

CMMS & SCADA

Condition-based maintenance

SCADA Intro

CMMS Intro

CMMS & SCADA

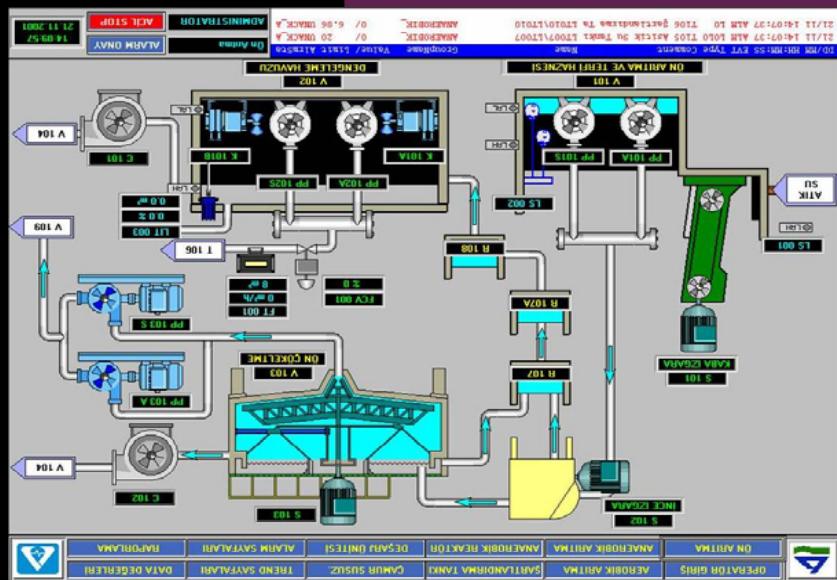
SCADA/CMMS Interfaces

Real-World Applications

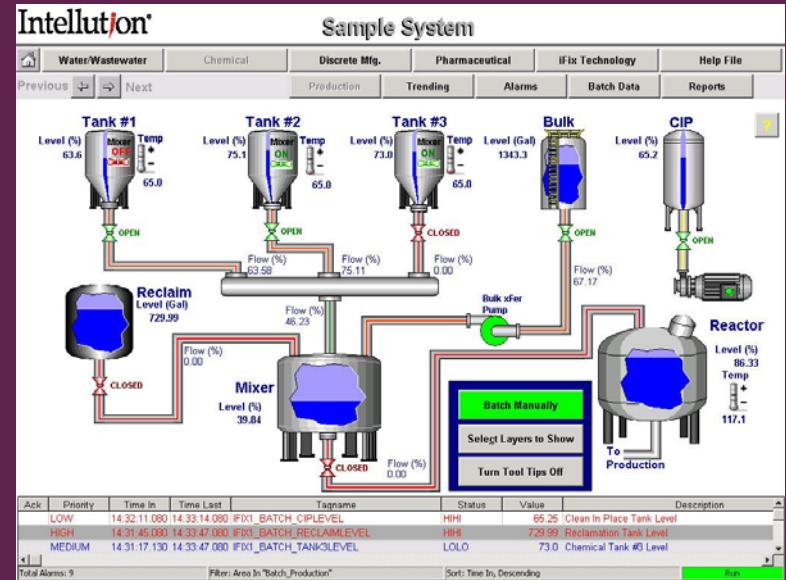
SCADA Intro

SCADA- *Supervisory Control And Data Acquisition*

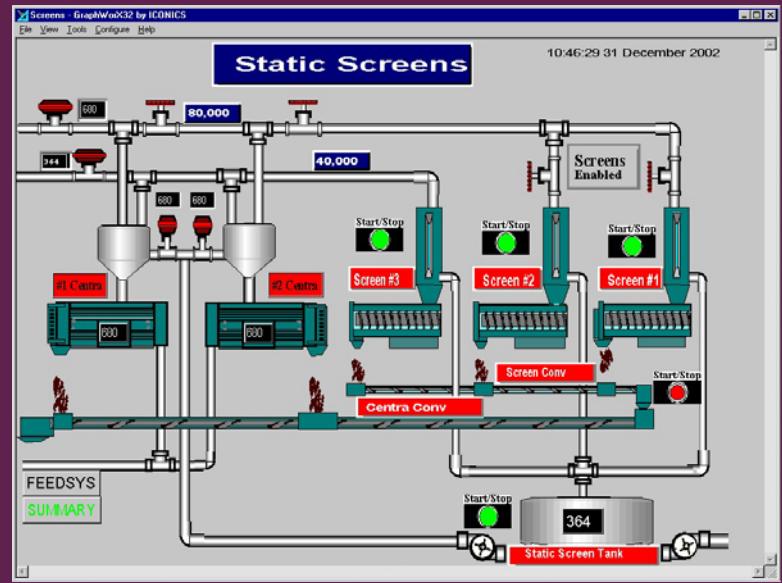
A system that collects data from various sensors at plant and sends this data to a central computer to interpret.



Wonderware InTouch

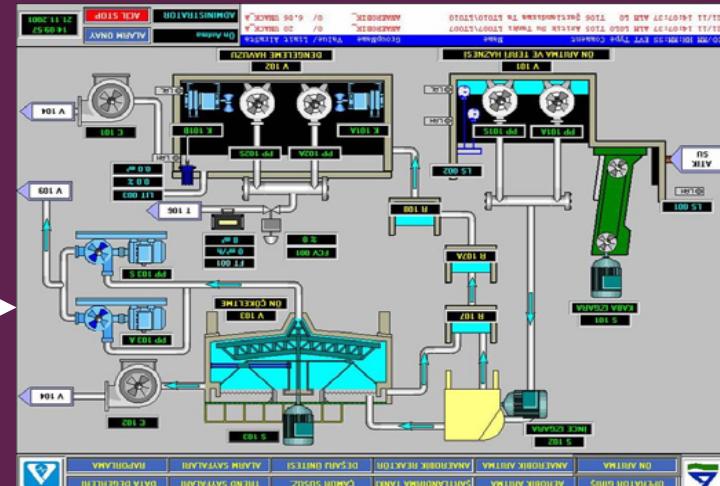


GE Intellution/ ifix



Allen-Bradley RS View

SCADA Intro



- A programmable logic controller (PLC) is communicating with a pump's flow meter.
- A SCADA system acts as an HMI (Human machine interface), allowing operators to view and change flow meter settings via the PLC



