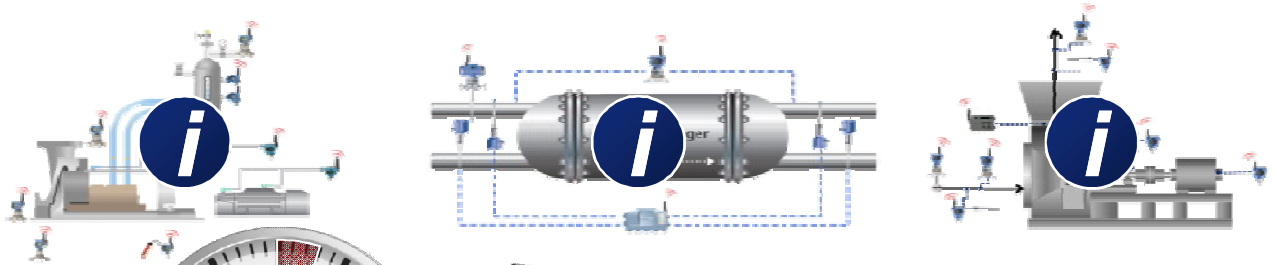


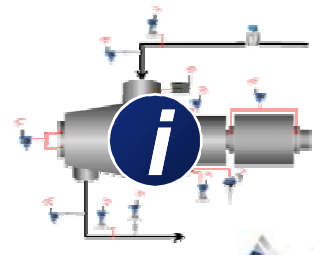
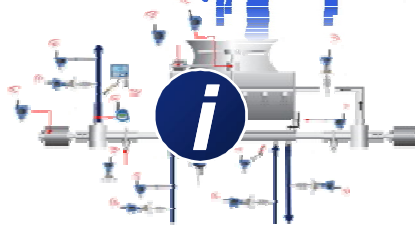
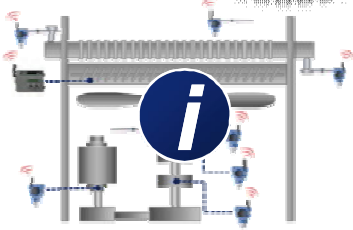
# Essential Asset Monitoring



Equipment



Process



**EMERSON**  
Process Management

# Access to Information – Operations Alert Status

Rotating Equipment



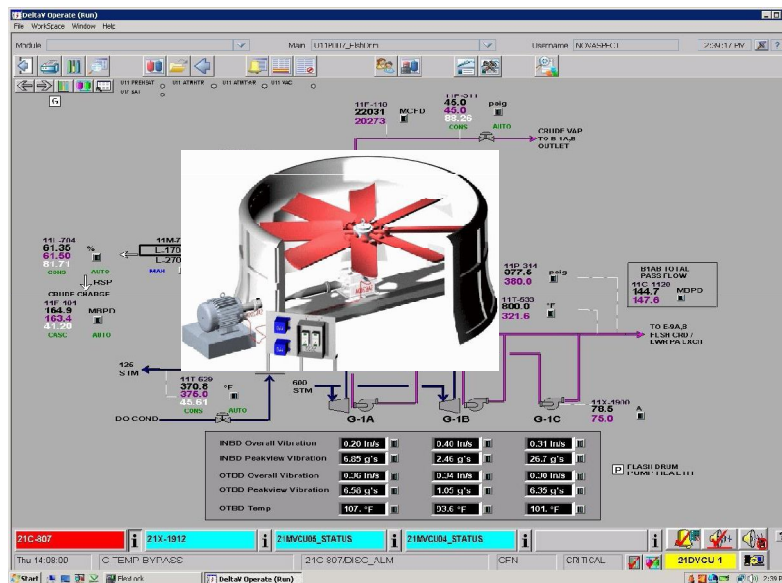
Control Room



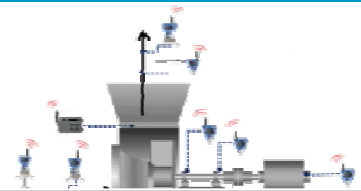
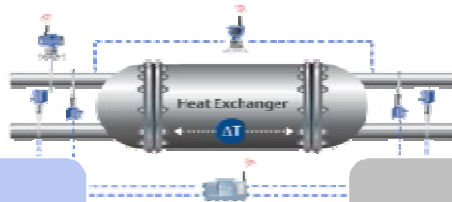
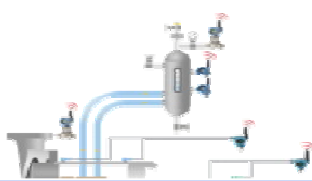
Maintenance



I&C Engineer



# Essential Asset Monitoring



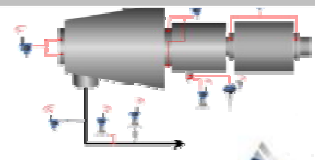
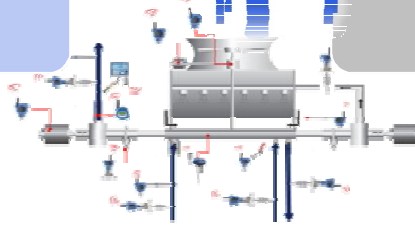
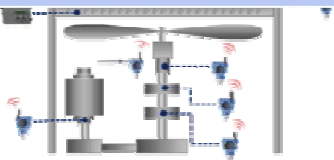
## Equipment

Velocity/PeakVue  
Bearing T  
Speed, Energy  
Lvr/Pitch/Vane Pos.  
Run/Stop Indicator  
Initial Baseline



## Process

Discharge/Suction P  
Strainer/Filter DP  
Seal Oil P/L  
Flow  
Air/Process T  
Hydrocarbon leaks



***Our solution uses tested algorithms on a combination of process and equipment data to deliver asset health***

---

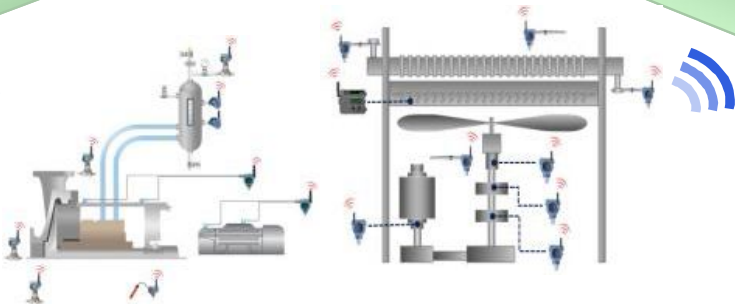
**Asset Health Indicator**  
Vibration Health/Alarm Health



**Pre-Engineered Software Algorithm**  
Analyze for statistically significant changes & max/min limits

**Process Data**

Discharge/Suction P  
Strainer/Filter DP  
Seal Oil P/L  
Flow  
Air/Process T  
Hydrocarbon leaks

