Activity ID: ######	
Primary Operator (enter details in section A0)	
Primary OpID	
Control Room Name	

Inspection Report

Inspector :	
Submit Date ##/##/####	

Inspection Dates

Start : ##/##/####	
End : ##/##/####	

Post Inspection Memorandum

Inspector :	
Submit Date: ##/##/####	
Peer Review :	
Peer Review Date:	
Approver :	
Approval Date:	

	Inspector(s)	**PHMSA or State (P/S)**	**Region or State Abbr.**	**Lead (Y/N)**	**AFO Days**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

	Person(s) Interviewed	**Title**	**Organization**	**Phone**	**Email**
1.					
2.					
3.					
4.					
5.					
6					
7.					
8.					
9.					
10.					

Summary :

Findings :

<u>This form is intended to be used for one control room</u>. If an operator has more than one control room, then separate forms are necessary. If an operator has a remote location (field office or station) that regularly takes control at nights and/or weekends, that location may be considered an extension of the subject control room, thereby not needing a separate control room inspection.

The compliance questions are numbered to correspond to the like-numbered paragraphs in the text of the CRM rule. For example, question B4-1 corresponds to rule paragraph (b)(4). Some rule paragraphs may have more than one associated compliance question, designated by a numerical suffix (e.g., D4-1, D4-2, D4-3 and D4-4 all pertain to rule paragraph (d)(4)).

Inspection questions represent PHMSA's expectations for meeting the minimum performance standard for the compliance question. However, an operator may be able to justify alternative approaches that differ from the approach described in the question.

Some questions are not listed in the order in which the related requirement appears in the rule. For example, C5 appears immediately after B4. This approach facilitates the efficiency of the inspection by grouping related questions together, while still retaining an easy cross correlation to the applicable rule paragraph.

195.446(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room that monitors and controls all or part of a pipeline facility through a SCADA system. …	**192.631(a)(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:** **(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.**

A0: INSTRUCTIONS

Please complete item A0, using the following instructions.

1) Does the operator have a SCADA system applied to regulated pipeline facilities? (YES/NO): As defined in 192.3 and 195.2, *Supervisory Control and Data Acquisition (SCADA) system* means a computer-based system or systems used by a controller in a control room that collects and displays information about a pipeline facility and may have the ability to send commands back to the pipeline facility. See FAQs A.04 through A.21.
2) Does the operator have controllers (individuals using computer-type displays and keyboard/mouse, etc.) using a SCADA system with assigned operational authority and responsibility to monitor and control regulated pipeline facilities? Note: Controllers performing these functions must be qualified under the applicable OQ regulations. See section H, Training, below. Status of qualification does not affect rule applicability. If controllers use a SCADA system for monitoring, but use verbal or manual means to call-out personnel to perform control actions, they are considered to be controllers that use a SCADA system to monitor and control the pipeline. Persons at local facilities that meet the definition of controller are also covered under the CRM rule. See FAQs A.04 through A.21, and A.23.
3) [Gas only] Does either or both of the exceptions listed in 192.631(a)(1) apply?: Exceptions must apply to the entire control room. If any console/desk operates pipeline segments for which the exceptions do not apply, then the entire control room must meet all provisions of the CRM rule, even if certain consoles/desks control pipeline segments that meet the exception description. Per 74 FR 63318 "It should be noted, however, that this limited exclusion applies only if the operations from a gas operator's control room are limited to such smaller operations. The full requirements of the rule apply to operators of such pipelines if the operator also operates other pipelines outside of this limited exclusion from the same control room. For example, there may be large gas transmission operators who also operate small distribution pipelines or large LDCs that also have or operate transmission without SCADA-enabled compressors. In such cases, all the provisions of this rule apply to all of the operator's pipeline operations in a common control room." See FAQs A.11, A.18, A.19, A.22, and A.24.
4) Does the CRM rule apply to this operator?: Based on items 1 through 3, indicate if the CRM rule applies to this control room. If the exceptions apply, then only sections A, D, I and J of the CRM rule apply to the control room.
5) Name/Location of this Primary Control Room: List the name and location (by zip code) of the control room being inspected. For security concerns, do not record the specific address of the control room in this form. Some control rooms are operated by third party contractors, one of the partners of a partnership or joint ownership arrangement, or other business relationship. Indicate the name of the company that operates the control room and the relationship with the pipeline owner(s).
6) System(s) controlled (by OpID): Please provide the following information for each OpID and pipeline system controlled from this control room.
   a) List the OpID. List only one OpID per line. Use continuation page(s) if necessary.
   b) List the pipeline system name and short description associated with the OpID.
   c) Please check the type(s) of systems applicable to each OpID/System. Check all that apply.
   d) For gathering and transmission systems, provide the total mileage for each type of system. For distribution systems, provide the total number of services for each type of system. The sum of the mileage or services breakdown should equal the total mileage or services reported on the annual report. Also, for storage facilities regulated under Parts 192 and 195, indicate the total number (count) of such facilities. For Part 192 storage facilities, count each gas storage field and distribution propane tank. For Part 195 storage facilities, count each regulated atmospheric tank, pressurized tank and storage cavern.
   e) Some OpIDs/Systems might not be controlled in their entirety from this control room. For example, some delivery laterals may be operated from another control room, or manually as needed. Under item 6e, "Total for this control room", report the services or mileage or facilities (whichever applies) that are controlled from this control room being inspected.
   f) If the system(s) or segment(s) belonging to each OpID are partially controlled by another control room (not a backup for this control room), please indicate this and identify the other control room (do not count backup control rooms).
7) Other control rooms (YES/NO): Indicate if the CRM program that applies to the control room being inspected is applicable to other control rooms.
8) Other control rooms (LIST): Provide a list of any other facilities the operator has that might qualify as a control room as defined in the CRM rule. Please list all candidate facilities, even if you are unsure if the facility is a control room. If there are none, enter "No".
9) Hours in operation per day (NUM): Indicate how many hours per day this control room is operated.
10) Days in operation per week (NUM): Indicate how many days per week this control room is operated.
11) Total no. of Consoles at Primary Control Room (NUM): Indicate the total number of consoles at the control room being inspected. Please count any spare consoles or consoles that are not used as a primary control seat (such as a training simulator console).
12) Scheduled shift length (NUM): Indicate the scheduled shift length in hours (without hand-over or overlap); usually 8, 10 or 12 hours.
13) Total number of shift crews (i.e., "teams") (NUM): Indicate the total number of crews that are employed; usually 4 or 5 for a 24/7 operation. A crew might be only one person for a single-desk operation. The number of crews does not include back-up controllers, such as qualified supervisors, who are not in the daily shift rotation. (While these individuals can still be used in the ultimate employment ratio/staffing level calculation, they are considered more as a last resort option and/or if everyone else in the normal rotation is too fatigued or otherwise unavailable to fill a slot).
14) Shift Rotation: One full cycle of the shiftwork plan in terms of day/morning (D); night/mid (N); swing/afternoon/evening (S); days off (O); and days on relief/on call (R) shifts: For example, for a 12-hour, 4-crew "DuPont" plan, it might be: DDDONNN OOODDDD OOOOOOO NNNNOOO
For a 12-hour, 5-crew "DuPont" plan, it might be: DDDONNN OOO RRRRROO DDDD OOOOOOO NNNNOOO
For the 8-hour, 4-crew "Continental" plan, it would be: DDSSNNN OODDSSS NNOO DDD SSNNOOO
If all crews are not on the same schedule, enter a second or third shiftwork plan on lines 14b/c. If all crews are on the same schedule, leave lines 14b and 14c blank.
15) F/T Qualified Controllers, incl. remotes (NUM): Please indicate the total number of full time OQ qualified controllers employed.

16) P/T Qualified Controllers, incl. remotes (NUM): Please indicate the total number of part time OQ qualified controllers employed. (Do not include supervisors.)
17) Supervisors, fully qualified as Controllers, incl. remotes (NUM): Please identify the number of supervisors/managers that are fully OQ qualified controllers and whose training is current.
18) Supervisors, qualified only for Emergency/AOC, incl. remotes (NUM): Some operators have supervisors that are partially qualified for some limited control activities, such as emergency shutdown or other basic tasks, and whose training is current. Please identify the number of supervisors/managers that are partially qualified controllers.
19) Administrative Supervisors, incl. remotes (NUM): Please identify the number of supervisors that are not qualified as a controller.
20) Input Points: Total & Safety-related (NUM)/(NUM): Please identify the total number of SCADA monitoring and control inputs. Include software calculated points (these are sometimes referred to as "synthetic points" or "soft points").
21) Output Control Points: Total & Safety-related (NUM)/(NUM): Please identify the total number of SCADA control outputs. Of the total, indicate how many are considered to be safety-related points.
22) Separate Development SCADA system (YES/NO): Indicate if the control room has a development SCADA system not used for pipeline control. (Re: ADB-03-09 at 68 FR 74289)
23) Redundancy for Primary SCADA server: Please indicate if the control room has a local redundant SCADA server. This is not a backup control room facility, which is addressed in item 24. If so, indicate if the redundant server is located locally with the primary server or in a remote location. If the remote location is also the backup control room, so designate.
24) Off-site Backup Control Room: Please list the offsite backup control room/s, if any. Indicate the level of functionality (compared to the primary control room). Some operators contract with third party providers for backup capabilities, sharing backup facilities. Please indicate if the backup is a shared facility or is dedicated solely to the primary control room being inspected.

A0:	***See previous page for instructions. Use additional pages as necessary for more OpIDs.***						
1. Does the operator have a SCADA system applied to regulated pipeline facilities? (YES/NO)							
2. Does the operator have controllers assigned to monitor and control regulated pipeline facilities? (YES/NO)							
3. [Gas only] Does either or both of the exceptions listed in 192.631(a)(1) apply?		Distr. < 250,000 services		Transmission lines without SCADA-enabled compression, or no Transmission lines		N/A	
4. Does the CRM rule apply to this operator?		Full Program		Fatigue & Deviations (Sections A, D, I, and J)		No	
5. Name/Location of this Primary Control Room							
City, State, Zip			Self/ Joint-Venture /Contractor/other (specify)				

6. Pipeline System(s) controlled from this control room (by OpID and System Name) – Use continuation page if needed.

6a. OpID	6b. Pipeline System Name and Description	6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
			6d. Total for entire OpID	6e. Total for this control room	
List only one OpID per block		Local Gas Distr. ---------- No. of Services:			
		Gas Transmission ---------- Mileage:			
		Gas Gathering ---------- Mileage:			
		Haz. Liquid Trans. ---------- Mileage:			
		Haz. Liquid Gather. ---------- Mileage:			
		Propane Distr. ---------- Count of Tanks:			
		192 Storage Facilities-Count of Facilities:			
		195 Storage Facilities-Count of Facilities:			

6a. OpID	6b. Pipeline System Name and Description	6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
			6d. Total for entire OpID	6e. Total for this control room	
List only one OpID per block	Use continuation sheet if needed.	Local Gas Distr. ---------- No. of Services:			
		Gas Transmission ---------- Mileage:			
		Gas Gathering ---------- Mileage:			
		Haz. Liquid Trans. ---------- Mileage:			
		Haz. Liquid Gather. ---------- Mileage:			
		Propane Distr. ---------- Count of Tanks:			
		192 Storage Facilities-Count of Facilities:			
		195 Storage Facilities-Count of Facilities:			

7. Does operator's CRM program apply to more than this control room & associated backup? (YES/NO)				
8. Does the operator have other facilities that might constitute control rooms under the meaning of the CRM rule?				
9. Hours in operation per day (NUM)				
10. Days in operation per week (NUM)				
11. Total no. of Consoles at Primary Control Room (NUM)				
12. Scheduled shift length (w/o hand-over or overlap) in hours (NUM)				
13. Total Number of shift crews (i.e., "teams") (NUM)				
14. Shift Rotation, i.e., shift plan(s) – (DNSOR notation) [If two or more shift plans are used in this control room, list each one.]	14a.			
	14b.			
	14c.			
15. F/T Qualified Controllers, incl. remotes (NUM)				
16. P/T Qualified Controllers, incl. remotes (NUM)				
17. Supervisors, fully qualified as Controllers, incl. remotes (NUM)				
18. Supervisors, qualified only for Emergency/AOC, incl. remotes (NUM)				
19. Administrative Supervisors, incl. remotes (NUM)				
20. Input Points: Total & Safety-related (NUM) / (NUM)	Total:		S-R:	
21. Output Control Points: Total & Safety-related (NUM) / (NUM)	Total:		S-R:	
22. Separate Development SCADA system (YES/NO)				

