U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

Control Room Management Implementation Workshop

Nov. 17, 2010

Getting Started

- Please……cell phones
- Should we need to evacuate ……
- Facilities ……..
- Breaks and Lunch
  - Handout and Locations
  - Parking

THANK YOU!

Those Behind The Scenes
A Big THANK YOU!

- Headquarters:
  - » Gwen Hill
  - » Janice Morgan
  - » Many Others
- Central Region:
  - » Sandy Cline
  - » Ginger Roberts
- Intercontinental:
  - » Christina Ter Poorten
  - » Miki Delane

Getting Started

- Objectives and Purpose of the Meeting
  - Foster an understanding of the CRM Rule
  - Panel Discussions for insight on:
    - »Fatigue management/maximum hours of service
    - »Alarm management
    - »Adequate information
  - Provide PHMSA input from which to refine guidance material

Getting Started

- Agenda
  - How it is organized
  - Workshop slides matched to audio
    - http://www.phmsa.dot.gov/
  - Evaluation Forms
  - Speaker Bios

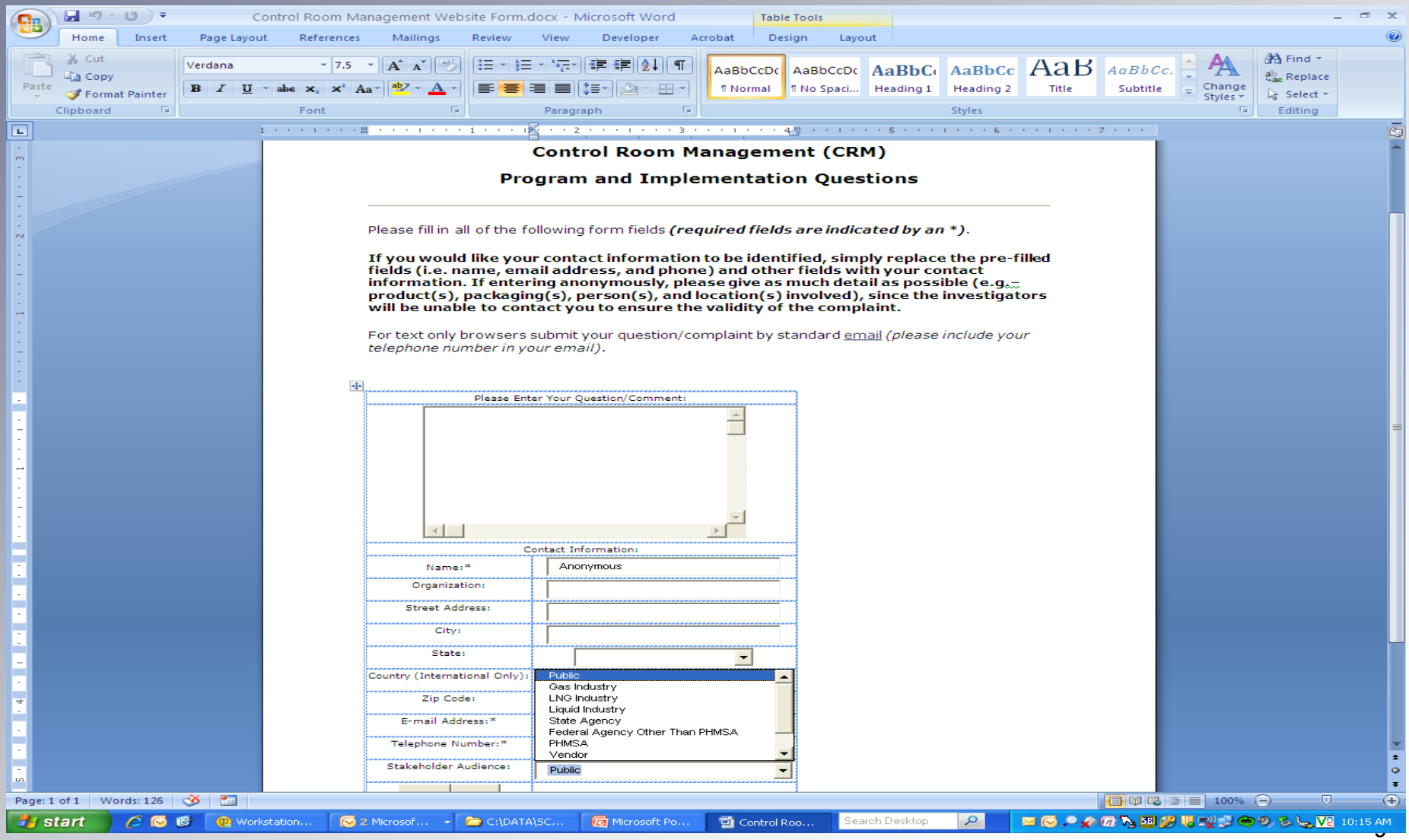
49CFR : 192.631 & 195.446

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

Getting Started

- Agenda (cont.)
  - Very Full Agenda
  - Questions Unique to Your Operation
  - Panels and Q&A
  - Ways to Submit Further FAQ Material
    - 3x5 cards
    - IT form on our website

Website Form for FAQs



Getting Started

- Make the most of participation opportunities
- What you learn, share with others
- Any problems with the room or other issues, please see me as soon as possible
- Byron – Introduce CRM Team
  - »PHMSA Speaker
- Enjoy the Workshop

Control Room Management

US DOT
Pipeline and Hazardous Materials Safety Administration

Linda Daugherty

Deputy Associate Administrator

Policy and Programs

USDOT / PHMSA

Current Project Team

- Dana Arabie, Louisiana Department of Natural Resources
- Tewabe Asebe, Regulations
- Karen Butler, Accident Invest. Supervisor, Central Region
- Byron Coy PE, (Team Lead) Dir. Eastern Region
- Ben Fred, Office of Chief Counsel
- Charlie Helm, Training & Qualifications
- Max Kieba, Engineering
- Wally McGaughey, Training & Qualifications
- David Piroutek, Wyoming Public Service Commission

Project Drivers