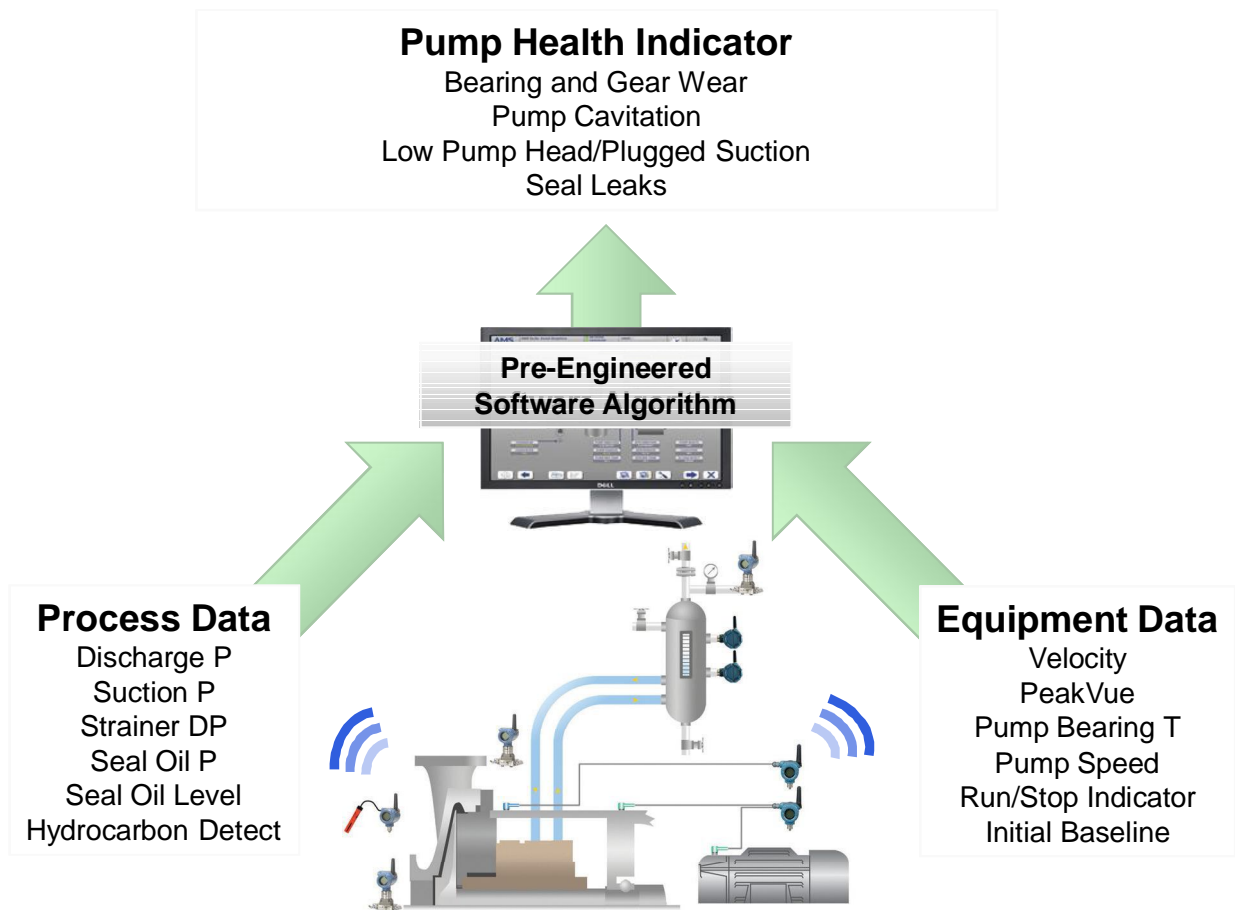


**Equipment Data**

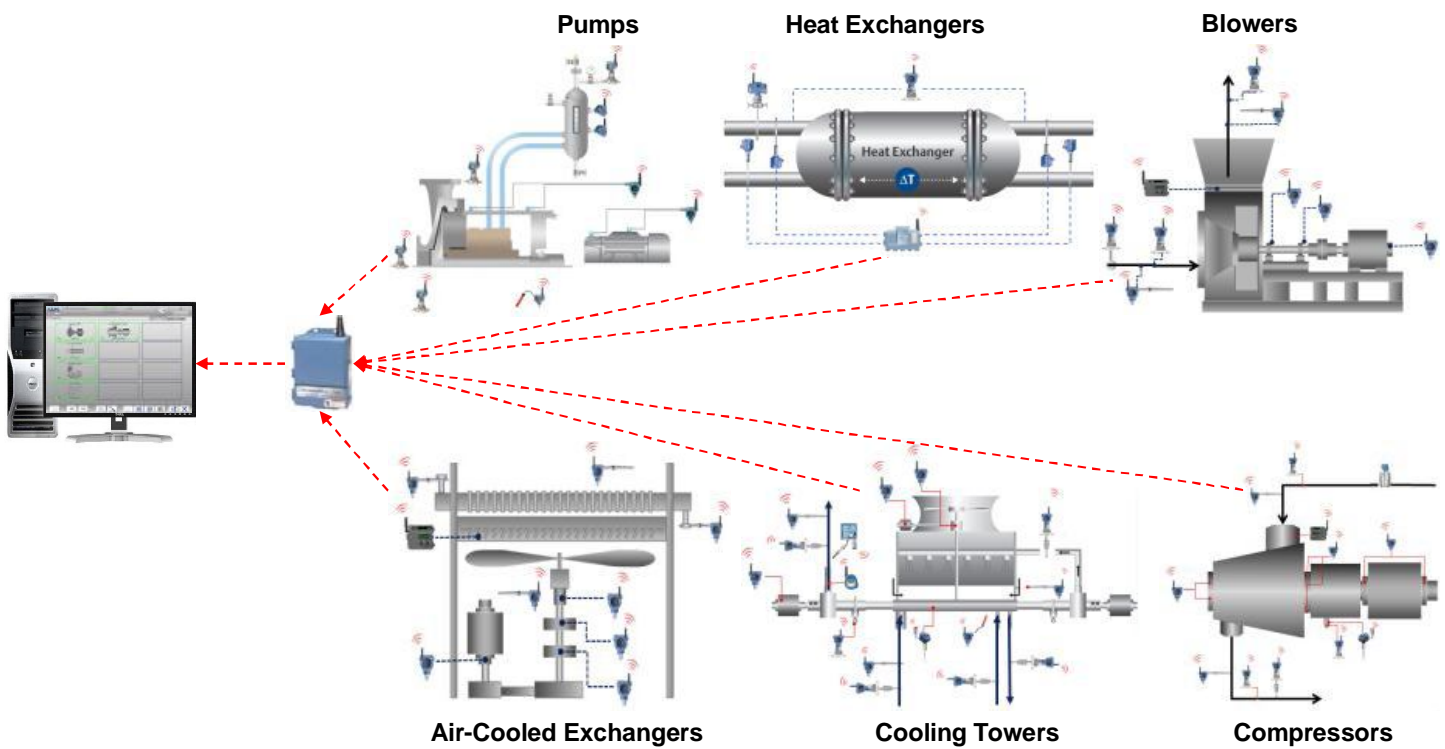
Velocity/PeakVue™  
Bearing T  
Speed, Energy  
Lvr/Pitch/Vane Pos  
Run/Stop Indicator  
Initial Baseline



