CITY OF ANACORTES WATER TREATMENT PLANT CRITICAL ALARM TESTING

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Operations Supervisor

ANACORTES WATER TREATMENT PLANT

OVERVIEW OF OUR OPERATION

- Regional Water Facility that provides water to approximately 57,000 People
- Staffed 24/7
- Treats on Average 20 MGD
- Operations Staff of 4 Operators, 2 Relief/Maintenance Operators, 1 Maintenance Worker, and 1 Instrument Technician

TREATMENT PROCESS

- Ballasted Sedimentation
- Filtration
- Chlorine Gas Disinfection
- Fluoridation (Within City Limits)

WHY WOULD YOU TEST YOUR ALARMS?

Control Systems Fail

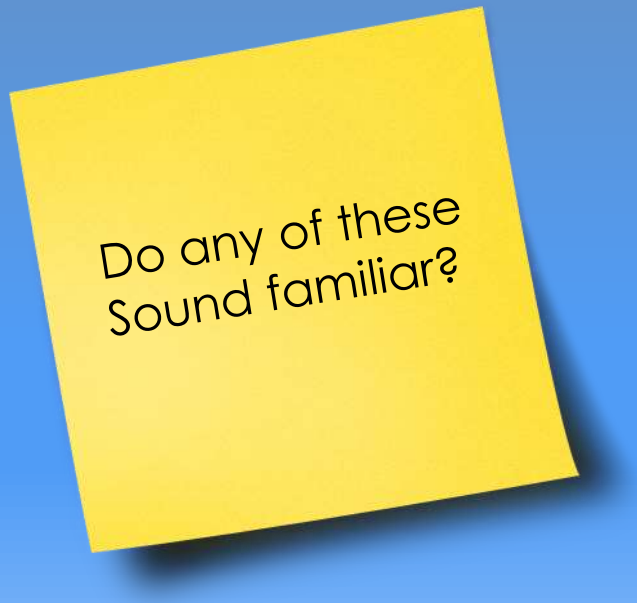
Alarm Setpoints get changed for various reasons.

Equipment doesn't last forever

People do make mistakes

THINGS WE HAVE FOUND IN OUR FACILITY

- No alarms on critical processes
- Inappropriate set points
- Alarms disabled during maintenance or repair
- Alarms not functioning
- Monitoring equipment off-line/not functioning
- Monitoring equipment not calibrated with SCADA



