



# **Control Room Management**

## **Western Regional Gas Conference**

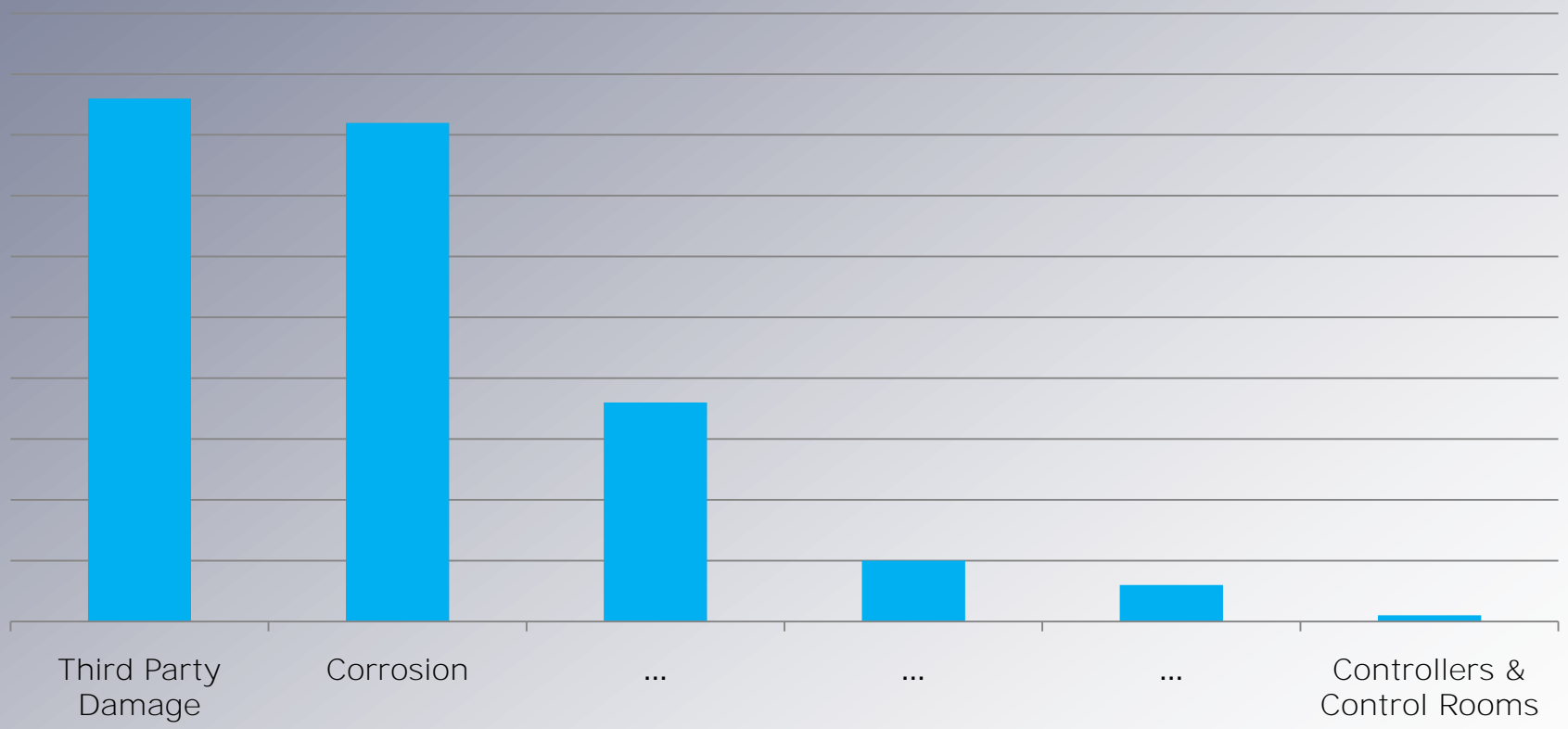
**Tempe: August 24, 2011**