# *Our solution uses tested algorithms on a combination of process and equipment data*



# Essential Asset Monitoring Suite



***Preconfigured applications built on AMS Asset Graphics software which combines process and asset data obtained from the field to report Overall Asset Health***

# EAM Home Page

The screenshot displays the 'AMS Suite' interface for 'Asset Graphics'. The top navigation bar includes the 'AMS Suite' logo, the title 'AMS Suite: Asset Graphics', and system status indicators for 'OPC Status' and 'Runtime Error'. The user is identified as 'USER: X' and the date is '09/03/2012'. The main content area is titled 'ASSET OPTIMISATION' and is divided into 'AREA A' and 'AREA B'. A grid of asset cards is shown, each with a status indicator (e.g., 'PUMP STOPPED', 'COMPRESSOR STOPPED', 'ACTIVE ALARM', 'BLOWER STOPPED', 'FAN STOPPED') and a '100%' health indicator. The 'PUMP STOPPED' card for 'PUMP101A' is highlighted with a red border. A yellow callout bubble labeled 'Asset tag' points to the 'PUMP101A' text. Another yellow callout bubble labeled 'Asset area' points to the 'COMPRESSOR STOPPED' card. A third yellow callout bubble labeled 'Asset Health' points to the '100%' indicator on the 'FAN STOPPED' card. A fourth yellow callout bubble labeled 'Click to open asset Overview Page' points to the 'COMPRESSOR STOPPED' card. The bottom of the interface features a toolbar with icons for home, navigation, printing, and other functions.

# EAM Asset Overview Page

**Asset Running/Stopped state**

AMS Suite: Asset Graphics    OPC Status    Runtime Error    USER: X    09/03/2012    EMERSON Process Management

PUMP101A    RUN TIME 96.1 HRS    SINCE OOS 3650.6 HRS

Running: 100%

Health Details

LIMITING PARAMETER: VIBRATION 1

Status Indicators

- PM01\_HODETECT: NORMAL
- PM01\_CAVALM: NORMAL

Set Out of Service

Element Names

Process parameters current Values

- PM01\_PMP\_HEAD: 28.02 psig
- DISCH\_PRESS: 29.99 psig
- PM01\_SUCTPPV: 2.00 kg/cm<sup>2</sup>
- PM01\_FLOWPV: 60.00 kg/hr
- PM01\_STRDPV: 0.11 kg/cm<sup>2</sup>
- P\_510\_CW\_OV1: 0.163 RMS
- P\_510\_CW\_PKV1: 1.907 G's
- P\_510\_CW\_TMP1: 41.01 °C
- PM01\_SEALPLO: NORMAL
- PM01\_SEALPHI: NORMAL
- PM01\_SEALPPV: 0.50 kg/cm<sup>2</sup>
- PM01\_SEALLHI: NORMAL
- PM01\_SEALLLO: NORMAL
- PM01\_SEALLPV: 51.00 %
- P\_510\_CW\_OV2: 0.2159 RMS
- P\_510\_CW\_PKV2: 1.891 G's
- PM01\_BEAR2TPV: 42.00 °C

Asset type: VARIABLE SPEED PUMP

SPEED\_TAG: 1,500 RPM

Parameter tags

Switch Element Names/Tag Names

EMERSON Process Management



# EAM Demo Asset Health Details

**AMS Suite** AMS Suite: Asset Graphics OPC Status Runtime Error USER: X 09/03/2012 EMERSON Process Management

PUMP101A RUN TIME **Click to open health details** EAM APP PROTECTION PREDICTION PERFORMANCE

RUNNING 100% **PROCESS** INPUTS CONFIGURATION

**Health Details**

LIMITING PARAMETER VIBRATION 1

Status Indicators

- PM01\_HODETECT NORMAL
- PM01\_CAVALM NORMAL

Set Out of Service

Element Names

PM01\_PMP\_HEAD 28.02 psig

PM01\_SEALPLO NORMAL

PM01\_SEALPHI NORMAL

PM01\_SEALPPV 0.50 kg/cm<sup>2</sup>

DISCH\_PRESS 29.99 psig

PM01\_SUCTPPV 2.00 kg/cm<sup>2</sup>

PM01\_SEALLHI NORMAL

PM01\_SEALLLO NORMAL

PM01\_SEALLPV 51.00 %

PM01\_FLOWPV 60.00 kg/hr

PM01\_STRDPPV 0.11 kg/cm<sup>2</sup>

VARIABLE SPEED PUMP

SPEED\_TAG 1,500 RPM

P\_510\_CW\_OV1 0.163 RMS

P\_510\_CW\_OV2 0.2159 RMS

P\_510\_CW\_PKV1 1.907 G's

P\_510\_CW\_PKV2 1.891 G's

P\_510\_CW\_TMP1 41.01 °C

PM01\_BEAR2TPV 42.00 °C

# EAM Demo Asset Health Details

**Overall Health**: 94 %

**Click to open health details**

**Minimum of all the parameter health is the overall health**

Parameter	Health
VIBRATION 1	94 %
PEAKVUE 1	100 %
VIBRATION 2	100 %
PEAKVUE 2	100 %
ALARM HEALTH	100 %

**Asset Parameters:**

- DISCH\_PRESS: 29.99 psig
- PM01\_SUCTPPV: 2.01 kg/cm<sup>2</sup>
- PM01\_FLOWPV: 60.00 kg/hr
- PM01\_STRDPPV: 0.09 kg/cm<sup>2</sup>
- P\_510\_CW\_OV1: 0.154 RMS
- P\_510\_CW\_PKV1: 1.894 G's
- P\_510\_CW\_TMP1: 41.00 °C
- P\_510\_CW\_OV2: 0.2283 RMS
- P\_510\_CW\_PKV2: 1.901 G's
- PM01\_BEAR2TPV: 42.00 °C
- SPEED\_TAG: 1,500 RPM
- PM01\_SEALLO: NORMAL
- PM01\_SEALPHI: NORMAL
- PM01\_SEALPPV: 0.51 kg/cm<sup>2</sup>
- PM01\_SEALLHI: NORMAL
- PM01\_SEALLLO: NORMAL
- PM01\_SEALLPV: 50.99 %

# EAM Inputs Page

The screenshot shows the 'EAM Inputs Page' interface. At the top, there's a header with 'AMS Suite: Asset Graphics' and 'EMERSON Process Management'. Below the header, there are tabs for 'PROCESS', 'INPUTS' (highlighted in red), and 'CONFIGURATION'. A table displays various process parameters with columns for 'CURRENT', 'AVERAGE', and 'BASELINE'. A 'Trend window' is visible on the right side, and an 'ALARMS' section is at the bottom right. Callouts point to specific features: 'Process parameters current values', 'Horn enable/disable button', 'Alarm acknowledge button', 'Process parameters average values', 'Baseline Capture button', 'Trend window', and 'Baseline signatures'.

