

Control Room Management Notice of Proposed Rulemaking

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Parts 192, 193, and 195

[Docket ID PHMSA-2007-27954]

RIN 2137-AE28

Pipeline Safety: Control Room Management/Human Factors

AGENCY: Pipeline and Hazardous Materials Safety Administration

ACTION: Notice of proposed rulemaking.

Ex Parte

- *Ex Parte* rules limit contact between the public and a rulemaking agency regarding a pending rule, with certain exceptions
- The agency may describe the substance of a proposal, explain terminology and discuss the intent of the NPRM
- PHMSA will work today to answer questions you may have regarding the existing NPRM
- The rule-making process is designed to allow comments from all stakeholders to help identify concerns or benefits associated with proposed regulation
- PHMSA recognizes and values your input through forum discussions and the Docket
- PHMSA encourages additional information to substantiate possible concerns, positions and/or benefits

Case History - 1

- Inadequate shift change procedures linked to tank overflow and explosion of three gasoline storage tanks that killed one worker, injured 24 other people and was heard 130 miles away
- Gas transmission controller failed to recognize abnormal operating condition resulting in slug of contaminants affecting downstream instruments (and loss of gas supply to several towns)
- Incorrectly displayed pressure data misleads the controller, resulting in a rupture
- Lack of coordination between controller and SCADA support contributes to significant product release, fire and three fatalities

Case History - 2

- Control room did not understand field terminology when working with a field maintenance crew. The event was considered a close call
- Confusion over the designation of a relocated valve created a misunderstanding between the field and the control room contributing to the magnitude of an accident
- Sheen on a creek located in a common pipeline corridor reported to a gas control room and no action taken for several days
- Citizen contacts gas control room, reports leak and controller indicated no facilities in the area. Subsequent calls result in finding several leaks in the area affecting the facilities operated by this same control room

Project Drivers

- Accident History
- Public Advocates
- Advisory Bulletins
- PSIA 2002 (CCERT)
- NTSB Recommendations
- NTSB SCADA Safety Study
- PIPES Act

Pipes Act Mandate

- Section 12

- Control Room Management regulations for operators of gas or hazardous liquid pipelines
- a human factors management plan designed to reduce risks associated with human factors, including fatigue. Each plan ... reduce risks, ... a maximum limit on the hours of service established by the operator