23. Redundancy for Primary SCADA server (Check all that apply)		Total Capability		Physically located with primary SCADA server
		Partial Capability		Located remote from primary SCADA server
		None		Remote Location is the Backup Control Room
				Redundant SCADA server also serves as Backup Control Room SCADA server

24. Off-site Backup Control Room (Check all that apply)		Total Capability	Number of Consoles		Zip Code	Self / Joint-Venture / Contractor / Other	Used by other OpIDs, not shown above [list other OpIDs]
		Partial Capability		Same as Primary			
		None		Fewer than Primary			

6a. OpID	6b. Pipeline System Name and Description		6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
				6d. Total for entire OpID	6e. Total for this control room	
			Local Gas Distr. ------------ No. of Services:			
			Gas Transmission ------------------ Mileage:			
			Gas Gathering --------------------- Mileage:			
			Haz. Liquid Trans. ----------------- Mileage:			
			Haz. Liquid Gather. --------------- Mileage:			
			Propane Distr. ------------ Count of Tanks:			
List only one OpID per block			192 Storage Facilities-Count of Facilities:			
			195 Storage Facilities-Count of Facilities:			

6a. OpID	6b. Pipeline System Name and Description		6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
				6d. Total for entire OpID	6e. Total for this control room	
			Local Gas Distr. ------------ No. of Services:			
			Gas Transmission ------------------ Mileage:			
			Gas Gathering --------------------- Mileage:			
			Haz. Liquid Trans. ----------------- Mileage:			
			Haz. Liquid Gather. --------------- Mileage:			
			Propane Distr. ------------ Count of Tanks:			
List only one OpID per block			192 Storage Facilities-Count of Facilities:			
			195 Storage Facilities-Count of Facilities:			

6a. OpID	6b. Pipeline System Name and Description		6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
				6d. Total for entire OpID	6e. Total for this control room	
			Local Gas Distr. ------------ No. of Services:			
			Gas Transmission ------------------ Mileage:			
			Gas Gathering --------------------- Mileage:			
			Haz. Liquid Trans. ----------------- Mileage:			
			Haz. Liquid Gather. --------------- Mileage:			
			Propane Distr. ------------ Count of Tanks:			
List only one OpID per block			192 Storage Facilities-Count of Facilities:			
			195 Storage Facilities-Count of Facilities:			

6a. OpID	6b. Pipeline System Name and Description		6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
				6d. Total for entire OpID	6e. Total for this control room	
			Local Gas Distr. ------------ No. of Services:			
			Gas Transmission ------------------ Mileage:			
			Gas Gathering --------------------- Mileage:			
			Haz. Liquid Trans. ----------------- Mileage:			
			Haz. Liquid Gather. --------------- Mileage:			
			Propane Distr. ------------ Count of Tanks:			
List only one OpID per block			192 Storage Facilities-Count of Facilities:			
			195 Storage Facilities-Count of Facilities:			

6a. OpID	6b. Pipeline System Name and Description		6c. Type of system (check all that apply to this OpID)	# of: Services or Mileage or Facilities		6f. Is there another control room(s) for this OpID? (Do not count local redundant or backup control rooms.)
				6d. Total for entire OpID	6e. Total for this control room	
			Local Gas Distr. ------------ No. of Services:			
			Gas Transmission ------------------ Mileage:			
			Gas Gathering --------------------- Mileage:			
			Haz. Liquid Trans. ----------------- Mileage:			
			Haz. Liquid Gather. --------------- Mileage:			
			Propane Distr. ------------ Count of Tanks:			
List only one OpID per block			192 Storage Facilities-Count of Facilities:			
			195 Storage Facilities-Count of Facilities:			

195.446(a) General. ... 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. The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) must be implemented no later than October 1, 2011. The procedures required by paragraphs (c)(1)-(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(a)(2) The procedures required by this section must be integrated, as appropriate, with operating and emergency procedures required by §§192.605 and 192.615. An operator must develop the procedures no later than August 1, 2011, and must implement the procedures according to the following schedule. The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) must be implemented no later than October 1, 2011. The procedures required by paragraphs (c)(1)-(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.**

Inspection Question		Procedures	Implementation	Inspector Notes
A1-1:	Do procedures adequately address the process and criteria by which the operator determines which of its facilities are control rooms?	☐ SAT ☐ UNSAT	N/A	
A1-2:	Are procedures formalized and controlled? [Note: Detailed review of the content of procedures is addressed in sections B through J.] • Integrated into O&M and Emergency procedures directly or by clear links and references. • Operator CRM program should conform to the principles and recommendations in NTSB Safety Study 05/02. http://primis.phmsa.dot.gov/crm/docs/SS0502_NTSB_SCADA_Study_2005.pdf http://primis.phmsa.dot.gov/crm/docs/SCADA_methods_issues_NTSB_SCADA_study.pdf http://primis.phmsa.dot.gov/crm/docs/SCADA_accidents_NTSB_presentation.pdf • Revision control to assure only the approved, effective procedures are in use (revision control must ensure that out of date procedures, nor draft or unapproved procedures, are used to perform work). • CRM procedures must be reviewed at least once each calendar year, not to exceed 15 months in accordance with O&M manual regulation.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
A1-3:	Were procedures approved, in place, and implemented on or before the regulatory deadline? • Procedures must be developed by August 1, 2011. Developed means approved and distributed/available for use. Merely having draft procedures is not acceptable. • Procedures implemented by the following deadlines: o October 1, 2011: procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) o August 1, 2012: procedures required by paragraphs (c)(1)-(4), (d)(1), (d)(4), and (e) o August 1, 2012: training procedures required by paragraph (h), EXCEPT that any training required by another paragraph of this section must be implemented no later than the deadline for that paragraph. • Implemented means that procedural steps have been executed, or that ongoing activity(-ies) are being conducted in accordance with applicable procedures. Specifying a procedural effective date that corresponds to the implementation deadline required by the CRM rule, alone, is not adequate evidence of implementation.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
A1-4:	Are procedures readily available to controllers in the control room? • Procedures in the control room must be the most current approved version. • Procedures should be conveniently available to on-shift controllers in paper format and/or electronically. • Procedures should be accessible from each controller's console/desk.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

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;**	**192.631(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;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that specify controller/supervisor roles and responsibilities
- Policies and/or procedures that prohibit non-qualified individuals from controller status
- Territory descriptions or maps detailing boundaries in physical domain of responsibility

Inspection Question	Procedures	Implementation	Inspector Notes
B1-1: The operator should have clear procedure been established to describe each controller's physical domain of responsibility for pipelines and other facility assets. • If the control room has more than one controller on shift, roles and domain of responsibility for each controller must be clearly established. • "Physical domain of responsibility" refers to both the physical pipeline assets being monitored and controlled, and SCADA/communications assets (such as desks, consoles, phones, radios, etc.) being used in support of monitor and control duties. • FAQ B.01. Procedure includes formal definition and documentation of controller roles and responsibilities.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B1-2: Are there provisions in place to assure that only qualified individuals may assume control at any console/desk? • Provisions could include measures such as SCADA login passwords, and/or controlled access to the control room. Such measures should address periods when the control room is unattended, if applicable (also, see B4-1e). • Provisions must be in place to assure that controllers are qualified persons as detailed in covered tasks that are required by Part 195, Subpart G—Qualification of Pipeline Personnel and Part 192, Subpart N—Qualification of Pipeline Personnel. • FAQ B.03. A control room supervisor may direct or advise a controller on specific actions to take to complete a safety-related task, if and only if, the supervisor is a qualified controller on that console/desk. If the supervisor is not a qualified controller, then the supervisor may assign activities to the controller, but not the precise actions to take to implement those activities.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B1-3: If the physical domain of responsibility periodically changes, has a clear procedure been established to describe the conditions for when such a change occurs? • Some operators consolidate control room operations on night shifts, after normal business hours, or on weekends to reduce staff. • Moving operations to another location must include a formal transfer of responsibilities, including shift-change forms or other documentation. • 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. • 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.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

B1-4:	Do the operator's procedures address a controller's role during temporary impromptu (unplanned) changes in controller responsibilities? This question is usually not applicable if only one person is on shift. • Procedures should address the possibility of impromptu changes to controller responsibilities and give examples of when such changes might need to take place. • For example, in control rooms with multiple controllers, individuals might seek help or temporary coverage from other controllers while taking a break. • An operator's SCADA system may be configured to allow a controller to watch another controller's console from his/her current location.		SAT UNSAT		SAT UNSAT Observed Records Interview	
B1-5:	Do the defined roles and responsibilities require controllers to stay at the console to verify all SCADA commands that have been initiated are fulfilled, and that commands given via verbal communications are acknowledged before leaving the console for any reason? • Some SCADA commands can be complex or take an extended period of time to execute in the field. Because control actions can be critical to maintain safety, controllers should remain attentive during this time, and not leave the console prematurely. • Shift change operations should not conflict or interfere with controller vigilance during the fulfillment of command actions or critical communications with field personnel.		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(b)(2) A controller's role when an abnormal operating condition is detected, even if the controller is not the first to detect the condition, including the controller's responsibility to take specific actions and to communicate with others;	**192.631(b)(2) A controller's role when an abnormal operating condition is detected, even if the controller is not the first to detect the condition, including the controller's responsibility to take specific actions and to communicate with others;**

Inspection Question	Procedures	Implementation	Inspector Notes
B2-1: Has a procedure been established to define the controllers' authority and responsibilities when an abnormal operating condition is detected? • Many controllers have the same authority and set of responsibilities during normal, abnormal and emergency situations, including the expectation to directly take action when abnormal conditions arise. • Some controllers may need to seek guidance or get a supervisor's approval before taking action. This must be explained in the operator's procedures. • If controllers must seek approval from supervisors or other authorized personnel, procedures must require that those other persons always be immediately available, and controllers should have the means to immediately communicate with those individuals. • Procedures should address a controller's responsibility when the controller is not the first to detect the condition, including the controller's responsibility to take specific actions and to communicate with others.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B2-2: Are controllers aware of the current MAOPs/MOPs of all pipeline segments for which they are responsible, and have they been assigned the responsibility to maintain those pipelines at or below the MAOP/MOP? • Some operators may choose to set actual operating pressure limits lower than MAOP/MOP. In these cases, controllers should at least know the limits in lieu of full MAOP/MOP. • Controllers' written procedures should include a stipulation to protect pipeline segments from exceeding authorized pressures. • A thorough listing of MAOPs/MOPs (or prescribed lower limits) should be in easy reach to the controllers, either in paper format or accessible on computer. • It is also especially important that procedures specify the importance of protecting pipeline segments from exceeding any imposed pressure reductions which would supersede normal maximum limits.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446 (b)(3) A controller's role during an emergency, even if the controller is not the first to detect the emergency, including the controller's responsibility to take specific actions and to communicate with others; and	**192.631(b)(3) A controller's role during an emergency, even if the controller is not the first to detect the emergency, including the controller's responsibility to take specific actions and to communicate with others; and**

Inspection Question		Procedures	Implementation	Inspector Notes
B3-1:	Has the operator procedurally defined the controllers' authority and responsibility to make decisions, take actions, and communicate with others upon being notified of, or upon detection of, and during, an emergency or if a leak or rupture is suspected? • Many controllers have the same authority and set of responsibilities during normal, abnormal and emergency situations, including the expectation to directly take action when abnormal conditions arise without the need to consult with supervision/ management or get management approval. • Other controllers may be required to seek guidance or get a supervisor's approval before taking action. This must be explained in the operator's procedures. If controllers must seek approval from supervisors or other authorized personnel, procedures must require that those other persons always be immediately available, and controllers should have the means to immediately communicate with those individuals. • Procedures should address a controller's responsibility when the controller is not the first to detect the emergency. • Procedures should address the controller's responsibility to: directly call 911 or local phone number of appropriate local emergency officials to report emergencies to first responder agencies/authorities, or prompt others to make such calls.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B3-2:	Do the operator's procedures specifically address the controller's responsibilities in the event the control room must be evacuated? • Although an unforeseen need to evacuate the control room or the entire building should be a rare event, operators must plan for such an occasion. • In such an event, there may be little time to act, so an operator's plan must be able to be executed immediately and quickly.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B3-3:	Do the operator's procedures specifically address the controller's responsibilities in the event of a SCADA system or data communications system failure impacting large sections of the controller's domain of responsibility? • Procedures must address controllers' initial actions after a major SCADA system or communications system failure. • Plans should include contacting supervision, but should also include what first actions the controllers should initiate in the first few minutes of the event.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(b)(4) A method of recording controller shift-changes and any hand-over of responsibility between controllers.	192.631(b)(4) A method of recording controller shift-changes and any hand-over of responsibility between controllers.

