Inspection Output (IOR)

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Inspection Information

Inspection Name	8284 Northwest Natural HQ Control Room Management	Operator(s)	NORTHWEST NATURAL GAS CO (13840)	Plan Submitted	11/09/2020
		Lead	David Cullom	Plan Approval	11/10/2020 by Joe Subsits
		Observer(s)	Scott Rukke, Dennis Ritter, Lex Vinsel, Anthony Dorrough, Deborah Becker, Derek Norwood, Scott Anderson, Kevin Hennessy, Ray Muller, Darren Tinnerstet, Rell Koizumi, David Hoy, John Ivey, Cody Cox	All Activity Start	03/22/2021
				All Activity End	03/23/2021
Status	PLANNED			Inspection Submitted	--
Start Year	2021			Inspection Approval	--
System Type	GD				
Protocol Set ID	WA.GD.2020.02	Supervisor	Joe Subsits		
		Director	Sean Mayo		

Inspection Summary

Inspection Scope and Summary

The 2021 Northwest Natural Control Room inspection was conducted as a joint audit with Washington State and Oregon. Records were provided in advance of the inspection for review and additional records and procedures were reviewed during the MS-Teams portion of the inspection.

Facilities visited and Total AFOD

Facilities were not visited due to COVID-19 restrictions, but controllers were interviewed via MS-Teams and records reviewed remotely.

AFODs included (2) remote records days and (2) remote MS-Teams days where additional records were reviewed with the operator and random records were selected for review.

Summary of Significant Findings

There were (5) Areas of concern noted.

1. 49 CFR §192.631 Control room management.

(a) *General.*

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

Finding(s):

The location of the main control room is listed as 220 NW 2nd Portland, Oregon 97209 in the manual that the UTC currently has a copy of. The title of this document is : Control Room Management Plan, Revision Number 6.0 (12/20/2017) (reviewed by NWN 12/07/2018) The manual needs to be updated with the current control room location.

2. 49 CFR §192.631 Control room management.

(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:

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

Finding(s):

Records were not provided or available to demonstrate that lessons learned from the operator's experience such as reportable incidents/accidents, near misses, abnormal operations, leaks, operational and maintenance errors, etc. were incorporated into the training program. Lessons learned from these experiences are required to be incorporated into the CRM program.

3. 49 CFR §192.631 Control room management.

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

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

Finding(s):

The procedure is lacking sufficient detail. The Compliance and Deviations section in NWN's CRM manual discusses creating records and storing them for 5 years, but that is the entirety of the procedure. It states "Documentation and records are retained for a minimum of five (5) years."

Northwest Natural has an entry in the manual to reference CRM records creation and storage but needs to be more clearly defined. The operator was not able to provide, during the inspection, a storage location, or any further information on where the records are stored or how they can be retrieved.

4. 49 CFR §192.631 Control room management.

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

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

Finding(s):

Records are saved for 5 years per the operator. Although the operator was able to provide a control room log from 5/3/2019 as requested, the information was stored on a system that was not readily available during the inspection. Secondary "mirrored" copies were not available without logging in at a production console. This can present issues if the main control room is disabled and the records are not available at the backup control room.

It is understood that security issues can arise from connecting remotely to a console while sharing information over shared teleconferencing. The operator should have redundancy and the capability either at a backup control room location or in another database that is not connected to the live SCADA system available. Records could then be reviewed as they are requested during an inspection rather than having the operator poll the system and return with information at a later time. This would also provide for greater transparency during the inspection process.

5. 49 CFR §192.631 Control room management.

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

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

Finding(s):

There was no documentation available of any deviations or the lack thereof. The absence of any statement containing "no deviations" makes it difficult to determine whether there were no deviations for the inspection time period, if they were not being documented, or if the operator cannot locate where they are stored.

For example, the National Pipeline Mapping System (NPMS) requires operators to submit updated pipeline mapping information on an annual basis. If there are no changes, they are documented with a submission and a statement for the record of "No Changes."

Primary Operator contacts and/or participants

This information is contained within the "Attendance List" located under the "Forms" tab

Operator executive contact and mailing address for any official correspondence

Jon G. Huddleston

Vice President of Engineering and Utility Operations

250 Southwest Taylor Street, Portland, Oregon 97204

Scope (Assets)

#	Short Label	Long Label	Asset Type	Asset IDs	Excluded Topics	Planned	Required	Total Inspected	Required % Complete
1.	8284	8284	other	--	--	143	143	143	100.0%
2.	88965 (1,826)	Northwest Natural-HEADQUARTERS	unit	88965	--	--	--	--	--

1. Percent completion excludes unanswered questions planned as "always observe".

Plans

#	Plan Assets	Focus Directives	Involved Groups/Subgroups	Qst Type(s)	Extent	Notes
1.	8284	Control Room Management	PRO, PRR, FR, GDIM, MMLPGIM, MISCTOPICS, GENERIC	P, R, O, S	Detail	

Plan Implementations

#	Activity Name	SMART Act#	Start Date End Date	Focus Directives	Involved Groups/Subgroups	Assets	Qst Type(s)	Planned	Required	Total Inspected	Required % Complete
1.	CRM	--	03/22/2021 03/23/2021	Control Room Management	PRO, PRR, FR, GDIM, MMLPGIM, MISCTOPICS, GENERIC	8284, 88965 (1,826)	all types	143	143	143	100.0%

1. Since questions may be implemented in multiple activities, but answered only once, questions may be represented more than once in this table.
2. Percent completion excludes unanswered questions planned as "always observe".

Forms

No.	Entity	Form Name	Status	Date Completed	Activity Name	Asset
1.	Attendance List	Attendance	STARTED	--	CRM	8284 88965 (1,826)

Results (all values, 144 results)

MISCTOPICS.CRM: Control Room Management

1. Question Result, ID, References: Concern, CR.CRMGEN.CRMCRITERIA.P, 192.631(a)(2)

Question Text: *Do procedures adequately address the process and criteria that determine which facilities are determined to be control rooms?*

Assets Covered: 8284, 88965 (1,826)

Result Issue Summary:

1. **49 CFR §192.631 Control room management.**

(a) *General.*

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

Finding(s):

The location of the main control room is listed as 220 NW 2nd Portland, Oregon 97209 in the manual that the UTC currently has a copy of. The title of this document is : Control Room Management Plan, Revision Number 6.0 (12/20/2017) (reviewed by NWN 12/07/2018) The manual needs to be updated with the current control room location.

Result Notes: The location of the main control room is listed as 220 NW 2nd Portland, Oregon 97209 in the manual that the UTC currently has a copy of. The title of this document is : Control Room Management Plan, Revision Number 6.0 (12/20/2017) (reviewed by NWN 12/07/2018) The manual needs to be updated with the current control room location.

_____

Northwest Natural's process and criteria to determine what facilities are control rooms is detailed below.

Control Room Management Plan, Revision Number 6.0 (12/20/2017) (reviewed by NWN 12/07/2018), defines a Control Room on Page 5 as:

"Operations centers staffed by personnel charged with the responsibility for remotely monitoring and controlling a pipeline facility."

Additionally, there is also control room language contained in the Standard Practice – Washington SPW 631.