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USDOT/PHMSA**



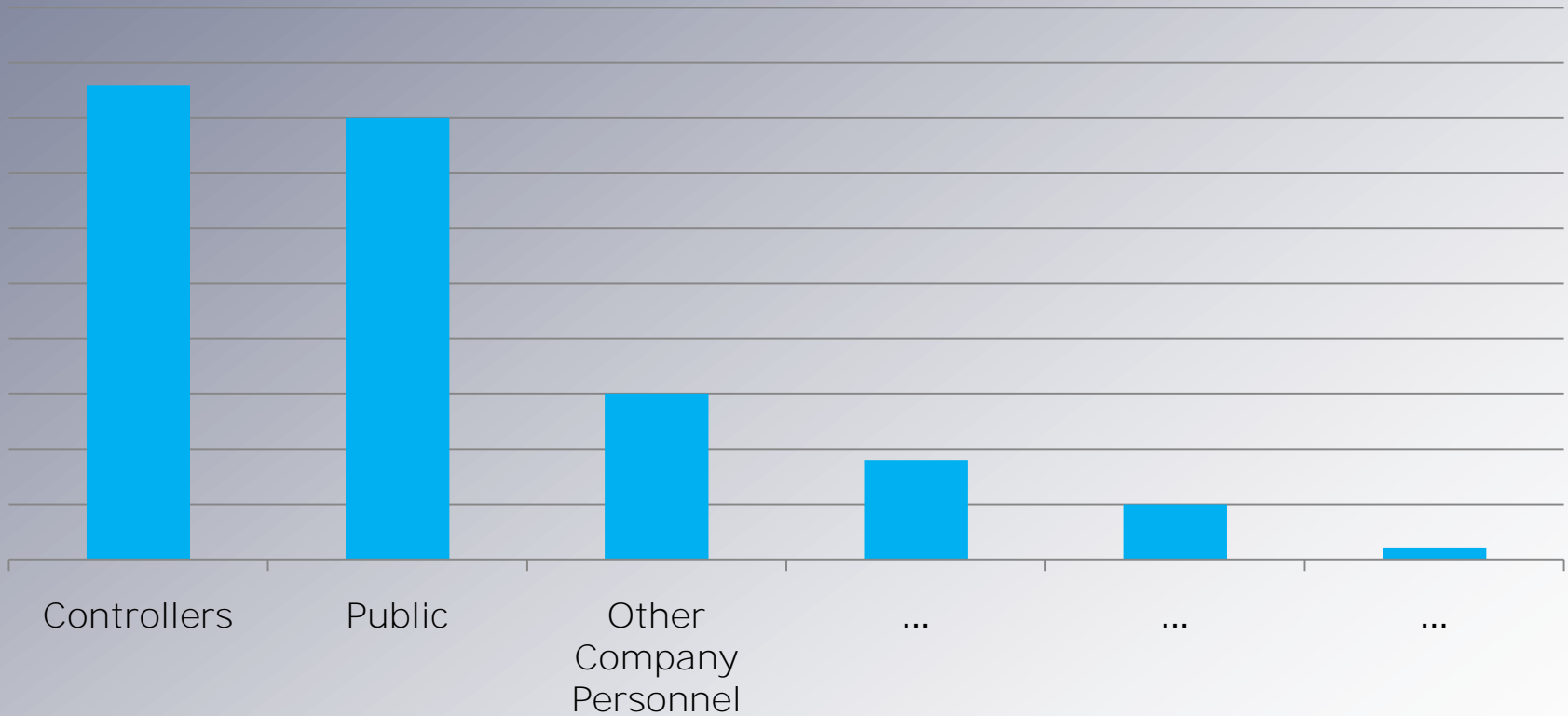
# Principle Cause of Pipeline Incidents and Accidents