- PHMSA has been examining Control Room operations for over 10 years
  - Three Advisory Notices on SCADA & Fatigue (1999, 2003, 2005)
  - SCADA System Check List Initiated (1998)
  - T&Q SCADA Training Class Developed (2001)
- Pipeline Safety Improvement Act of 2002 (Section 13b)
  - CCERT Study of control room operations to enhance pipeline safety (2003-2006)
  - Operator Qualification Requirements (2006-2007)
  - Two CRM Workshops (2006, 2007)
  - OQ Report to Congress, Section 6 (Dec-2006)
- National Transportation Safety Board
  - 10 of 18 Hazardous Liquid accidents have potential CRM involvement (1998-2005)
  - SCADA Safety Study (2005)
- PIPES Act of 2006 (Sections 12, 19, 20)
  - Establish human factors management plan
  - Program to assure safe operation of pipelines
  - NTSB Recommendations on Displays, Alarms and Training
  - Accident/incident form changes on Fatigue
  - Issue Regulations

CRM Workshop

- Foster an understanding of the Control Room Management Rule issued on December 3, 2009
- Workshop is in conjunction with the National Association of Pipeline Safety Representatives (NAPSR)
- Broad base of Stakeholders
- Panel discussions
- Provide input to further refine guidance material currently in development
- Inspection forms and FAQs are being developed and will be published

Workshop Agenda Highlights

- Introduction and Overview
- Definitions
- Fatigue and Maximum Hours of Service (Panel)
- Alarms (Panel)
- Roles and Responsibilities
- Adequate Information (Panel)
- Remaining Items of Concern
- Open Questions and Discussion
- Wrap Up and Path Forward

Case History

- Inadequate shift change procedures resulted in tank overflow and explosion
- Incorrect display data misled the controller, resulting in a rupture
- Controller fails to recognize abnormal operating condition resulting in loss of gas supply to several towns
- Citizen contacts control room to report a leak. Controller indicated no facilities in the area. Follow up analysis finds several leaks in operator's pipeline, in the specified area.
- Lack of coordination between controller and SCADA support results in significant product release, fire and fatalities