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT

Reverse Osmosis Unit No 1

System Reset

11/2/2006
11:10:12 AM

Process Index

Plant Data Overview

Alarm Summary

Login

Trends

Back

Go to:
RO Unit No 2

RO Unit No 1
ControlsRO Skid - Well
MatrixRuntimes
& Hours

Flow Totals

Flow Totals

1

0 GPM
Stage 1 Flow

0 GPM
Stage 2 Flow

0 GPM
Total Permeate Flow

0 GPM
Concentrate Flow

PERMEATE TO
DEGASIFIER

0.0
Recovery %

0.0
Salt Removal %

109.6 umhos
Permeate Conductivity

3760 umhos
Concentrate Conductivity

HOA: Auto
Stopped
0.0 %

HOA: Auto
Closed
0.0 %

HOA: Auto
Closed
0.0 %

HOA: Auto
Closed
0.0 %

HPP #1

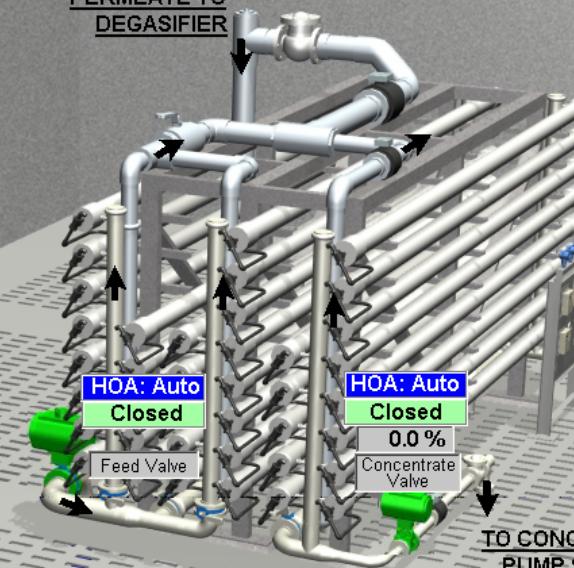
3 GPM
Feed Water Flow

6.4 PSI
Feed Water Suction Pressure

High High Pressure
Low Pressure

Low HPP Suction Pressure

FROM RO FEED
WATER FILTERS



TO CONCENTRATE
PUMP STATION

15.2 PSI
Feed Pressure

15.8 PSI
Stage 2 Pressure

15.3 PSI
Concent. Press.

11.0 PSI
Permeate Press.

0.0 PSI
Stage 1 DP

0.7 PSI
Stage 2 DP

Ack	Date In	Time In	Tagname	Description	Status	Value	Area	Node	Priority
11/2/2006	10:21:01.125	PB_RO_BLN_PH_AIT1006_LL_ALM	RO Blended Water Low Low pH	CFN	ALARM	ROPLANT2	PBROSC	LOW	
11/2/2006	10:20:46.125	PB_RO_BLN_PH_AIT1006_LO_ALM	RO Blended Water Low pH	CFN	ALARM	ROPLANT2	PBROSC	LOW	
11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN	ALARM	ROPLANT2	PBROSC	LOW	
11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN	ALARM	ROPLANT2	PBROSC	LOW	



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT Sulfuric Acid Feed System

System Reset

11/2/2006
11:15:42 AM

Process
Index

Plant Data
Overview

Alarm
Summary

Login

Trends

Back

Runtimes
& Hours

3.7
Blended pH

7.3
Feed pH

Degasifiers
Transfer Pumps

TO BLENDED
WATER INJ.
(P3 & P4)

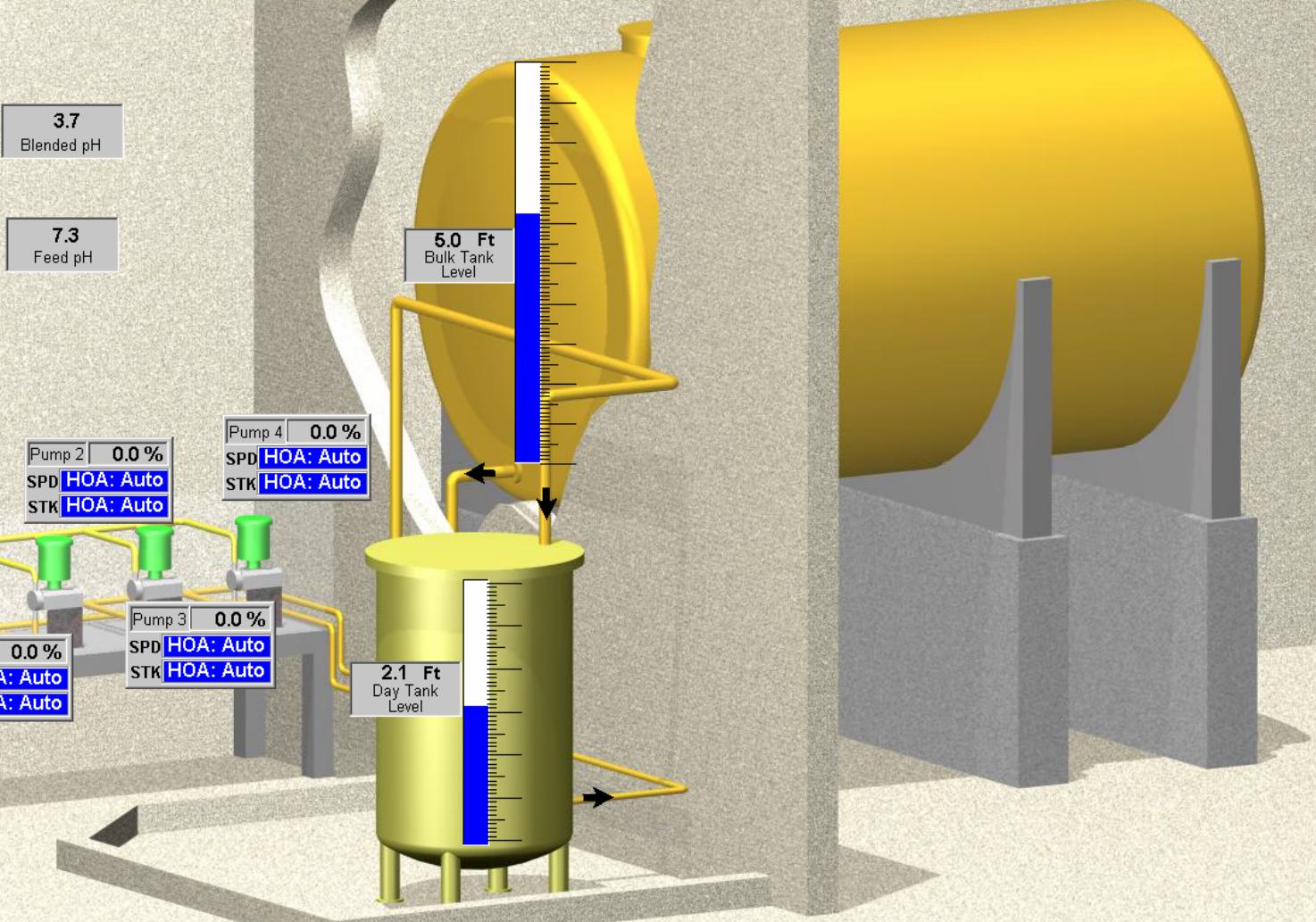
Pump 2 0.0 %
SPD HOA: Auto
STK HOA: Auto

TO FEED H2O
INJECT.
(P1 & P2)

Pump 1 0.0 %
SPD HOA: Auto
STK HOA: Auto

2.1 Ft
Day Tank Level

RO Unit No. 1
RO Unit No. 2



Ack	Date In	Time In	Tagname	Description	Status	Value	Area	Node	Priority
	11/2/2006	10:21:01.125	PB_RO_BLN_PH_AIT1006_LL_ALM	RO Blended Water Low Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:20:46.125	PB_RO_BLN_PH_AIT1006_LO_ALM	RO Blended Water Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN		ROPLANT2	PBROSC	LOW