\* Artificial Data for illustrative purposes



# Who initially detects Pipeline Leaks & Failures



\* Artificial Data for illustrative purposes

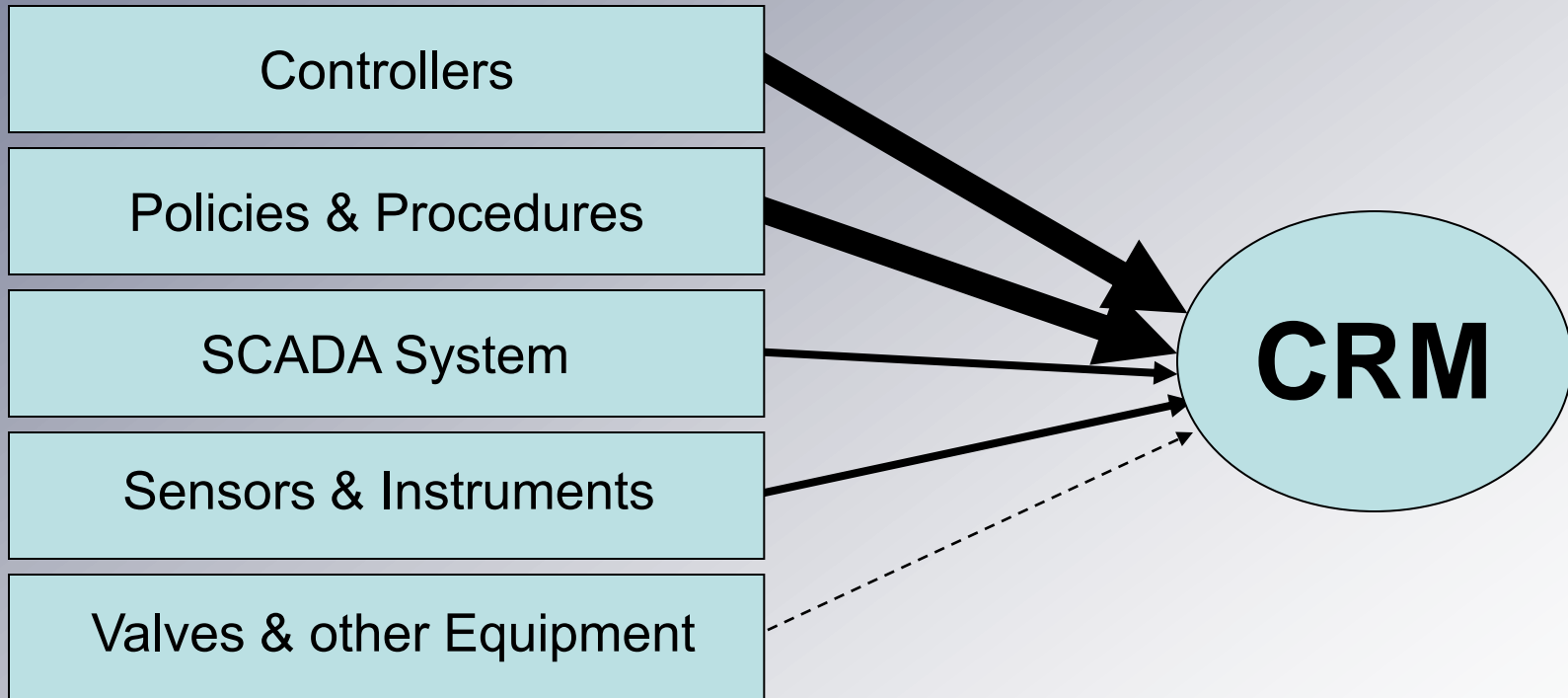


# Objective

- **Help assure controllers will continue to be successful in maintaining pipeline safety and integrity**
  - Verify that procedures, systems and equipment are well thought out, and function as designed
  - Assure pipeline operators are addressing fatigue risks in the control room



# Control Room Management People - Process - Pipeline





# 49CFR : 192.631 & 195.446

- a) General \*
- b) Roles and Responsibilities
- c) Adequate Information \*
- d) Fatigue Mitigation
- e) Alarm Management
- f) Change Management \*
- g) Operating Experience
- h) Training
- i) Compliance Validation
- j) Compliance Deviation

\* - Subtle Differences between 192 & 195



# Revised Final Rule

- Revised Final Rule published June 16, 2011
- The plans and procedures must be established August 1, 2011
- Certain program elements need to be implemented by October 1, 2011
- Implementation of remaining program elements are due August 1, 2012