2. Question Result, ID, References: Sat, CR.CRMGEN.CRMMGMT.P, 192.631(a)(2)

Question Text: *Are CRM procedures formalized and controlled?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Per the operators CRM Plan: "NW Natural's written Control Room Management Policies and Procedures (P&P) provide a formalized and controlled process including version control and review. NW Natural's most current and approved version of this Plan and corresponding policies and procedures are conveniently available to on-shift Controllers in electronic format. All procedures are accessible from each Controller's desk/console. The Manager of Storage Operations and Gas Control or designee reviews the Plan, corresponding policies and procedures (P&P), and supplemental plans for accuracy at least once each calendar year, but at intervals not to exceed 15 months. If applicable or if required by code, this includes the review and effectiveness of corresponding programs, forms, and reports. See CRM Annual Audit Checklist in the References section for a link to timelines on scheduled activities. Prior versions of this Plan and associated records are stored in CRM electronic files for five (5) years. Scheduled backups of directories and data are performed daily."

3. Question Result, ID, References: Sat, CR.CRMGEN.CRMIMPLEMENT.R, 192.631(a)(2)

Question Text: *Were procedures approved, in place, and implemented on or before the regulatory deadline?*

Assets Covered: 8284

Result Notes: Notes - Plan Revision 3.0 replaced the original Plan document that was effective as of 08/01/2011 and implemented in accordance with timeline stated in 49 CFR 192.631 (a).

4. Question Result, ID, References: Sat, CR.CRMGEN.CRMPROCLOCATION.O, 192.631(a)(2)

Question Text: *Are procedures readily available to controllers in the control room?*

Assets Covered: 8284

Result Notes: This inspection was performed remotely. Hard copies are available and the procedures are available at the desk console according to controllers remotely interviewed.

5. Question Result, ID, References: Sat, CR.CRMRR.RESPONSIBLE.P, 192.631(b)

Question Text: *Are there clear processes to describe each controller's physical domain of responsibility for pipelines and other facility assets?*

Assets Covered: 8284

Result Notes: Controller on Duty The Controller who is responsible for all aspects of the Control Room during a specific shift. Any other qualified Controllers working during that shift will take direction from the Controller on Duty. All shifts have a Primary and a Secondary Controller on duty.

Under both normal and abnormal operations no others are given the authority to direct or supersede the specific technical actions of a Controller. Only under emergency operating conditions, when the Incident Command team is activated, may the Incident Commander provide technical guidance to the Controller on duty.

NW Natural's Controllers have the authority to operate the pipeline in accordance with federal, state, local, and company rules, regulations, policies, procedures, and best practices.

Roles and Responsibilities 192.631(b) pg.27

6. Question Result, ID, References: Sat, CR.CRMRR.QUALCONTROL.P, 192.631(b)

Question Text: *Are there provisions in place to assure that only qualified individuals may assume control at any console/desk?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Per NWN's manual on Page 10, "NWN Control Rooms are located in secure areas and are staffed with qualified Controllers. Controllers that are not qualified, receive on-the-job training under direct supervision of a qualified Controller."

7. Question Result, ID, References: Sat, CR.CRMRR.DOMAINCHANGE.P, 192.631(b)

Question Text: *If the physical domain of responsibility periodically changes, has a clear process been established to describe the conditions for when such a change occurs?*

Assets Covered: 8284

Result Notes: The CRM–C100 form is used and references the NWN CRM Plan Manual Shift Change Information Sheet GCP-005 – Shift Scheduling. This form is located in the CRM-C100 procedure.

8. Question Result, ID, References: Sat, CR.CRMRR.RESPCHANGE.P, 192.631(b)

Question Text: *Do processes address a controller's role during temporary impromptu (unplanned) changes in controller responsibilities?*

Assets Covered: 8284

Result Notes: This procedure is also documented in CRM–C100 (Gas Control)

3.6 A temporary handover of one (1) hour or less may occur, for the following reasons when another qualified Controller is available and the original Controller will be returning to duty:

- Controller on duty needs to attend a meeting outside the Control Room.
- Compliance with drug and alcohol testing.
- Other situations approved by the Supervisor of Gas Control, or designee.

3.7. The Controller on duty meets with the temporary Controller and briefs them on the current conditions and upcoming events. Formal Shift Change procedure is not required for temporary handover.

3.8. Outgoing Controller ensures that SCADA commands that have been initiated are fulfilled and commands given via verbal communications are acknowledged.

3.9. When the original Controller returns, another temporary handover is performed.

9. Question Result, ID, References: Sat, CR.CRMRR.COMMANDVERIFY.P, 192.631(b)

Question Text: *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?*

Assets Covered: 8284

Result Notes: Page 10,12, and 14 of the CRM Plan. The most detailed portion is contained on page 14.

Physical Domain of Responsibility There is one primary and one secondary console in Gas Control and three additional work stations with access to SCADA. All alarms are routed to all work stations. **The Controller on duty has sole responsibility for monitoring and controlling the system, including acknowledging alarms and issuing commands.** All phone, radio, and visitor interaction is the responsibility of the Controller on duty. **Any other Controllers using the SCADA system will not acknowledge alarms or issue commands unless directed by the Controller on duty. Before leaving the console, the Controller must confirm that all issued SCADA commands have been fulfilled, all verbal requests communicated are complete, and intentions are verbally communicated to other Controllers in the Control Room.** If the Primary Controller temporarily leaves the console, the Secondary Controller will assume responsibility of the console. Physical control locations of Mist and Gas Control are completely separated.

10. Question Result, ID, References: Sat, CR.CRMRR.AUTHORITYABNORMAL.P, 192.631(b)(2)

Question Text: *Have processes been established to define the controllers' authority and responsibilities when an abnormal operating condition is detected?*

Assets Covered: 8284

Result Notes: Page 12 and 13 in the operator's manual (Revision 6.0, 12/20/2017) states:

Abnormal Operating Conditions In addition to activities related to normal operating conditions, NW Natural's Controllers have the authority and responsibility to:

- Prevent an abnormal condition from escalating into a more serious situation by taking direct action when abnormal conditions arise including the following activities:
  - Operate remote control equipment using the SCADA system.
  - Approve or deny the manual operation of valves and other pipeline related equipment by field personnel.
  - Remotely shutdown or authorize field personnel to shut down a pipeline or associated equipment.
  - Consult others as needed. o Implement curtailments as needed.
- Initiate Engineering Procedures to address abnormal operating conditions. This may include verbal approval to proceed.
- Direct the issuance of notifications for Incident Command System Events (ICS).
- Coordinate communications with suppliers, appropriate agencies and NW Natural field personnel and ICS team as conditions require.
- Communicate with field personnel in the operation of transmission, production, storage, and distribution facilities during abnormal conditions.
- Directly call 911 to report events or emergencies to first responder agencies/authorities, or prompt others to make such calls.
- Continue to monitor and operate the systems that remain in normal operating condition.

- Closely monitor operating parameters to ensure that the affected pipeline or equipment is returned to normal after an abnormal operating condition.

11. Question Result, ID, References: Sat, CR.CRMRR.PRESSLIMITS.O, 192.631(b)(2) (192.619(a), 192.631(e)(1))

Question Text: *Are controllers aware of the current MAOPs 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?*

Assets Covered: 8284

Result Notes: The MAOPs are in MapFrame. All controllers have access to this software. It was demonstrated during the inspection over MS-Teams.