Related Advisories

- ADB-99-03, July 7, 1999
  - Operators should review the capacity of its SCADA system
  - Assure system modifications do not adversely affect overall performance of the SCADA system
- ADB-05-06, August 11, 2005
  - Operators should ensure that controllers are not assigned to shift duties while fatigued
  - Concern for a reduction of mental alertness and decision making ability
  - Encourage fatigue management practices

Control Room Management: Cross References

Enhancement Areas	Basis			Affiliations and Regulations	
	PSIA-2002 CCERT Study Outcomes	Pipes Act 2006	NTSB Recommendations	PHMSA Advisory Bulletins & Reg.Codes	Industry RP's and Standards
Roles & Responsibilities	X				API RP-1168**
Shift Change	X				API RP-1168**
Fatigue Awareness & Mitigation	X	Section 12	P-05-04@, P-99-12@ P-98-30@	ADB-05-06	API RP-1168** SGA Fatigue Mgt**
SCADA Displays	X	Section 19	P-05-01@, P-98-22@ P-93-22@	ADB-99-03	API RP-1165
Point Data	X				
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**
Operating Experience & Training	X	Section 19	P-05-03@ P-98-21@	195.500 192.800	

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

Initial Observations

- Pipeline incidents/accidents are usually caused by mechanical damage, material defects, or corrosion
- A Controller's job frequently places them in a critical position to aid in the prevention, detection and mitigation of abnormal and emergency situations
- Controllers know how to complete actions but on rare occasions they do not:
  - Detect and react as expected
  - Choose the right action
- From a risk perspective, low probability of controller error can be offset by the potential consequences of their actions/errors

NPRM-2008 Conclusions

- A Controller can be qualified but not always successful in managing abnormal situations due to many factors; such as thoroughness of procedures, dependence on others, SCADA system design, fatigue, etc.
- Most operators are already performing many of the forthcoming regulations, but frequently without a basis for their design choices, and sometimes without formalized procedures
- A major objective of the regulations is to insure Controllers have sufficient tools and resources to be successful in maintaining pipeline safety.

Pipeline CRM Risk Matrix

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

Red indicates highest risk, Yellow indicates lower risk

More Complex →

Pipeline Control Risk Matrix		Hazardous Liquids	Gas Transmission	Gas Distribution
Remote Operation	Remote monitor & remote control	--- All Regulations ---		
	Remote monitor; action by others			
Individual Field Station Operation	Local facility with centralized control panel			Limited to Fatigue Mgt
	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