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT

Air Blowers

System Reset

11/2/2006
11:10:55 AM

Process
Index

Plant Data
Overview

Alarm
Summary

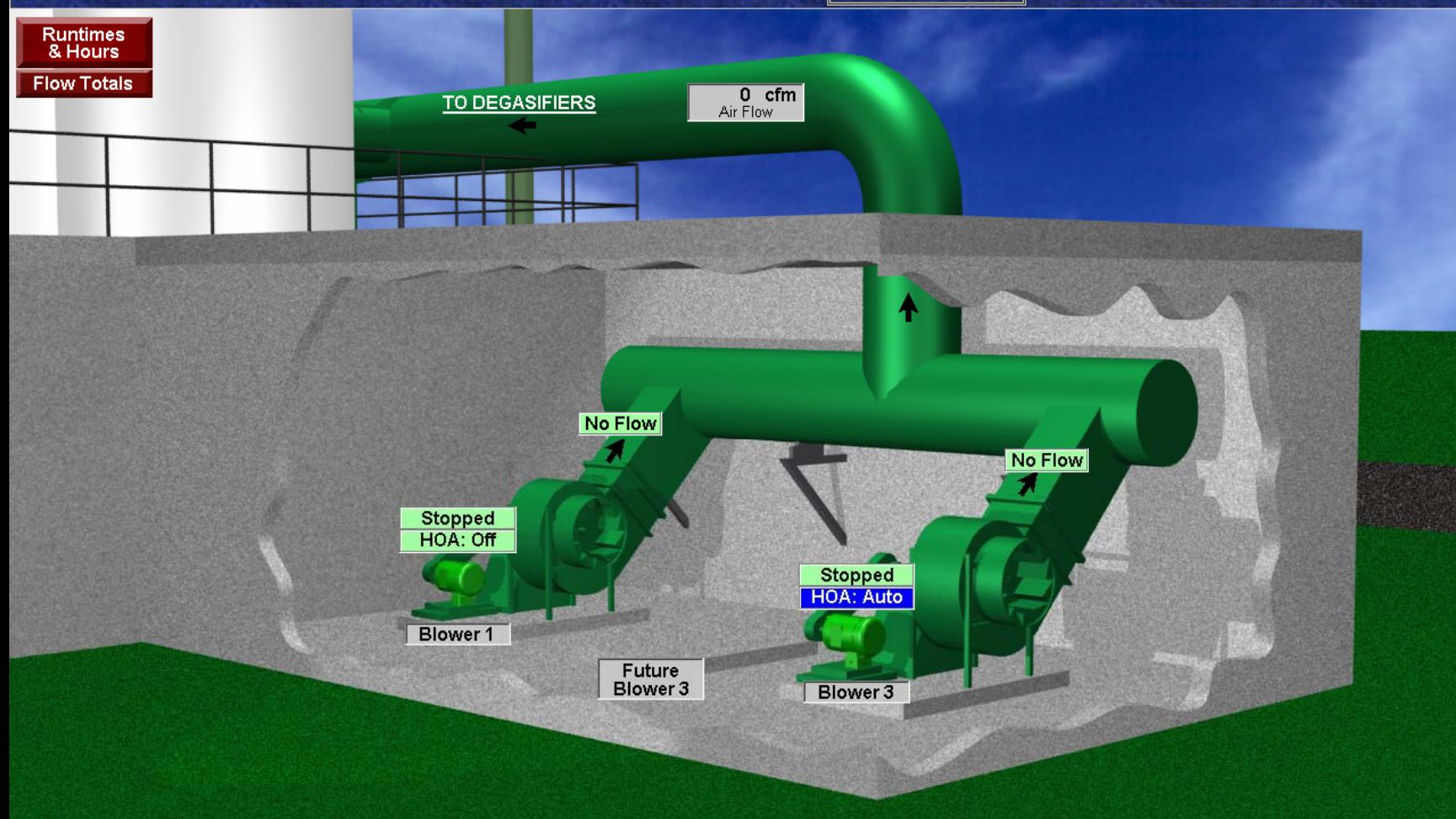
Login

Trends

Back

Runtimes
& Hours

Flow Totals



Ack	Date In	Time In	Tagname	Description	Status	Value	Area	Node	Priority
	11/2/2006	10:21:01.125	PB_RO_BLN_PH_AI1006_LL_ALM	RO Blended Water Low Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:20:46.125	PB_RO_BLN_PH_AI1006_LO_ALM	RO Blended Water Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN		ROPLANT2	PBROSC	LOW



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT Degasifier & Odor Control Scrubbers

System Reset

11/2/2006
11:11:23 AM

Process
Index

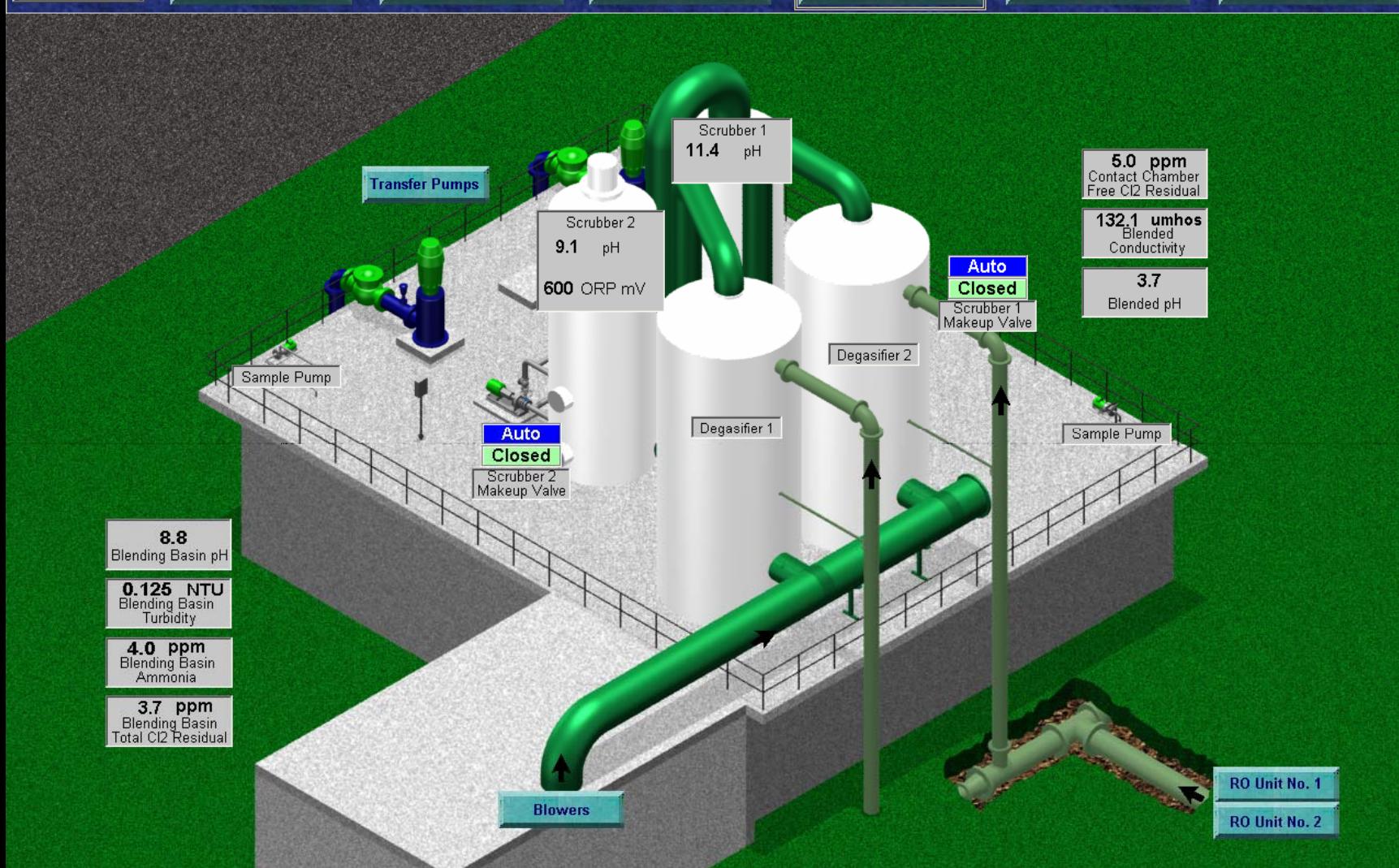
Plant Data
Overview

Alarm
Summary

Login

Trends

Back



Ack	Date In	Time In	TagName	Description	Status	Value	Area	Node	Priority
	11/2/2006	10:21:01.125	PB_RO_BLN_PH_AIT1006_LL_ALM	RO Blended Water Low Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:20:46.125	PB_RO_BLN_PH_AIT1006_LO_ALM	RO Blended Water Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN		ROPLANT2	PBROSC	LOW