	CURRENT	AVERAGE	BASELINE
VIBRATION 1	0.156 RMS	0.1548	0.1571
PEAKVUE 1	1.899 G's	1.8984	1.9003
VIBRATION 2	0.225 RMS	0.2185	0.2246
PEAKVUE 2	1.899	1.8999	1.9053
SPEED	60.00	60.00	60.00
DISCHARGE P	29.97 psig	29.99	30.05
SUCTION P	2.01 kg/cm <sup>2</sup>	2.00	2.00
STRAINER ΔP	0.10 kg/cm <sup>2</sup>	0.10	0.10
PUMP HEAD	28.0 psig	28.02	23.25
BEAR TEMP 1	40.99 °C	41.00	41.00
DCAR TCOMP 2	42.00 °C	42.00	42.00
SEAL PRESSURE	0.51 kg/cm <sup>2</sup>	0.50	0.49
PRESSURE - HI	NORMAL		
PRESSURE - LO	NORMAL		
SEAL I FVFI	51.01 %	51.00	51.01
LEVEL - HI	NORMAL		
LEVEL - LO	NORMAL		
HC LEAK	NORMAL		
CAVITATION (STD)	0.0338	0.0321	0.0277

# EAM Inputs Limits Configuration Page

AMS Suite | AMS Suite: Asset Graphics | OPC Status | Runtime Error | USER: X | 09/03/2012 | EMERSON Process Management

PUMP101A | RUNNING 99% | PREDICTION | PERFORMANCE | CONFIGURATION

Low alarm limit | High alarm limit

	CURRENT	LOW	ENABLE	SUPPRESS	HIGH	ENABLE	SUPPRESS
VIBRATION 1	0.155 RMS	0.0792	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 1	1.907 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VIBRATION 2	0.213 RMS	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 2	1.898 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FLOW	60.00 kg/hr	30.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
SPEED	1,500 RPM	750	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2700	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DISCHARGE P	29.94 psig	15.03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	54.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SUCTION P	2.00 kg/cm <sup>2</sup>	1.40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
STRAINER ΔP	0.11 kg/cm <sup>2</sup>	0.00	<input type="checkbox"/>	<input type="checkbox"/>	0.18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PUMP HEAD	27.9 psig	15.00	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 1	40.99 °C	0.00	<input type="checkbox"/>	<input type="checkbox"/>	73.81	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 2	42.00 °C	0.00	<input type="checkbox"/>	<input type="checkbox"/>	50.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SEAL PRESSURE	0.49 kg/cm <sup>2</sup>	0.25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
SFAI LEVEL	50.99 %	25.50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	91.81	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CAVITATION (STD)	0.0276	PRE ALARM	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
MISCELLANEOUS							

VARIABLE SPEED PUMP

INPUT LIMITS | VSP SETUP | RESET LIMITS

# EAM Inputs Limits Configuration Page

AMS Suite | AMS Suite: Asset Graphics | OPC Status | Runtime Error | USER: X | 09/03/2012 | EMERSON Process Management

PUMP101A | RUN TIME 96.5% | EAM APP | CONFIGURATION | PERFORMANCE

RUNNING 99%

	CURRENT	LOW	ENABLE	SUPPRESS	HIGH	ENABLE	SUPPRESS
VIBRATION 1	0.155 RMS	0.0792	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 1	1.907 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VIBRATION 2	0.213 RMS	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 2	1.898 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FLOW	60.00 kg/hr	30.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
SPEED	1,500 RPM		<input type="checkbox"/>	<input type="checkbox"/>	2700	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DISCHARGE P	29.94 psig		<input type="checkbox"/>	<input type="checkbox"/>	54.10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SUCTION P	2.00 kg/cm <sup>2</sup>	1.40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
STRAINER ΔP	0.11 kg/cm <sup>2</sup>	0.00	<input type="checkbox"/>	<input type="checkbox"/>	0.18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PUMP HEAD	27.9 psig	15.00	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 1	40.99 °C	0.00	<input type="checkbox"/>	<input type="checkbox"/>	73.81	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 2	42.00 °C	0.00	<input type="checkbox"/>	<input type="checkbox"/>	50.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SEAL PRESSURE	0.49 kg/cm <sup>2</sup>	0.25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500.00	<input type="checkbox"/>	<input type="checkbox"/>
SFAI L FVFI	50.99 %	25.50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	91.81	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CAVITATION (STD)	0.0276	PRE ALARM	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
MISCELLANEOUS							

VARIABLE SPEED PUMP

INPUT LIMITS | VSP SETUP | RESET LIMITS

# EAM Inputs Limits Configuration Page

AMS Suite | AMS Suite: Asset Graphics | OPC Status | Runtime Error | USER: X | 09/26/2012 | EMERSON Process Management

PUMP101A | RUN TIME 0 HRS SINCE OOS 3360.5 HRS | EAM APP | PROTECTION | PREDICTION | PERFORMANCE

RUNNING 94% | PROCESS | INPUTS | CONFIGURATION

	CURRENT	LOW	ENABLE	SUPPRESS	HIGH	ENABLE	SUPPRESS	
VIBRATION 1	0.154 RMS	0.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
PEAKVUE 1	1.907 G's	1.0000	<input type="checkbox"/>	<input type="checkbox"/>	3.0000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VIBRATION 2	0.214 RMS	0.1000	<input type="checkbox"/>	<input type="checkbox"/>				
PEAKVUE 2	1.900 G's	1.0000	<input type="checkbox"/>	<input type="checkbox"/>				
FLOW	60.00 kg/hr	30.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
SPEED	1,500 RPM	750	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2700	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
DISCHARGE P	29.94 psig	15.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SUCTION P	2.00 kg/cm <sup>2</sup>	1.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.00	<input type="checkbox"/>	<input type="checkbox"/>	
STRAINER ΔP	0.10 kg/cm <sup>2</sup>	0.00	<input type="checkbox"/>	<input type="checkbox"/>	0.18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
PUMP HEAD	20.5	0.17	<input type="checkbox"/>	<input type="checkbox"/>				
BEAR TEMP		0.00	<input type="checkbox"/>	<input type="checkbox"/>	73.79	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
BEAR TEM		0.00	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SEAL PRESSURE		0.25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.00	<input type="checkbox"/>	<input type="checkbox"/>	
SFAI L FVEL	51.01	25.50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	91.79	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
CAVITATION (STD)	0.0485	PRE ALARM	<input checked="" type="checkbox"/>	<input type="checkbox"/>			<input checked="" type="checkbox"/>	
MISCELLANEOUS								

