



**Oklahoma Corporation Commission
Pipeline Safety Department**

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2018 Natural Gas and Hazardous Liquids Pipeline Safety Seminar

Control Room Management

49 CFR 192.631

(a) General.

(1) This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section, except that for each control room where an operator's activities are limited to either or both of:

192.631(a)(i)(ii)

(i) Distribution with less than 250,000 services, or
(ii) Transmission without a compressor station,
the operator must have and follow written
procedures that implement only paragraphs (d)
(regarding fatigue), (i) (regarding compliance
validation), and (j) (regarding compliance and
deviations) of this section.

195.446(a)

(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section. The procedures required by this section must be integrated, as appropriate, with the operator's written procedures required by §195.402. An operator must develop the procedures no later than August 1, 2011, and must implement the procedures according to the following schedule.

195.446(a)

The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) of this section must be implemented no later than **October 1, 2011**. The procedures required by paragraphs (c)(1) through (4), (d)(1), (d)(4), and (e) must be implemented no later than **August 1, 2012**. The training procedures required by paragraph (h) must be implemented no later than **August 1, 2012**, except that any training required by another paragraph of this section must be implemented no later than the deadline for that paragraph.

192.631(b)

195.446(b)

- ❑ Roles and responsibilities
- ❑ Each operator must define the roles and responsibilities of a controller during normal, abnormal, and emergency operating conditions. To provide for a controller's prompt and appropriate response to operating conditions, an operator must define each of the following:

- (1) A controller's authority and responsibility to make decisions and take actions during normal operations;
- (2) A controller's role when an abnormal operating condition is detected,
- (3) A controller's role during an emergency,
- (4) A method of recording controller shift-changes and any hand-over of responsibility between controllers; and
- (5) The roles, responsibilities and qualifications of others with the authority to direct or supersede the specific technical actions of a controller.

192.631(c)

195.446(c)

(c) Provide adequate information. Each operator must provide its controllers with the information, tools, processes and procedures necessary for the controllers to carry out the roles and responsibilities the operator has defined by performing each of the following:

192.631(c)

195.446(c)

- (1) Implement sections 1, 4, 8, 9, 11.1, and 11.3 of API RP 1165 (incorporated by reference, see §192.7) whenever a SCADA system is added, expanded or replaced, unless the operator demonstrates that certain provisions of sections 1, 4, 8, 9, 11.1, and 11.3 of API RP 1165 are not practical for the SCADA system used; **(For 195.446 (c) all of API RP 1165 must be followed)**
- (2) Conduct a point-to-point verification between SCADA displays and related field equipment when field equipment is added or moved and when other changes that affect pipeline safety are made to field equipment or SCADA displays;
- (3) Test and verify an internal communication plan to provide adequate means for manual operation of the pipeline safely, at least once each calendar year, but at intervals not to exceed 15 months;
- (4) Test any backup SCADA systems at least once each calendar year, but at intervals not to exceed 15 months; and
- (5) Establish and implement procedures for when a different controller assumes responsibility, including the content of information to be exchanged.

192.631(d)

195.446(d)

(d) Fatigue mitigation. Each operator must implement the following methods to reduce the risk associated with controller fatigue that could inhibit a controller's ability to carry out the roles and responsibilities the operator has defined:

(1) Establish shift lengths and schedule rotations that provide controllers off-duty time sufficient to achieve *eight hours of continuous sleep*;

(2) Educate controllers and supervisors in fatigue mitigation strategies and how off-duty activities contribute to fatigue;

(3) Train controllers and supervisors to recognize the effects of fatigue; and

(4) Establish a maximum limit on controller hours-of-service, which may provide for an emergency deviation from the maximum limit if necessary for the safe operation of a pipeline facility.

192.631(e)

195.446(e)

(e) Alarm management. Each operator using a SCADA system must have a written alarm management plan to provide for effective controller response to alarms. An operator's plan must include provisions to:

- (1) Review SCADA safety-related alarm operations using a process that ensures alarms are accurate and support safe pipeline operations;
- (2) Identify at least once each calendar month points affecting safety that have been taken off scan in the SCADA host, have had alarms inhibited, generated false alarms, or that have had forced or manual values for periods of time exceeding that required for associated maintenance or operating activities;

192.631(e)

195.446(e)

(3) Verify the correct safety-related alarm set-point values and alarm descriptions at least once each calendar year, but at intervals not to exceed 15 months;

(4) Review the alarm management plan required by this paragraph at least once each calendar year, but at intervals not exceeding 15 months, to determine the effectiveness of the plan;

(5) Monitor the content and volume of general activity being directed to and required of each controller at least once each calendar year, but at intervals not to exceed 15 months, that will assure controllers have sufficient time to analyze and react to incoming alarms; and

(6) Address deficiencies identified through the implementation of paragraphs (e)(1) through (e)(5) of this section.

