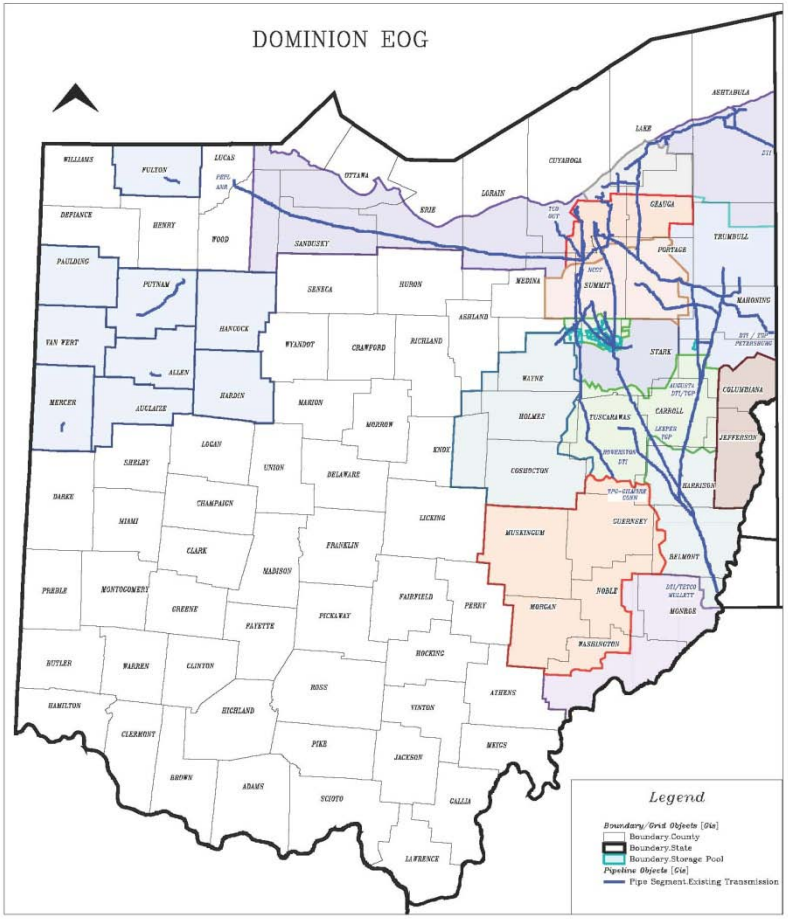
# Alarm Management

## PHMSA Meeting

## November 17, 2010

# Dominion East Ohio




- Gas distribution company
- 900 miles of transmission lines
- 59 BCF storage working gas
- 1.2 million customers
- Cleveland, Youngstown, Akron
- >15,500 SCADA points
- 7 Shift Controllers
- 1 Coordinator

# Written Alarm Management Plan

- **Alarm Management Plan details response to CRM 192.631 rule as part of overall Control Room Management Plan Document**

- **Alarm Philosophy Document will include how DEO defines, categorizes and prioritizes alarms.**





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# (1) Review Safety-Related Alarm Operations

- **Define Safety-Related Alarms**

- **Dominion purchased vendor supported software* for analyzing Safety-Related alarms and creating reports to track performance**

*** INGAA does not endorse a specific vendor and so, I am simply identifying that this is specific to Dominion operations".**





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# Current Alarm States and Priorities

## Analogs

| | Priority |
|---|---|
| High-High | High |
| High | Medium |
| Normal | Low |
| Low | Medium |
| Low-Low | High |





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# Classifications: Safety Related vs. Alerts

| | | | |
|---|---|---|---|
| Safety Related Alarms | Status, rate of change, or creep alarms that may indicate danger to the public or employees | MAGENTA | HIGH PRIORITY |
| | Low-Low alarms that may indicate the potential for loss of supply to customers | MAGENTA | HIGH PRIORITY |
| | High-High alarms that may indicate pipeline pressure levels approaching MAOP | MAGENTA | HIGH PRIORITY |
| | Uncommanded change of state of remote control valves | MAGENTA | HIGH PRIORITY |
| Operator Alerts | Non - Safety Related High-High and Low-Low Alerts | RED | MED PRIORITY |
| | Non - Safety related status changes, rate of change and creep alerts | RED | MED PRIORITY |
| | Alerts that trigger High or Low Limits | YELLOW | LOW PRIORITY |
| | All alarms or alerts that return to Normal State | GREEN | LOW PRIORITY |





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# Selecting Alarm State - Safety Related Alarms

Analogs

Safety Related

| | | | |
|---|---|---|---|
| High-High<br>High-High | High | Safety Related Alarm | Requires Immediate Action |
| High | Low | | |
| Normal | Low | | |
| Low | Low | | |
| Low-Low<br>Low-Low | High | Safety Related Alarm | |





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# Non-Safety Related Alert Priorities