12. Question Result, ID, References: Sat, CR.CRMRR.AUTHORITYEMERGENCY.P, 192.631(b)(3)

Question Text: *Do processes define 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Page 13 in the operator's manual (Revision 6.0, 12/20/2017) states:

Emergency Operating Conditions

In addition to activities related to normal and abnormal operating conditions, NW Natural's Controllers have the authority and responsibility to: Prevent a normal or abnormal condition from escalating into a more serious situation by taking direct action when emergency conditions arise including the following activities:

- Operate remote control equipment using the SCADA system.
  - Approve or deny the manual operation of valves and other pipeline related equipment by field personnel.
  - Remotely shutdown or authorize field personnel to shut down a pipeline or associated equipment.
  - Consult others as needed.
- Implement curtailments as needed.
- Initiate Engineering Procedures to address emergency operating conditions. This may include verbal approval to proceed.
- Direct the issuance of notifications for Incident Command System Events (ICS).
- Directly call 911 to report events or emergencies to first responder agencies/authorities, or prompt others to make such calls.
- Continue to monitor and operate the systems that remain in normal and abnormal operating conditions.
- Closely monitor operating parameters to ensure that the affected pipeline or equipment is returned to normal after an emergency operating condition.

13. Question Result, ID, References: Sat, CR.CRMRR.EVACUATION.P, 192.631(b)(3)

Question Text: *Do processes specifically address the controller's responsibilities in the event the control room must be evacuated?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM-B200 contains this. It references:

CRM-C400 Activation of Backup SCADA System

CRM-C300 Internal Communications for Manual Operations

Gas Control SCADA DR Test Forms

14. Question Result, ID, References: Sat, CR.CRMRR.COMMSYSFAIL.P, 192.631(b)(3)

Question Text *Do processes 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?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Plan Page 14 - Controller Responsibility during SCADA Outage

CRM-C300 - Gas Control

3.1. Manager or Supervisor of Gas Control or designee determines when to activate manual operations based on a significant loss of situational awareness due to a SCADA outage.

CRM-C400 - Activation of Backup SCADA System

15. Question Result, ID, References Sat, CR.CRMRR.HANDOVER.P, 192.631(b)(4) (192.631(c)(5))

Question Text *Have processes been established for the hand-over of responsibility that specify the type of information to be communicated to the oncoming shift?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM–C100 Gas Control

4. RELATED COMPANY INFORMATION:

NWN CRM Plan Manual Shift Change Information Sheet (attached)

GCP-005 – Shift Scheduling

API 1168 – Pipeline Control Room Management Fatigue Risk Management Plan, Hours of Work and Rest Guidelines for Normal Operation

16. Question Result, ID, References Sat, CR.CRMRR.HANDOVER.O, 192.631(b)(4) (192.631(c)(5))

Question Text *Do observations indicate adequate hand-over of responsibility to the oncoming shift?*

Assets Covered 8284, 88965 (1,826)

Result Notes A global handover screen was shown with handover start and finish time. There is a comments section where any outstanding issues are noted. Any logs that have been created by on controller on their shift is documented. The new controller that is incoming has their name on the handover screen. There is also an announcement portion where issues or notes can be documented.

17. Question Result, ID, References Sat, CR.CRMRR.HANDOVERDOC.P, 192.631(b)(4) (192.631(c)(5))

Question Text *Do processes 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?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM C-100

A shift change document is completed by the outgoing Controllers and consists of information provided to the incoming Controllers as to the current operating conditions of the system. Shift change information is tracked electronically and may contain the following information:

- Status of shift events considered “on going”.
- Daily operation information.
- Status of completed procedures or procedures and/or maintenance in progress.
- Changes to physical assets, practices, and responsibilities.
- System conditions including any abnormal or emergency conditions.
- SCADA system events including any existing alarms and actions taken.
- Telecommunications conditions affecting SCADA and actions taken.
- Incident or Safety conditions.
- Third-party activities with potential direct or indirect impact on operations.
- Any other information that the Controller deems necessary.

18. Question Result, ID, References: Sat, CR.CRMRR.HANDOVERDOC.R, 192.631(b)(4) (192.631(c)(5))

Question Text: *Are there records that 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: This was addressed in question 18. Shift change records from 5/26/2020 were shown with telemetry tickets and incoming controller information. 2/8/2019 records were also shown. Information displayed were logs for incoming controllers.

19. Question Result, ID, References: Sat, CR.CRMRR.HANDOVEROVERLAP.P, 192.631(b)(4)

Question Text: *Do processes require the controllers to discuss recent and impending important activities ensuring adequate overlap?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM C-100

A shift change document is completed by the outgoing Controllers and consists of information provided to the incoming Controllers as to the current operating conditions of the system. Shift change information is tracked electronically and may contain the following information:

- Status of shift events considered “on going”.
- Daily operation information.
- Status of completed procedures or procedures and/or maintenance in progress.
- Changes to physical assets, practices, and responsibilities.
- System conditions including any abnormal or emergency conditions.
- SCADA system events including any existing alarms and actions taken.
- Telecommunications conditions affecting SCADA and actions taken.
- Incident or Safety conditions.
- Third-party activities with potential direct or indirect impact on operations.
- Any other information that the Controller deems necessary.

20. Question Result, ID, References: Sat, CR.CRMRR.HANDOVERALTERNATIVE.P, 192.631(b)(4)

Question Text: *When a controller is unable to continue or assume responsibility for any reason, do the shift hand-over processes include alternative shift hand-over actions that specifically address this situation?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM C-100

3.3. Outgoing Controllers ensure that the incoming Controllers are fit for duty. If for any reason, an incoming Controller is unable to continue or assume responsibility, then the Supervisor of Gas Control, or designee is notified and the current Controller on duty continues controlling the system until a qualified replacement is found.

TEMPORARY HANDOVER

3.6.A temporary handover of one (1) hour or less may occur, for the following reasons, when another qualified Controller is available and the original Controller will be returning to duty:

• Controller on duty needs to attend a meeting outside the Control Room.

• Compliance with drug and alcohol testing.

• Other situations approved by the Supervisor of Gas Control, or designee.

3.7. The Controller on duty meets with the temporary Controller and briefs them on the current conditions and upcoming events. Formal Shift Change procedure is not required for temporary handover.

3.8. Outgoing Controller ensures that SCADA commands that have been initiated are fulfilled and commands given via verbal communications are acknowledged.

3.9. When the original Controller returns, another temporary handover is performed.

21. Question Result, ID, References: NA, CR.CRMRR.UNATTENDCONSOLE.P, 192.631(b)(4)

Question Text: *Has the operator established an adequate process for occasions when the console is left temporarily unattended for any reason?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: No such relevant facilities/equipment existed in the scope of inspection review. The operator does not leave the console unattended.