NOTE: SHIFT CHANGE PROCESS IS ADDRESSED IN B4. THE CONTENT OF SHIFT CHANGE IS ADDRESSED IN C5.

Inspection Question		Procedures	Implementation	Inspector Notes
B4-1:	Has the operator established a procedure for the hand-over of responsibility that specifies the type of information to be communicated to the oncoming shift? • FAQ B.02. Anytime 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. • See C5-1 for specifics.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B4-2:	Do the procedures require that records document the hand-over of responsibility, document the time the actual hand-over of responsibility occurs, and the key information and topics that were communicated during the hand-over? • An operator's records must annotate what topics were covered during shift change. In the event certain operational aspects are not important to the incoming controller, the record must still annotate "no change" rather than not covering the topic. • The specific time and date of shift change must be included in the records, not just "Tuesday night" or "morning shift" • Just recording the time/date of shift change, without the annotation of topics covered, is not adequate. • SCADA server time should be synchronized with other sources of timekeeping used for operational records. • Because of varying operational needs, a controller arriving late or an extended discussion of unusual events, shift change will not actually occur at exactly the same time every day. Records that annotate a shift change at exactly the same time every day should be questioned during an inspection. • Shift hand-over records may refer to other information or records, as appropriate. • See C5-1 for specifics.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B4-3:	Do the procedures require the controllers to discuss recent and impending important activities ensuring adequate overlap? • The use of a form to orchestrate shift change will help maintain thoroughness in shift change, but the form should be used in conjunction with a short conversation, rather than as a substitute for conversation.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
B4-4:	When a controller is unable to continue or assume responsibility for any reason, does the shift hand-over procedure include alternative shift hand-over actions that specifically address this situation? • If the incoming controller is late arriving, procedures should address the responsibilities of the current controller and/or management to address the issue. • If controllers are permitted to find their own replacement among available controller staff, control room supervisors/managers should still be accountable for Hours of Service (HOS) requirements and limitations. • Operator's procedures should provide a mechanism for an on-shift controller (or a controller due to come on shift) to alert management that he/she is unable or unfit for duty, because of illness, fatigue, car trouble or other issues.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

B4-5:	Has the operator established adequate procedures for occasions when the console is left temporarily unattended for any reason? • FAQ B.04. Depending on an operator's specific system operations, a particular control room may not have to be staffed by controllers, full time. The operator's procedures should include an explanation of when and how the pipeline is operated when the control room is unattended. • Such procedures should include special provisions for shift change realizing that face-to-face communications between the departing and arriving controllers may not occur.		SAT UNSAT		SAT UNSAT Observed Records Interview	
B4-6:	Does the operator maintain adequate console coverage during shift hand-over? • Assure coverage if occasionally the controller needs to leave the console/desk area (beyond visual and hearing range of alarms). • If the controller is allowed to leave the console/desk area, procedures must assure adequate responsiveness. • If the shift changes to a different physical location, the actual time of the hand-over in responsibility must be known to both the outgoing and incoming controllers. • The time allocated to complete shift hand-over should be sufficient to adequately communicate needed information exchange.		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(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: … (5) Implement section 5 of API RP 1168 (incorporated by reference, see § 195.3) to establish procedures for when a different controller assumes responsibility, including the content of information to be exchanged.	192.631(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: … (5) Establish and implement procedures for when a different controller assumes responsibility, including the content of information to be exchanged.

NOTE: SHIFT CHANGE PROCESS IS ADDRESSED IN B4. THE CONTENT OF SHIFT CHANGE IS ADDRESSED IN C5.

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address shift hand-over
- Listing of information required to be included in shift change discussions
- Policies and/or procedures that address when the controllers are temporarily away from console
- Shift hand-over forms and checklists
- Records of shift hand-over

Inspection Question	Procedures	Implementation	Inspector Notes
C5-1: Has the operator established and implemented a procedure to orchestrate the hand-over of responsibility from one controller to another? • All items in this listing are specified in section 5 of API RP 1168, and are mandatory for HL operators. Gas operators should also address these items, but may be able to justify not including some of these items in their checklist based on the specific nature of their gas pipeline operations. o Assure operational continuity o Address system control accountability during hand-over o Generate a record of accountability transfer o Assure phone monitoring during transfer o Manage distractions that could adversely impact transfer o Require a meeting to be conducted to brief incoming controllers on the status of current operations. o Procedures to require a console specific checklist of information to be exchanged. (See C5-1c for content of checklist.) • FAQ C.10. Shift hand-over procedure must be performed even if no unusual events occurred during the entire previous shift. • FAQ C.11. Shift hand-over procedure must be performed even if an operator has a controller on regular day shifts only (e.g., 8-5 M-F) and uses callouts to handle off-shift needs, since the controller may unexpectedly have to be replaced as the result of illness or other circumstance that prevents the controller from returning to duty the next day as planned. • Even if the same individual plans to return the next morning, the shift hand-over process will help ensure no critical information has been forgotten.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

C5-2:	Does the checklist of information to be exchanged during shift change consider the following items? • All items in this list are specified in section 5 of API RP 1168, and applicable items are mandatory for HL operators. Gas operators should also address these items, but may be able to justify not including some based on their specific circumstances.) • Emergency/AOC [API RP 1168, §5.3.1]; • Daily operation information [API RP 1168, §5.3.2]; • Status of scheduled/unscheduled maintenance activities [API RP 1168, §5.3.3]; • Incident and/or safety conditions [API RP 1168, §5.3.4]; • Changes to physical assets, practices, and responsibilities [API RP 1168, §5.3.5]; • Alarm reviews [API RP 1168, §5.3.6]; • Third-party incidents with potential direct or indirect impact on operations [API RP 1168, §5.3.7].		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(c)(1) Implement API RP 1165 (incorporated by reference, see § 195.3) whenever a SCADA system is added, expanded or replaced, unless the operator demonstrates that certain provisions of API RP 1165 are not practical for the SCADA system used;	**192.631(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;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address display standards
- Procedures that address incorporation of aspects of API-1165
- Forms used to guide the implementation and thoroughness of displays
- Records to demonstrate display modifications and internal display evaluations

Inspection Question	Procedures	Implementation	Inspector Notes
C1-1: Do procedures clearly define the types of changes to the SCADA system(s) that constitute additions, expansions, or replacements under the meaning of the CRM rule? • FAQ C.15. Routine upgrades, such as upgrading to a later version of SCADA software, or upgrading to larger/faster hard disc drives, or modernizing communications infrastructure, are not necessarily considered an addition, expansion, or replacement of a SCADA system, depending on the specific scope of the changes. However, changes that impact display parameters (i.e. display symbols, color palettes or anything that affects the controller-machine interface) would require implementation of API RP 1165. • FAQ C.19. When an operator adds, expands, or replaces a SCADA system after August 1, 2012, the SCADA must be in compliance with API RP 1165 immediately upon deployment. If it is not practical for the SCADA system to be in immediate compliance with CRM requirements, operators must document the deviation in accordance with paragraph (j)(2) of the CRM rule. The documentation must demonstrate why immediate compliance with all CRM requirements is not practical, how the deviation is necessary for safe operation, and include a justified project timeline that includes an indication when full compliance is to be attained.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
C1-2: Has the operator developed written procedures to implement the API RP 1165 display standards to the SCADA systems that have been added, expanded, or replaced since August 1, 2012? • [HL ONLY] Implementation of the entire API RP 1165 is required. • [Gas ONLY] Implementation of sections 1, 4, 8, 9, 11.1, and 11.3 of API RP 1165 is required. • Procedures should utilize the reference material contained in section 2 of API RP 1165. • Procedures must utilize the same definitions of terms defined in Section 3 of API RP 1165. • Operators may not rely solely on OEM specifications to satisfy compliance. The operator is responsible to assure that the applicable requirements of API RP 1165 are actually implemented. • FAQ C.12. Implementation of API RP 1165 as a result of additions, expansions, or replacement of portions of a SCADA system might be appropriately limited to the portions affected, as long as there is no cross console impact. To address differences between two or more consoles that a controller uses, controllers/supervisors (that would operate both the new and old systems) must be specifically trained on each of the different display standards in order to avoid cross-console impact.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	

C1-3:	Has the operator implemented section 4 of API RP 1165 regarding human factors engineering?
	
	• 4.1 Short term memory
	• 4.2 Signal to noise ratio
	• 4.3 Eye scan pattern
	• 4.4 Consistency
	  o General consistency for shapes and symbols
	  o Layout consistent among displays
	  o Information density consistent among displays
	  o Flow paths depicted consistently among displays
	  o If the operator has grouped more than one console/desk into a team, consistency of display formats, layout, shapes and colors across all team consoles/desks.
	  o Consistency between control room display colors for off, closed, open, on and locked out with color choices on related field equipment controls
	• 4.5 Coding
	  o Coding is the assignment of meaning to an arbitrary visual cue. Examples of information coding include color-coding of normal/abnormal conditions or shape-coding of device symbols such as pumps, valves, and meters.
			SAT
			UNSAT
			N/A
					SAT
					UNSAT
					N/A
					
					Observed
					Records
					Interview	

C1-4:	[HL ONLY] Has the operator implemented section 5 of API RP 1165 regarding display hardware?
	
	• 5.1 General considerations
	• 5.2 Display devices
	• 5.3 Display response
	  o Operator establish thresholds times for field data collection (there may be more than one data collection rate based on different type of data)
	  o Actual field data collection rates should be within the operator's established threshold
	  o Operator periodically monitor the speed of field data collection, and take prompt corrective actions to restore identified problems
	• 5.4 Controller input devices
			SAT
			UNSAT
			N/A
					SAT
					UNSAT
					N/A
					
					Observed
					Records
					Interview	

C1-5:	[HL ONLY] Has the operator implemented section 6 of API RP 1165 display layout and organization? • 6.1 General considerations • 6.2 Display hierarchy • 6.3 Window management issues		SAT UNSAT N/A		SAT UNSAT N/A Observed Records Interview	
C1-6:	[HL ONLY] Has the operator implemented section 7 of API RP 1165 display navigation? • 7.1 General considerations • 7.2 Navigation techniques • 7.3 Zoom, pan, and overlays		SAT UNSAT N/A		SAT UNSAT N/A Observed Records Interview	

C1-7:	Has the operator implemented section 8 of API RP 1165 display object characteristics?
	
	• 8.1 General considerations
	• 8.2 Color
	  o Review the number of colors, and especially colors that are nearly alike
	  o Review the meaning of different colors
	  o Chosen colors should vividly differ from one another
	• 8.3 Symbols and shapes
	• 8.4 Animation
	• 8.5 Text
		☐	SAT	☐	SAT	

		☐	UNSAT	☐	UNSAT	
		☐	N/A	☐	N/A	
				☐	Observed	
				☐	Records	
				☐	Interview	

C1-8:	Has the operator implemented section 9 of API RP 1165 display object dynamics?
	