**Analogs**
**Non-Safety Related**

| | Priority | |
|---|---|---|
| High-High | Medium | May require same day action |
| High | Low | May not require an action |
| Normal | Low | |
| Low | Low | |
| Low-Low | Medium | |

# (2) Monthly Identify Points Off-Scan

- **Utilization of alarm analysis software tools**





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# (3) Verify Safety-Related Alarm Set-Points

- **Utilization of alarm analysis software tools**





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# (4) Review Alarm Management Plan

- **Utilization of alarm analysis software tools**
- **Annually document review process and results**

# (5) Monitor Content and Volume of Controller Activity

- Utilization of alarm analysis software tools for SCADA related activity (much of Controller workload)
- Phone log evaluation
- Evaluate controller paperwork activities

# Initial Audit of Alarms

- **Generated a report of all alarms acknowledged by controllers (January – October**
- **63,302 acknowledged alarms / 11,152 Controller hours = 5.7 alarms per hour**

# Evaluating Controller Activity - Alarms

- **Using Left Click / Right Click Alarm Acknowledgement to track time required to clear an Alarm / Alert**





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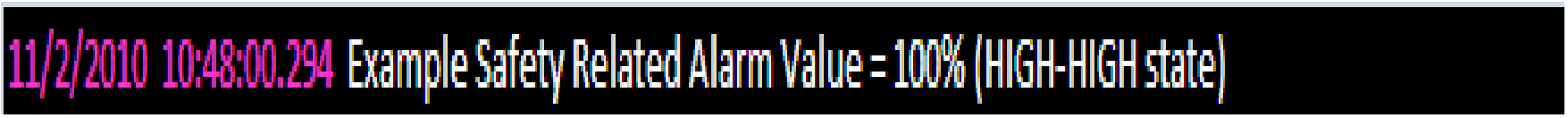
# Initial Alarm





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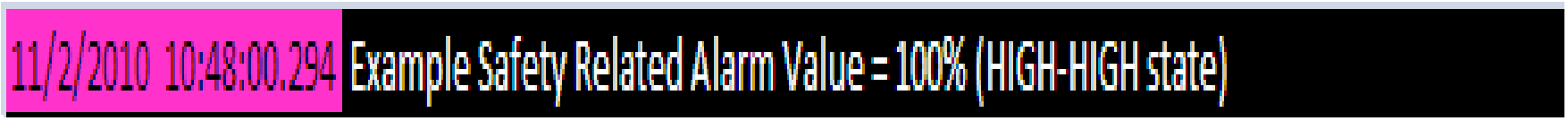
# Initial Alarm





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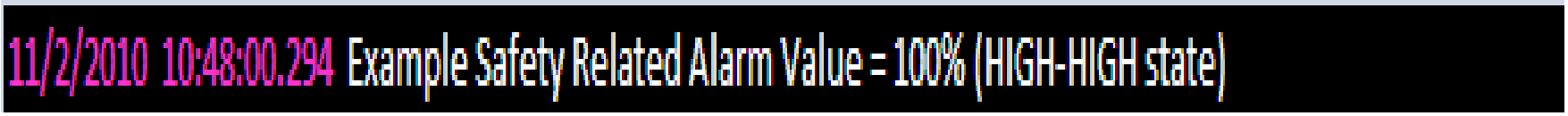






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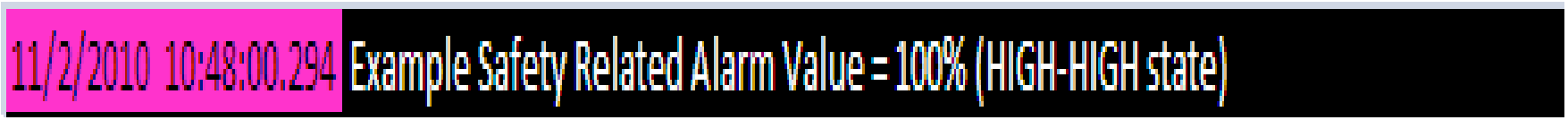






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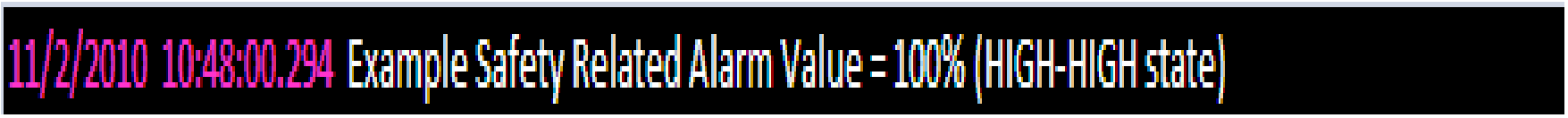