Physical Domain of Responsibility (Pg 14)

There is one primary and one secondary console in Gas Control and three additional work stations with access to SCADA. All alarms are routed to all work stations. The Controller on duty has sole responsibility for monitoring and controlling the system, including acknowledging alarms and issuing commands. All phone, radio, and visitor interaction is the responsibility of the Controller on duty. Any other Controllers using the SCADA system will not acknowledge alarms or issue commands unless directed by the Controller on duty. Before leaving the console, the Controller must confirm that all issued SCADA commands have been fulfilled, all verbal requests communicated are complete, and intentions are verbally communicated to other Controllers in the Control Room. **If the Primary Controller temporarily leaves the console, the Secondary Controller will assume responsibility of the console.**

22. Question Result, ID, References: Sat, CR.CRMRR.CONSOLECOVERAGE.P, 192.631(b)(4)

Question Text: *Do processes maintain adequate console coverage during shift hand-over?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The CRM-C100 Shift Change procedure addresses this.

23. Question Result, ID, References: Sat, CR.CRMRR.OTHERAUTHORITYDISALLOW.P, 192.631(b)(5)

Question Text: *Do processes disallow others to have authority to direct or supersede the specific technical actions of a controller?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 14 - The Controller on duty has sole responsibility for monitoring and controlling the system, including acknowledging alarms and issuing commands. All phone, radio, and visitor interaction is the responsibility of the Controller on duty. **Any other Controllers using the SCADA system will not acknowledge alarms or issue commands unless directed by the Controller on duty.**

24. Question Result, ID, References: Sat, CR.CRMRR.OTHERAUTHORITYDISALLOW.R, 192.631(b)(5)

Question Text: *Do records indicate that the policy disallowing others to have authority to direct or supersede the specific technical actions of a controller has been communicated to controllers and others?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Records were reviewed. Specifically Jan 2019 a monthly controller meeting record was provided. It included controller roles and responsibilities.

25. Question Result, ID, References: Sat, CR.CRMRR.OTHERAUTHORITYDISALLOW.O, 192.631(b)(5)

Question Text: *Are controllers aware of, and can reference, processes that disallow others to have authority to direct or supersede the specific technical actions of a controller?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Role and responsibilities were discussed with the controllers about the inability for another to direct a controller.

26. Question Result, ID, References: Sat, CR.CRMRR.OTHERAUTHORITYQUAL.P, 192.631(b)(5)

Question Text: *Does the process result in identification of required qualification elements for those authorized to direct or supersede the technical actions of a controller that are sufficient for those individuals to understand the implications of the scope of potential actions?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Plan and Procedure - Pg 10

"Under both normal and abnormal operations no others are given the authority to direct or supersede the specific technical actions of a Controller. Only under emergency operating conditions, when the Incident Command team is activated, may the Incident Commander provide technical guidance to the Controller on duty."

27. Question Result, ID, References Sat, CR.CRMRR.OTHERAUTHORITYQUAL.R, 192.631(b)(5)

Question Text *Do records indicate that others given authority to direct or supersede the specific technical actions of a controller were qualified?*

Assets Covered 8284, 88965 (1,826)

Result Notes Controller supervisors are qualified. The Control Room managers cannot direct - only provide guidance.

28. Question Result, ID, References Sat, CR.CRMRR.OTHERAUTHORITYIMPLEMENT.P, 192.631(b)(5)

Question Text *Is the process defined with respect to the details of how those authorized to direct or supersede the technical actions of a controller are to implement their authority?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg. 10

Under both normal and abnormal operations **no others are given the authority to direct or supersede the specific technical actions of a Controller**. Only under emergency operating conditions, when the Incident Command team is activated, may the Incident Commander provide technical guidance to the Controller on duty.

29. Question Result, ID, References Sat, CR.CRMRR.OTHERAUTHORITYLIST.R, 192.631(b)(5)

Question Text *Is a list of individuals with authority to direct or supersede the technical actions of a controller readily available to controllers?*

Assets Covered 8284, 88965 (1,826)

Result Notes The primary controller on duty regains control. This is in the CRM manual under Roles and Responsibilities. Only direction can be provided.

30. Question Result, ID, References NA, CR.CRMRR.OTHERAUTHORITYIMPLEMENT.R, 192.631(b)(5)

Question Text *Do records adequately document occurrences of when others authorized to direct or supersede the technical actions of a controller have done so?*

Assets Covered 8284, 88965 (1,826)

Result Notes The primary controller on duty retains control. No records of this occurrence were provided.

31. Question Result, ID, References Sat, CR.CRMRR.OTHERAUTHORITYIMPLEMENT.O, 192.631(b)(5)

Question Text *Do others authorized to direct or supersede the technical actions of a controller demonstrate an understanding of the process to implement this authority?*

Assets Covered 8284, 88965 (1,826)

Result Notes This was discussed with the active controllers during the MS Teams meeting 3/22/2021. However, the primary controller on duty regains control.

32. Question Result, ID, References Sat, CR.SCADA.SYSTEMMOC.P, 192.631(c)(1)

Question Text *Do processes clearly define the types of changes to the SCADA system(s) that constitute additions, expansions, or replacements under the meaning of the CRM rule?*

Assets Covered 8284, 88965 (1,826)

Result Notes Here are some examples from the procedure manual.

Tag Description Changes - CRM–E300

2.5 HMI Management of Change Control and Maintenance

Change Management 192.631(f) (Pg21)

Change Management is more than one process. It encompasses other workflows and policies and procedures to assure that changes that could affect Gas Control are coordinated with Controllers by performing each of the following:

- Establish communications between Controllers, Management, and Field personnel when planning and implementing physical changes to pipeline equipment or configuration.
- Require SCADA personnel to contact Controllers when emergency conditions exist, such as significant SCADA outages and/or when making changes that affect Gas Control.
- Seek Controller participation in planning prior to SCADA and data communications maintenance and configuration activities. This assures controllers are aware of, review, and provide input in advance of work.
- Seek Controller participation in planning prior to implementing significant pipeline hydraulic or configuration changes. Controller training is updated as necessary to reflect changes to system operations.

33. Question Result, ID, References: Sat, CR.SCADA.DISPLAYCONFIG.P, 192.631(c)(1)

Question Text: *Are there written processes to implement the API RP 1165 display standards to the SCADA systems that have been added, expanded, or replaced since August 1, 2012?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: **High Performance HMI Philosophy and Style Guide (Pg 6)**

Compliance with API-RP-1165: Recommended Practice for Pipeline SCADA Displays (2006)

Implementation of API RP 1165 (Pg 15 of the CRM Plan)

When a display is updated or a new display is added to the SCADA System, SCADA Developers and Gas Control ensure consistency by following NW Natural's HMI Philosophy and Style Guide and Change Management processes. If NW Natural deviates from the requirements of API RP 1165, business reasons for the deviation are documented in accordance with paragraph (j) (2) of the CRM rule.

34. Question Result, ID, References: Sat, CR.SCADA.1165HUMANFACTORS.O, 192.631(c)(1)

Question Text: *Has section 4 of API RP 1165 regarding human factors engineering been implemented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The HMI policy document was reviewed. 4.0 Control Room Factors and Work Practices. They use a "spider chart" on the overview screen. It contains multiple areas. Each subsystem can go from Level 2 to Level 4 to provide additional detail.

35. Question Result, ID, References: Sat, CR.SCADA.DISPLAYOBJECTS.O, 192.631(c)(1)

Question Text: *Has section 8 of API RP 1165 regarding display object characteristics been implemented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Objects flash when they are in motion. Grayscale is used to limit the amounts of colors. If there is critical alarm it will indicate that as text and animation under alarm objects.