Alarm limit configuration window

Click on the row to open alarm limit configuration window

SUCTION P

LOW LIMIT: 1.00 kg/cm<sup>2</sup>

MULTIPLIER (A): 0.5000

BIAS (B): 0.0000

ENB AUTO LIMIT:

HIGH LIMIT: 5.00 kg/cm<sup>2</sup>

MULTIPLIER (A): 1.8000

BIAS (B): 0.0000

ENB AUTO LIMIT:

BASELINE (BL): 2.00 kg/cm<sup>2</sup>

LIMIT FORMULA: (A \* BL) + B

AVERAGE: 2.00 kg/cm<sup>2</sup>

INPUT LIMITS

VSP SETUP

RESET LIMITS

# EAM Demo 'Export' feature

AMS Suite | AMS Suite: Asset Graphics | OPC Status | Runtime Error | USER: X | 09/26/2012 | EMERSON Process Management

FIN FAN 101A | RUN TIME 0.1 HRS SINCE OOS 1487.4 HRS

PROCESS | CONFIGURATION

	CURRENT	LOW	ENABLE	SUPPRESS	HIGH	ENABLE	SUPPRESS
VIBRATION 1	0.221 RMS	0.1155	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 1	1.921 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VIBRATION 2	0.226 RMS	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 2	1.927 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VIBRATION 3	0.223 RMS	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 3	1.924 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VIBRATION 4	0.232 RMS	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	0.3000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEAKVUE 4	1.938 G's	0.0000	<input type="checkbox"/>	<input type="checkbox"/>	5.1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SPEED	1,550 RPM	775	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2790	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ENERGY	44.41 A				222.99	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 1	39.99 °F	0.00	<input type="checkbox"/>	<input type="checkbox"/>	72.02	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BEAR TEMP 2	40.00 °F	0.00	<input type="checkbox"/>	<input type="checkbox"/>	72.01	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR IN TEMP	12.00 °F	9.61	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21.61	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR OUT TEMP	35.00 °F	27.99	<input checked="" type="checkbox"/>	<input type="checkbox"/>	62.99	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AIR ΔT	23.00 °F	18.39	<input checked="" type="checkbox"/>	<input type="checkbox"/>	41.37	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PROCESS IN TEMP	42.00 °F	33.59	<input checked="" type="checkbox"/>	<input type="checkbox"/>	75.59	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PROCESS OUT TEMP	34.99 °F	28.01	<input checked="" type="checkbox"/>	<input type="checkbox"/>	63.01	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PROCESS ΔT	7.01 °F	5.59	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.57	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ACT PITCH	29.99 %	24.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	53.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LVR POS DEV	*****				*****	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MISCELLANEOUS							

MISCELLANEOUS: BL CAPTURE MODE (AUTO), BL CAPTURE DELAY (120 SECONDS), BL LAST CAPTURED (15:47:51 09/26/2012)

EXPORT

INPUT LIMITS | VSF SETUP | RESET LIMITS

Click to open Data Export page

# EAM Demo 'Export' feature

Select the data sampling frequency

Enter the interval for which the data export is required

Select the parameter type for export required

OR click this to select all the listed parameters

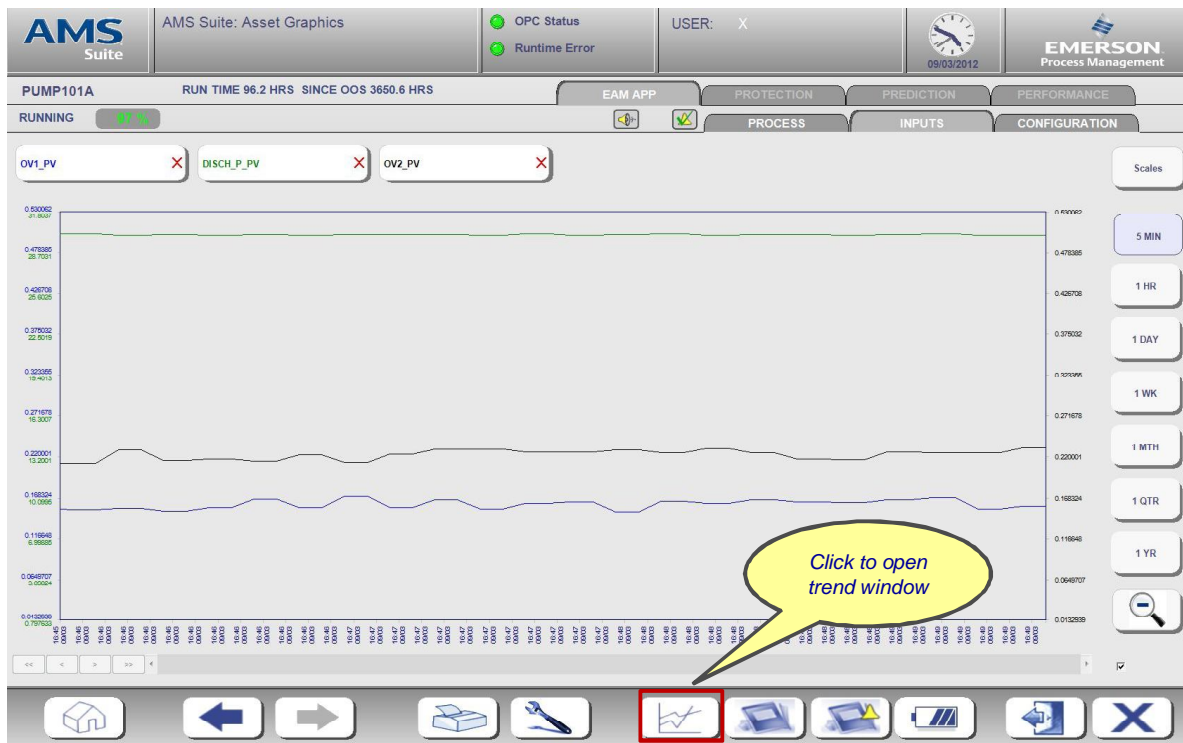
Click 'Export' to generate the data export file that is in CSV format