192.631(f)

195.446(f)

(f) Change management. Each operator must assure that changes that could affect control room operations are coordinated with the control room personnel by performing each of the following:

- (1) Establish communications between control room representatives, operator's management, and associated field personnel when planning and implementing physical changes to pipeline equipment or configuration;
- (2) Require its field personnel to contact the control room when emergency conditions exist and when making field changes that affect control room operations; and
- (3) Seek control room or control room management participation in planning prior to implementation of significant pipeline hydraulic or configuration changes.

192.631(g)

195.446(g)

(g) Operating experience. Each operator must assure that lessons learned from its operating experience are incorporated, as appropriate, into its control room management procedures by performing each of the following:

(1) Review accidents that must be reported pursuant to 49 CFR part 191 or §195.50 and 195.52 to determine if control room actions contributed to the event and, if so, correct, where necessary, deficiencies related to:

- (i) Controller fatigue;
- (ii) Field equipment;
- (iii) The operation of any relief device;
- (iv) Procedures;
- (v) SCADA system configuration; and
- (vi) SCADA system performance.

(2) Include lessons learned from the operator's experience in the training program required by this section.

192.631(h)

195.446(h)

(h) Training. Each operator must establish a controller training program and review the training program content to identify potential improvements at least once each calendar year, but at intervals not to exceed 15 months. An operator's program must provide for training each controller to carry out the roles and responsibilities defined by the operator. In addition, the training program must include the following elements:

- (1) Responding to abnormal operating conditions likely to occur simultaneously or in sequence;
- (2) Use of a computerized simulator or non-computerized (tabletop) method for training controllers to recognize abnormal operating conditions;
- (3) Training controllers on their responsibilities for communication under the operator's emergency response procedures;

192.631(h)

195.446(h)

(4) Training that will provide a controller a working knowledge of the pipeline system, especially during the development of abnormal operating conditions;

(5) For pipeline operating setups that are periodically, but infrequently used, providing an opportunity for controllers to review relevant procedures in advance of their application; and

(6) Control room team training and exercises that include both controllers and other individuals, defined by the operator, who would reasonably be expected to operationally collaborate with controllers (control room personnel) during normal, abnormal or emergency situations. Operators must comply with the team training requirements under this paragraph by no later than January 23, 2018.

192.631(i)

195.446(i)

(i) 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.

192.631(j)

195.446(j)

(j) Compliance and deviations. An operator must maintain for review during inspection:

(1) Records that demonstrate compliance with the requirements of this section; and

(2) Documentation to demonstrate that any deviation from the procedures required by this section was necessary for the safe operation of a pipeline facility.

Agenda

49 CFR §§ 192.631 and 195.446

✓ Others and TEAM training

- Jan 23, 2017, PHMSA modified 49 CFR §§ 192.631 and 195.446
- What is the background, what is driving it?
- Will there be additional guidance as far as FAQ or inspection guidelines
- What are enforcement expectations
- Define “others” and “supersede”
- Compliance Dates

- ✓ What is the background and what is driving it?
 - Following a pipeline accident, PHMSA discovered there were personnel in the control room or that had access to the controller and had direct influence over the actions of the controllers that were not “Qualified” or “Trained” in the roles and responsibilities of a person that was tasked with monitoring and controlling a pipeline from a SCADA system in a Control Room.
 - These “other” personnel were able to influence or “supersede” the actions of the controller even though they themselves were not controllers and they were seen as posing a significant risk to the safe operation of a pipeline.

- ✓ (b) Roles and responsibilities. Each operator must define the roles and responsibilities of a controller during normal, abnormal, and emergency operating conditions. To provide for a controller's prompt and appropriate response to operating conditions, an operator must define each of the following:
 - (5) The roles, responsibilities and qualifications of **others** with the authority to direct or supersede the specific technical actions of a controller.

- ✓ The identification of and qualification of the “others” was required to be completed by March 23, 2017
- ✓ Did this create a new covered task for your operations or were the “others” simply qualified as controllers
- ✓ Have you defined their roles and responsibilities?
- ✓ Have they been provided with the adequate information necessary to carry out their roles and responsibilities during normal, abnormal and emergency operations?
- ✓ Are they identified in the fatigue mitigation plan, controller training plan, and hours of service plan?

- ✓ Will there be additional guidance as far as FAQ or inspection guidelines
 - PHMSA has published some FAQ's related to the Final Rule language
 - A key take away from this is that PHMSA won't be doing targeted inspections on this new regulation, it will be included in the CRM "II" inspection question set and used during and as part of a CRM II inspection on your Control Room Programs.
 - NOTE: the requirement for the "others" is in force and can be included in an inspection today.

✓ What are enforcement expectations?

- Expectations are that the operator will identify anyone in the control room or that has access to the controller who has the ability and authority to influence or supersede the actions of the controller
- Those personnel identified will be fully trained and qualified to complete their roles and responsibilities as identified by the operator.
- It will also be expected, I believe, that anyone who has access to or can influence the controllers actions that does not have the full authority of the operator to do so will also be identified, trained and instructed to not interfere with the performance of the controller in their duties.