	• 9.1 General considerations
	• 9.2 Data values
	• 9.3 Data attributes
	  o On-scan / off-scan
	  o Manual override / real time
	  o Alarm / normal
	  o Communication failure / communication normal
	  o Alarm inhibit / alarm enabled
	  o Unacknowledged / acknowledged
	  o Informational tag / no tag
	• 9.3.1 Data Attribute Hierarchy and Display Techniques
	  o A consistent approach to displaying data attributes is important. All displays should use the same technique for each data attribute where feasible.
	  o Display of every data attribute for every point is not practical. A hierarchy of data attributes should be considered. Any attribute that indicates “stale” data or inhibited alarms should be treated with high importance and displayed prominently.
	  o Some attributes should be addressed with symbol, color change, and/or text displays, along with a suggested order of precedence are off-scan, manual, communication failure and alarm inhibit.
	  o It is useful to have examples displays available for reference if controllers are uncertain of a specific display technique.
	  o As with objects, it is a common practice to use more than one technique to display a data attribute, such as combining a character with a color scheme. Text strings can also be used to indicate data attributes.
	  o Operator should have controls to assure that only authorized personnel can change alarm setpoints, or inhibit, override, or force values for safety-related alarms and points.
		☐	SAT	☐	SAT	

		☐	UNSAT	☐	UNSAT	
		☐	N/A	☐	N/A	
				☐	Observed	
				☐	Records	
				☐	Interview	

C1-9:	[HL ONLY] Has the operator implemented section 10 of API RP 1165 control selection and techniques?
	
	• 10.1 Object selection
	• 10.2 Command execution
	  o Two-step (select/execute) process
	• 10.3 Error management
	  o Timeout mechanism if the entire command process is not performed
		☐	SAT	☐	SAT	

		☐	UNSAT	☐	UNSAT	
		☐	N/A	☐	N/A	
				☐	Observed	
				☐	Records	
				☐	Interview	

C1-10:	Has the operator implemented applicable paragraphs of section 11 of API RP 1165 administration? • Gas operators are required to implement paragraphs 11.1 and 11.3, only. HL operators must implement all of section 11. • 11.1 Consistency within a company • [HL ONLY] 11.2 Documentation • 11.3 Consistency between control rooms and remote locations • [HL ONLY] 11.4 Management of Change (See also Section F)	☐	SAT UNSAT N/A	☐ ☐ ☐	SAT UNSAT N/A Observed Records Interview	
C1-11:	If the operator has not implemented any/all applicable paragraph(s) of API RP 1165, did the operator demonstrate and document that the unimplemented provisions are impractical for the SCADA system used? • Examples of circumstances which might make some provisions impractical are provided in Section 1.2 of API RP 1165. • Operators may claim their SCADA system is not capable, when in reality the operator may have just chosen not to configure available SCADA capabilities. • The inspector should further investigate this item if the operator claims SCADA limitations as the reason for not implementing aspects of API RP 1165.	☐	SAT UNSAT N/A	☐ ☐ ☐	SAT UNSAT N/A Observed Records Interview	

195.446(c)(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;	**192.631(c)(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;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address point-to-point verification
- Point verification forms
- Records to demonstrate thoroughness of process

Inspection Question	Procedures	Implementation	Inspector Notes
C2-1: Has the operator adequately defined safety-related points? • Examples of safety-related points are provided in FAQ C.01. • Procedures should be established to define which points are declared as safety-related • Operator should have a list (or database) of points that indicates whether or not each point is safety-related. • Procedures should also address criteria for treating points as safety-related. • Points associated with all safety-related alarms and control points must be included. • Station inlet and discharge pressures should fall into the safety-related category. • Pressure Regulator inlet and outlet pressures should fall into the safety-related category. • Soft points (points created in SCADA software) should be considered when determining a list of safety-related points.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
C2-2: Has the operator adequately established and implemented procedures to define and identify the circumstances which require that a point-to-point verification be performed? • Procedures should define the types of field changes that require point-to-point verification. • Like-for-like replacement of field instrumentation requires a point-to-point verification, if only to verify the replacement and related calculation results in proper functionality and correct information. • FAQ C.03. Point-to-point verification is required even if the change only affects the SCADA display. • Safety-related points should be identified and documented. • Change control documentation should explicitly document if the change requires point-to point verification.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
C2-3: Has the operator established and implemented an adequate procedure for the thoroughness of the point-to-point verification? • FAQ C.02 and C.06. • The procedure must define the extent of verification to include physical location of device, data value or status, any alarm settings, and to assure that any test signals are injected at the actual device in the field. • The verification procedure must include a requirement to check a representative sampling of impacted displays. FAQ C.03. • FAQ C.05. If the verification process includes partial simulation, the operator must establish a procedure to define when simulation should be used in point-to-point verification. • FAQ C.05. If the verification process includes partial simulation, the operator must establish a procedure to define what type(s) of simulation is/are applicable for specific instruments and equipment during point-to-point verification.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

C2-4:	Has the operator established and implemented an adequate procedure for defining when the point-to-point verification must be completed? • FAQ C.20. Point-to-point verification must be completed in a timely manner. Those data points already being used by controllers should be verified the same day a verification process became necessary. • FAQ C.20. Those data points being added or checked out as a part of a major system enhancement or replacement should be verified before those data points are turned over to controllers for use.		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(c)(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;	**192.631(c)(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;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address Internal Communications Plan
- Records to demonstrate interval and thoroughness of process
- Record of actual events when the plan was pressed into service

Inspection Question	Procedures	Implementation	Inspector Notes
C3-1: Has the operator established and implemented an internal communication plan that is adequate to manually operate the pipeline during a SCADA failure/outage? • FAQ C.09. Plans and procedures must be commensurate with the level of operational performance intended by the operator to be maintained while in manual mode. • FAQ C.09. If the operator does not plan to continue operation in manual mode, the communication plan must, at a minimum, address the safe manual shutdown of the pipeline/s. • Communication plans should include periodic communication (such as periodic status call-in) among persons engaged in pipeline control. If the nature of operations results in reasonably periodic calls to field personal, status calls may not be necessary. • Communication plans should include requirements for timely impromptu call-in and communication in case of abnormal or emergency conditions. • Communication plan should provide guidelines for evaluating the causes/circumstances of a major SCADA system or communications outage and how those causes/circumstances will affect manual operations. Manual operations procedures should be flexible enough to successfully operate under the circumstances to be encountered. • Communication plan should address scenarios when the control room (and perhaps the entire building) must be evacuated. • If the operator intends to keep the pipeline/s running in manual mode, communications plan should include procedures for manually obtaining operational data from the field or remotely via dial-in connection (if that capability exists). • Communication plan should include procedures that address how station and pipeline equipment respond on loss of power or when switched to local control (i.e., if it remains in the last commanded state or changes state).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
C3-2: Has the operator tested and verified the internal communication plan for manual operation of the pipeline safely at least once each calendar year but at intervals not exceeding 15 months? • If the operator does not intend to operate in manual mode, then a robust plan for continued manual operation is not required, however, a basic plan is still necessary to affect an orderly shutdown. • FAQ C.14. Operator must have a procedure for testing and verifying the internal communication plan. • Test procedure should verify state/mode of remote facilities and equipment following a SCADA failure. • If remote facilities are not designed to remain as last commanded when a SCADA or communications outage occurs, tests should verify that these events do not create upset conditions. • Actual instances whereby the internal communication plan for manual operation is executed may be credited as a test, if it met all requirements for a successful test.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(c)(4) Test any backup SCADA systems at least once each calendar year, but at intervals not to exceed 15 months; and	**192.631(c)(4) Test any backup SCADA systems at least once each calendar year, but at intervals not to exceed 15 months; and**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address back-up SCADA systems
- Records to demonstrate periodic back-up testing
- Listing of functional differences between primary and back-up systems

Inspection Question	Procedures	Implementation	Inspector Notes
C4-1: Does the operator have a backup SCADA system? • Backup SCADA systems are not required • Backup SCADA systems include both: (1) redundant (or diverse) capabilities of the primary control room, and (2) SCADA systems housed in separate backup control rooms.	N/A	☐ YES ☐ NO ☐ Observed ☐ Records ☐ Interview If "NO", remainder of C4 is "N/A"	
C4-2: Has the operator adequately defined the use of the backup SCADA system for development work? • Operators should be very cautious about using a back-up system for development work, since prototyping could inadvertently reach the on-line system • Operators should implement the guidance in Advisory Bulletin (ADB–03–09) "Potential Service Disruptions in Supervisory Control and Data Acquisition Systems" dated December 23, 2003 (68 FR 74289) and Advisory Bulletin (ADB-99-03), "Potential Service Interruptions in Supervisory Control and Data Acquisition Systems" dated July 16, 1999 (64 FR 38501). • If a separate development SCADA server is being used, it should be isolated from the on-line environment.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	
C4-3: Is the backup SCADA system tested at least once each calendar year at intervals not to exceed 15 months? • FAQ C.18. If an operator experiences an actual SCADA failure that results in the back-up SCADA system being pressed into service, the operator may claim that event as testing and verifying their back-up SCADA system, as long as an adequate representative sampling of functions are performed, verified and documented during back-up operations.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

C4-4:	Does the testing verify that there are adequate procedures in place for decision-making and internal communications to successfully implement a transition from primary SCADA to backup SCADA, and back to primary SCADA. • Procedure and test must address the circumstances under which the back-up SCADA system is to be activated, so that the test adequately simulates conditions under which the backup SCADA system will be used. • Procedures must clearly define who is responsible for making the decision to transfer pipeline control to the backup SCADA system, and restoring control from backup to normal operations. This decision-making process must be a part of the annual testing. • Procedures must address and test internal communications to implement transfer of control to backup SCADA systems, as well as to transfer control back to the primary SCADA system. • Procedure must provide guidelines for evaluating the causes/circumstances of a primary SCADA system or communications outage before making the decision to transfer to backup SCADA, and how those causes/circumstances impact operations using backup SCADA systems. • Any redundant SCADA for primary control room must be tested. • Any SCADA at a backup control room must be tested. • An adequate procedure should be in place to explain when it is safe to put the primary SCADA system back on-line.		SAT UNSAT N/A		SAT UNSAT Observed Records Interview	
C4-5:	If the back-up SCADA system is not designed to handle all the functionality of the main SCADA system, does the testing determine whether there are adequate procedures in place to account for displaced and/or different available functions during back-up operations? • If the back-up SCADA system has a generally lower performance level than the primary system, the operator must assure that differences in general performance, displays, report generation, interaction with keyboard/mouse, etc., do not adversely impact controller performance. • All potentially impacted controllers must be informed about both the capabilities and limitations of any back-up SCADA system(s). • If the back-up system does not provide the same number of displays per console that the primary site has, the operator should be able to explain how the limitation does not impact controller performance.		SAT UNSAT N/A		SAT UNSAT Observed Records Interview	
C4-6:	Do procedures adequately address and test the logistics of transferring control to a backup control room? • Procedures must include a practical plan to transport qualified controllers (and SCADA support technicians if necessary) to the back-up control room. • Realistic time duration to get qualified controllers to, and activate, the back-up control room must be aligned with the operator's strategy for engaging the back-up during a primary SCADA outage. (i.e., the operator's strategy must not make unrealistic assumptions about how long it takes to activate the backup control room.)		SAT UNSAT N/A		SAT UNSAT Observed Records Interview	

C4-7:	Do procedures adequately address and test the logistics of returning operations back to the primary control room? • Procedures must include a process to orchestrate when and how operations are returned to the primary control room.	☐	SAT UNSAT N/A	☐	SAT UNSAT Observed Records Interview	
C4-8:	Is a representative sampling of critical functions in the back-up SCADA system being tested to ensure proper operation in the event the backup system is needed? • FAQ C.17. Automatic functions (if any) must be included in testing. • Successful data acquisition and communications must be verified. • Tests must include the ability to remotely control field equipment from SCADA (if so equipped). • Tests must include the ability to monitor key operating parameters such as equipment status/state and pressure and flow. • Testing should include confirmation of important types of functionality and critical data sources to/from critical facilities/equipment. • Operator may be able use alarm and event logs from the backup SCADA system to help demonstrate an adequate representative sampling of functions were tested during back up operations.	☐	SAT UNSAT N/A	☐	SAT UNSAT Observed Records Interview	

195.446(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:	**192.631(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:**
…	**…**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that specify HOS limits and requirements for managing emergency deviations from the HOS limits
- Records such as timesheets or time cards demonstrating that all controllers and qualified supervisors comply with HOS limits
- Records documenting emergency deviations, including justifications
- Type(s) of schedule(s) including shift plan (rota), shift length, shift differentials, shift change times, length of shift hand-over time (overlap), shift rotation scheme for non-12 hour shifts (forward or backward), etc.
- Number of shift crews used.
- Employment ratio or other means to justify there is a sufficient number of qualified controllers to cover staffing level needs.
- Documentation of fatigue mitigation measures (countermeasures) the operator uses and when controllers use them.