	CURRENT	AVERAGE	BASELINE	XBARBAR	UCL	R	RBAR	HEALTH
VIBRATION 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PEAKVUE 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VIBRATION 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PEAKVUE 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VIBRATION 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PEAKVUE 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VIBRATION 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PEAKVUE 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	CURRENT	AVERAGE	BASELINE
SPEED	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ENERGY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BEAR TEMP 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BEAR TEMP 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
AIR IN TEMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
AIR OUT TEMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PROCESS IN TEMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PROCESS OUT TEMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ACT LVR POS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ACT PITCH	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LVR POS DEV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PITCH DEV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# EAM Demo Asset Trends



# EAM Demo Event Viewer Display

The screenshot displays the AMS Suite Asset Graphics interface. The main window shows four asset cards: PUMP101A, HT EXCH E1, BLOWER101A (93%), and FIN FAN 101A (97%). Each card has a 'NO ACTIVE ALARM' status and an 'OOS' checkbox. An event viewer window is open over the PUMP101A card, showing a list of historical events. A yellow callout bubble points to the event viewer icon in the bottom toolbar, with the text 'Click to open event log window'.

AMS Suite: Asset Graphics

OPC Status: ●

Runtime Error: ●

USER: X

09/03/2012

EMERSON Process Management

ASSET OPTIMISATION

AREA A

AREA B

NO ACTIVE ALARM

PUMP101A

NO ACTIVE ALARM

HT EXCH E1

NO ACTIVE ALARM

BLOWER101A 93%

NO ACTIVE ALARM

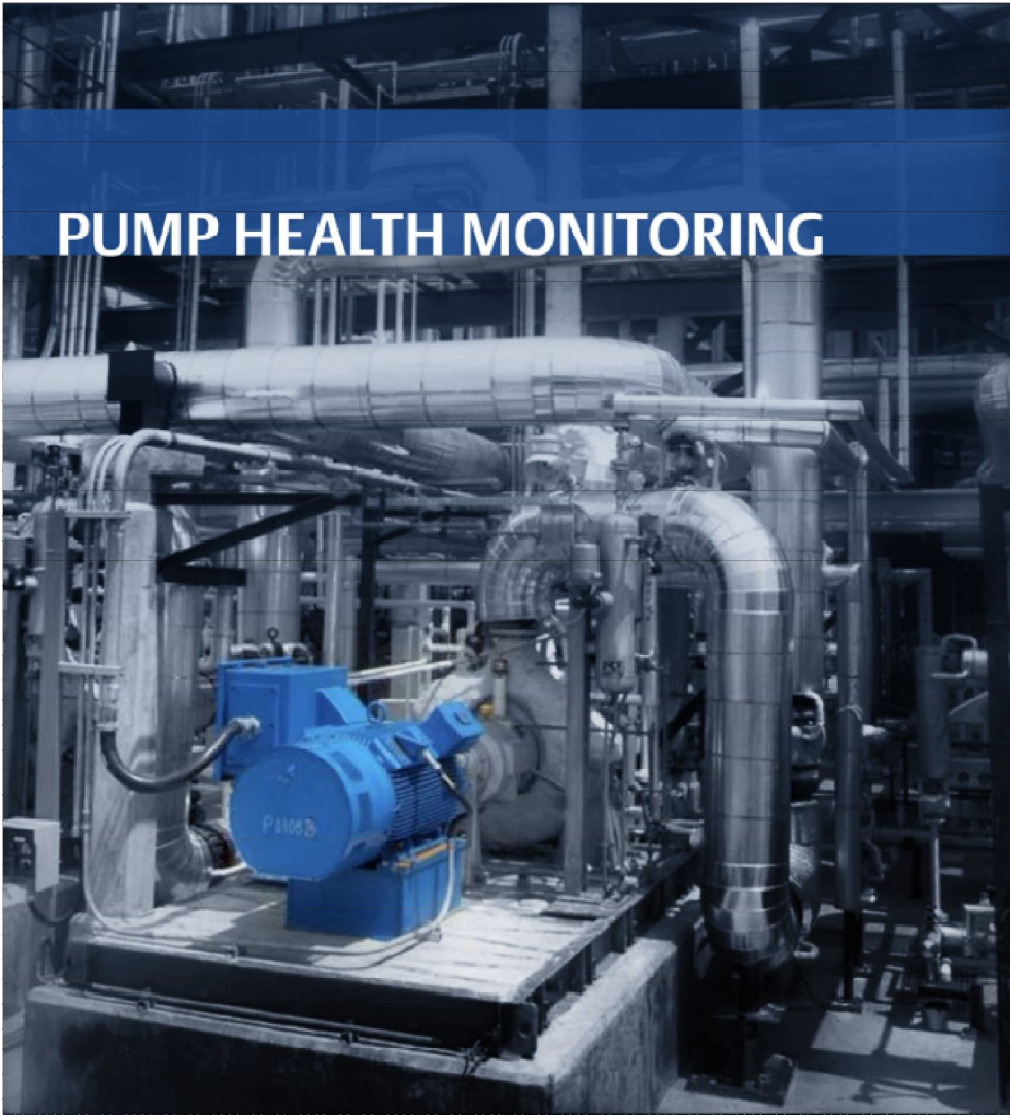
FIN FAN 101A 97%

AMS Asset Graphics 5.4 Event Viewer - [History]

Time	Alarm text	Status	Alarm group
1 9/3/2012 4:31:47 PM	PRE CAVITATION	Went out	PM 101A
2 9/3/2012 4:31:27 PM	VIBRATION 1 INCREASING TREND DETECTED	Went out	PM 101A
3 9/3/2012 4:31:22 PM	CAVITATION	Went out	PM 101A
4 9/3/2012 4:31:17 PM	HIGH PEAKVUE VIBRATION 1	Went out	PM 101A
5 9/3/2012 4:31:17 PM	HIGH VIBRATION 1	Went out	PM 101A
6 9/3/2012 4:31:08 PM	VIBRATION 1 INCREASING TREND DETECTED	Acknowledged	PM 101A
7 9/3/2012 4:31:08 PM	CAVITATION	Acknowledged	PM 101A
8 9/3/2012 4:31:08 PM	HIGH PEAKVUE VIBRATION 1	Acknowledged	PM 101A
9 9/3/2012 4:31:08 PM	HIGH VIBRATION 1	Acknowledged	PM 101A
10 9/3/2012 4:31:08 PM	PRE CAVITATION	Acknowledged	PM 101A
11 9/3/2012 4:27:42 PM	VIBRATION 1 INCREASING TREND DETECTED	Came in	PM 101A
12 9/3/2012 4:27:37 PM	CAVITATION	Came in	PM 101A
13 9/3/2012 4:27:32 PM	HIGH PEAKVUE VIBRATION 1	Came in	PM 101A
14 9/3/2012 4:27:32 PM	HIGH VIBRATION 1	Came in	PM 101A
15 9/3/2012 4:23:57 PM	PRE CAVITATION	Came in	PM 101A
16 9/3/2012 1:27:28 PM	HORN DISABLED	Went out	CM 101A
17 9/3/2012 1:27:28 PM	HORN DISABLED	Came in	CM 101A
18 9/3/2012 1:11:33 PM	HORN DISABLED	Went out	CM 101A
19 9/3/2012 12:41:53 PM	HORN DISABLED	Came in	CM 101A
20 9/3/2012 12:15:57 PM	HIGH BLWR DIFF PRESSURE	Came in	PM 101A