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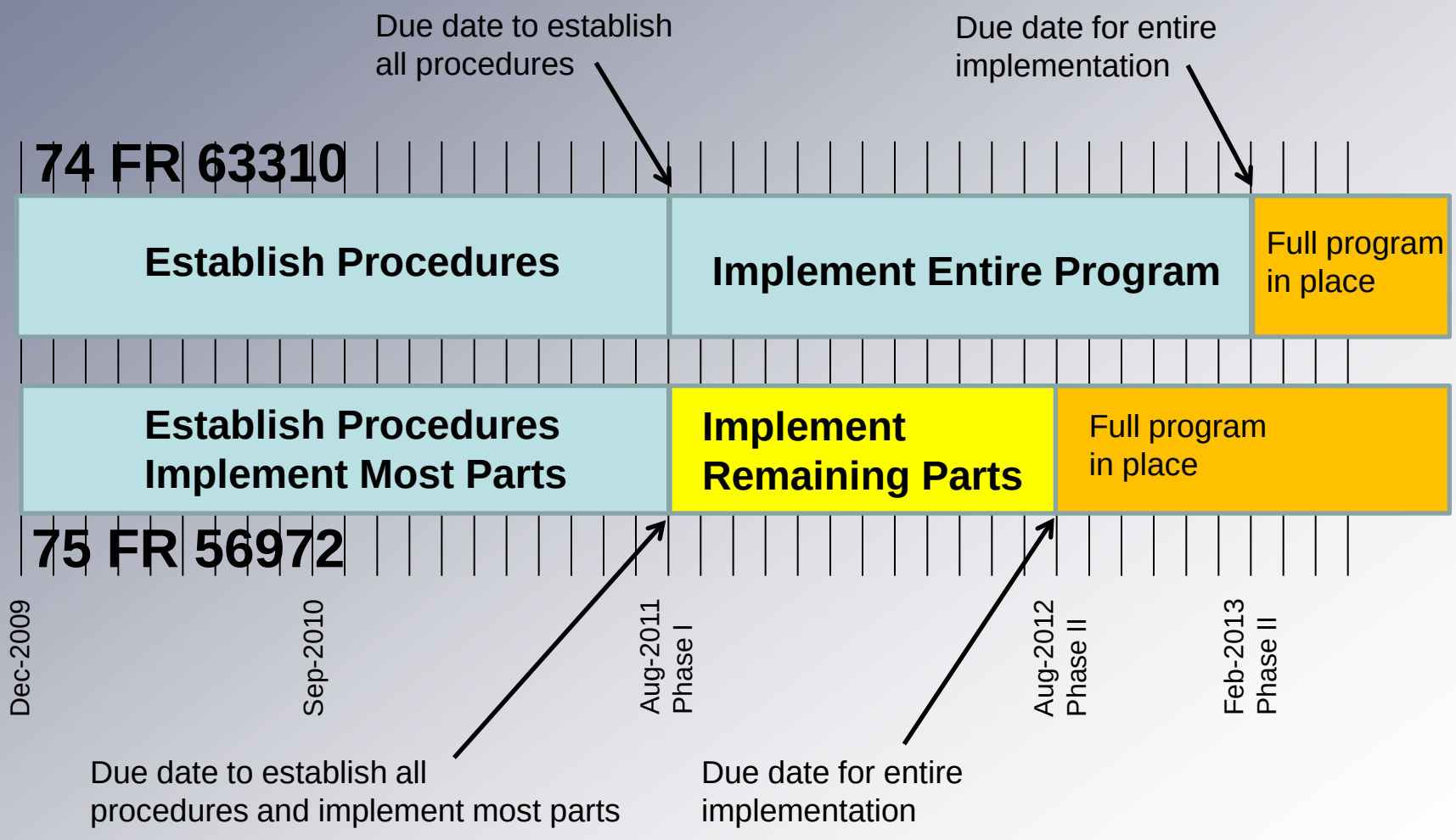
Notice of Proposed Rulemaking September 17, 2010

- Federal Register (75 FR 56972) a Notice of Proposed Rulemaking
- Proposes to expedite the program implementation deadline in a final rule that was published on December 3, 2009 (74 FR 63310) to August 1, 2011 for most of the requirements in that final rule
- Certain provisions regarding adequate information and alarm management, which would have a program implementation deadline of August 1, 2012
- Deadline for submitting comments has just been published in the Federal Register, extended to Dec. 3rd

Impact on Timeline



2010 - 2011

- **Final Rule Effective Date, Feb-2010**
- **NTSB Recommendation Closures : Feb/Apr-2010**
- **NPRM to expedite Deadlines : Sep-2010**
- **Public Workshop : Nov-2010**
- Hours of Service Criteria Finalized : 1Q11
- Shift Schedules Criteria Finalized: 1Q11
- FAQ's Finalized : 1Q11
- Pilot Inspections : Mar-Apr, 2011
- Inspection Enforcement Guidance : 2Q11
- Inspector Training Material : Jun-2011
- **Phase I Implementation Date : Aug-2011**
- Phase I Inspections Begin : Sep-2011

Inspections

- The legislation calls for PHMSA (or State partners) to review and approve operators' plans
- PHMSA will be making provisions to conduct inspections on an orchestrated basis
- We anticipate dedicated initial CRM inspections of every operator with Controllers
- If we find an operator’s plan, implementation and eventual documentation do not comply with the regulation, or is inadequate, the agency has a variety of enforcement options available to ensure compliance