# Implementation Timelines

- Implementation of “procedural” elements are due on October 1, 2011, examples:
  - Shift Change Process
  - Change Management
  - Fatigue Awareness/Mitigation Training
  - Operating Experience
- Implementation of remaining program elements are due August 1, 2012, examples:
  - Hours of Service
  - Alarm Management
  - Data Point Validation
  - Display Standards
- Training in place as each of these elements are deployed



# Special Notes

- New regulations do not change any existing jurisdictional boundaries
- New regulations do not require operators to have SCADA systems, control rooms or controllers.
- An operator can have a SCADA system without controllers, thereby no CRM implementation
- Type A Gathering is considered transmission pipe and potentially requiring CRM regulations
- **Some small LDC's with control rooms are only required to have (in essence) fatigue mgt**
  - Less than 250,000 customers, and
  - Transmission lines without compression



# <http://primis.phmsa.dot.gov/crm/>

- Bounty of Information
- Reference Materials
- Background Documents and PPTs
- Frequently Asked Questions
- Inspection Guidance



# Pilot Program for Inspection Guidance Development

Operator	Type	2011 Week of
Colonial Pipeline	Large Haz Liquid	Feb 28
Kern River Gas Transmission	Med Gas Trans	Mar 14
Enterprise Products	Large Liq/Gas	Apr 04
The Energy Cooperative	Small LDC	Apr 04
Portland Montreal Pipeline	Med Haz Liquid	Cancelled, Federal Budget Issues
City of Mesa	Med LDC	Apr 18
Southern Natural Gas	Large Gas Trans	Apr 25
Ameren Corporation	Large LDC/Trans	May 23



# Upcoming Inspection Process

- Each inspection is based on a Control Room, not operator or inspection unit
- Paper-based inspections in 4Q-2011
- Inspection Assistant Application in 2012
- After full program inspection roll-out, subsequent CRM inspections will be more concise



# Initial Inspections – 4Q11

- PHMSA will be conducting 10-15 CRM inspections in 4Q11
- At least two in each region
- 100+ State and Federal Inspectors trained in Aug-Oct, 2011
- Plan for 3 – 3.5 days for these early inspections
- Region partnering and interaction with states for consistency
- States to begin conducting their own independent inspections
- No stated target for 2012 inspections at this time



# Frequently Asked Questions

February initial release, with several updates

■ Applicability	23	
■ Adequate Information	19	} 69
■ Alarm Management	17	
■ Fatigue Management	12	
■ Roles & Responsibility	5	
■ All Others	16	



## FAQ A.08

- If a controller directs a technician in the field to manipulate a valve, or take other action that does not involve use of, or access to, the SCADA system, is the technician in the field considered to be a controller?

No, in this scenario the technician is not a controller.



## FAQ A.10

- If a person monitors a pipeline status indication for non-operational purposes, and does not have assigned responsibility to initiate corrective action, is this person a controller?

No. Persons that monitor a pipeline status indication for non-operational purposes, such as business or maintenance personnel, would not normally be considered controllers.



## FAQ A.16

- What are “safety-related” operations and parameters in the CRM rule?

For purposes of Control Room Management, PHMSA considers safety-related to mean any operational factor that is :

- Necessary to maintain pipeline integrity
- Could lead to the recognition of a condition that could impact the integrity of the pipeline
- Could lead to the recognition of a developing abnormal or emergency situation



## FAQ A.20

- Does the CRM rule apply to a local control room and station personnel that monitor and control a local operation that is completely within the fenced boundary of the local facility?

Field personnel who exclusively operate station equipment within the defined station boundaries (fence lines or property/map boundaries) and who are not responsible for connected pipelines beyond the boundaries are not considered to be remotely monitoring and controlling a pipeline. Therefore, such personnel are not considered to be controllers.

However, field personnel who operate station equipment within the station boundaries and also have either full-time or part-time control room operational responsibility for connected regulated pipelines beyond the station boundaries are considered controllers.



## FAQ B.02

- Do I need shift hand-over procedures if I do not have 24 hour shift coverage?

Yes. Anytime a controller completes his/her shift and/or control of the pipeline is transferred from one person to another person, shift hand-over requirements apply, even if there is a portion of time when the control room is planned to be unattended.