9/3/2012 - 9/3/2012 Filter active

Click to open event log window



## PUMP HEALTH MONITORING

**Refinery Solutions**

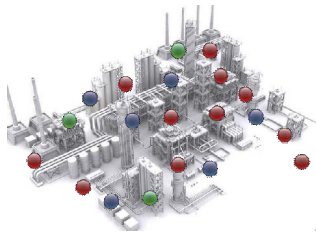
**Pump Health  
Monitoring for  
Improved  
Safety,  
Reliability,  
and  
Operations**



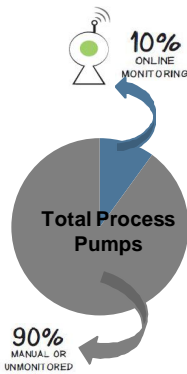
**EMERSON**<sup>™</sup>  
Process Management

# Importance of Pump Health Monitoring

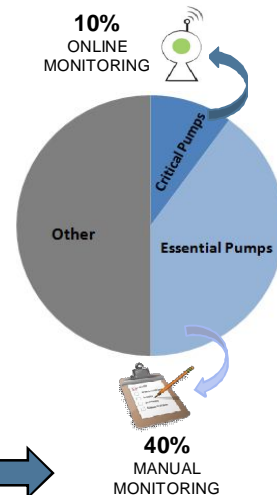
There are approximately **200 process pumps** in the average refinery, chemical or petrochemical plant.



Typically, only **10%** of the most critical pumps have on-line health monitoring. As many as **90%** of process pumps are manually or not monitored at all.

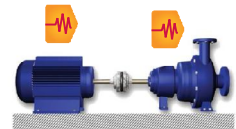


**40%** of total process pumps are considered "essential" pumps that are manually monitored



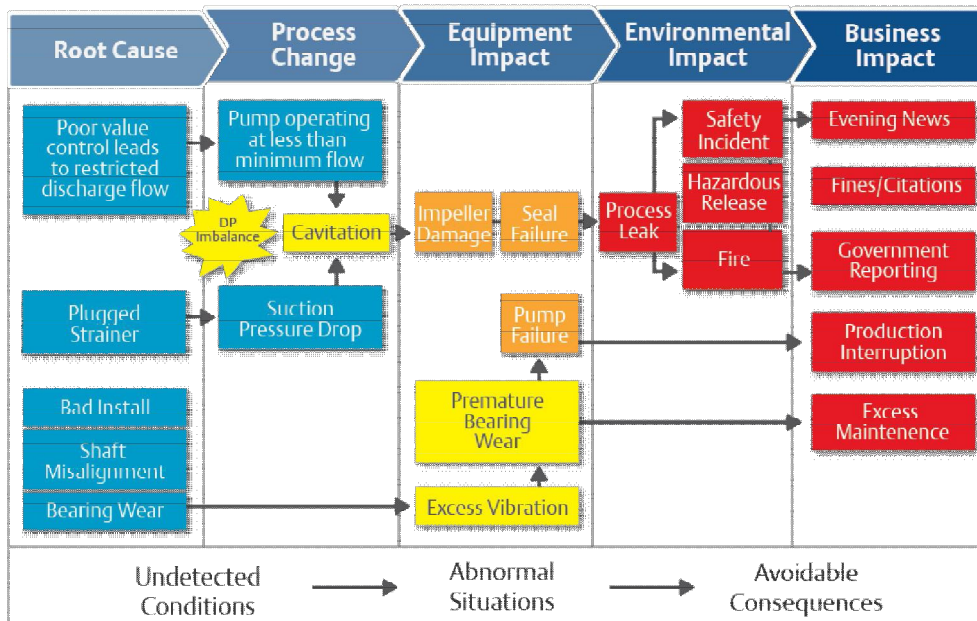
Manual monitoring is not always enough to identify degrading performance and take action.

Pump failures can cause process upsets and downtime, **taking hours or days to recover normal operations.**



# Looking at a typical Pump Root Cause & Effect Diagram

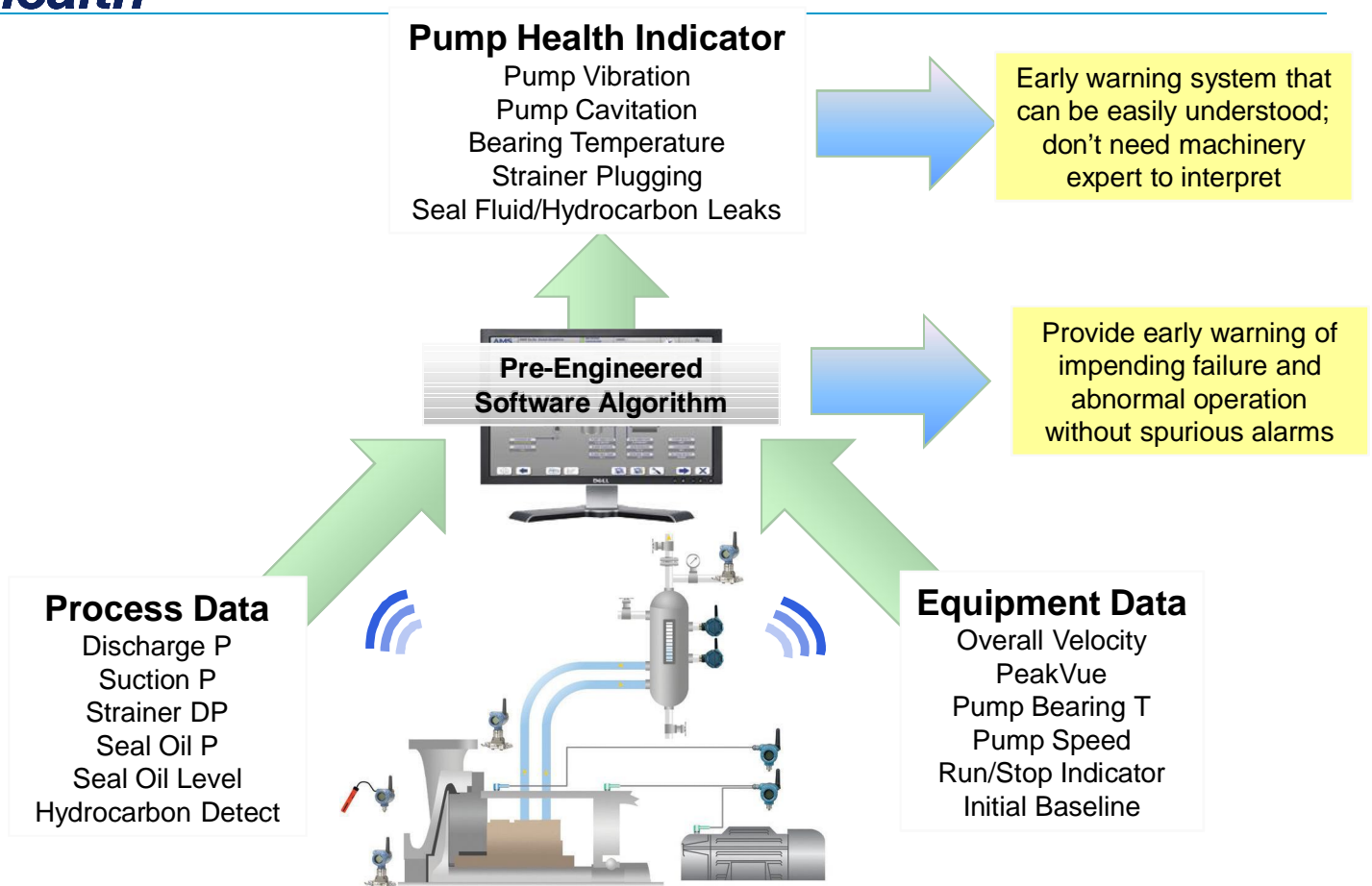
Pump failure can impact several process areas



