OIT:
Ethernet:
Radio:
DC Power Supply:
Switches:
Amount of I/O:
Other:

APPENDIX B – PLC LIFECYCLES

Date

Address

Dear Schneider Electric Customer:

At Schneider Electric, we recognize that you have a lot of resources, knowledge and intellectual property invested in your Schneider Electric SY/MAX™ PLC applications. Because of this, we have continued to provide you with new SY/MAX PLC modules to help you protect your investment. We find ourselves in a situation where it is becoming increasingly difficult to secure the components required to maintain this level of support.

The End of Commercialization (EOC) of the SY/MAX PLC product offer will occur on 30 July 2014. End of Service (EOS) is scheduled for 30 July 2022. Last Buy is 31 March 2014. In the event that certain components become unavailable more quickly than anticipated, we will not be able to maintain the planned EOC or EOS dates for any module that requires the components that are no longer available. We are making this announcement now to provide you with ample time to determine how best to manage your application.

It is important to know that we offer several tools to minimize the impact of upgrading your applications. We can provide mounting plates that will allow you to mount new Modicon™ Quantum™ PLCs in the cabinet using the same mounting holes that were already drilled for the SY/MAX PLC. We also offer Quick Wiring Adapters that let you move your field wiring terminal from the SY/MAX I/O module directly to the new Quantum I/O modules. By using the same terminal strips and wiring used to connect to your existing SY/MAX I/O, you can reduce your down time for the upgrade and the potential for wiring errors considerably. The commissioning of the upgrade will take much less time.

We can also convert your existing application directly into Unity™ Pro IEC ladder logic. The converted program will look and operate very much the same as before. This will reduce the amount of time and effort required for your people to get up to speed on the new application software program. This conversion service uses a proprietary conversion utility to greatly reduce the time taken to convert your PLC logic versus manual methods.

We help you manage your budget, productivity and profitability during the upgrade by offering options in how to perform the upgrade. You could change everything at the same time. You would experience only one period of scheduled down time to do this. When complete, you would have a new application that would allow you to take advantage of all the new technology available in our newest Modicon Quantum PLCs to help you improve your operating efficiency

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You could also schedule your upgrade to be completed in phases. This would allow you to manage your budget and minimize the down time during each phase of the upgrade process. This approach is especially helpful if you have limited time for regular maintenance outages.. The same tools still apply. The new Modicon Quantum PLC can manage both the Quantum I/O and any SY/MAX I/O remaining in your application. In either scenario, our goal is to help you minimize the business impact of performing an upgrade.

If you have any questions, you should contact your Schneider Electric authorized Distributor or your Schneider Electric Industry Business Account Manager or Application Engineer.

Sincerely,

Schneider Electric Representative

Brochure: “Boost your productivity by upgrading your SQD Sy/MAX PLCs”

http://static.schneider-electric.us/docs/Automation%20Products/SYMAX%20Programmable%20Controller/8000BR1259_US_Symax%20Upgrade%20BR.pdf