36. Question Result, ID, References: Sat, CR.SCADA.DISPLAYDYNAMICS.R, 192.631(c)(1)

Question Text: *Has Section 9 of API RP 1165 regarding display object dynamics been implemented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: This is on Page 15, 31, and in the HPHMI portion on Page 6.

37. Question Result, ID, References: Sat, CR.SCADA.ADMINISTRATION.R, 192.631(c)(1)

Question Text: *Have applicable paragraphs of section 11 of API RP 1165 administration been implemented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: API RP 1165 11.1 CONSISTENCY WITHIN A COMPANY This document acknowledges that each pipeline company may have a different approach to implementing SCADA systems and, therefore, not all elements

of this recommended practice may be applicable. An important consideration is to insure that the operator interface provides as much consistency as possible in both functionality and appearance.

Pg 15 in NWN's CRM Plan contains this:

Implementation of API RP 1165 When a display is updated or a new display is added to the SCADA System, SCADA Developers and Gas Control ensure consistency by following NW Natural's HMI Philosophy and Style Guide and Change Management processes.

If NW Natural deviates from the requirements of API RP 1165, business reasons for the deviation are documented in accordance with paragraph (j) (2) of the CRM rule.

"API RP 1165 11.3 CONSISTENCY BETWEEN CONTROL CENTERS AND REMOTE LOCATIONS To avoid confusion and enhance communications between control center personnel and field personnel, displays, control panels, and other indicators used in both locations should be consistent. This could include, but not be limited to, colors, symbols, text and labels. Naming conventions including equipment tags, station names, and other identifiers between the control center and remote locations should be standardized."

Pg 15 in NWN's CRM Plan contains this:

Point-to-Point Validation A point-to-point validation is conducted between field personnel and the Control Room prior to field personnel leaving the site. Validation of data between SCADA displays and safety related field equipment occurs when:

- Field equipment is added or moved, including like-for-like replacement that could affect data values.
- Modification is made to RTUs (SCADAPack, DART, PLC) that could affect data values.
- Modifications are made to SCADA tag definitions or HMI displays that could affect data values.

Additionally, Standardization of Tag Descriptions is in CRM-E300

38. Question Result, ID, References: NA, CR.SCADA.1165IMPRACTICAL.R, 192.631(c)(1)

Question Text: *If any/all applicable paragraph(s) of API RP 1165 have not been implemented, has it been demonstrated and documented that the unimplemented provisions are impractical for the SCADA system used?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: No such event occurred, or condition existed, in the scope of inspection review.

39. Question Result, ID, References: Sat, CR.SCADA.SETPOINT.P, 192.631(c)(2)

Question Text: *Does the process adequately define safety-related points?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM-E100 Accuracy of Safety Related Alarm Setpoints - During a point-to-point validation, the Controller verifies the data, tag information, control functions, and alarm setpoints.

40. Question Result, ID, References: Sat, CR.SCADA.SETPOINT.R, 192.631(c)(2)

Question Text: *Do records indicate safety-related points have been adequately implemented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: SCADA PC Test "IF" reports for 2016-2020 were reviewed

41. Question Result, ID, References: Sat, CR.SCADA.POINTVERIFY.P, 192.631(c)(2)

Question Text: *Are there adequate processes to define and identify the circumstances which require a point-to-point verification?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 15 has the list of requirements for a P2P validation.

42. Question Result, ID, References: Sat, CR.SCADA.POINTVERIFY.R, 192.631(c)(2)

Question Text *Have required point-to-point verifications been performed?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed for 2016-2020 (Sherwood) and the transducer reports as contained in the inspection records portion uploaded into QB. Sherwood is the back-up control room and the operator states it is the same exact system that is at their HQ location.

43. Question Result, ID, References Sat, CR.SCADA.POINTVERIFYEXTENT.P, 192.631(c)(2)

Question Text *Are there adequate processes for the thoroughness of the point-to-point verification?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 15 contains this in the CRM Plan and Procedure Manual.

44. Question Result, ID, References Sat, CR.SCADA.POINTVERIFYEXTENT.R, 192.631(c)(2)

Question Text *Do records demonstrate adequate thoroughness of the point-to-point verification?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed for 2016-2020 (Sherwood) and the transducer reports as contained in the inspection records portion uploaded into QB. Sherwood is the back-up control room and the operator states it is the same exact system that is at their HQ location.

45. Question Result, ID, References Sat, CR.SCADA.POINTVERFIYINTVL.P, 192.631(c)(2)

Question Text *Is there an adequate process for defining when the point-to-point verification must be completed?*

Assets Covered 8284, 88965 (1,826)

Result Notes Point-to-Point Validation A point-to-point validation is conducted between field personnel and the Control Room prior to field personnel leaving the site. Validation of data between SCADA displays and safety related field equipment occurs when:

• Field equipment is added or moved, including like-for-like replacement that could affect data values.

• Modification is made to RTUs (SCADAPack, DART, PLC) that could affect data values.

• Modifications are made to SCADA tag definitions or HMI displays that could affect data values.

• Any other change that affects pipeline safety is made to field equipment or SCADA system.

During a point-to-point validation, the Controller verifies the data, tag information, control functions, and alarm setpoints. If a validation fails, repairs are required and a calibration may be performed if needed. All point to point validations and calibrations are coordinated and documented via Compliance Management Software, using a standard form.

46. Question Result, ID, References Sat, CR.SCADA.POINTVERFIYINTVL.R, 192.631(c)(2)

Question Text *Do records indicate the point-to-point verification has been completed at the required intervals?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed for 2016-2020 (Sherwood) and the transducer reports as contained in the inspection records portion uploaded into QB. Sherwood is the back-up control room and the operator states it is the same exact system that is at their HQ location.

47. Question Result, ID, References Sat, CR.SCADA.POINTVERIFY.O, 192.631(c)(2)

Question Text *Are point-to-point verifications performed adequately when required?*

Assets Covered 8284, 88965 (1,826)

Result Notes The operator provided an example of what a technician sees from work history in "Advantica" when performing a P2P verification. If a technician is working they call the control center, and then they perform a test to do point to point verification.

48. Question Result, ID, References Sat, CR.SCADA.COMMPLAN.P, 192.631(c)(3)

Question Text *Has an internal communication plan been established and implemented that is adequate to manually operate the pipeline during a SCADA failure/outage?*

Assets Covered 8284, 88965 (1,826)

Result Notes Internal Communications for Manual Operations CRM-C300 Manual Operations are activated when a SCADA system outage occurs that causes a significant loss of situational awareness and recovery time is undetermined.

49. Question Result, ID, References Sat, CR.SCADA.COMMPLAN.R, 192.631(c)(3)

Question Text *Has the internal communication plan been tested and verified for manual operation of the pipeline safely at least once each calendar year but at intervals not exceeding 15 months?*

Assets Covered 8284, 88965 (1,826)

Result Notes We reviewed a record of Oregon City, Mt Scott, Albany. The document was the 2019 Station Bypass form for manual valve operation. It is integrated into the J-5 software. We reviewed the J-5 program and reviewed the station bypass form creation process. Screenshot 2021-03-22 103156.

50. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADA.O, 192.631(c)

Question Text *Is there a backup SCADA system?*

Assets Covered 8284, 88965 (1,826)

Result Notes Sherwood is the backup system. There is an operator there today training a new controller (3/22/2021). Oregon has been there in the past. Due to Covid-19 we were not able to visit the site.

51. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADADEV.P, 192.631(c)(4)

Question Text *Has the use of the backup SCADA system for development work been defined?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM–C400 NW Natural uses a separate development SCADA server which is isolated from the on- line environment.

52. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADATEST.P, 192.631(c)(4)

Question Text *Is the backup SCADA system required to be tested at least once each calendar year at intervals not to exceed 15 months?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM-C400 - NW Natural maintains a documented activation process that includes annual testing of the backup SCADA System at least once per calendar year, but at intervals not to exceed 15 months.

53. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADATEST.R, 192.631(c)(4)

Question Text *Is the backup SCADA system tested at least once each calendar year at intervals not to exceed 15 months?*

Assets Covered 8284, 88965 (1,826)

Result Notes The records for Sherwood (back-up site) from 2016-2020 were reviewed and the transducer reports from 2016-2021.

54. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADAVERIFY.P, 192.631(c)(4)

Question Text *Is testing required to verify adequate processes are in place for decision-making and internal communications to successfully implement a transition from primary SCADA to backup SCADA, and back to primary SCADA?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM–B200 Control Room Evacuation

CRM-C400 Activation of Backup SCADA System

CRM-C300 Internal Communications for Manual Operations

55. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADAVERIFY.R, 192.631(c)(4)

Question Text *Does the testing verify that there are adequate processes in place for decision-making and internal communications to successfully implement a transition from primary SCADA to backup SCADA, and back to primary SCADA?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is in CRM-C400.

56. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADAADEQUACY.R, 192.631(c)(4)

Question Text *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?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM C-400 Section 2 (Policy)

If primary SCADA network is down and One Pacific Square (OPS) is down, visibility of SCADA sites is reduced to approximately 65% of normal. Critical sites in the missing 35% are monitored manually. See OPS Outage Data Impact document.

57. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADATRANSFER.P, 192.631(c)(4)

Question Text *Do processes adequately address and test the logistics of transferring control to a backup control room?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM-C400

NW Natural maintains a documented activation process that includes annual testing of the backup SCADA System at least once per calendar year, but at intervals not to exceed 15 months. The points/systems testing include:

Automatic functions, if applicable.

Data acquisition and communications.

Remote control of field equipment.

Confirmation of important types of functionality and critical data sources to/from critical facilities/equipment.

A test script of actions taken to verify SCADA functionality is used and shall be included as part of test documentation. See SCADA Fail-Over Test document. The testing ensures the following:

Backup system is in working order.

Controllers are familiar with how the system works, including capabilities and limitations of backup system.

Controllers understand the circumstances under which the back-up SCADA system is to be activated

58. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADARETURN.P, 192.631(c)(4)

Question Text *Do procedures adequately address and test the logistics of returning operations back to the primary control room?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM-C400

3.6. Manager or Supervisor of Gas Control or designee makes decision to transfer pipeline control back to the primary SCADA system.

3.7. Manager or Supervisor of Gas Control or designee verifies that the primary SCADA system is back online.

3.8. Gas Control assumes responsibility of primary SCADA system.

3.9. Gas Control communicates return to primary SCADA system via information page to IC Team group.

59. Question Result, ID, References Sat, CR.SCADA.BACKUPSCADAFUNCTIONS.R, 192.631(c)(4)

Question Text *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?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed of the Sherwood (back-up) system testing (2016-2020) were adequate.

60. Question Result, ID, References Sat, CR.CRMFM.FATIGUEMITIGATION.P, 192.631(d)

Question Text *Does the fatigue mitigation process or procedures (plan) identify operator-specific fatigue risks?*

Assets Covered 8284, 88965 (1,826)

Result Notes NWN has a Fatigue Risk Management System (FRMS) Section 3.2 has the factors.

61. Question Result, ID, References Sat, CR.CRMFM.FATIGUERISKS.P, 192.631(d)

Question Text *Does the fatigue mitigation plan adequately address how the program reduces the risk associated with controller fatigue?*

Assets Covered 8284, 88965 (1,826)

Result Notes Fatigue Risk Management System (FRMS) Section 4.5.5

CRM Page 17

62. Question Result, ID, References Sat, CR.CRMFM.FATIGUEQUANTIFY.P, 192.631(d)

Question Text *Do processes require that the potential contribution of controller fatigue to incidents and accidents be quantified during investigations?*

Assets Covered 8284, 88965 (1,826)

Result Notes SPW 617

3.2 Incident Review Council (IRC) 3.2.1 IRC includes representatives from Code Compliance, Utility Operations, Utility Field Services, Utility Technical Services, Risk and Land, Resource Management, and other associated departments and/or workgroups as necessary. 3.2.2 Convene the IRC periodically to review and evaluate company emergency response activities regarding reportable gas-related incidents and other operational activities as necessary. 3.2.3 Conduct an evaluation of company emergency response activities related to incidents that meet regulatory reporting guidelines or other operational activities as deemed appropriate. Complete the evaluations and document the findings.

NWN FRMS Section 3.4.1 Data Collection

63. Question Result, ID, References Sat, CR.CRMFM.FATIGUEMANAGER.P, 192.631(d)

Question Text *Is there 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?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 17 of the CRM Plan contains this topic.

The Fatigue Risk Manager for NW Natural Gas Control is the Gas Control Supervisor, as designated by the Gas Control Manager. He is the subject matter expert on fatigue risk mitigation.

64. Question Result, ID, References Sat, CR.CRMFM.SHIFTLENGTH.R, 192.631(d)(1)

Question Text *Is the scheduled shift length less than or equal to 12 hours (not including shift hand-over) or is there a documented technical basis to show that shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?*

Assets Covered 8284, 88965 (1,826)

Result Notes We reviewed a schedule during the MS-Teams portion of the inspection. Review Screenshot 2021-03-22 103616 in the inspection documents

65. Question Result, ID, References Sat, CR.CRMFM.SHIFTLENGTHTIME.R, 192.631(d)(1)

Question Text *Does the operator factor in all time the individual is working for the company when establishing shift lengths and schedule rotations or is there a documented technical basis to show that shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 18. Records were also reviewed during the inspection.

66. Question Result, ID, References Sat, CR.CRMFM.SCHEDULEDTIMEOFF.R, 192.631(d)(1)

Question Text *Are all scheduled periods of time off at least one hour longer than 8 hours plus commute time or is there a documented technical basis to show that shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed during the inspection showed typical duty schedules.

67. Question Result, ID, References Sat, CR.CRMFM.ONCALLCONTROLLER.P, 192.631(d)

Question Text *For controllers who are on call, do processes minimize interrupting the required 8 hours of continuous sleep or require a documented technical basis to show that shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 18 states: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- Shift starts on 7 consecutive days or nights
- 65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period
- Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject.

FRMS: Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.