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT

Antiscalant Feed System

System Reset

11/2/2006
11:14:46 AM

Process
Index

Plant Data
Overview

Alarm
Summary

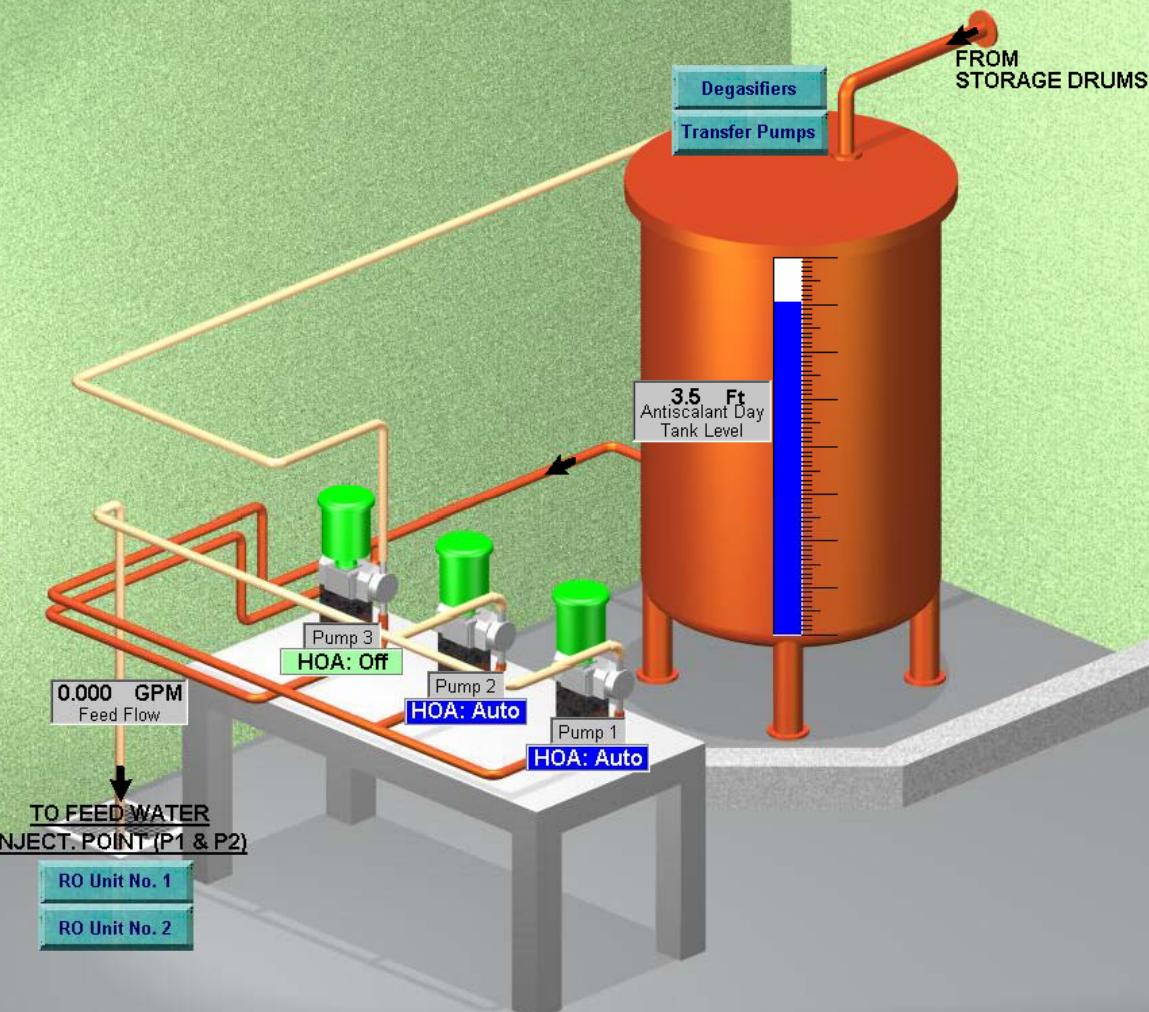
Login

Trends

Back

Runtimes
& Hours

Flow Totals



Ack	Date In	Time In	Tagname	Description	Status	Value	Area	Node	Priority
	11/2/2006	10:21:01.125	PB_RO_BLN_PH_AIT1006_LL_ALM	RO Blended Water Low Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:20:46.125	PB_RO_BLN_PH_AIT1006_LO_ALM	RO Blended Water Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN		ROPLANT2	PBROSC	LOW