Inspection Question		Procedures		Implementation		Inspector Notes
D0-1:	Does the operator's fatigue mitigation process or procedures (plan) identify operator-specific fatigue risks? • FAQ D.09. PHMSA promotes the use of a fatigue risk management system (FRMS) as a tool for implementing fatigue mitigation.	☐	SAT UNSAT	☐ ☐ ☐ ☐ ☐	SAT UNSAT Observed Records Interview	
D0-2:	Does the operator's plan adequately address how the program reduces the risk associated with controller fatigue? • An operator's fatigue mitigation plan and document the scientific basis for provisions of the plan. (74 FR 63321) • Operators should have a documented and accessible policy for dealing with controllers who are self-identified and/or identified by supervisors as being too fatigued to safely control the pipeline. • The operator's plan should address identified issues in Advisory Bulletin (ADB–05–06) "Countermeasures to Prevent Human Fatigue in the Control Room" dated August 11, 2005 (70 FR 46917).	☐	SAT UNSAT	☐ ☐ ☐ ☐ ☐	SAT UNSAT Observed Records Interview	
D0-3:	Do the policies and procedures require that the potential contribution of controller fatigue to incidents and accidents be quantified during investigations? • See FAQ D.12 and white paper entitled "Investigating the Possible Contribution of Fatigue to Pipeline Mishaps" (http://primis.phmsa.dot.gov/crm/fm.htm) for fatigue factors that should be considered in accident/incident investigations. • See instructions for incident report forms PHMSA F 7100.1, 7100.2, and 7000-1, and requirements for reporting incident causes in accordance with 191.9, 191.15, and 195.54. Forms and instructions are available online at: http://www.phmsa.dot.gov/pipeline/library/forms .	☐	SAT UNSAT	☐ ☐ ☐ ☐ ☐	SAT UNSAT Observed Records Interview	

D0-4:	Does the operator have a designated fatigue risk manager who is responsible and accountable for managing fatigue risk and fatigue countermeasures, and someone (perhaps the same person) that is authorized to review and approve HOS emergency deviations? • The fatigue risk manager should be the operator's subject matter expert on fatigue risk mitigation, either a designated individual in upper management or designated by upper management. The fatigue risk manager and the person authorized to approve HOS emergency deviations may or may not be the same person. Ideally the individual would not always be the supervisor on the same shift(s)/schedule as the individual needing exception, since one consequence of fatigue is a willingness to accept more risk. • Emergency deviations, if applicable, should align with those in (d)(4), but operators should factor in any unique aspects of their operations, be able to deal with extraordinary cases of individual fatigue and individual differences that can increase risk of fatigue even if not necessarily in an emergency deviation scenario. • FAQ D.13. PHMSA encourages a formalized HOS deviation process with provisions for written approval in advance of anticipated deviations. PHMSA recognizes some deviations cannot be forecasted.		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(d)(1) Establish shift lengths and schedule rotations that provide controllers off-duty time sufficient to achieve eight hours of continuous sleep;	**192.631(d)(1) Establish shift lengths and schedule rotations that provide controllers off-duty time sufficient to achieve eight hours of continuous sleep;**

Typical operator documents that should be available for PHMSA inspection:

- Shift schedule (including shift lengths and schedule rotation) for pipeline controllers
- Procedures or other documentation describing controller duties performed outside the published shift schedule, if any, such as shift hand-over, administrative, or other duties or tasks assigned to controller personnel.
- Procedures, processes, or policies used to establish the shift schedule, including but not limited to considerations taken into account when establishing the shift schedule.

Inspection Question		Procedures	Implementation	Inspector Notes
D1-1:	Is the scheduled shift length less than or equal to 12 hours (not including shift hand-over)? Normal (scheduled) shift lengths should not exceed 12 hours (not including shift hand-over). • FAQs D-06 and D-07. • If scheduled shift lengths exceed 12 hours, then ……	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D1-2:	Does the operator factor in all time the individual is working for the company when establishing shift lengths and schedule rotations? • FAQ D.02. • All time worked for the operator by the controller must be accounted for to ensure the controller has off-duty time sufficient to achieve 8 hours of continuous sleep • An operator must keep records such as timesheets or time cards demonstrating that all controllers and qualified supervisors work hours allow an opportunity to have 8 hours of continuous sleep.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D1-3:	Are all scheduled periods of time off at least one hour longer than 8 hours plus commute time? • FAQs D-01 and D-03. • The operator must establish shift lengths and schedule rotations that provide off duty time sufficient to achieve 8 hours of continuous sleep. In most situations, an individual will need reasonable time for commute plus some personal time before falling asleep and after waking up. • Occasional double shifts are allowed, but the controller must still be given the opportunity of 8 hours of continuous sleep between shifts.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D1-4:	For controllers who are on call, does the operator minimize interrupting the required 8 hours of continuous sleep? • FAQs D.02 and D.06. • Being on-call itself may not necessarily be a concern, particularly if the individual rarely if ever ends up getting a call and/or spends minimal time assisting when a call is made. However, if the calls are excessive, and particularly if done during time when the individual should be getting sleep that is a concern and should be factored in appropriately. If this is occurring and not being addressed appropriately, one could justify the operator is not providing the opportunity for 8 hours of sleep. • If on-call controllers are required to report to the control room on an unscheduled basis, the controllers commute time should be counted as on-duty hours.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D1-5:	If the answer to any one of D1 questions above is "UNSAT", does the operator have a documented technical basis to show that the operator's shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(d)(4) Establish a maximum limit on controller HOS, which may provide for an emergency deviation from the maximum limit if necessary for the safe operation of a pipeline facility.	**192.631(d)(4) Establish a maximum limit on controller HOS, which may provide for an emergency deviation from the maximum limit if necessary for the safe operation of a pipeline facility.**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that specify HOS limits and requirements for managing emergency deviations from the HOS limits
- Records such as timesheets or time cards demonstrating that all controllers and qualified supervisors comply with HOS limits
- Records documenting emergency deviations, including justifications
- Type(s) of schedule(s) including shift plan (rota), shift length, shift differentials, shift change times, length of hand-over time (overlap), shift rotation scheme for non-12 hour shifts (forward or backward), etc.
- Number of crews.
- Total number of employees that are qualified controllers.

Inspection Question		Procedures	Implementation	Inspector Notes
D4-1:	Is the maximum HOS limit in any sliding 7 day period no more than 65 hours? • FAQs D.06 and D.07. • For the schedule, the operator can display their schedule in whichever manner they are used to, whether in terms of one week or multiple weeks (pay period, month etc.) For the 7 consecutive day period, the inspector should be looking for any 7 day period throughout the schedule where the 65 hour limit might be exceeded.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D4-2:	After reaching the HOS limit in any sliding 7 day period, is the minimum time off at least 35 hours? • FAQs D.06 and D.07 • 35 hours is intended to allow for time sufficient to provide an individual to obtain at least 2 full sleep cycles, and allows for one full day (24 hours) plus 12 hours (less 1 hour to account for shift handover time).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D4-3:	If the answer to D4-1 or D4-2 is "UNSAT", does the operator have a documented technical basis to show that they have reduced the risk associated with controller fatigue?	☐ YES ☐ NO ☐ N/A	☐ YES ☐ NO	
D4-4:	Does the operator have a formal system to document all scheduled and unscheduled HOS worked, including overtime and time spent performing duties for the operator <u>other</u> than control room duties? • FAQ D.02. • In its HOS tabulation, an operator must account for <u>all</u> time an individual works for the company, even if in a non-controller status. It is realistic to assume overtime does occur, but the operator must factor in this time as well. • Assure compliance with HOS limits for on-call controllers who are called to work on an unscheduled basis. • Operators who have supervisors or alternate controllers that are fully qualified as controllers and are used to substitute when needed must have a means to track the hours worked by these individuals, as well. • Substitute controllers are subject to the same HOS limits as normally scheduled controllers, in order to assure they are not too fatigued to assume controller duties. If such individuals are at risk for fatigue and there are no better options for substitutes, the operator must document and justify an emergency deviation that includes a description of fatigue countermeasures implemented. • An operator must keep records such as timesheets or time cards demonstrating that all controllers and qualified supervisors comply with HOS limits.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

D4-5:	For normal business hour type operations (i.e., five days per week), are no more than five days worked in succession before at least two days off? • FAQ D.06.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
		☐	N/A			
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-6:	For normal business hour type operations (i.e., five days per week), is the shift start time no earlier than 6:00 a.m. and the shift end time no later than 7:00 p.m.? • FAQ D.06. Even with a relatively low-risk scenario, operators should be aware that fatigue can still set in and should be vigilant of the potential for increased fatigue, and consider if countermeasures are needed, especially during the 9th through 12th hour of 12 hour shifts. For day only work, this typically only requires measures such as additional beaks throughout the day, but operators should consider additional measures as needed given the individual differences of its employees. • FAQ D.05.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
		☐	N/A			
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-7:	For shifts longer than 8 hours, have specific fatigue countermeasures been implemented for the 9th and beyond hours? • FAQ D.05. • The longer the shift extends beyond 8 hours, the more attention to countermeasures is needed. • Operators should document the countermeasures used and when they are used.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
		☐	N/A			
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-8:	Is the daily maximum HOS limit no more than 14 hours in any sliding 24-hour period? • FAQ D.07. • Time for performing shift hand-over is included in the 14 hour limit.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-9:	Does the operator have a sufficient number of qualified controllers? • See FAQ D.11 and white paper entitled "Staffing of Regular, Cyclic 24/7 Operations" (http://primis.phmsa.dot.gov/crm/fm.htm). • Staffing must be adequate to avoid chronic or routine deviations from HOS limits • Staffing must be adequate to account for vacation, holidays, sick leave, training, and other (non-controller) duties	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
				☐	Observed	
				☐	Records	
				☐	Interview	

D4-10:	Does the operator provide controllers with at least thirty-five (35) continuous off-duty hours when any one or more of the following limits are reached following the most recent 35-hour (minimum) off-duty rest period: a) Shift starts on seven successive days or nights; b) 65 duty hours in any sliding 7-day period; c) Seven 8-hour shifts in any sliding 7-day period; d) Six 10-hour shifts in any sliding 7-day period; or e) Five 12-hour shifts in any sliding 7-day period. • FAQ D.02. • FAQ D.07. • Show the shift plan in terms of Day/Swing/Night/Off (D/S/N/O) or equivalent notation. • If an operator exceeds these thresholds, they should be able to substantiate how an increased risk of fatigue has been mitigated. • 35-hours off may be used as a "reset" within any sliding 7 day period if and only if it follows a sequence of two or more day shifts. For example, the 12-hour DDDONNN sequence is acceptable even though it appears to violate the 65-hour HOS guideline (6 days x 12 HOS per day = 72 HOS in 7 days). The day off in this sequence begins in the evening and extends 48 hours to the beginning of the next night shift, providing the opportunity for two nights of sleep.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-11:	Does the operator conform to the following shift holdover guideline? a) For an 8-hour shift, one 16-hour (double shift) (17 hours with hand-over time), or two 10-hour shifts (11 hours with hand-over time) in any sliding 7-day period. b) For a 10-hour shift, one 15-hour shift (16 hours with hand-over time), or two 12-hour shifts (13 hours with hand-over time) in any sliding 6-day period. c) For a 12-hour shift, one 18 hour shift (19 hours with hand-over time), or two 14-hour shifts (15 hours with hand-over time) in any sliding 5-day period. • FAQ D.07. • If a controller needs to work a double shift, their schedule for subsequent days should be adjusted accordingly to stay within the HOS limit, unless there is an emergency deviation has been documented, justified and approved. • Controllers must still be provided the opportunity to obtain 8 continuous hours sleep between shifts.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-12:	Does the operator implement specific fatigue countermeasures during: a) Any and all shift duty hours worked after the first 8 hours? b) Any and all hours worked between 2:00 a.m. and 6:00 a.m.? c) Any and all night shifts immediately following three successive nights? d) Any and all day or night shifts following four successive night shifts unless three nocturnal sleep cycles have been completed? • FAQs D.05 and D.07.	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
				☐	Observed	
				☐	Records	
				☐	Interview	
D4-13:	If the answer to any item in D4-10, 11 or 12 is "UNSAT", does the operator have a documented technical basis to show that the operator's maximum limit on controller HOS is adequate to reduce the risk associated with controller fatigue?	☐	SAT	☐	SAT	
		☐	UNSAT	☐	UNSAT	
		☐	N/A			
				☐	Observed	
				☐	Records	
				☐	Interview	

D4-14:	Does the operator have a formal procedure for approving deviations from the maximum HOS limits?
	