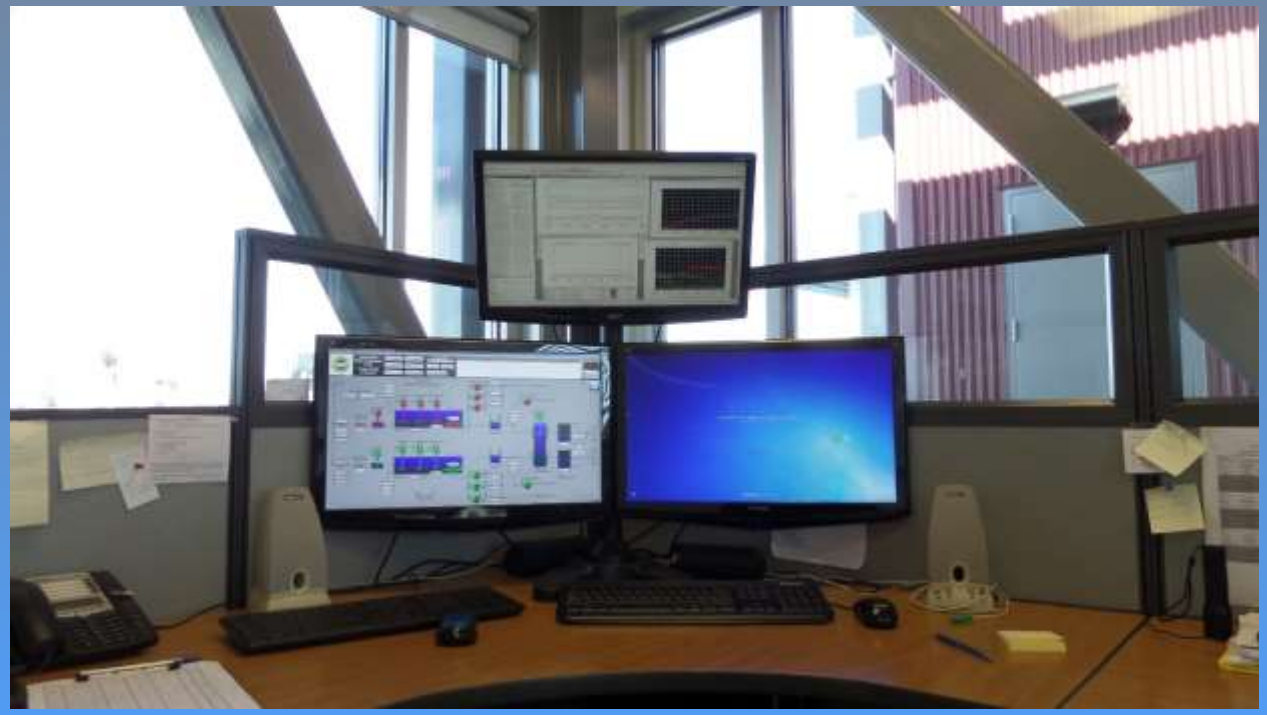
DEVELOPING A TESTING PROGRAM

- Identify processes that poses an immediate risk to public health or safety
  - Examples Include:
    - Coagulation
    - Filtration
    - Disinfection
    - pH Adjustment
    - Site specific safety gas detectors

DEVELOPING A TESTING PROGRAM

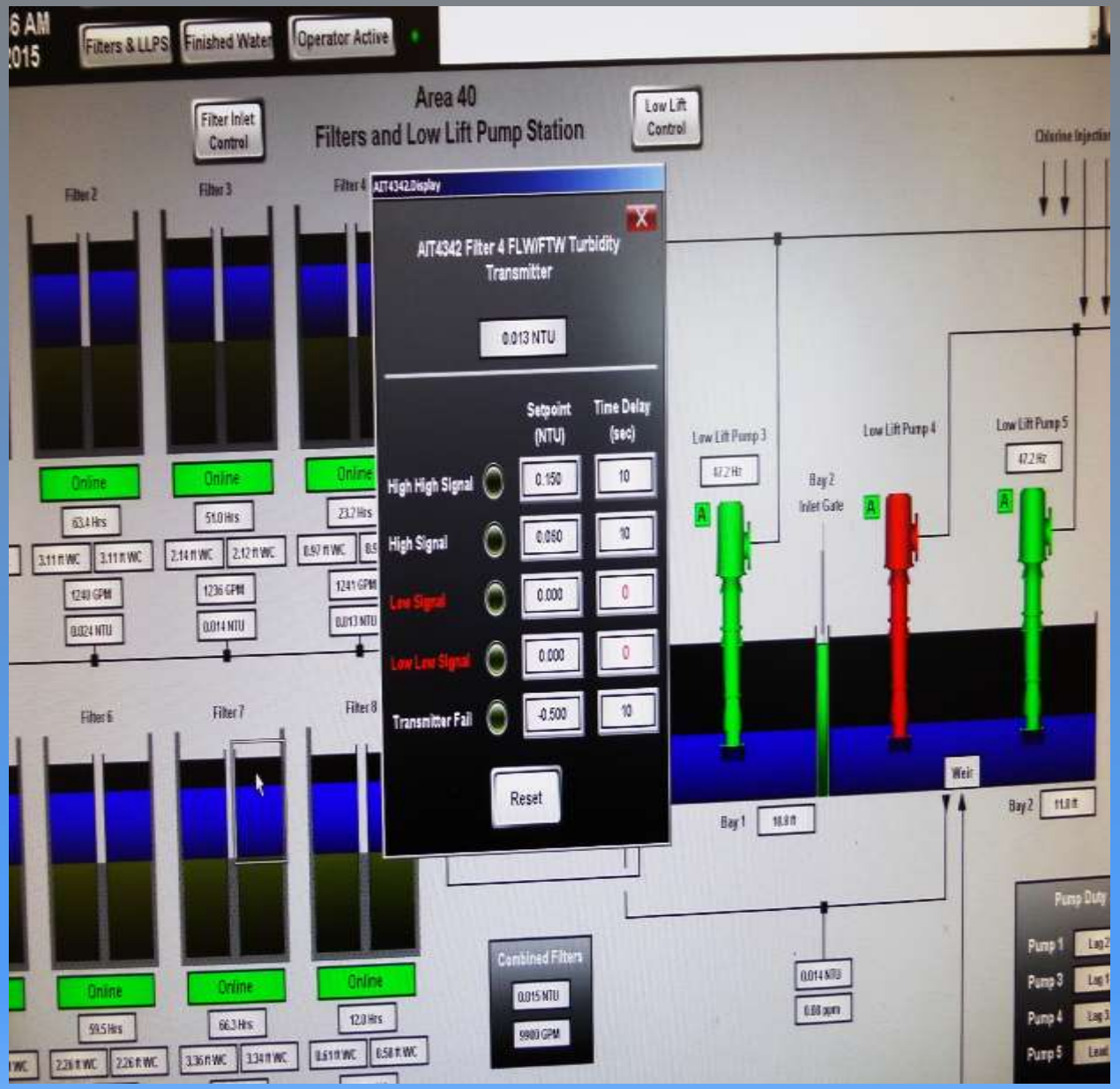
Identify the critical alarms you need to test