Current User:
ADMINISTRATOR

PALM BAY RO WATER TREATMENT PLANT

Blend Water Filters

System Reset

11/2/2006
11:09:32 AM

Process
Index

Plant Data
Overview

Alarm
Summary

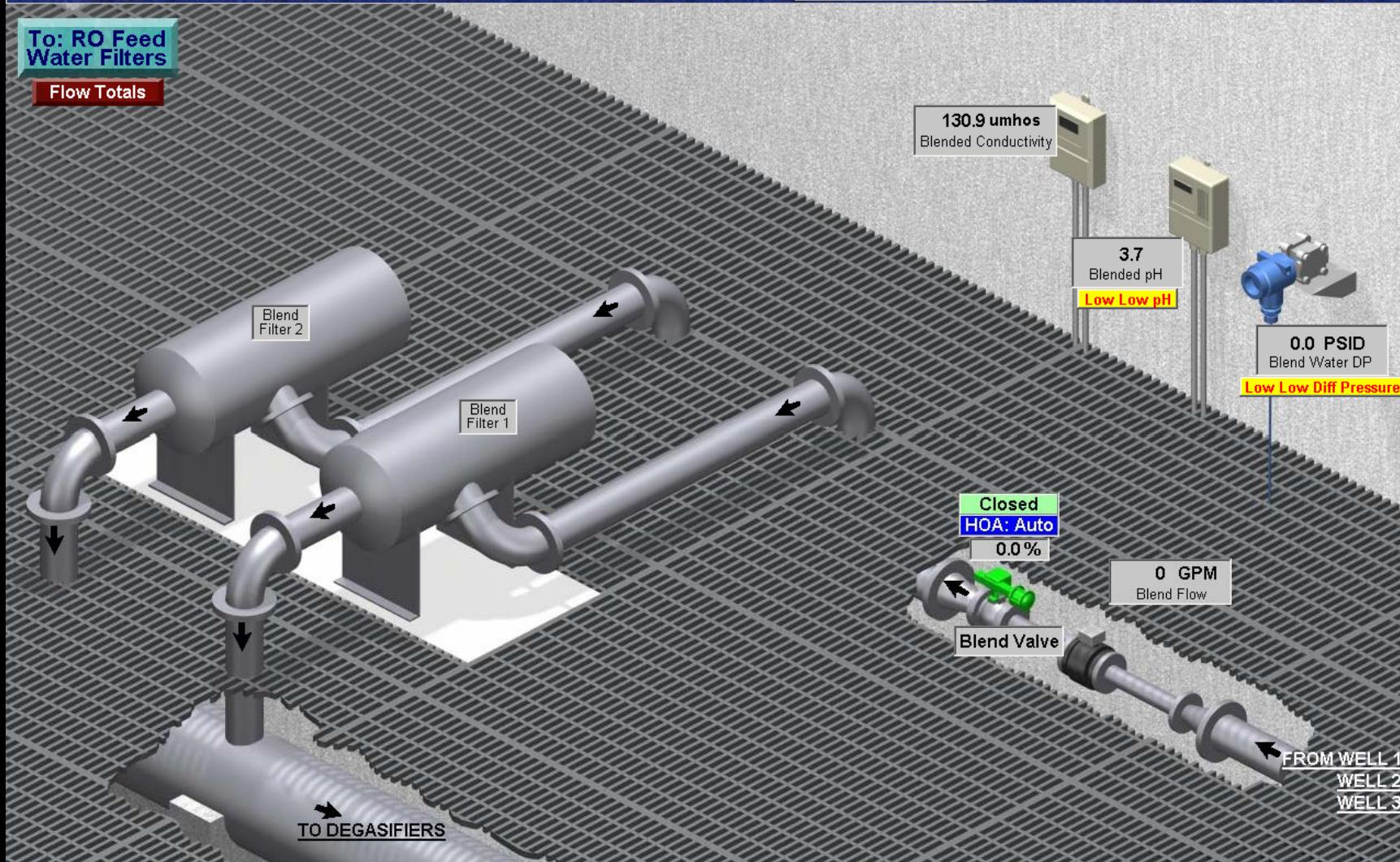
Login

Trends

Back

To: RO Feed
Water Filters

Flow Totals



Ack	Date In	Time In	Tagname	Description	Status	Value	Area	Node	Priority
	11/2/2006	10:21:01.125	PB_RO_BLN_PH_AIT1006_LL_ALM	RO Blended Water Low Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:20:46.125	PB_RO_BLN_PH_AIT1006_LO_ALM	RO Blended Water Low pH	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:42.640	PB_FD_H2O_SUC_PIT600_LO_ALM	RO Feed Water Suction Low Pressure	CFN		ROPLANT2	PBROSC	LOW
	11/2/2006	10:18:38.125	PB_FD_H2O_PDIT500_LL_ALM	RO Feed Water Low Low Diff Pressure	CFN		ROPLANT2	PBROSC	LOW

CMMS & SCADA

Condition-based maintenance

SCADA Intro

CMMS Intro

CMMS & SCADA

SCADA/CMMS Interfaces

Real-World Applications

CMMS Intro

- CMMS typically use calendar-based preventive maintenance

Location	<input type="text"/>	Sched #	<input type="text" value="346"/>		
Area	<input type="text" value="PF"/> Puritan - Fenkell CSO Basin	WO Status	<input type="text" value="1"/>		
Asset	<input type="text" value="PF-069A"/> Parent ID Float Switches	New Record			
Component	<input type="text"/>				
Main	Calendar	Miscellaneous	Skip Dates	Open WO's	Attachments
<u>Task Code</u>	<input type="text" value="FSW-PF-YRY"/>	<u>Schedule Type</u>	<input type="text" value="Fixed"/>	Manual Schedule	
<u>Interval Type</u>	<input type="text" value="Months"/>	<u>Time Interval</u>	<input type="text" value="12"/>	MM/DD	
<u>Job Type</u>	<input type="text" value="PM"/>	<u>Initialize Date</u>	<input checked="" type="text" value="5 / 20 / 2002"/>	1.	<input type="text" value="/"/>
<u>Min Days</u>	<input type="text" value="180"/>	<u>Last Release</u>	<input checked="" type="text" value="8 / 8 / 2008"/>	2.	<input type="text" value="/"/>
<u>Last Completed</u>	<input checked="" type="text" value="9 / 5 / 2008"/>	<u>Labor Group</u>	<input type="text" value="ELECT"/>	3.	<input type="text" value="/"/>
<u>Next Scheduled</u>	<input checked="" type="text" value="9 / 5 / 2009"/>	<u>Est. # of Techs.</u>	<input type="text" value="1"/>	4.	<input type="text" value="/"/>
<u>Technician</u>	<input type="text"/>	<u>Shift</u>	<input type="checkbox"/>	<u>Priority</u>	<input type="text"/>
<u>Est. Job Hours</u>	<input type="text" value="4.00"/>	<input checked="" type="checkbox"/> Activate Calendar PM		<input type="checkbox"/> Auto Close	<input type="text" value="Planning = 1"/>
<u>Overdue Days</u>	<input type="text" value="5"/>				

CMMS Intro

MAINTENANCE ITEMS	See Engine Schdl.	SERVICE TIME					
		Daily or after 8 Hours	Weekly or after 50 Hours	Monthly or after 100 Hours	6 Months or after 250 Hours	Yearly or after 500 Hours	4000 – 4500 Hours
General Genset Inspection	X ¹	X ²					
Check Coolant Heater		X					
Check Oil Level		X					
Check Coolant Level		X					
Check Fuel Level		X					
Check Charge Air Piping		X					
Check Air Cleaner (Clean if required)			X ³				
Check Battery Charging System			X				
Drain Water and Sediment from Fuel Tank			X ⁵				
Drain Exhaust Condensate Trap				X			
Check Starting Batteries				X			
Change Air Cleaner Element					X ³		
Check Radiator Hoses for Wear & Cracks					X		
Test Generator Insulation Resistance						X ⁷	
Grease generator bearing (P7)							X
Drain Fuel Filter(s)	X ¹						
Check Anti-freeze and DCA Concentration	X ¹						
Change Crankcase Oil and Filter	X ^{1, 6}						
Check Drive Belt Tension	X ¹						
Change Coolant Filter	X ¹						
Clean Crankcase Breather	X ¹						
Change Fuel Filters	X ¹						
Clean Cooling System	X ¹						

Calendar-based

Runtime-based

CMMS & SCADA

Condition-based maintenance

SCADA Intro

CMMS Intro

CMMS & SCADA

SCADA/CMMS Interfaces

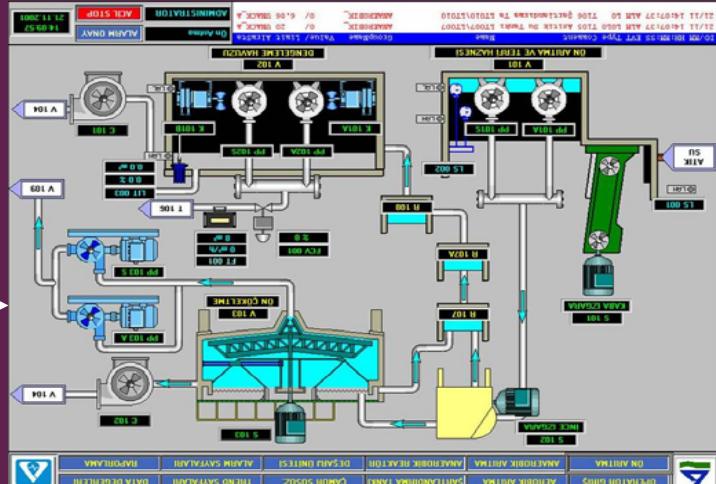
Real-World Applications

CMMS & SCADA

- SCADA software can deliver signals indicating the status of equipment or systems and corrective work orders can be raised based on the data received.