	• FAQ D.13.
	• Process should include analysis of events leading to the deviation
	• Operators' actions following deviations should be reviewed, since follow on deviations may occur if not managed adequately.
	• Written approval from the designated fatigue program manager should be obtained in advance for anticipated deviations. In cases where unforeseen events occur, verbal and subsequent written approval should be obtained at the first practical moment after the event.
	• Records must document justification for, and approval of, deviations.
	• Documentation should address:
	  • Reason for exception (i.e. which portion(s) of the HOS schedule/procedures to be exceeded)
	  • Why is the exception needed for the safe operation of a pipeline facility
	  • Date and time work schedule will be impacted
	  • Deviation will affect the following employee(s)
	  • Work schedule before and after the exception
	  • Any additional fatigue risks associated with the exception
	  • Countermeasures to be employed to offset any additional risks for fatigue
	  • Date, time and by whom the deviation is being reviewed/approved
			SAT		SAT	

			UNSAT		UNSAT	
					Observed	
					Records	
					Interview	

195.446(d)(2) Educate controllers and supervisors in fatigue mitigation strategies and how off-duty activities contribute to fatigue;	**192.631(d)(2) Educate controllers and supervisors in fatigue mitigation strategies and how off-duty activities contribute to fatigue;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that specify controller/supervisor education
- Educational materials used to teach controllers and supervisors
- Records demonstrating that all controllers and supervisors have successfully acquired the minimum information, including attendance rosters and test records

Inspection Question	Procedures	Implementation	Inspector Notes
D2-1: Is fatigue education required to all controllers and control room supervisors? • Records must demonstrate that all controllers and supervisors have received the required fatigue training. • The content of training material for new controllers may include additional topics not necessary for experienced controllers • Education on fatigue mitigation strategies may be incorporated into OQ requirements or may be implemented as a separate training program.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D2-2: Is refresher fatigue education provided at regular intervals? • Refresher training should be provided on an annual basis (typically once per calendar year, not to exceed 15 months).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D2-3: Is the effectiveness of the fatigue education program reviewed at least once each calendar year, not to exceed 15 months? • One gauge of effectiveness may be controller test scoring, but there could be other methods as well (table top type scenarios, bringing up at regular meetings, etc.) • Another gauge of effectiveness may be soliciting the trainees on the thoroughness or missing elements of training material content • Annual review of O&M programs required by 192.605 and 195.402.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D2-4: Does fatigue education address fatigue mitigation strategies (countermeasures)? • FAQs D.04 and D.05. • Fatigue should be defined in terms of time-on-task, circadian, acute, cumulative, chronic, and physical effects.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D2-5: Does fatigue education address how off-duty activities contribute to fatigue? • FAQs D.04 and D.05. • Fatigue education should address sleep physiology, sleep hygiene and sleep pathologies, especially Shift Work Sleep Disorder • Employer-specific policies and procedures related to fatigue management	☐ YES ☐ NO	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(d)(3) Train controllers and supervisors to recognize the effects of fatigue; and	**192.631(d)(3) Train controllers and supervisors to recognize the effects of fatigue; and**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that specify controller/supervisor training
- Training materials used to train controllers and supervisors
- Records demonstrating that all controllers and supervisors have been successfully trained, including attendance rosters and test records

Inspection Question	Procedures	Implementation	Inspector Notes
D3-1: Is fatigue training required for all controllers and qualified supervisors? • The content of training material for new controllers may include additional topics not necessary for experienced controllers • Records must demonstrate that all controllers and supervisors have received the required fatigue training.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D3-2: Is refresher fatigue training provided at regular intervals? • Refresher training is needed to assure that controllers remain cognizant of fatigue issues in the long term. • Refresher training should be provided on an annual basis (typically each calendar year, not to exceed 15 months).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D3-3: Is the effectiveness of the fatigue training program reviewed at least once each calendar year, not to exceed 15 months? • Operator to establish what metrics best serve to demonstrate the effectiveness of their program • Effectiveness reviews should address all stated metrics • Annual review of O&M programs required by 192.605 and 195.402.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
D3-4: Is the content of fatigue training adequate for training controllers and supervisors to recognize the effects of fatigue? • FAQ D-04. • Circadian rhythm effects on work performance • Time-on-task-fatigue effects on work performance • Effects of prescription and over-the-counter drugs on sleep and work performance • Uses of prescription sleep aids and alertness aids • Actions to be taken when controllers are self-identified or identified by colleagues or supervisors as being too fatigued to safely control the pipeline	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(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:	**192.631(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:**
…	**…**

Typical operator documents that should be available for PHMSA inspection:

- Alarm management policies and procedures
- Records associated with alarm management reviews, and actions taken

Inspection Question	Procedures	Implementation	Inspector Notes
E0-1: Is the operator's alarm management plan a formal process that specifically identifies critical topical areas included in their program? • Operator may use other terms rather than "alarm", such as "alert." • Refer to FAQ E.04 for the definition for safety-related alarm and FAQ A.16 for definition of safety-related. • Operator should have a list of alarm setpoints for each safety-related point. • Alarm management should be included in the management of change process. • International Society of Automation (ISA) 18 may be used for guidance. • Typical critical topical areas are: o Alarm philosophy o Alarm identification o Alarm rationalization, not necessarily alarm reduction. o Detailed design o Implementation o Operation o Maintenance o Monitoring o Assessment (including a method to confirm effective controller response) o Internal audits	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(e)(1) Review SCADA safety-related alarm operations using a process that ensures alarms are accurate and support safe pipeline operations;	**192.631(e)(1) Review SCADA safety-related alarm operations using a process that ensures alarms are accurate and support safe pipeline operations;**

Inspection Question	Procedures	Implementation	Inspector Notes
E1-1: Does the operator have a process to identify and correct inaccurate or malfunctioning alarms? • Operator must have a means to identify inaccurate alarms. • Operator should have formal process for controllers to report alarm problems and malfunctions. • Process should include requirements for prompt correction of alarm malfunctions. • Alarm reports and alarm inhibited reports are useful tools, but may not be a complete listing of alarms that fail to function as or when required.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E1-2: Does the review of safety-related alarms account for different alarm designs and all alarm types/priorities? • Operator must ensure soft (software calculated or "synthetic") alarms are accurate and can be identified by the controller. • Adequate procedures must be in place to explain the administrative controls for the disabling of safety -related alarms. • FAQ E.12. Alarm priorities used by the operator should differentiate alarm importance. Too many alarm priorities could lead to confusion and inconsistent response to alarms. • In evaluating whether alarms support safe operations, operators should account for type of alarm used, e.g., visual alarms are more likely to go unnoticed than alarms that are both audible and visual. Make a notation of the types of alarm used. • If there are differences in alarm design based on alarm priority, the operator should be able to explain the rationale for the chosen approach and its effect on ensuring controllers recognize and handle alarms efficiently.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E1-3: Does the review of safety-related alarms account for individual-specific controller qualification and performance? • If there are differences in display object characteristics, formats, or colors from one console to another, those differences must be explicitly addressed in controller training and accounted for in alarm management plan. • Controller qualification tests should evaluate the ability of controllers to accurately perceive SCADA display object characteristics (e.g., color, shape, text) that indicate safety related alarms used in the operator's SCADA system. • If a controller is not able to clearly discern all individual colors used, the operator may consider incorporating alternatives to achieve an equivalent level of SCADA display understanding for all controllers. • Requirements for operator qualification are addressed in 195.505(b) and 192.805(b).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

E1-4:	Does the review of safety-related alarms include specific procedures and practices for managing stale or unreliable data? • Adequate procedures should be in place for controllers to manage stale data. Reviews of safety related alarms should account for the way controllers manage stale data. • The operator should have a procedure to insure errant or stale data sources are promptly remediated, in order to minimize adverse impact on safety related alarm capabilities. • Operators should account for errant or stale data when reviewing safety related alarms. The cause of errant or stale data should also be accounted for, including but not limited to, communication system errors, SCADA system errors, operational practices to take points off-scan or inhibit alarms, and other applicable causes. • Operators should be able to determine stale data for all points that impact safety or safety-related points. • Operators should be able to distinguish between stale or forced data in the RTU versus the SCADA system.		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(e)(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)(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;**

Inspection Question		Procedures	Implementation	Inspector Notes
E2-1:	Does the procedure require the monthly identification, recording, review, and analysis of points that have been taken off scan, 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? • Documentation must include dates showing: o When points were taken off scan/inhibited/forced/manual, o When points were restored, and o The duration of outage. • FAQ E.02 for false alarms. • FAQ E.03 for alarms generated during testing. • FAQ E.04 for safety related alarms and FAQ A.16 for definition of safety-related. • FAQ E.05 for alarm setpoint values. • Procedures must require the review of analysis of such points. • Results of the review and analysis should be documented. • Off scan points should be promptly restored to service.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E2-2:	Does the operator's alarm management plan include a procedure for promptly correcting identified problems and for returning these points to service? • Operator should analyze problems to identify recurring or chronic issues that are not getting corrected promptly enough. • FAQ E.14.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(e)(3) Verify the correct safety-related alarm setpoint values and alarm descriptions <u>when associated field instruments are calibrated or changed and</u> at least once each calendar year, but at intervals not to exceed 15 months;	**192.631(e)(3) Verify the correct safety-related alarm setpoint values and alarm descriptions at least once each calendar year, but at intervals not to exceed 15 months;**

Inspection Question	Procedures	Implementation	Inspector Notes
E3-1: Does the operator have a formal process to determine the correct alarm setpoint values and alarm descriptions? • Operators should confirm that alarm descriptors are clearly understood by controllers. • Controllers should be solicited for input when choosing or editing the text of alarm descriptors. • Alarm descriptors should be in a consistent format; where alarms from the same location have the same location coding. Similar devices from multiple locations share the same device coding. • Procedures should include a formal process to determine correct pressure and flow alarm setpoints for each alarm priority. • The process should accommodate the need to adjust pressure and flow requirements based on the discovery of imminent integrity threats (e.g., discovery of immediate repair conditions during integrity assessments and notifications). • The process should verify that field alarm setpoints are consistent with control room alarm setpoints, or a rationale for any offset. (Some operators intentionally offset field and control room alarm setpoints so controllers are alerted and can take action before critical field thresholds are breached.)	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E3-2: Have procedures been established to clearly address how and to what degree controllers can change alarm limits or setpoints, or inhibit alarms, or take points off-scan? • FAQ E.17. Controllers should not be able to change setpoints associated with critical maximum or minimum safety limits. However, operators may choose to allow controllers to change other mid-level alarm setpoints used for operational purposes. • Changed setpoints should be verified as having the correct valve before implementation. • Verification should explicitly check setpoint values currently in the SCADA system, not just check a listing of what the setpoints should be. • Controllers should have convenient access to a listing of all alarm limits and alarm descriptions.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E3-3: [HL ONLY] Do procedures require that any calibration or change to field instruments require verification of alarm setpoints and alarm descriptions? • O&M procedures must require setpoint verification as part of field work package control. • FAQ E.15. Verification must be completed and documented as part of the field work package.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(e)(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;	**192.631(e)(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;**