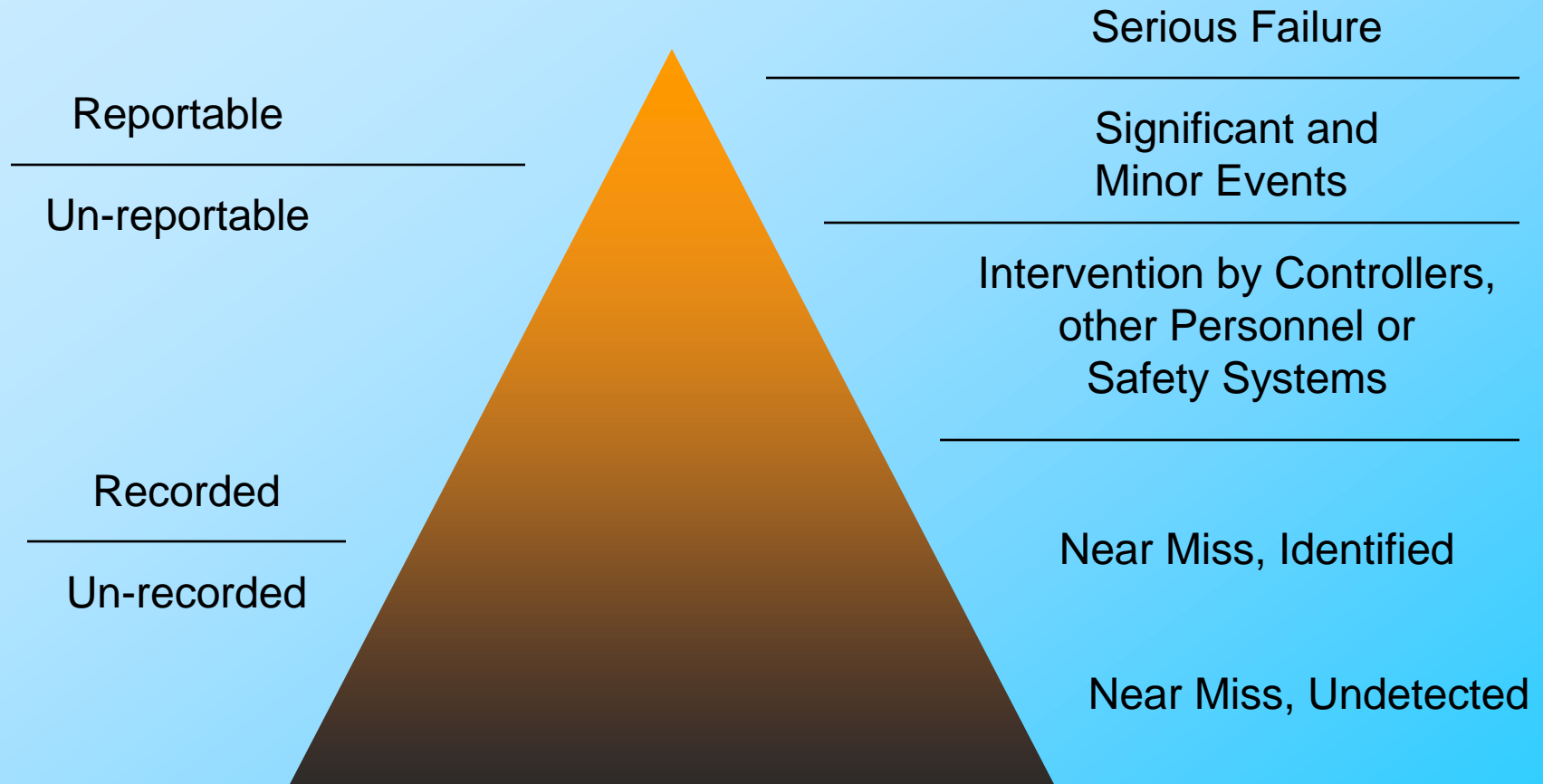
- Section 19

- Implement the following recommendations contained in the NTSB report entitled “Supervisory Control and Data Acquisition (SCADA) in Liquid Pipelines”
 1. API Recommended Practice 1165 for the use of graphics on the supervisory control and data acquisition screens
 2. Standard for pipeline companies to review and audit alarms on monitoring equipment
 3. Standards for pipeline controller training that include simulator or non-computerized simulations for controller recognition of abnormal pipeline operating conditions, in particular, leak events

Additional Statutory Directives

- 49 U.S.C. § 60102. Purpose and general authority
- 49 U.S. C. § 60103. Standards for LNG
- Provide adequate protection against risks to life and property posed by pipeline transportation and pipeline facilities
- Law directs PHMSA to establish minimum safety standards for pipeline transportation and for pipeline facilities
- Those standards may apply to the operation, maintenance, design, installation, construction, testing, etc., of pipeline facilities
- When prescribing a standard, PHMSA must consider relevant pipeline safety information, the appropriateness and reasonableness of the standard, estimated costs and benefits, public comments, and comments/recommendations from the advisory committees

Safety Pyramid



Control Room Management Processes can help assure that developing situations don't climb the pyramid to become Significant Events or Serious Failures

Identifying the Target

Controllers know how to complete actions, but on rare occasions do not:

- Detect and react as expected
- Choose the proper action

Safety could be enhanced by:

- Identifying key attributes in Controller training, qualification and skills validation processes
- Assuring thoroughness in control room procedures and practices affecting safety and integrity

Enhancement Areas

- Roles and Responsibilities
- Controller Qualifications
- Fatigue Awareness & Mitigation
- Shift Change
- SCADA Displays
- Alarm Management
- Operating Experience & Training
- Change Management
- Executive Validation