CMMS & SCADA

Flow
Meter



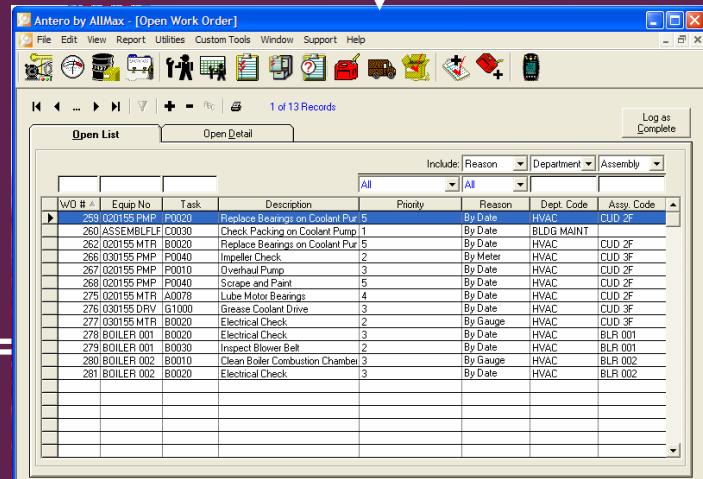
SCADA

PLC

Pump



Workers
Informed

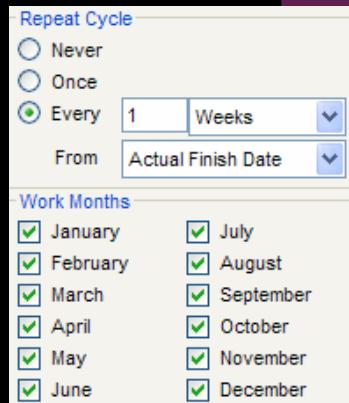


W/O #	A	Equip No.	Task	Description	Priority	Reason	Dept. Code	Assy. Code
259	020155	IMP	F0020	Replace Bearings on Coolant Pur 5	By Date	HVAC	CUD_2F	
260	ASSEMBLYLF	C0007		Check Packing on Coolant Pump 1	By Date	BLDG MAINT		
261	020155	MTR	B0024	Replace Bearings on Coolant Pur 5	By Date	HVAC	CUD_2F	
266	030155	IMP	F0040	Impeller Check	2	By Meter	HVAC	CUD_3F
267	020155	IMP	F0019	Overhaul Pump	3	By Date	HVAC	CUD_2F
268	020155	IMP	F0040	Scrape and Paint	5	By Date	HVAC	CUD_2F
275	020155	MTR	B0078	Lube Motor Bearings	4	By Date	HVAC	CUD_2F
276	020155	MTR	B0078	Brease Motor Drive	3	By Date	HVAC	CUD_3F
277	030155	MTR	B0020	Electrical Check	2	By Gauge	HVAC	CUD_3F
278	BOILER	001	B0030	Electrical Check	3	By Date	HVAC	BLR_001
279	BOILER	001	B0010	Inspect Blower Belt	2	By Date	HVAC	BLR_001
280	BOILER	002	B0010	Clean Boiler Combustion Chamber	3	By Gauge	HVAC	BLR_002
281	BOILER	002	B0020	Electrical Check	3	By Date	HVAC	BLR_002

CMMS

CMMS & SCADA

Why not rely solely on **calendar-based** preventive maintenance?



- Inadequate maintenance: A “Weekly or 50 hours” PM is generated every week- but runs 100 or more hours per week
- Wasting money: A “Weekly or 50 hours” PM is generated every week but only runs about 50 hours a year

With many integrations- alarms for high chlorine level, pump failure, high level, low flow etc. can automatically generate a CM work order.

Leading to:

- Reduction in human error
- A more standardized process
- An increase in equipment uptime
- Reduced cost in the long-run

CMMS & SCADA

Condition-based maintenance

SCADA Intro

CMMS Intro

CMMS & SCADA

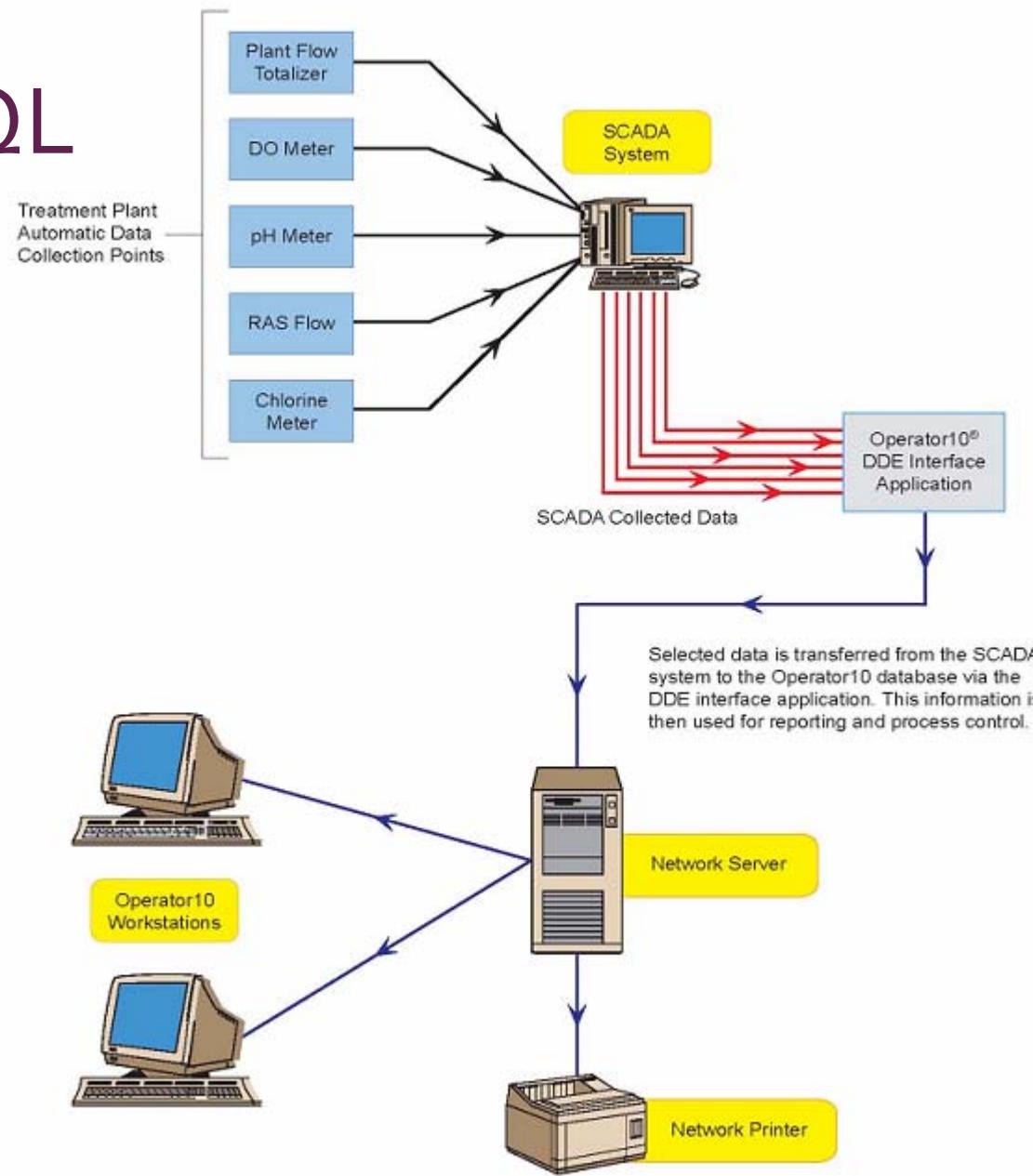
SCADA/CMMS Interfaces

Real-World Applications

SCADA/CMMS Interfaces

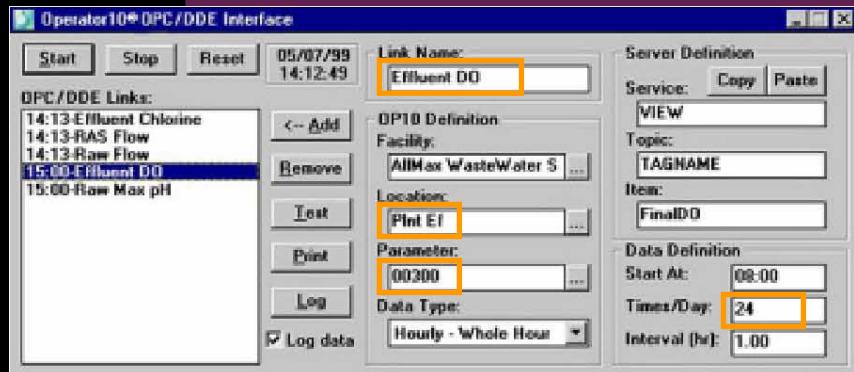
- Direct SQL link
- Manual input
- Historical data CSV interpretation

Direct SQL Link



Direct SQL link (Wonderware InTouch)

- In this example, a reading of the “Effluent DO” meter is taken 24 times per day (every hour)



Data can be exchanged with any running application that supports OPC/DDE linking using the ASCII text format.