Inspection Question	Procedures	Implementation	Inspector Notes
E4-1: Has the operator established and implemented procedures to review the alarm management plan at least once each calendar year, but at intervals not exceeding 15 months, in order to determine the effectiveness of the plan? • Procedure must identify the interval and method for reviewing alarm management plan. • Procedure must identify factors and criteria used to measure alarm management effectiveness. • Results of the review must be documented, even if the review determines that no changes were warranted. • FAQ E.16. Procedure must provide for addressing findings in a timely manner. In addition, the operator's alarm management plan should include provisions to analyze its specific deficiencies to identify root cause, common cause, trends, etc., that are indicative of systemic deficiencies that need to be identified and corrected. • Alarm management effectiveness metrics might include number (volume) of alarms, clarity of alarm descriptions, how alarms are displayed or presented to controllers, etc. Effectiveness could include, but not necessarily mean reduction in number of alarms or reduction in alarm volume.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	

195.446(e)(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 exceeding 15 months, that will assure controllers have sufficient time to analyze and react to incoming alarms; and	**192.631(e)(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 exceeding 15 months, that will assure controllers have sufficient time to analyze and react to incoming alarms; and**

Inspection Question	Procedures	Implementation	Inspector Notes
E5-1: Does the operator's program have a means of identifying and measuring the work load (content and volume of general activity) being directed to an individual controller? • Process must have a sufficient degree of formality and documentation. Operators might implement this requirement by means of a job task analysis (JTA), formal workload study or other means. • "General activity" means any activity that is required of the controller. This includes, but is not limited to, pipeline operations, handling SCADA alarms, conducting shift change, greeting and responding to visitors, administrative tasks, impromptu requests, telephone calls, faxes, or other activities such as monitoring weather and news reports, training (including CBT), checking security and video surveillance systems, using the internet, and interacting with colleagues, supervisors, and managers. Operator should be able to describe the level of activity for each console, including (in cases of control rooms with multiple consoles) which console has the most activity and which has the least. • For continuous operations, operator should be able to describe the differences in the level of activity during weekdays/weekends, and during day/night shifts. • If the operator has added any significant assets or SCADA points since the previous review, the operator must account for this change in the next workload review. • If the operator has impressed other activities, not related to pipeline operation, onto the controller position, the operator should ascertain these activities do not undermine pipeline safety. • Measurement of workload should be performed during all periods of time, seasons, and shifts to account for variations in overall demands on controllers.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
E5-2: Is the process of monitoring and analyzing general activity comprehensive? • Activities to be analyzed may include: o manual calculations o alarms o on duty (or on the job) training o manual entries of setpoints or control o phone usage metrics o customer/shipper interactions o [HL ONLY] slack line operations o increased activity as a result of failures, near misses, errors • Metrics may include: o Phone usage metrics number and duration of calls, o Keyboard interaction time, o Amount of idle time, o Time to acknowledge alarms, o Number of data points being monitored, o Number of control actions.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

E5-3:	Does the operator's program have a means of determining that the controller has sufficient time to analyze and react to incoming alarms? • Controller response metrics associated with alarm handling such as frequency of alarms (typically alarms per shift) received per console. • Criteria for acceptable controller performance in response to alarms. • Operators should place particular importance on proper and timely response to leak detection alarms. FAQ A.15 clarifies that leak detection systems, batch tracking systems and other special applications can be considered as an extension of the SCADA System and subject to CRM requirements. • [HL Only] See Advisory Bulletin ADB–10–01, "Leak Detection on Hazardous Liquid Pipelines" dated January 26, 2010 (75 FR 4134). • Operators may identify relevant alarm management practices by consulting with applicable industry standards such as International Society of Automation (ISA) 18. Analysis of increased activity as a result of failures, near misses, errors, operating experience, or lessons learned and how they relate to volume of work. • FAQ E.08. Operators should identify the workload threshold that would lead to adding controllers and/or consoles. • Operators should document the results of the workload analysis and document the number of controllers and consoles needed to safety manage workload. • FAQ E.07. Credible reviews should identify the need to make adjustments as workload increases. Inspections should include discussions about any changes in the number of consoles in the past year, and if the operator has plans to change the workload on any console. • FAQs E.09 and E.13.		SAT UNSAT		SAT UNSAT Observed Records Interview	
E5-4:	Has the operator performed an analysis to determine if controller(s) performance is currently adequate? • FAQs E.09 and E.13. • Tabulating current assignments and responsibilities alone is not adequate as a workload analysis. • Combining current workload and the outcome of performance metrics can provide a basic understanding of workload. • Operators should assure that controller performance meets minimum performance standards as defined by the operator.		SAT UNSAT N/A		SAT UNSAT Observed Records Interview	

195.446(e)(6) Address deficiencies identified through the implementation of paragraphs (e)(1) through (e)(5) of this section.	**192.631(e)(6) Address deficiencies identified through the implementation of paragraphs (e)(1) through (e)(5) of this section.**

Inspection Question	Procedures	Implementation	Inspector Notes
E6-1: Has the operator developed and implemented a procedure to address how deficiencies found in implementing (e)(1) through (e)(5) will be resolved? • FAQ E.16. Operators should promptly correct specific issues commensurate with their importance to safety. Operators should maintain an itemized list of deficiencies and their date of discovery, the corrective action to be taken, and the completion date (or schedule) for corrective actions. • FAQ E.16. Procedure should provide a criteria and/or guidelines for prioritizing the resolution and correction of deficiencies. The operator's documentation should also record the basis for the selection and scheduling of corrective action.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(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) Implement section 7 of API RP 1168 (incorporated by reference, see § 195.3) for control room management change and require coordination between control room representatives, operator's management, and associated field personnel when planning and implementing physical changes to pipeline equipment or configuration;	**192.631(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;**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address change management
- Records to demonstrate control room participation in change management activity
- Listing of changes that trigger the use of procedure

Inspection Question	Procedures	Implementation	Inspector Notes
F1-1: [HL ONLY] Does the operator's program have a process/procedure to assure changes in field equipment (for example, moving a valve) that could affect control room operations are coordinated with the control room personnel? • Procedures must manage SCADA and data communications maintenance or configuration activities to assure controllers are aware of, review, and provide input, in advance of work. • When temporary changes are no longer necessary, return to normal constitutes the need to invoke the change management procedure. • Records must demonstrate that field personnel have contacted the control room whenever required by procedure. • FAQs F.01 and F.02. Do the operator's procedures include guidance or a description of what changes in field equipment would constitute the need to invoke change management provisions. Examples include but are not limited to: purchase or sale of physical assets; new equipment coming online; retired equipment going offline; and field maintenance activity affecting pipeline control room operations.	☐ SAT ☐ UNSAT ☐ N/A (Gas)	☐ SAT ☐ UNSAT ☐ N/A (Gas) ☐ Observed ☐ Records ☐ Interview	
F1-2: [HL ONLY] Is there a procedure to mandate a control room representative will participate in meetings where changes that could directly or indirectly affect control room operations (including routine maintenance and repairs) are being considered, designed and implemented? • The actual control room representative must have sufficient familiarity with control room activities to adequately perform this task. • The control room representative must adequately communicate related information to impacted controllers. • Records should include meeting topics and communiqué created for controllers. • See API RP-1168 section 7 for examples.	☐ SAT ☐ UNSAT ☐ N/A (Gas)	☐ SAT ☐ UNSAT ☐ N/A (Gas) ☐ Observed ☐ Records ☐ Interview	
F1-3: [HL ONLY] Before implementing changes, does the operator provide controllers with notification and training to assure the controllers ability to safely incorporate the proposed change into their operations? • See API RP-1168 section 7.3 for specific information.	☐ SAT ☐ UNSAT ☐ N/A (Gas)	☐ SAT ☐ UNSAT ☐ N/A (Gas) ☐ Observed ☐ Records ☐ Interview	

F1-4:	[Gas ONLY] Does the operator have a procedure to assure changes in field equipment that could affect control room operations are coordinated with the control room personnel? • FAQs F.01 and F.02. Procedures should include guidance or a description of what changes in field equipment would constitute the need to invoke change management provisions. • Management of Change process must also assure that controller training is updated to reflect the change and that controllers are adequately trained, as needed, on changes before the changes are placed into operation. • There should be a procedure to manage SCADA and data communications maintenance or configuration activities to assure controllers are aware of, review, and provide input, in advance of work. • The change management procedure should also be implemented when temporary changes are no longer necessary and operations are returned to normal.		SAT UNSAT N/A (HL)		SAT UNSAT N/A (HL) Observed Records Interview	
F1-5:	[Gas ONLY] Is there a procedure to mandate a control room representative will participate in meetings where changes that could directly or indirectly affect the hydraulic performance of the pipeline (including routine maintenance and repairs) are being considered, designed and implemented? • The control room representative must have sufficient technical and procedural familiarity with control room activities to adequately perform this task. • The control room representative must adequately communicate related information to all impacted controllers. • Records should include meeting topics and communiqué created for controllers.		SAT UNSAT N/A (HL)		SAT UNSAT N/A (HL) Observed Records Interview	

195.446(f)(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	**192.631(f)(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**

Inspection Question	Procedures	Implementation	Inspector Notes
F2-1: Does the operator have a process or procedure to require its field personnel and SCADA support personnel to contact the control room when emergency conditions exist? • Field personnel must communicate with the control room immediately upon discovery of an emergency condition. • Records must demonstrate that field personnel have contacted the control room whenever emergency conditions existed.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
F2-2: Does the operator have and implement a procedure to require its field personnel and SCADA support personnel to contact the control room when making field changes (for example, moving a valve) that affect control room operations? • Field personnel must communicate with the control room before any equipment is being put into local control or returned to remote control. • Field personnel must communicate with the control room before any equipment is being taken out of service or returned to service. • Field personnel should alert the control room before personnel enter a SCADA-controlled facility (including but not limited to compressor/pump stations, meter stations, main-line valves, etc.), which is normally unattended. • Field personnel should be trained to call the controller when making field changes that have the potential to affect control room operations.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

No (f)(3) for HL	**192.631(f)(3) Seek control room or control room management participation in planning prior to implementation of significant pipeline hydraulic or configuration changes.**

Inspection Question	Procedures	Implementation	Inspector Notes
F3-1: [Gas ONLY] Does management include control room or control room management participation in planning, prior to the implementation of significant pipeline hydraulic or configuration changes?	☐ SAT ☐ UNSAT ☐ N/A (HL)	☐ SAT ☐ UNSAT ☐ N/A (HL) ☐ Observed ☐ Records ☐ Interview	

195.446(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:	**192.631(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 § 195.50 and 195.52 to determine if control room actions contributed to the event and, if so, correct, where necessary, deficiencies related to:	**(1) Review incidents that must be reported pursuant to 49 CFR part 191 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.**
(i) Controller fatigue; (ii) Field equipment; (iii) The operation of any relief device; (iv) Procedures; (v) SCADA system configuration; and (vi) SCADA system performance.	**…**
…	

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address the lessons learned program
- Records to demonstrate that lessons learned have been incorporated into its CRM procedures

Inspection Question	Procedures	Implementation	Inspector Notes
G1-1: Does the operator employ a formal, structured approach for reviewing and critiquing reportable events to identify lessons learned? • Operator must incorporate a methodology to determine the cause of the event. • Event cause analysis includes analysis of the potential contribution of controller or control room decisions/actions to the event. • A root cause analysis process should be used when applicable. • Secondary or contributing causes should be addressed. • Operator should address potential contribution of erroneous training. • When applicable, the operator's review and critique of actual failure experience should critique the adequacy of SCADA design and performance of both the primary and back-up systems.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
G1-2: Does the review of reportable events specifically analyze all contributing factors to determine if control room actions contributed to the event, and correct any deficiencies? • Reviews should analyze the following factors: o Controller fatigue o Field equipment o Operation of any relief device o Procedures o SCADA system configuration o SCADA system performance • Operator should perform a quantitative evaluation of the potential contribution of controller fatigue. • Operator should specifically evaluate the potential contribution of personnel located in the field.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(g)(2) Include lessons learned from the operator's experience in the training program required by this section.	**192.631(g)(2) Include lessons learned from the operator's experience in the training program required by this section.**