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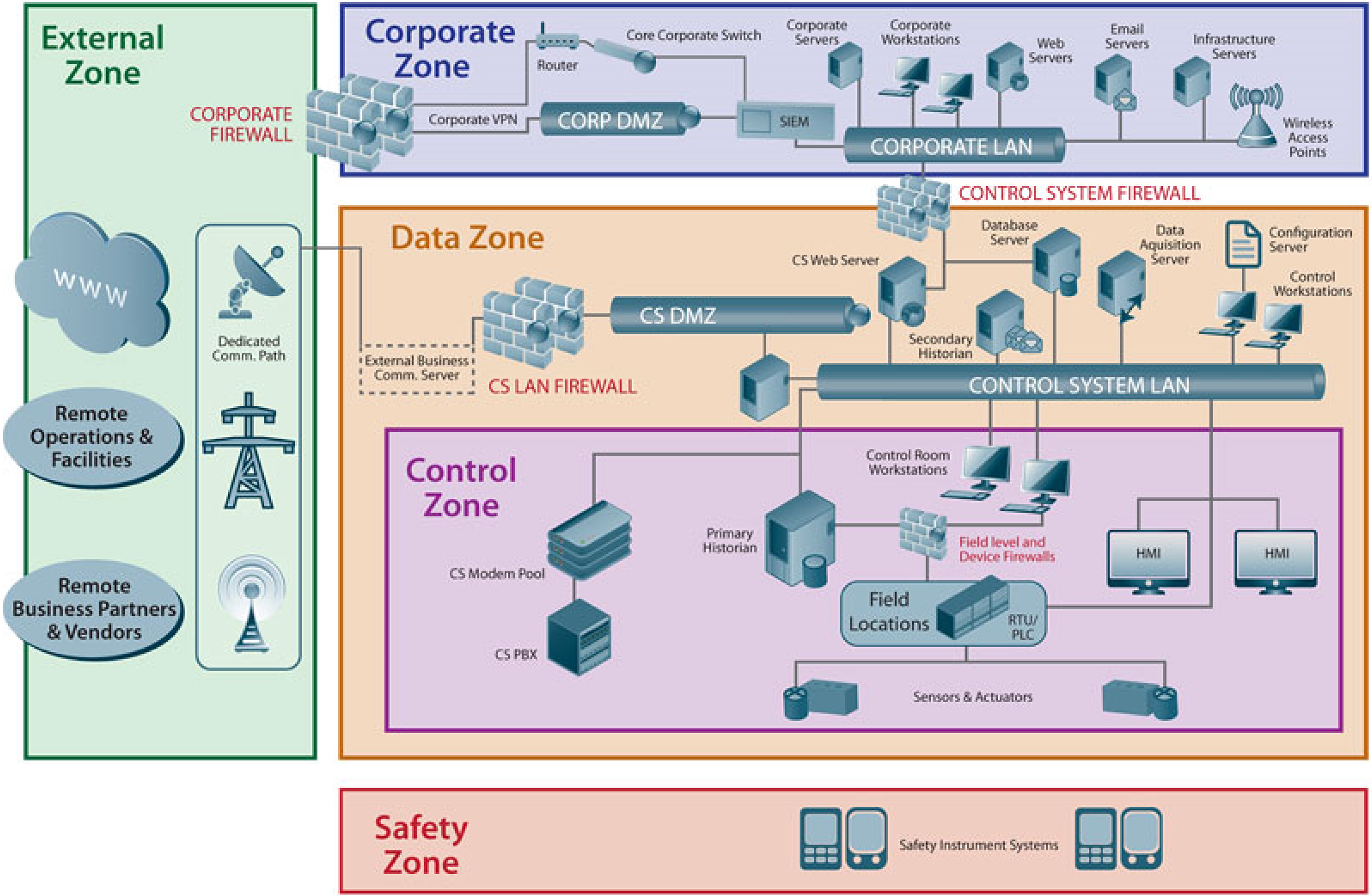
APPENDIX C - ICS NETWORK ARCHITECTURE


External Zone
CORPORATE FIREWALL
WWW
Dedicated Comm. Path
Remote Operations & Facilities
Remote Business Partners & Vendors
Corporate Zone
Router
Core Corporate Switch
Corporate Servers
Corporate Workstations
Web Servers
Email Servers
Infrastructure Servers
Corporate VPN
CORP DMZ
SIEM
CORPORATE LAN
Wireless Access Points
CONTROL SYSTEM FIREWALL
Data Zone
Database Server
Data Aquisition Server
Configuration Server
CS Web Server
Control Workstations
CS DMZ
Secondary Historian
External Business Comm. Server
CS LAN FIREWALL
CONTROL SYSTEM LAN
Control Zone
Control Room Workstations
Primary Historian
Field level and Device Firewalls
HMI
HMI
CS Modem Pool
Field Locations
RTU/ PLC
CS PBX
Sensors & Actuators
Safety Zone
Safety Instrument Systems