## FAQ C.10

- If no unusual events occurred during an entire shift, would a shift hand-over procedure still have to be performed?

Yes. The CRM regulations require the operator to define the information that will be transferred during shift turnover and the process by which this information is exchanged.

The fact that no unusual events occurred is in itself information that an incoming controller is expected to know.



## FAQ C.02

- What constitutes an adequate point-to-point verification?

Principally, the process should verify:

- The actual physical location and sequence among other devices and equipment at the location
- The data, information and any control or alarm functions to/from the point are being accurately represented on all SCADA displays on which it resides



## FAQ D.02

- What on-duty time must be included in the tabulation of duty hours for fatigue mitigation consideration?

Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator.

Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.



## FAQ D.03

- What minimum time should be scheduled between shifts to provide controllers off-duty time sufficient to achieve eight hours of continuous sleep?

Controllers must have an opportunity for eight hours of continuous sleep between shifts.

PHMSA encourages at least ten continuous hours of off-duty time to allow for commutes and other personal activities prior to going to sleep or after waking up. Shorter/longer commute times or the availability of nearby sleep facilities may influence the appropriate amount of off-duty time.



## FAQ E.06

- Does the requirement to annually monitor alarm activity require an operator to conduct a formal work / time-study?

Operators must monitor the overall content and volume of activity for a controller. The process by which this monitoring is to be done is not specified, but is expected to have a sufficient degree of formality and documentation. Operators must monitor the content and volume of activity being directed to a controller to substantiate any conclusions about maintaining or changing assigned duties.



## FAQ F.02

- If piping changes are being considered at a field location that do not impact any SCADA data, must the control room still be involved in change management discussions?

Yes. Even though SCADA data may not be impacted, the hydraulics performance of the pipeline system could be affected in a way that impacts control room operations.

SCADA data is not the only thing that could impact control room operations. For example, replacing a mainline valve may not change any SCADA data, but such a change may impact valve cycle time which can be a very critical factor for controllers. The operator must define, in its CRM program, what impending field changes will be included in the management of change process.



# Inspection Guidance and Questions

<b>B1-1: Has the operator adequately defined a controller’s authority and responsibility to make decisions and take actions during normal operations?</b>	<b>Procedure</b> <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT <input type="checkbox"/> NA	<b>Implementation</b> <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT <input type="checkbox"/> NA	<b>Notes/Comments</b>
<p>B1-1c: If the physical domain of responsibility periodically changes, has a clear procedure been established to describe the conditions for when such a change occurs?</p> <ul style="list-style-type: none"> <li>Some operators consolidate control room operations on night shifts, after normal business hours, or on weekends by reducing staff.</li> <li>Moving operations to another location must include a formal transfer of responsibilities, including shift-change forms or other documentation.</li> <li>If the domain of responsibility is transferred to a different location, procedures should define how the actual time of transfer is made clear to both controllers.</li> <li>Consolidating control room operations by reducing staff or transferring to another location for operational needs does not necessarily have to occur at normal shift change times, but will require the formality of shift change. Special or unusual operations sometimes prompt operators to bring help into the control room. On such occasions, clarity about who is responsible for what is very important.</li> </ul>	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N  <input type="checkbox"/> Observed <input type="checkbox"/> Records <input type="checkbox"/> Interview	



# A Few Inspection Tips - 1

- Dependency on Color Acuity
- Consistent Use of Colors
- Shift Change Content & Records
- Schedule Upsets & the Domino Effect
- Controller Commute Times



## A Few Inspection Tips - 2

- Logging Controller Hours
- Controllers working “after hours”
- 7 day sliding window
- Tracking Hours of ‘back-up’ Controllers



## A Few Inspection Tips - 3

- Control Actions : autonomy or mgt involvement
- Evacuating the Control Room
- SCADA Outages
- Definitive and Consistent Safety-Related Data Points
- Alarm Descriptor Clarity and Consistency
- Excessive or Cyclical Deviations
- Evolution of Procedures



# **Control Room Management**

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**<http://primis.phmsa.dot.gov/crm/index.htm>**