68. Question Result, ID, References Sat, CR.CRMFM.ONCALLCONTROLLER.R, 192.631(d)(1)

Question Text *For controllers who are on call, does the operator minimize interrupting the required 8 hours of continuous sleep or is there a documented technical basis to show that shift lengths and schedule rotations are adequate to provide controllers off-duty time sufficient to achieve 8 hours of continuous sleep?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8

hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- Shift starts on 7 consecutive days or nights
- 65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period
- Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject.

FRMS: Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.

69. Question Result, ID, References: Sat, CR.CRMFM.MAXHOS.P, 192.631(d)(4)

Question Text: *Do processes limit the maximum HOS limit in any sliding 7-day period to no more than 65 hours or is there a documented technical basis to show a reduction of the risk associated with controller fatigue?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- Shift starts on 7 consecutive days or nights
- 65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period
- Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject

FRMS: Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any

and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.

70. Question Result, ID, References: Sat, CR.CRMFM.MINTIMEOFF.P, 192.631(d)(4)

Question Text: *After reaching the HOS limit in any sliding 7-day period, is the minimum time off at least 35 hours or is there a documented technical basis to show a reduction of the risk associated with controller fatigue?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- **Shift starts on 7 consecutive days or nights**
- **65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period**
- **Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period**

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject.

FRMS: Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.

71. Question Result, ID, References: Sat, CR.CRMFM.DOCSCHEDULE.P, 192.631(d)(4)

Question Text: *Is there a formal system to document all scheduled and unscheduled HOS worked, including overtime and time spent performing duties other than control room duties?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- Shift starts on 7 consecutive days or nights
- 65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period
- Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject.

FRMS: **Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.**

72. Question Result, ID, References: NA, CR.CRMFM.DAYSOFF.P, 192.631(d)(4)

Question Text: *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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: NWN does not operate on normal business type operations.

73. Question Result, ID, References: Sat, CR.CRMFM.WORKHOURS.R, 192.631(d)(4)

Question Text: *For normal business hour type operations (i.e., five days per week), do records indicate shift start times no earlier than 6:00 a.m. and shift end times no later than 7:00 p.m.?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: They use 0600 to 1800 as the (12hr) day shift time.

74. Question Result, ID, References: Sat, CR.CRMFM.FATIGUECOUNTERMEASURES.P, 192.631(d)(4)

Question Text: *For shifts longer than 8 hours, have specific fatigue countermeasures been implemented for the ninth and beyond hours?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Contained in FRMS 4.5.5

75. Question Result, ID, References: Sat, CR.CRMFM.DAILYHOSLIMIT.P, 192.631(d)(4)

Question Text: *Do processes limit the daily maximum HOS limit no more than 14 hours in any sliding 24-hour period?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- Shift starts on 7 consecutive days or nights
- 65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period
- Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

FRMS Section 4.2 also contains significant guidance on this subject.

From the FRMS: **Hours of service include time while an individual is performing controller activities, including shift-change and overlap, on-call duties, events, emergency or spill drills, meetings, training, receiving or providing performance reviews and all other time the individual performs activities for the operator. Any and all non-controller type duties a controller performs for the operator are considered on-duty time for fatigue mitigation purposes.**

76. Question Result, ID, References: Sat, CR.CRMFM.CONTROLLERNUMBERS.O, 192.631(d)

Question Text: *Do operations include a sufficient number of qualified controllers?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: They have 9 qualified controllers for a single console operation. (MS-Teams interviews)

77. Question Result, ID, References: Sat, CR.CRMFM.OFFDUTYHOURS.P, 192.631(d)(4)

Question Text: *Do processes ensure that controllers are provided with at least thirty-five (35) continuous off-duty hours when limits are reached following the most recent 35-hour (minimum) off-duty rest period or is there a documented technical basis to show that the maximum limit on controller HOS is adequate to reduce the risk associated with controller fatigue?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 18: NW Natural has adopted the guidelines for the industry based on information and recommendations from PHMSA and Circadian Technology's "Scientific Support for Gas Pipeline Control Room Operations Hours of Work and Rest". Gas Control uses 12 hour shifts for on-duty Controllers and 8 hour shifts for relief, special assignment (SA), and Continuity Controllers. The Work/Rest hours for normal operations used by NW Natural are as follows:

• Maximum of 65 duty hours in any 7 day (168 hour) period.

• Maximum of 14 hours consecutive duty in any 24 hour period, which includes shift handover.

• Minimum of 35 hours off duty when any of the following occur:

- **Shift starts on 7 consecutive days or nights**
- **65 duty hours in any 7 day (168) hour period o Seven 8-hour shifts in any 7-day period**
- **Six 10 hour shifts in any 7-day period o Five 12 hour shifts in any 7 day period**

• No more than one 18 hour shift (excluding shift handover) or two 14-hour shifts (excluding shift handover) in any 5 day period.

• Schedules are created to allow Controllers sufficient off duty time to achieve 8 hours of continuous sleep. Hours of service for Controllers include all time performing Controller duties as well as any other duties required as an employee of NW Natural.

78. Question Result, ID, References: Sat, CR.CRMFM.SHIFTHOLDOVER.P, 192.631(d)(4)

Question Text: *Does the shift holdover process conform to shift holdover guidelines or is there a documented technical basis to show that the maximum limit on controller HOS is adequate to reduce the risk associated with controller fatigue?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Page 19 of Shift Guidelines (Fatigue mitigation)

79. Question Result, ID, References: Sat, CR.CRMFM.SPECIFICCOUNTERMEASURES.P, 192.631(d)(4)

Question Text *Do processes require specific fatigue countermeasures during applicable time periods, or is there a documented technical basis to show that the maximum limit on controller HOS is adequate to reduce the risk associated with controller fatigue?*

Assets Covered 8284, 88965 (1,826)

Result Notes FRMS Section 1, 4.3.1, 4.5.4, and 4.5.5 discuss countermeasures.

80. Question Result, ID, References Sat, CR.CRMFM.HOSDEVIATIONS.P, 192.631(d)(4)

Question Text *Is there a formal process for approving deviations from the maximum HOS limits?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 17 - NW Natural has a formalized Hours of Service (HOS) deviation process with provisions for written approval in advance of anticipated deviations.

81. Question Result, ID, References Sat, CR.CRMFM.FATIGUEEDUCATE.P, 192.631(d)(2) (192.631(d)(3))

Question Text *Does the program require that fatigue education/training is required for all controllers and control room supervisors?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Page 24: The design of the Training Program is intended to provide initial and refresher training to ensure proficiency in the following areas but not limited to:

- Natural Gas Overview
- NW Natural Basics
- The Role of Gas Controller
- Control Room Operations
- **Gas Controller Best Practices / Fatigue Training**
- CRM and Regulatory Compliance

82. Question Result, ID, References Sat, CR.CRMFM.FATIGUEEDUCATE.R, 192.631(d)(2) (192.631(d)(3))

Question Text *Is fatigue education/training documented for all controllers and control room supervisors?*

Assets Covered 8284, 88965 (1,826)

Result Notes There is initial and refresher training. 12/12/2018 training was shown for fatigue training at a Gas Controller meeting. 8/14/2019 it was also covered.