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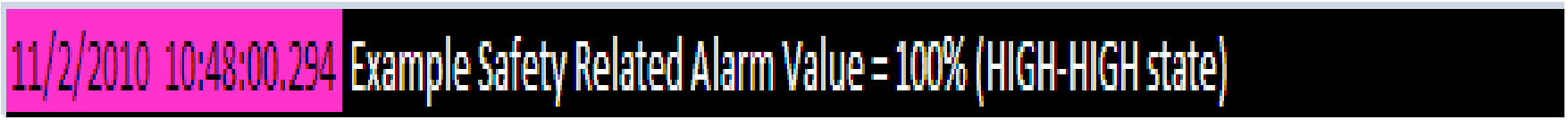






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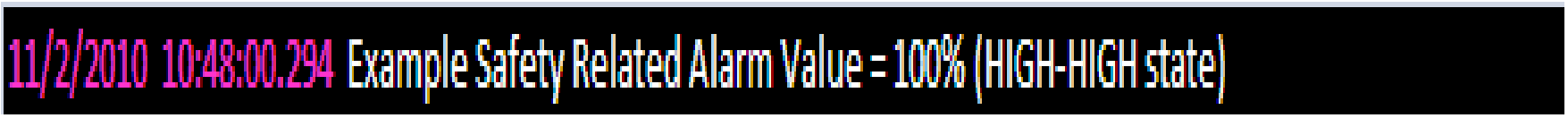






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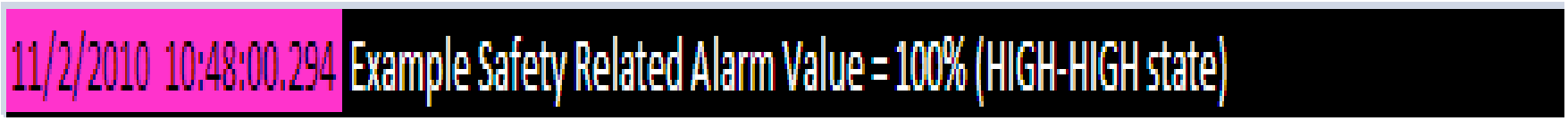






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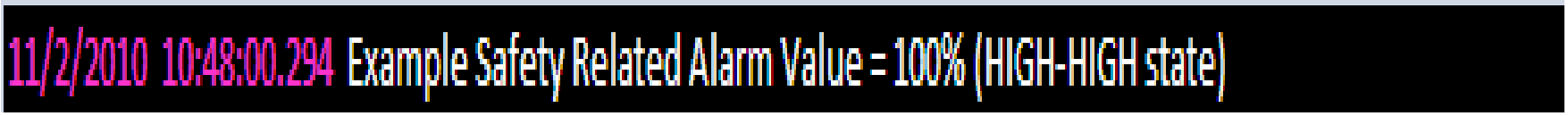






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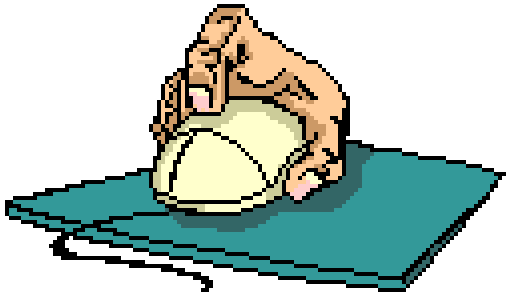
# Left Click to Acknowledge Alarm

11/2/2010 10:48:00.294 Example Safety Related Alarm Value = 100% (HIGH-HIGH state)

*CONTROLLER LEFT CLICKS ON MOUSE TO ACKNOWLEDGE ALARM*

*ALARM IS FROZEN ON ALARM BAR ON SCREEN*

*ACKNOWLEDGEMENT TIME STAMP*







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# Right Click to Clear Alarm

*CONTROLLER RIGHT CLICKS ON MOUSE TO CLEAR ALARM*

*ALARM IS REMOVED FROM ALARM BAR ON SCREEN*

*CLEARED TIME STAMP*





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# Evaluating Controller Activity – Phone Calls

- **Evaluate phone call activity - Minutes per Hour**





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# Initial Audit of Phone Calls

- **Generated a report of all phone call activity for October**
- **2,925 minutes logged in October / 1,052 hours = 2.78 minutes per hour**

# Evaluating Controller Activity – Reports

- **Evaluate controller reporting responsibilities**
- **Planning to do time studies**
  - **SCADA Input**
  - **Storage Summary**
  - **Shift Report**

# (6) Address Deficiencies

- **Management of Change process to address deficiencies**

- **Utilization of alarm analysis and/or other software tools for documentation**





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# Summary

- Purchased alarm analysis software
- Planning functionality changes in SCADA system:
  - To designate Safety-Related alarms by state
  - To add ability to track when alarm is acknowledged and when it is cleared (left click / right click)
- Tracking alarm, phone call and reporting statistics





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# *Questions?*





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# *Thank You !*





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