✓ Define “others” and “supersede”

- **In my opinion, these would apply**
- **Others** – anyone that has access to the controller who can influence the actions of the controller or supersede the actions of the controller in the performance of the defined roles and responsibilities.
- **Supersede** – anyone in the control room or with access to the controller that by their position or rank would be perceived as having authority over the controllers actions; i.e. a Vice President or District Manager/Director, non-qualified supervision, etc.

Team Training in Other Modes

- ✓ NTSB stated in their recommendation to PHMSA the following: TO THE PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Develop requirements for team training of control center staff involved in pipeline operations similar to those used in other transportation modes.
- ✓ Related to this proposed amendment, the NTSB issued the following safety recommendations to PHMSA on July 25, 2012:
 - Develop requirements for team training of control center staff involved in pipeline operations similar to those used in other transportation modes. (P-12-7), and extend operator qualification requirements (emphasis mine) in Title 49 Code of Federal Regulations Part 195 Subpart G to all hazardous liquid and gas transmission control center staff involved in pipeline operational decisions. (P-12-8) The proposed NPRM adds team training requirements in §§ 192.631 and 195.446.

Team Training in Other Modes, NTSB Continued

- It also adds language to §§ 192.631(b)(5) and 195.446(b)(5) that would require each operator to define “the roles, responsibilities and qualifications of others with the authority to direct or supersede the specific technical actions of a controller.”
- These proposed regulatory improvements were discussed in the April 8, 2015, NTSB letter to PHMSA where the PHMSA plan to codify the training guidance previously issued as an advisory bulletin was accepted.
- In accepting this the proposed changes related to operator qualifications were also accepted.

Team Training in Other Modes, NTSB Continued

- ✓ (h) Training. Each operator must establish a controller training program and review the training program content to identify potential improvements at least once each calendar year, but at intervals not to exceed 15 months. An operator's program must provide for training each controller to carry out the roles and responsibilities defined by the operator. In addition, the training program must include the following elements:
 - (6) Control room team training and exercises that include both controllers and other individuals, defined by the operator, who would reasonably be expected to operationally collaborate with controllers (control room personnel) during normal, abnormal or emergency situations. Operators must comply with the team training requirements under this paragraph by no later than January 23, 2018.

Team Training in Other Modes

- ✓ So, what is intended by the “other modes” idea and how might it apply?
- ✓ Lets look at CRM Team Training information for two other modes:
 - Air traffic control
 - Rail control

Team Training in Other Modes

✓ Air Traffic Control

- “Many air traffic control positions are staffed by two controllers who work together, with one handling radar monitoring and communications tasks and the other dealing with flight data. Thus a ground-based team manages the aircraft under its control, but a single individual usually communicates with the team's air traffic.”
 - There is a need for study of the relationships among workload, teamwork, situational awareness, and operational errors at American air traffic control facilities.
- ✓ For the FAA and Control Center team work, it is a clearly defined process of team identification, roles and responsibilities, and team training to ensure the safety of the transportation of people, goods and services by air.

Team Training in Other Modes

- ✓ Now a look at rail Control Room Team Training processes
- ✓ Two major types of teams were identified, elemental teams and interactive teams
 - Elemental Teams – Those teams that remain consistent across the operating arena; i.e. An example of an elemental team would be a train operating crew for either mainline or yard operations consisting, most often, of an engineer and conductor but occasionally with the addition of a switchman or brakeman to assist in coupling/ de-coupling of trains and manual operation of track switches.
 - Interactive Teams – The interactive team, forms when an elemental team must interact with either an outside individual or another elemental team in order to perform a task that occurs during the course of the workday.

Team Training in Other Modes

- ✓ An example of an interactive team would be the team which is formed when a train dispatcher, a Maintenance of Way (MOW) crew, and a train operating crew must coordinate their efforts to safely move a train through an area of the track where the MOW crew is repairing or maintaining the track.
- ✓ From this information we can begin to see the intent of the NTSB when they advised to follow the example of the “other modes.”

Team Training in Other Modes

- ✓ CRM Team Training will require operators to conduct a comprehensive assessment of who the team members are, what their roles and responsibilities are, and how they operationally collaborate with the Controller. From this assessment, a comprehensive operationally specific training program will need to be established to meet the intent and letter of the regulation.
- ✓ It becomes obvious then that off the shelf team training packages will not satisfy the intent or purpose of this new regulation. It must be configured with the operators processes and procedures included in the training.

Compliance Dates

- ✓ Subsection (b)(5) of both 49 §§ 192.631 and 195.446 was required to be complied with effective March 23, 2017.
- ✓ Subsection (h)(6) of both 49 §§ 192.631 and 195.446 Operators must comply with the team training requirements under this paragraph by no later than January 23, 2018.
- ✓ The FAQ's tend to indicate that compliance with the training part can be completed by January 2019 if the operator has identified who the team members are and is developing the training materials to be able to complete the training by Jan. 2019???

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