Control Room Management: Cross References

NPRM	Basis of Inclusions			Affiliations and Regulations	
	PSIA CCERT Study Outcomes	Pipes Act	NTSB Recommendations	PHMSA Advisory Bulletins & Reg. Codes	Industry RP's and Standards
Enhancement Areas					
Roles & Responsibilities	X				API RP-1168** API RP-1162
Shift Change	X				API RP-1168**
Fatigue Awareness & Mitigation	X	Section 12	P-98-30^	ADB-05-06	API RP-1168**
SCADA Displays & Data Points	X	Section 19	P-05-01, P-98-22^ P-93-22^	ADB-99-03	API RP-1165
Alarm Management	X	Section 19	P-05-02 P-98-22^		API RP-1167* AGA White Paper*
Change Management	X			ADB-99-03 ADB-03-09	API RP-1168**
Qualifications	X			195.500, 192.800 193.2700	API RP-1118, 1161 ASME B31Q
Operating Experience & Training	X	Section 19	P-05-03 P-98-21^	195.500, 192.800 193.2700	
Executive Validation	X	Section 16		ADB-07-01	

(*)Under Development (**)New since NPRM (^)Closed Recommendation

NPRM Definitions

- **Controller is:**
 - An individual who uses computer-based equipment to monitor, or monitor and control, all or part of a pipeline system or LNG facility
 - Individuals who monitor or control a pipeline or LNG facility using computerized systems are controllers
 - Individuals who operate equipment locally but who cannot actually see the equipment respond without using a closed circuit television system or other external devices
 - Individuals performing controller activities, regardless of their job title or whether their actions are overseen by other controllers or supervisors
- **Controller is not:**
 - Individuals who operate equipment locally and can see the equipment respond without using a closed circuit television system or other external devices
 - Personnel accessing data from the control system for performing maintenance, testing of equipment, etc.
- **Alarm is:**
 - An indication provided by SCADA or a similar monitoring system that a monitored parameter is outside normal or expected operating conditions
- **Alarm is not ...**

Conceptual Pipeline CRM Risk Matrix

--- Risk derived from monitor and control ---

Red indicates highest risk, Yellow indicates lowest risk

Pipeline Control Risk Matrix		Hazardous Liquids	Gas Transmission & LNG	Gas Distribution
Remote Operation	Remote monitor & remote control	Red	Orange	Yellow
	Remote monitor; action by others			
Individual Field Station Operation	Local facility with centralized control panel			
	Individual equip. with status control and indicators			

Matrix coding principally represents the combination of frequency and consequence of pipeline upset conditions and failures, where CRM may be a contributing factor

Controller Groups

Liquids

- Large Hazardous Liquid Operators, 24 hours
 - Centralized and Field
- Small Hazardous Liquid Operators, 24 hours
 - Centralized or Field
- Small Hazardous Liquid Operators, Intermittent
 - Field
- *Small operators are less efficient in stations or mileage / controller compared to large operators*

Controller Groups

LNG and Natural Gas

- *LNG Facilities - 24 hours*
 - Centralized Control Room
- *Gas Transmission - Typically 24 hours*
 - Centralized Control Room
 - Field Controllers are used
- *Distribution – 24 hours & Day shift only*
 - Larger LDCs – May be Centralized and/or Field controllers
 - Smaller LDCs – Less formal control environment
- *Master Meters & Small Propane Systems unless the operator transports gas as a primary activity are excluded (aka RP1162 criteria)*

Participation and Recognition

- Control Room Forums
- Recommended Practices
- Research
- Public Workshops

Preliminary Feedback

- Controller Definition
- Shift Overlap
- Alarm Analysis
- Hearing/Vision Assessment
- Operator Qualification
- Data Point Validation

We are hear to promote communications

- A comment letter has already been posted to the docket
- We encourage you to read it, and post your own comment

Web Links & Docket

- <http://www.thefederalregister.com/d.p/2008-09-12-E8-20701>
- <http://edocket.access.gpo.gov/2008/pdf/E8-20701.pdf>
- Regulatory Information # 2137–AE28
- Docket ID PHMSA–2007–27954
- www.regulations.gov
- Old related PHMSA dockets: 98-4470, 2004-18938, and 2004-18584