Control Room Management Outline

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Control Room Management Outline

199 Operators with Control Rooms in Texas

Gas Only, Hazardous Liquids Only, Or Both

*As of June 16, 2025

CRM FAQs

PHMSA Control Room Management FAQs

https://www.phmsa.dot.gov/pipeline/control-room-management/control-room-management-faqs

This site provides information about PHMSA's implementation of Control Room Management oversight and links to other educational information on human factors and human operational performance.

Definitions

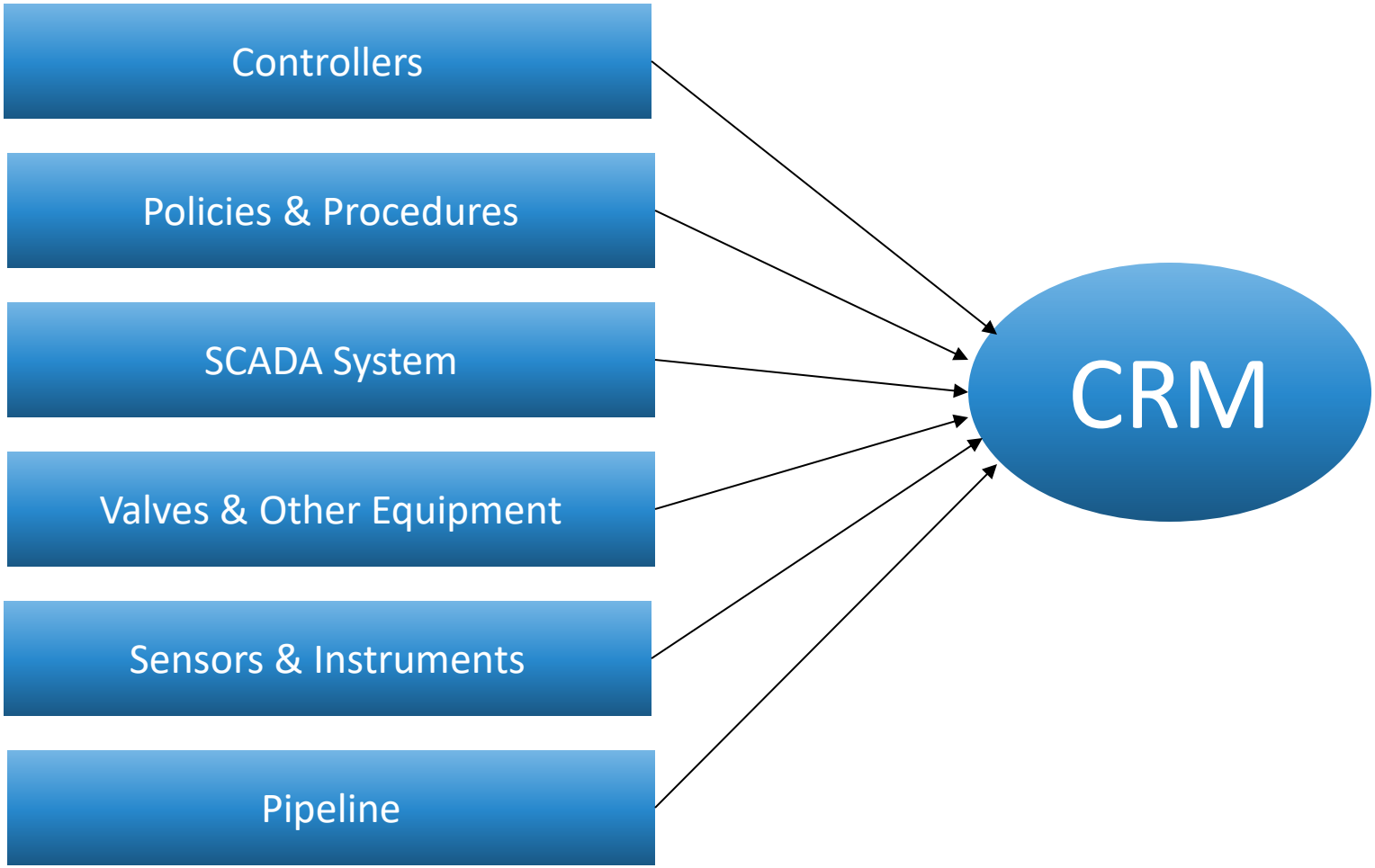
Control Room

- An operations center staffed by personnel responsible for remotely monitoring and controlling a pipeline facility.