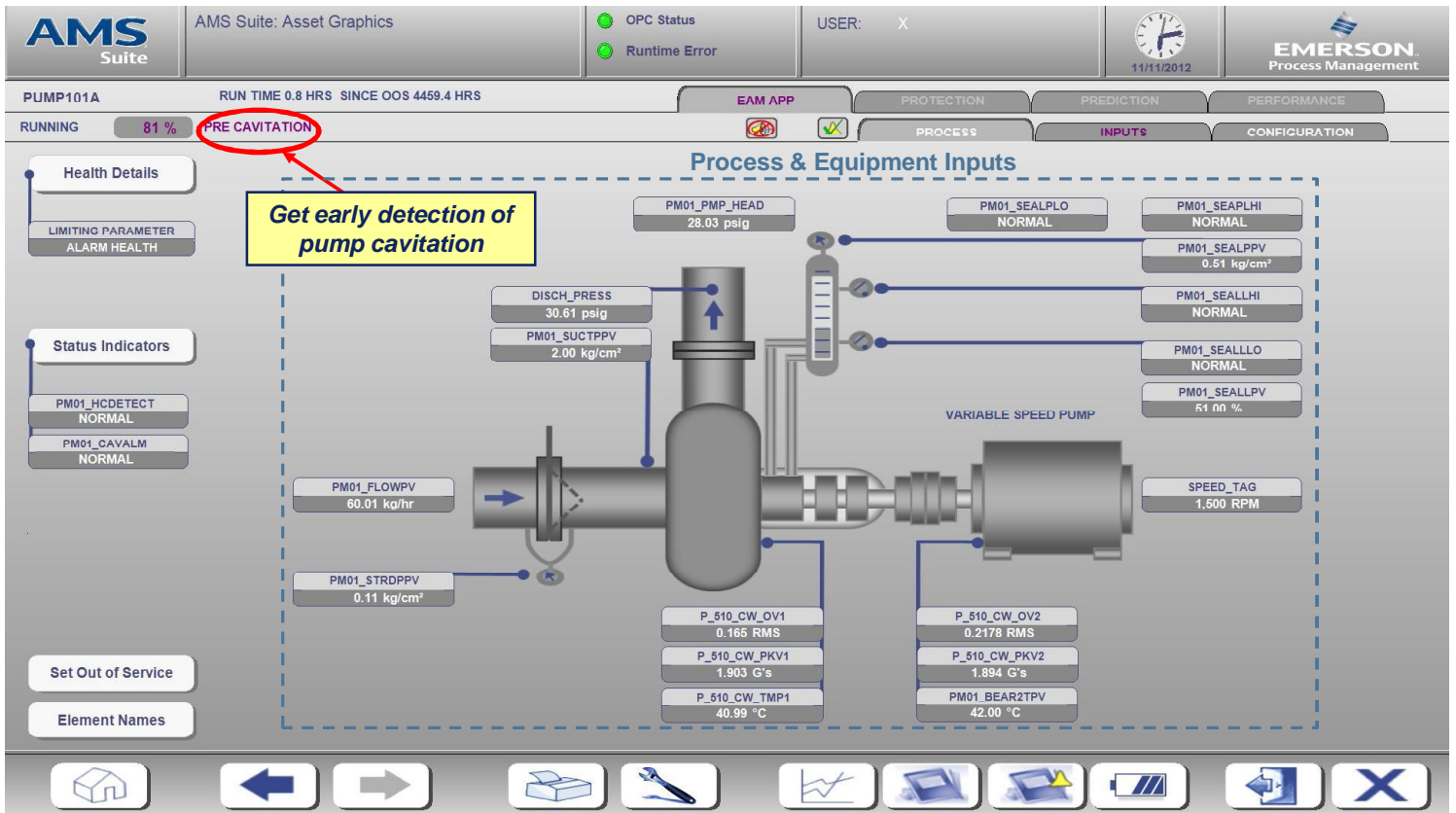
**Only with Emerson...  
Address every critical root cause...**

Fault Condition	Vibration	Peak Impacting	Pressure (Discharge, Differential and Seal Fluid)			Seal Fluid Level	Temperature	Leak Detection
High Vibration	<input checked="" type="checkbox"/>							
Cavitation		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Bearing fault		<input checked="" type="checkbox"/>						
Pre-cavitation			<input checked="" type="checkbox"/>					
Low head			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Low Discharge			<input checked="" type="checkbox"/>					
Seal Pressure				<input checked="" type="checkbox"/>				
Low Suction				<input checked="" type="checkbox"/>				
Low Flow				<input checked="" type="checkbox"/>				
Strainer Fault				<input checked="" type="checkbox"/>				
Seal Failure					<input checked="" type="checkbox"/>			
Seal Fluid Level						<input checked="" type="checkbox"/>		
Bearing temp							<input checked="" type="checkbox"/>	
Liquid HC Leak								<input checked="" type="checkbox"/>

# *...using pre-engineered algorithms on a combination of process and equipment data to report asset health*



# Pump cavitation detection





# Early Cavitation Warning with Process Data