- Turbidity
- Chlorine Residual
- pH
- Level Control
- Safety Alarms



DEVELOPING A TESTING PROGRAM

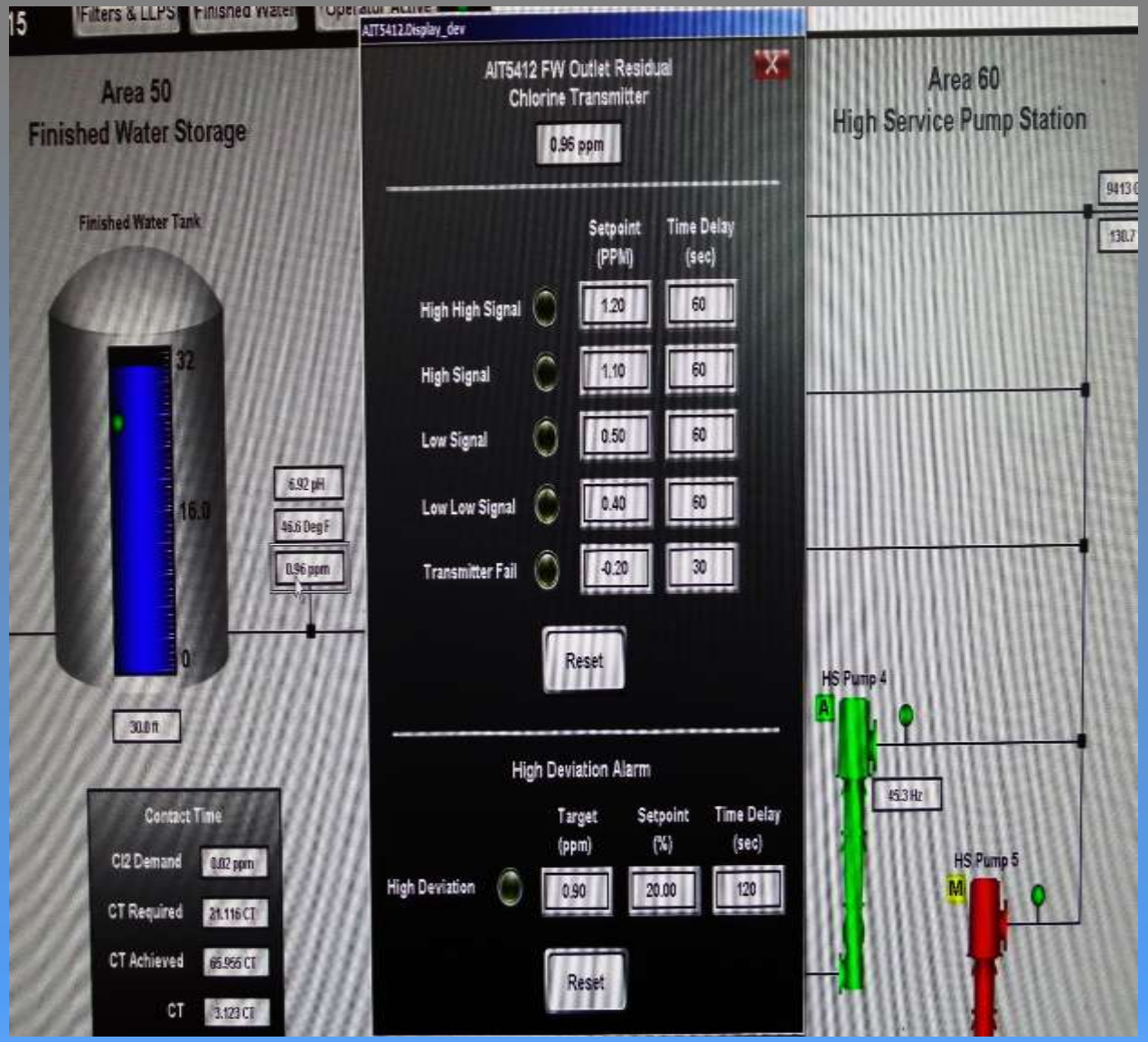
- Establish Alarm Limits for each process
  - Avoid a violation
  - Specific to each facility
- Communicate with staff on the limits that have been established
- Train Staff on how to respond to each alarm.
- Develop a testing schedule that meets the needs of your facility