Inspection Question		Procedures		Implementation		Inspector Notes
G2-1:	Is training provided on lessons learned from a broad range of events, even though the control room may not have been at fault?		SAT		SAT	
			UNSAT		UNSAT	
					Observed	
					Records	
					Interview	
G2-2:	Does the operator's program include other operating events (in addition to reportable incidents/accidents) like near misses, leaks, operational and maintenance errors, etc?		SAT		SAT	
			UNSAT		UNSAT	
					Observed	
					Records	
					Interview	

195.446(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: **...**	**192.631(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:** **...**

Typical operator documents that should be available for PHMSA inspection:

- Controller training procedures, and controller training course materials, tests, exercises, etc.
- Records to demonstrate that each controller successfully completed all required training

Inspection Question		Procedures	Implementation	Inspector Notes
H0-1:	Has the operator established and implemented a controller training program to provide training for each controller to carry out their roles and responsibilities? • CRM training program must provide training as appropriate to ensure that individuals performing "controller" activities (i.e., covered tasks) have the necessary knowledge and skills to perform the tasks in a manner that ensures the safe operation of pipeline facilities. • Records must demonstrate that each controller has successfully completed the controller OQ and CRM training program, including requalification training. • Records must include names and dates of training. • All elements of OQ and CRM training must be documented on training records. • Training program can address cross-training on consoles not normally used, but cross-training to other consoles is not required.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	
H0-2:	Has the operator established and implemented procedures to review the controller training program content to identify potential improvements at least once each calendar year, but at intervals not to exceed 15 months? • Procedures must establish a program review interval. • Records must demonstrate that a review occurs at least once each calendar year, with intervals not to exceed 15 months between consecutive reviews. • Procedures must specify that any identified improvements must be promptly addressed. • Verify that reviews are credible, i.e., they are expected to identify improvements, or document that no improvements were necessary. • Reviews may be conducted by independent persons/organizations.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	
H0-3:	Does training content address all required material, including training each controller to carry out the roles and responsibilities that were defined by the operator (as required in section B, above)? • FAQ H.03. The training must require each controller to demonstrate proficiency on each of the roles and responsibilities identified by the operator as well as applicable OQ covered tasks. • Training must address backup SCADA systems and backup control rooms, if they exist. • Training must include cross training controllers on other consoles not normally attended, if they might be assigned to substitute or cover another controller's console. • FAQ H.02. If prior qualification (i.e., qualification completed before the effective date of the CRM rule) meets all OQ and CRM requirements, controllers need not be re-qualified/retrained immediately after the effective date of the rule, until their next requalification deadline.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	

195.446(h)(1) Responding to abnormal operating conditions likely to occur simultaneously or in sequence;	**192.631(h)(1) Responding to abnormal operating conditions likely to occur simultaneously or in sequence;**

Inspection Question	Procedures	Implementation	Inspector Notes
H1-1: Has the operator established a list of the abnormal operating conditions that are likely to occur simultaneously or in sequence? • Establishing a list would be necessary to identify training for this requirement.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	
H1-2: Does the operator's program provide controller training on recognizing and responding to abnormal operating conditions that are likely to occur simultaneously or in sequence? • Operators must include training on lessons learned from the review of operating experience, in accordance with (g)(2), including critiques of all recent accidents/incidents. • Operators should review historical alarm logs to identify candidate scenarios for training.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	

195.446(h)(2) Use of a computerized simulator or non-computerized (tabletop) method for training controllers to recognize abnormal operating conditions;	**192.631(h)(2) Use of a computerized simulator or non-computerized (tabletop) method for training controllers to recognize abnormal operating conditions;**

Inspection Question	Procedures	Implementation	Inspector Notes
H2-1: Does the operator's training program use a simulator or tabletop exercises to train controllers how to recognize and respond to abnormal operating conditions? • Operators must use either or both computerized and non-computerized (tabletop) method for simulator training. • The training must require that controllers demonstrate proficiency in recognizing and responding to abnormal conditions based on actual scenarios from reportable accidents/incidents and likely abnormal situations in order to prevent or mitigate future similar conditions. • Operators are not required to use of a computerized training simulator. Well thought out and interactive tabletop exercises are likely to be used by smaller operators. • If computerized simulators are used, consoles should be clearly labeled to avoid controller/trainee from confusing a live console with a training console. • Use of simulator should be more than just interacting with SCADA system. Simulator training should also include use of related operational and emergency procedures and interaction with others.	☐ SAT ☐ UNSAT ☐ Simulator ☐ Tabletop	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(h)(3) Training controllers on their responsibilities for communication under the operator's emergency response procedures;	**192.631(h)(3) Training controllers on their responsibilities for communication under the operator's emergency response procedures;**

Inspection Question	Procedures	Implementation	Inspector Notes
H3-1: Does the operator's program train controllers on their responsibilities for communication under the operator's emergency response procedures? • The training program must require that controllers demonstrate knowledge and proficiency in communicating during an emergency. • The operator should have controllers participate in accident/incident drills.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ N/A ☐ Observed ☐ Records ☐ Interview	

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; and	**192.631(h)(4) Training that will provide a controller a working knowledge of the pipeline system, especially during the development of abnormal operating conditions; and**

Inspection Question	Procedures	Implementation	Inspector Notes
H4-1: Does the operator training program provide controllers a working knowledge of the pipeline system, especially during the development of abnormal operating conditions? • Training must ensure that controllers have practical knowledge of how fluid dynamics, electrical power, communications, etc. impact operations. • Training must include information about how pressure and flow in all pipeline segments are impacted by control actions. • Training must include any facilities that are different than typical. • Training should include information (within the controller's domain of responsibility) about flexibility and limitations at inlet points, mainline valves, stations and delivery points. • Training must include MAOPs/MOPs, and any imposed lower pressures, on all pipeline segments.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(h)(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.	**192.631(h)(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.**

Inspection Question	Procedures	Implementation	Inspector Notes
H5-1: Has the operator established a list of pipeline operating setups that are periodically (but infrequently) used? • "Periodically but infrequently" means operational setups that are repeatedly used at quarterly or greater intervals. • Operational setups occurring more frequently than quarterly would not be "infrequent." • FAQ H.01. The operator must establish a list of applicable setups, including but not limited to: startup, shutdown, shut-in, purge, ILI tool runs, station or line section bypass, system configurations involving mainline block valve closure, operating pressure restrictions, stopple fittings, slack line conditions, occasional delivery lateral operation, line reversals (reversing direction of flow), combining pipelines through valving to run in common versus split, bleed valve operations, power loss failure modes, seasonal set-ups, etc.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
H5-2: Do procedures specify that, for pipeline operating set-ups that are periodically (but infrequently) used, the controllers must be provided an opportunity to review relevant procedures in advance of their use? • Operators should give special consideration to training on set-ups for reverse flow. • FAQ H.01. Note that this requirement applies to all controllers subject to paragraph (h) of the CRM rule, even if their SCADA system only provides monitoring functionality, where control functions are provided through controller interaction with field personnel.	☐ SAT ☐ UNSAT ☐ N/A	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(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(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.**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address requests from regulatory agencies
- Records to demonstrate compliance with requests to submit CRM procedures

Inspection Question		Procedures		Implementation		Inspector Notes
I0-1:	Does the operator have and implement adequate procedures to assure that it is responsive to requests from applicable agencies to submit their CRM procedures? • Operator must have records to demonstrate timely compliance with this requirement. • FAQ I.03. The rule does not specify a mandatory deadline for submitting documents for compliance validation. PHMSA (or the State Agency) will endeavor to include in its request a specific deadline on a case-by-case basis that reflects the need date. For example, in preparation for an inspection, PHMSA (or the State Agency) may request the operator to submit documents by a specified date, or time frame, in advance of the inspection. Operators must submit documents by any reasonable deadline so requested. If PHMSA (or the State Agency) does not include a specific need date in the request, operators are expected to submit the information no later than 30 days from the date of the request.		SAT UNSAT		SAT UNSAT Observed Records Interview	
I0-2:	Does the operator have an individual that is responsible and accountable for compliance with requests from PHMSA or other applicable agencies?		SAT UNSAT		SAT UNSAT Observed Records Interview	

195.446(j) Compliance and deviations. An operator must maintain for review during inspection: **(1) Records that demonstrate compliance with the requirements of this section; and**	**192.631(j) Compliance and deviations. An operator must maintain for review during inspection:** **(1) Records that demonstrate compliance with the requirements of this section; and**

Typical operator documents that should be available for PHMSA inspection:

- Policies and/or procedures that address records management
- Policies and/or procedures that require deviations be documented and have a documented basis to substantiate that the deviation was necessary for safe operation
- Records to demonstrate compliance with all CRM requirements
- Documentation of all deviations from CRM requirements

Inspection Question	Procedures	Implementation	Inspector Notes
J1-1: Does the operator have and implement records management procedures that are adequate to assure records sufficient to demonstrate compliance with the CRM rule. • Records must be readily retrievable. • If paper records are used, they must be stored and archived to prevent loss, damage, and assure long term retrievability. • Procedures must require that information needed to demonstrate compliance with CRM requirements is documented as a record. • Records must be sufficiently detailed to demonstrate compliance. Merely annotating work performed/completed on a certain date would usually be deemed as inadequate. • Records should include date, individual name (or employee ID), and nature of work. • Records should also include any errant condition that is discovered, and what was performed to correct the condition. • Records associated with calibration should include both the "as found" and "as left" values. • FAQs J.01 and J.03 (retention time).	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
J1-2: Are electronic records properly stored, safeguarded, and readily retrievable? • FAQ J.04. Records that are stored on electronic media must be backed up, ideally by using diverse, redundant and geographically independent media to protect from loss. • FAQ J.04. If the operator is dependent on electronic records, the operator must maintain the ability to access and read older electronic records, even if the operator may have upgraded to a newer technology or data architecture. Operators must assure that changes or upgrades in technology do not make the media used to store prior electronic records unreadable. • FAQ J.04. Operators must have a process or means to assure and demonstrate the authenticity of electronic records. • Having retained old electronic media (tapes, disks, etc.) without having the ability to retrieve actual records for review by an inspector is inadequate. • The SCADA event, alarm, and command log must be stored on non-volatile memory and/or paper, thereby protected from loss in the event of a SCADA failure, including immediately following incidents or accidents.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	

195.446(j)(2) Documentation to demonstrate that any deviation from the procedures required by this section was necessary for the safe operation of the pipeline facility.	**192.631(j)(2) Documentation to demonstrate that any deviation from the procedures required by this section was necessary for the safe operation of the pipeline facility.**

Inspection Question		Procedures	Implementation	Inspector Notes
J2-1:	Does the operator have and implement procedures to demonstrate and provide a documented record that every deviation from any CRM rule requirement was necessary for safe operation? • FAQ J.02. • Procedures must include acceptable criteria for determining if a deviation was necessary for safe operation. • Records of actual deviations must demonstrate the deviation was necessary for safe operation. • The occurrence of schedule or maximum HOS deviations often cause a domino effect of further deviations, if managers do not thoroughly study and adjust schedules. • Deviations that occur on a routine or cyclical basis should be scrutinized during an inspection.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	
J2-2:	Were all deviations documented in a way that demonstrates they were necessary for safe operation? • Inspectors that identify instances of a deviation should check if the deviation was documented. • Inspectors that identify instances of a deviation should check if the deviation was justified as necessary for safe operation.	☐ SAT ☐ UNSAT	☐ SAT ☐ UNSAT ☐ Observed ☐ Records ☐ Interview	