Examples are:

Microsoft® Excel®
Microsoft Access®
Microsoft Word®
FactoryLink®
Wonderware®
InTouch®
LookOut®
Intellution Fix®
Citect®
RSLinkx®
FMT

- The readings are placed in the database location “Plnt Ef” (Plant Effluent) for parameter 00300 (Disolved Oxygen). When a reading surpasses a user-defined high or low, a work order is generated.

SCADA/CMMS Interfaces

- Direct SQL link
- Manual input
- Historical data CSV interpretation

Manual Input

1. Declare maintenance intervals

Location						Sched #	1030
Area	HS Hubble Southfield CSO Basin					WO Status	1
Asset	HS-031 Dewatering Pump #3 (DWP-3)					New Record	
Component							
Main	Levels	View	Miscellaneous	Open WO's	Attachments		
Mult.	Hours	Techs	C Days	Pri.	Shift.	Task Code	Task Description
A:	500.00	1	0			PWSM-MTY	Flushing water Strainer PM
B:	0	1,000.00	2	0		PWPM-YRY	Flushing Water Pump Motor PM
C:	0	0.00	0	0			
D:	0	0.00	0	0			
E:	0	0.00	0	0			

Manual Input

2. Perform routine inspections

Meter Readings

	Interval Total	Asset Total	Date
▶	207	508	10/2/2008
	152	301	9/2/2008
	149	149	8/2/2008

Area: HS

Asset: HS-031

Meter Name: Runtime

Asset Total: 508

Meter Total: 508

New Reading: 508.0000

Date: 10/2/2008

Old Meter Reading: 0.0000

Manual Input

3. Work order enters queue once "Asset Total" surpasses "Levels- Hours"

Meter Readings

Interval Total	Asset Total	Date
207	508	10/2/2008
152	301	9/2/2008
149	149	8/2/2008

Area: HS
Asset: HS-031
Meter Name: Runtime
Asset Total: 508
Meter Total: 508
New Reading: 508.0000
Date: 10/2/2008
Old Meter Reading: 0.0000

Buttons: Save, Restart, Close, Replaced, Edit Last Reading

Work Order Details:

Location:	Hubble Southfield CSO Basin	Sched #:	1030				
Area:	HS	WO Status:	1				
Asset:	HS-031	Dewatering Pump #3 (DWP-3)					
Component:		New Record					
Main		Levels	View	Miscellaneous	Open WO's	Attachments	
Mult.	Hours	Techs	C Days	Pri.	Shift.	Task Code	Task Description
A:	500.00	1	0			FWSM-MTY	Flushing water Strainer PM
B:	0	1.000.00	2	0		FWPM-YRY	Flushing Water Pump Motor PM
C:	0	0.00	0	0			
D:	0	0.00	0	0			
E:	0	0.00	0	0			

Manual Input

4. Work order is generated and distributed

Page 1 of 1 Printed: 10/2/2019

14365 Work Order

Area Description:	HS	Bubble Southfield CSO Basin.	Tech	PageTotal	Date
Asset Description:	HS-041	Flushing Water Pump M1 (FWP-1)			
Location:					

Schedule Number:	30
Last Assigned Date:	3/12/2019
Last Release Date:	4/29/2019
Next Scheduled Date:	3/12/2019

Task:	Flushing Water Pump Motor PM	Estimated Task Hours:	4.00
W.O. Type:	PM	Est. # Techs for Task:	1
W.O. Status:	Closed		

Labor Group:	ELECT	Technician:	
--------------	-------	-------------	--

Follow Up: Y N
Occurrences:
W.O. Status:

Clock #	Name	Date	Start	Finish	Hours	Rate

Qty	Item	Part Number	Description	Cost
	Y N			
	Y N			
	Y N			

Task Instructions: See attached file FWP.M-TRY.doc for task instructions.
W.O. Instructions:
Lockout/Tagout Instructions

SCADA with CMMS Interfaces

- Direct SQL link
- Manual input
- Historical data CSV interpretation

Historical data CSV interpretation

JOB Plus with Wonderware SCADA –

1. Intouch (by Wonderware) writes daily values to a “HistData” comma separated values (csv) file.
2. JOB Plus reads and interprets the csv file
3. JOB Plus summarizes that data based upon user-defined statistics and places summarized values into the “meter” field
4. When the “meter” field value goes beyond an upper or lower bound- a work order will be generated

Historical data CSV interpretation

Screenshot showing a Windows file explorer window and a "Touch -> Action Script" dialog box.

The file explorer window shows a list of files in the C:\Datalog directory:

Name	Size	Type	Date Modified
08010100.idx	187 KB	IDX File	1/2/2008 12:00
08010100.lgh	1,292 KB	LGH File	1/2/2008 12:00
08010200.idx	186 KB	IDX File	1/3/2008 12:00
08010200.lgh	1,293 KB	LGH File	1/3/2008 12:00
08010300.idx	182 KB	IDX File	1/4/2008 12:00
08010300.lgh	1,264 KB	LGH File	1/4/2008 12:00
08010400.idx	181 KB	IDX File	1/5/2008 12:00
08010400.lgh	1,244 KB	LGH File	1/5/2008 12:00
08010500.idx	175 KB	IDX File	1/6/2008 12:00
08010500.lgh	1,227 KB	LGH File	1/6/2008 12:00
08010600.idx	184 KB	IDX File	1/7/2008 12:00
08010600.lgh	1,281 KB	LGH File	1/7/2008 12:00
08010700.idx	177 KB	IDX File	1/8/2008 12:00
08010700.lgh	1,224 KB	LGH File	1/8/2008 12:00
08010800.idx	204 KB	IDX File	1/9/2008 12:00
08010800.lgh	1,404 KB	LGH File	1/9/2008 12:00
08010900.idx	207 KB	IDX File	1/10/2008 12:00
08010900.lgh	1,386 KB	LGH File	1/10/2008 12:00
08011000.idx	197 KB	IDX File	1/11/2008 12:00
08011000.lgh	1,362 KB	LGH File	1/11/2008 12:00
08011100.idx	182 KB	IDX File	1/12/2008 12:00
08011100.lgh	1,296 KB	LGH File	1/12/2008 12:00
08011200.idx	181 KB	IDX File	1/13/2008 12:00
08011200.lgh	1,289 KB	LGH File	1/13/2008 12:00
08011300.idx	175 KB	IDX File	1/14/2008 12:00

25 objects

The "Touch -> Action Script" dialog box contains the following script:

```
HDWDataDir = "C:\LogData"; [LogData is the directory where the log files reside]
HDWDBDir = "C:\Program Files\FactorySuite\InTouch\MyApp"; (MyApp is the application directory)
HDWStartDate = "05/22/01";
HDWStartTime = "12:28:00";
HDWDuration = "1h";
HDWInterval = "1m";
HDWFilename = "C:\MyDocuments\H1.csv";
HDWTags = "$date,$time,Tag1,Tag12,Tag3,Tag4,Tag5";
```

If the HDWTags tag exceeds 131 characters you can append more tags using the HDWTags1 tagname. For example:

Script editor buttons:

IF	ELSE	AND	<	<=	=	<>	>=	>
THEN	ELSE IF	OR	=	+	-	*	/	;
ENDIF		NOT						

Buttons on the right side of the dialog:

- OK
- Cancel
- Convert
- Validate
- Functions
 - All...
 - String...
 - Math...
 - System...
 - Add-ons...
 - Misc...
 - Quick...
 - Help...
- InTrack OLE