Controller

- A qualified individual who remotely monitors and controls the safety-related operations of a pipeline facility via a SCADA system from a control room and who has operational authority and accountability for the remote operational functions of the pipeline facility.

People – Process – Pipeline



Is CRM Applicable?

- Is there a Control Room?
  - Is there SCADA on a Jurisdictional Pipeline Facility?
  - Is there a controller with authority to monitor and control the pipeline?

- Remote Actions and Phone Calls are both Controller Functions

CRM Exceptions (1 of 2)

Gas *49 CFR 192.631(a)(1)(i) and (ii)*

- (i) - Distribution with less than 250,000 services, or

- (ii) - Transmission without a compressor station
  - Only Requires (d) Fatigue, (i) Compliance Validation, and (j) Compliance and Deviations

CRM Exceptions (2 of 2)

No Liquid Exceptions!

If the control room facility is responsible for jurisdictional gas and liquid pipelines, then there are no gas exceptions.

(b) Roles and Responsibilities (1 of 2)

- Qualified vs Qualifications
- Evacuations
- Shift Handover
  - HL - Section 5 API RP 1168 (1st Edition)
- Authority to Supersede
  - Direct or Supersede

(b) Roles and Responsibilities (2 of 2)

- Past Issues
  - Procedures
    - Authority to Direct or Supersede
  - Records
    - Shift Change
      - Record not showing all required topics covered.
      - Record not showing time of shift change.

(c) SCADA (1 of 2)

- Supervisory Control and Data Acquisition
  - Additions, Expansions, or Replacements
    - Define Procedures. Check FAQ C.15
  - API RP 1165
    - Documenting Review of SCADA when Adding, Expanding, or Replacing
    - Observation
  - Safety Related Points
    - Procedures and Records

(c) SCADA (2 of 2)

- SCADA (Continued)
  - Point-to-Point Verification
    - Records – Field and CR Information
  - Internal Communication Plan
    - Operations during SCADA outage
  - Backup SCADA System
    - Records - Thoroughness

SRP vs SRA (1 of 4)

- **Safety Related Point** refers to a specific location, object, or parameter whose state or behavior is critical for maintaining safety.