TYPICAL ALARM LIMITS (EXAMPLE)

Limits will be specific to each plant process

City of Anacortes Filter Effluent Turbidity Setpoints		
Low:	0.000	
High	0.080	10 Seconds
High High	0.150	10 Seconds



TYPICAL ALARM LIMITS (EXAMPLE)

Limits will be specific to each plant process

City of Anacortes Finished Water Chlorine Setpoints		
High High	1.20	60 Seconds
High	1.10	60 Seconds
Low	0.50	60 Seconds
Low Low	0.40	60 Seconds
Fail	-0.20	30 Seconds

Work Order Number
1109.01

Work Order

Anacortes WTP

Date Scheduled	3/18/2015	**Date Completed**
Date Delinquent		
Date Last Completed	1/21/2015	_____
Date Printed	3/18/2015	

Equipment No Filters #1-#8 & LLPS Turbidity Anazlyers Filters #1-#8 & LLPS Turbidity Anazlyers

Location Treatment Building

Sub Location Filter Pipe Gallery

Task Description Filter Turbidimeter Critical Alarm Testing

Task Instructions

Note: Use appropriate calibration cylinder when completing this procedure
1. Notify operator prior to performing a test of the alarm.
2. Operator needs to document in E-log and on the trends when the test is taking place and when it is completed for each filter.
3. Fill the calibration cylinder using a 800 mNTU Std. Part number 2788453. This will generate a 0.800 NTU approximately standard.
4. Follow the on-screen instructions to place the turbidity analyzer in the "Hold Outputs" mode.
5. Transfer the turbidity head unit to the calibration cylinder.
6. Follow the on-screen instructions to place the turbidity analyzer in the "Release" mode. The reading will flash on the display until the outputs are released and the signal is live.
7. Verify that the turbidimeter reacts to the standard.
8. Verify with the operator that an alarm was received and the values displayed locally match the PLC readings.
9. Return analyzer to service. Verify proper flow through the analyzer.
10. Notify Supervisor and create a CAS if the turbidimeter did not function properly or an alarm was not generated on the PLC.