CMMS & SCADA

Condition-based maintenance

SCADA Intro

CMMS Intro

CMMS & SCADA

SCADA/CMMS Interfaces

Real-World Applications

Real-world applications

Preventive Maintenance:

- Runtime hours
- Low flow

Corrective Maintenance:

- High level
- High gas readings

Runtime Hours

W/W/R/T East Area Pump Station

PCT	RUNTIME				MID-MINUTES				STARTS				HOA - HMI				HOA - STAT				ALARMS					
	#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4	WL	HW	PF	TF	BF	GR				
3215 ABBEYFIELD	91	0.5	0.4		7	7			12	10	0	0	Y	Y	Y	Y	6.6	N	N	N	N	N				
12733 ABESS BLVD.	0	15.6	15.0	15.8	0.0	305	350	338	0	21	20	19	0	17	Y	Y	Y	Y	N	6.8	Y	N	H	N	N	
2488 ADELE	90	4.4	4.0			84	66			28	66		1	Y	Y	Y	Y	Y	Y	Y	4.1	N	N	N	N	N
10150 AGAVE	92	1.6	1.8			28	25			35	35		10	Y	Y	Y	Y	Y	Y	Y	8.4	N	N	H	N	N
10150 AGAVE	97	1.6	1.8			28	25			35	35		10	Y	Y	Y	Y	Y	Y	Y	8.4	N	N	N	N	N
11221 ALDEN	98	2.3	2.3			49	1			49	48		0	Y	Y	Y	Y	Y	Y	Y	4.6	N	N	N	N	N
4567 ALUMNI	81	0.3	0.3			3	4			20	22		0	Y	Y	Y	Y	Y	Y	Y	3.6	N	N	N	N	N
1109 ALUMNI	95	2.0	1.9			35	38			34	33		0	Y	Y	Y	Y	Y	Y	Y	6.1	N	N	N	N	N
11220 ALUMNI	93	3.1	3.4			57	70			30	31		0	Y	Y	Y	Y	Y	Y	Y	5.7	N	N	N	N	N
11867 ARBOR LAKE	86	1.6	1.9			30	30			37	39		1	Y	Y	Y	Y	Y	Y	Y	1.7	N	N	N	N	N
12026 ARBOR LAKE	75	2.1	1.6			48	33			37	37		0	Y	Y	Y	Y	Y	Y	Y	1.8	N	N	N	N	N
6912 ARLEX	96	1.2	1.1			24	22			22	23		1	Y	Y	Y	Y	Y	Y	Y	1.5	N	N	N	N	N
1090 ARLINGTON RD	98	1.3	1.3			26	24			41	41		1	Y	Y	Y	Y	Y	Y	Y	3.3	N	N	N	N	N
7528 ARLINGTON XY	94	1.5	1.9			27	37			45	46		0	Y	Y	Y	Y	Y	Y	Y	1.6	N	N	N	N	N
7837 ARLINGTON XY	93	1.1	1.2			18	21			23	24		0	Y	Y	Y	Y	Y	Y	Y	1.5	N	N	N	N	N
6233 ARLINGTON XY	79	3.6	2.8			72	59			76	75		0	Y	Y	Y	Y	Y	Y	Y	1.1	N	N	H	N	N
8155 ARLINGTON XY	93	2.3	2.5			44	53			96	95		0	Y	Y	Y	Y	Y	Y	Y	1.6	N	N	N	N	N
8052 ARLINGTON XY	78	2.2	2.8			57	67			35	36		1	Y	Y	Y	Y	Y	Y	Y	2.3	N	N	N	N	N
4894 ASHLEY	36	7.0	2.5																							
4110 ATLANTIC	24	1.2	5.0																							
9380 ATLANTIC	90	1.4	1.6																							
10065 ATLANTIC	57	0.4	0.2																							
12570 ATLANTIC	82	1.2	1.4																							
4437 BARNES	81	3.8	3.8	4.6																						
4571 BAY HARBOUR	0	0.0	16.7	10.9																						
855 AVIATION	82	0.2	0.2																							
9815 BEACH	81	3.1	3.9																							
11260 BEACH	99	3.5	3.5																							

Location: Hubble Southfield CSO Basin

Area: HS Dewatering Pump #3 (DWP-3)

Asset: HS-031

Component:

Main **Levels** **View** **Miscellaneous**

Mult. **Hours** **Techs** **C Days** **Pri.** **Shift.** **Task Code** **Task Description**

A:	500.00	1	0		FWSM-MTY	Flushing water Strainer PM
B:	0	1,000.00	2	0	FPM-YRY	Flushing Water Pump Motor PM
C:	0	0.00	0	0		
D:	0	0.00	0	0		
E:	0	0.00	0	0		

When the runtime hours surpass “500” hours, a PM will be generated to lubricate bearings and check amperage and voltage draw.

When the runtime hours surpass “1000” hours, a PM will be generated to lubricate and inspect drive line.

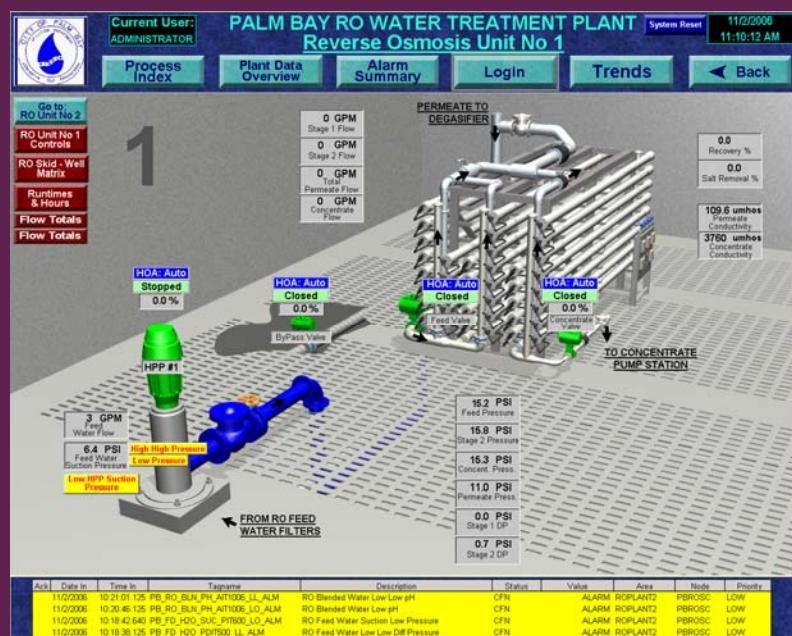
Low flow



Once permeate flow drops by 10%, a PM is automatically generated to flush the RO membranes.



The RO membranes should be cleaned whenever permeate flow drops 10% below its initial flow rate



High gas alarm



Once chlorine gas levels approach dangerous levels, a CM is generated to inspect supply and exhaust fans, tubing, chlorine storage tanks, etc.

Low DO readings



When DO readings drop below an acceptable level, a CM will be generated to check rotors, solids level, and potential IPP issues.

CMMS software with built-in SCADA integration

- | | |
|-----|--|
| Yes | <ul style="list-style-type: none">• Maintenance Connection Onsite/Online 2.5• TabWare EFX EFXoo• Infor EAM Asset Sustainability Edition 8.3• Avantis.PRO 4.1• Oracle Utilities Work and Asset Management 1.7.15.2• FaciliWorks 8i• IBM Maximo Asset Manager 7.1• Lawson Enterprise Asset Management (EAM)• IFS Applications 7• Ivara SuprEAM 5.0• Jobcal |
| No | <ul style="list-style-type: none">• Bigfoot CMMS Internet/Enterprise Edition 8.0.1 – No• MaintiMizer 4.0 - No• Cityworks 4.5- No• ePAC- No |

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