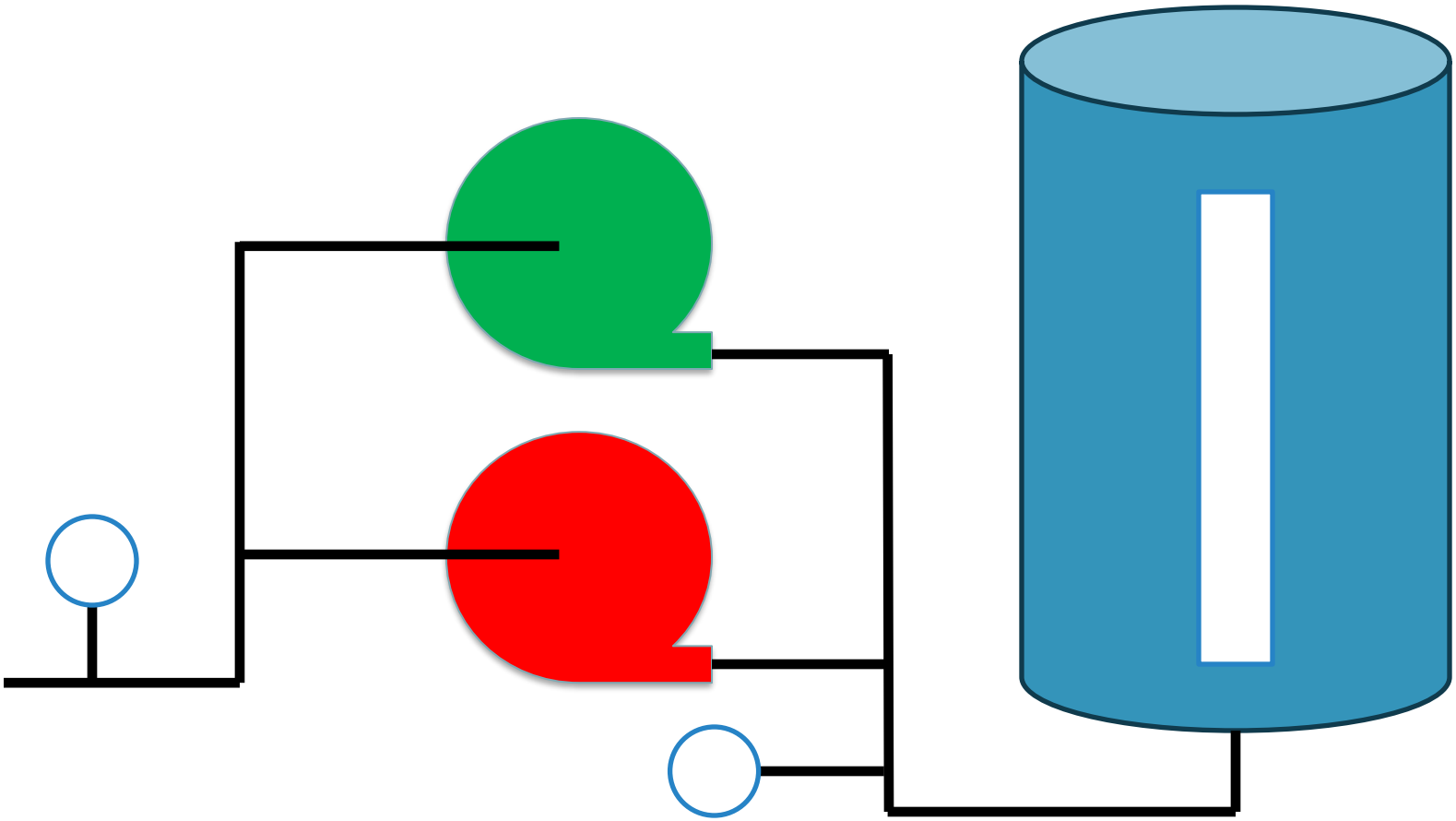
- **Safety Related Alarm** is an audible or visual indication to the operator that a safety-related point has deviated from its normal or safe state, requiring a timely response to prevent or mitigate a hazardous situation.

SRP vs. SRA (2 of 3)

- Safety-Related Point
  - Devices
    - Status of Valves
    - Pressure Transmitters
    - Flow Transmitters
    - Leak Detection
    - Pressure Regulators
    - Communication Status
    - H_2S / Water Alarms
    - Odorant Alarms
    - Flame, Gas and Vapor Detectors
    - Power Supply

- Safety Related Alarm
  - Example Alarms
    - Setpoints
    - HI, HIHI
    - LO, LOLO
    - Critical, High, Medium, Low
    - Alerts

SRP vs. SRA (3 of 3)



Fatigue

No Sleep = Blood Alcohol Level

- Center for Disease Control
  - Being awake for 17 hours is similar to having a BAC of 0.05%.
  - Being awake for 24 hours is similar to having a BAC of 0.10%.

https://www.cdc.gov/niosh/work-hour-training-for-nurses/longhours/mod3/08.html

(d) Fatigue Management (1 of 3)

- Fatigue Risks
  - Extended hours of work (12 Hour Normal)
  - Successive nights in a row
  - Lighting
  - Sedentary nature of work
  - Noise
  - *Commute Times

- Controller Fatigue – Incidents

(d) Fatigue Management (2 of 3)

- Fatigue Countermeasures
  - Coffee *(Tactical Use)*
  - Lighting
  - Exercise/Equipment
  - Snacks
  - Sit/Stand Workstation
  - Temperature Control
  - Break Areas/Napping

(d) Fatigue Management (3 of 3)

- Fatigue Education
- Review of Fatigue Education / Training Program Effectiveness
  - Metrics, or how measuring effectiveness
- Hours of Service Limits
  - Tracking Actual Hours
  - Normal Business Hours – Managers

(e) Alarm Management (1 of 3)

- Alarm Philosophy & Rationalization
- Malfunctioning Alarms
- Monthly Alarm Analysis
  - Should include a process to correct and return to service.
  - Records

(e) Alarm Management (2 of 3)

- Alarm Setpoint and Descriptions Process
  - Annual verification records
- Controller Abilities
  - Change Alarm Limits/Set Points/Inhibit/off-scan
- Alarm Management Plan Review
  - Effectiveness, what are the Metrics?