Mark date completed: Hold / Release

Filter 1 Turbidity Analyzer AIT-4312: _____ _____/_____

Filter 2 Turbidity Analyzer AIT-4322: _____ _____/_____

TAKING IT BEYOND TESTING

- Calibration Procedures and Schedule
- Preventive Maintenance Schedule for Process Analyzers
- Routine Verification of Process Analyzers

PROCESS ANALYZER CALIBRATION DATA RECORD

LOOP INFORMATION

Building/Location: HSPS Building

Service: Post FW Residual Chlorine

INSTRUMENT INFORMATION

Instrument Tag (Per P&ID): AIT-5412

MFG: Rosemount	Model:
S/N:	

cceptable Instrument Tolerance +/- .1 or 15%

eason for Calibration: ☐ PM ☐ Corrective Action ☐ Other ☐ New Installation

PROCESS ANALYZER

nput Range to Device (*Applied*) _____ Output Range from Device/PLC (*Expected*) _____

INPUT		RESULT		
PERCENT	APPLIED	AS FOUND	DEVIATION	AS LEFT
LRV				
URV				

TEST pH INFORMATION

VENDOR	CONCENTRATION	EXP. DATE

Comments:
Cl2: Field grab was 1.01 and online analyzer was 0.87; acceptable tolerance 0.91-1.11 (+/-.1); standardized to field grab.

heck the physical condition of the transmitter and its components (display, body, valves, conduit, etc.)
Vrite a work order notification to repair or replace any components that are not working properly.

lotification Number_____ Date_____

CALIBRATION DATA RECORD
EXAMPLE

PROCESS ANALYZER CALIBRATION DATA RECORD

LOOP INFORMATION	
Building/Location: HSPS Building	
Service: Post FW pH	
INSTRUMENT INFORMATION	
Instrument Tag (Per P&ID): AIT-	
MFG: Rosemount	Model:
S/N:	

Acceptable Instrument Tolerance +/- 2%

Reason for Calibration: ☐ PM ☐ Corrective Action ☐ Other ☐ New Installation

PROCESS ANALYZER

Input Range to Device (*Applied*) _____ Output Range from Device/PLC (*Expected*) _____

INPUT		RESULT		
PERCENT	**APPLIED**	**AS FOUND**	**DEVIATION**	**AS LEFT**
LRV	4.01 pH	4.36 pH		4.01 pH
URV	7.01 pH	7.31 pH		7.01 pH

TEST pH INFORMATION

VENDOR	CONCENTRATION	EXP. DATE

Comments:

pH: Reset analyzer. Calibrated with buffers then standardized. AF was 6.90 and AL was 6.80 (lab grab). Offset was -20mV.

Check the physical condition of the transmitter and its components (display, body, valves, conduit, etc.). Write a work order notification to repair or replace any components that are not working properly.

Notification Number_____ Date_____

CALIBRATION DATA RECORD EXAMPLE

Example of Turbidimeter Verifications

Turb Verificatons **January 02, 2015** S/N: A560 Ice Pick: 4948

#1 .043 .044 Good Hold: 1144 Release: 1152 500mL/min	#2 .055 .058 Good Hold: 1139 Release: 1152 425mL/min	#3 .045 .048 Good Hold: 1134 Release: 1151 500mL/min	#4 .051 .052 Good Hold: 1128 Release: 1151 420mL/min
#5 .044 .044 Good Hold: 1123 Release: 1150 400mL/min	#6 .049 .048 Good Hold: 1118 Release: 1150 500mL/min	#7 .043 .045 Good Hold: 1112 Release: 1149 400mL/min	#8 .047 .049 Good Hold: 1006 Release: 1148 400mL/min
Comb. .045 .045 Good Hold: 1245 Release: 1313 540mL/min	Set#1 1.162 1.078 Good Hold: 1017 Release: 1026 575mL/min	Set#2 .865 .860 Good Hold: 1022 Release: 1027 520mL/min	Project 1.135 1.091 Good Hold: 1030 Release: 1036 400mL/min

SUMMARY

- Identify your critical processes within your facility
- Establish appropriate setpoints with safety margins
- Develop a routine alarm testing schedule
- Develop SOP's for your testing your alarms.
- Put it all together in a written plan.

CONTACT INFORMATION

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