(e) Alarm Management (3 of 3)

- Measuring Controller Workload
  - Sufficient Time for the Controller to React
  - Metrics, Procedure
    - *API 1167*
    - *ANSI/ISA -18.2*
  - Records

- Alarm Deficiency Resolution
  - Procedure and complete cycle

(f) Change Management

- Ensure Controller Representee is Included
- Notification and Training prior beginning operations
- Field Equipment Changes
- MOC Records

(g) Operating Experiences

- Lessons Learned
  - Control Room or outside Control Room

- Past Concerns
  - Operator not considering possible lessons learned from outside their organization.
  - Records (Not Documenting)

(h) Training (1 of 2)

- Process
  - Qualification vs. Qualified
  - Training Content and Review

- AOCs that are likely to occur simultaneously or in sequence.
  - Operator should have a record (list, training, etc.)

- Set-ups Periodically but Infrequently Used

(h) Training (2 of 2)

- Teams Training
  - Who operationally collaborates with controllers:
    - field personnel, leak detection SMEs, hydraulic engineers, 800 number emergency call personnel, etc.
  - Operator Defined Frequency
    - New Hires
  - FAQ H.06 for potential training content

(i) Compliance Validation

- Compliance Validation
  - Upon request, operators must submit their procedures to PHMSA or, in the case of an intrastate pipeline facility regulated by a State, to the appropriate State agency.
  - FAQ I.03
    - If no specific date is given, 45 Days to submit requests.

(j) Compliance & Deviations

- HOS Deviations and Deviations
  - FAQ D.13 – Date, Time, and by whom deviation is being reviewed/approved

- Records
  - TAC Title 16 Chapter 8.105
  - Maintain records for five years if no other time period is specified.

49 CFR 195.134/.444 Leak Detection (1 of 3)

- New Addition to Liquid CRM Inspections
  - 49 CFR 195.134(b)
  - (1) For each pipeline constructed prior to October 1, 2019. Each pipeline must have a system for detecting leaks that complies with the requirements in § 195.444 by October 1, 2024.
  - (2) For each pipeline constructed on or after October 1, 2019. Each pipeline must have a system for detecting leaks that complies with the requirements in § 195.444 by October 1, 2020.

49 CFR 195.134/.444 Leak Detection (2 of 3)

- CPM Leak Detection Systems
  - 49 CFR 195.134(c) CPM leak detection systems. A new computational pipeline monitoring (CPM) leak detection system or replaced component of an existing CPM system must be designed in accordance with the requirements in section 4.2 of API RP 1130 (incorporated by reference, see § 195.3) and any other applicable design criteria in that standard.

49 CFR 195.134/.444 Leak Detection (3 of 3)

- Concerns:
  - Documentation of training controllers for the leak detection system.
  - Documentation that pipeline controllers are trained to recognize leaks on the system.
  - Documentation of Capability Evaluation
  - Documentation of the Leak System Testing.

PHMSA Discussions

- National Transportation Safety Board Safety Recommendation P-11-009

- Require operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines to ensure that their control room operators immediately and directly notify the 911 emergency call center(s) for the communities and jurisdictions in which those pipelines are located when a possible rupture of any pipeline is indicated. (Supersedes Safety Recommendation P-11-002)

Observations

What to Look for:

- Security
- Screens (API RP 1165)
- Hardware
  - Monitors, Phones, etc.
- Direct and/or Supersede
- Availability of Procedures
- Controller Knowledge
- Shift Turnover
- Evacuation Materials

Summary

CRM Questions?

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