83. Question Result, ID, References Sat, CR.CRMFM.FATIGUEREVIEW.P, 192.631(d)(2) (192.631(d)(3), 192.605(a))

Question Text *Do processes require that the effectiveness of the fatigue education/training program be reviewed at least once each calendar year, not to exceed 15 months?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 32 - NWN CRM Audit Checklist Gas Control

84. Question Result, ID, References Sat, CR.CRMFM.FATIGUESTRATEGY.P, 192.631(d)(2)

Question Text *Does fatigue education address fatigue mitigation strategies (countermeasures)?*

Assets Covered 8284, 88965 (1,826)

Result Notes FRMS training Section 4.3.1 discusses countermeasures included in the live training,

85. Question Result, ID, References Sat, CR.CRMFM.OFFDUTY.P, 192.631(d)(2)

Question Text *Does fatigue education address how off-duty activities contribute to fatigue?*

Assets Covered 8284, 88965 (1,826)

Result Notes FRMS training Section 4.2.5, 4.3.1, 4.5.2, Pg 4

CRM Plan Pg 17

86. Question Result, ID, References: Sat, CR.CRMFM.FATIGUECONTENT.P, 192.631(d)(3)

Question Text: *Is the content of fatigue training adequate for training controllers and supervisors to recognize the effects of fatigue?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: FRMS training Section 3.2.4.1, 4.5.3, Pg 4

CRM Plan Pg 17

87. Question Result, ID, References: Sat, CR.CRMFM.FATIGUECONTENT.R, 192.631(d)(3)

Question Text: *Has controller and supervisor training to recognize the effects of fatigue been documented?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: They showed a Circadian (TM) Workforce Solutions training. "The Myths and Realities of Fatigue - Reducing the costs of Fatigue"

88. Question Result, ID, References: Sat, CR.CRMAM.ALARM.P, 192.631(e)

Question Text: *Is the alarm management plan a formal process that specifically identifies critical topical areas included in the program?*

Assets Covered: 8284

Result Notes: I reviewed the NWN_CRM_Alarm_Management_Plan_2020. It identifies critical topical areas:

89. Question Result, ID, References: Sat, CR.CRMAM.ALARMMALFUNCTION.P, 192.631(e)(1)

Question Text: *Is there a process to identify and correct inaccurate or malfunctioning alarms?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The NWN_CRM_Alarm_Management_Plan_2020 has Equipment Outages, Abnormal Operating Conditions, and Broken and Missing Equipment on Pg 8 addressed.

90. Question Result, ID, References: Sat, CR.CRMAM.ALARMREVIEW.P, 192.631(e)(1)

Question Text: *Does the review of safety-related alarms account for different alarm designs and all alarm types/priorities?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: There are 4 priority levels for alarms. This is in "Alarm Annunciation and Response". This is in the CRM Alarm Management Plan.

91. Question Result, ID, References: NA, CR.CRMAM.CONTROLLERPERFORMANCE.P, 192.631(h) (192.631(e)(1))

Question Text: *Does the review of safety-related alarms account for console differences that could affect individual-specific controller qualification and performance?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: No such relevant facilities/equipment existed in the scope of inspection review. All consoles are the same and are not different from one to the other.

92. Question Result, ID, References: Sat, CR.CRMAM.STALEDATA.P, 192.631(e)(1)

Question Text: *Does the review of safety-related alarms include specific procedures and practices for managing stale or unreliable data?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM-E200 Alarm Auditing and Verification.

CRM-E400 Managing Inaccurate Alarms and Unreliable Data

PG 5 of the CRM.

Pg 8 of the CRM also has guidance for broken or missing equipment.

Broken and Missing Equipment Field and SCADA equipment is replaced if missing and repaired if broken. If certain equipment has ongoing and unavoidable operational problems and therefore cannot be

rendered fully operational during production, then site specific procedures may need to be created to handle the situation.

See CRM-E400 Managing Inaccurate Alarms and Unreliable Data

93. Question Result, ID, References: Sat, CR.CRMAM.MONTHLYANALYSIS.P, 192.631(e)(2)

Question Text: *Do processes 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The NWN 2020 Alarm Management Plan contains these performance considerations on Page 6 for Alarm performance.

The alarm activation target KPIs and their target values are listed below. The priority ratios for alarm activations are of no consequence and are not monitored for anything more than Controller loading.

Average alarm rate per hour - <6

• Average alarm rate per 10 minutes - <1

• Percent of time that number of alarm activations exceed 6 per hour - <1%

• Peak alarm rate - N/A

• Number of alarms (or % of time) that occur during alarm flood (these constitute alarms that will likely be missed) - 0

• Number of active alarms Gas Control - <15

• Number of stale alarms (Stale = present at least 24 hours) - 0-2

• Number of disabled, shelved, or otherwise inhibited alarms (does not include alarms disabled due to normal, seasonal operations) - <5

• Number and distribution of “nuisance” alarms - 0

• Number of alarms that account for more than 20% of all alarm activations - 0 Logmate captures all of the activation KPIs and is evaluated every month following CRM-E200 Alarm Auditing and Verification. Irregularities are reviewed for cause and remedied in a timely manner.

94. Question Result, ID, References: Sat, CR.CRMAM.PROBLEMCORRECTION.P, 192.631(e)(2)

Question Text: *Does the alarm management plan include a process for promptly correcting identified problems and for returning these points to service?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Equipment Outages Equipment outages are resolved in a timely manner. Their effect on the alarm system will be handled through alarm suppression methods outlined in CRM-E400 Managing Inaccurate Alarms and Unreliable Data.

95. Question Result, ID, References: Sat, CR.CRMAM.ALARMVERIFY.R, 192.631(e)(2)

Question Text: *Do records verify that monthly reviews and analysis of alarm points have been performed?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The document "NWN_CRM_Alarm_Audit_Log_2016-2020_WA" was reviewed.

96. Question Result, ID, References: Sat, CR.CRMAM.ALARMSETPOINTS.P, 192.631(e)(3)

Question Text: *Is there a formal process to determine the correct alarm setpoint values and alarm descriptions?*

Assets Covered: 8284, 88965 (1,826)

Result Notes Alarm Management Philosophy, Section 8 for assigning alarm priorities.

CRM E100 Accuracy of Safety Related Alarm Setpoints.

CRM-E200 Alarm Auditing and Verification

Used for review, identification, and reporting of alarm deficiencies, and making alarm setpoint adjustments as appropriate for changing operational parameters.

The CRM-E200 states:

NW Natural maintains a documented ongoing auditing and verification process that includes the following:

Review of monthly alarm reports.

Annual review of Alarm setpoints and descriptions.

Making alarm setpoint adjustments as appropriate for changing operational parameters.

Remediate deficiencies in a timely manner commensurate with priority assigned.

97. Question Result, ID, References Sat, CR.CRMAM.SETTINGCONTROL.P, 192.631(e)(3)

Question Text *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?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM–E200: This document sets forth the following policy and procedure (P&P) to document and demonstrate auditing and verification as required by CFR §192.631 (CRM Rule).

- Safety-related alarm setpoint values and alarm descriptions are verified.
- 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 maintenance or operating activities.

98. Question Result, ID, References Sat, CR.CRMAM.ALARMVALUEVERIFY.R, 192.631(e)(3)

Question Text *Do records demonstrate verification of correct safety-related alarm set-point values and alarm descriptors when associated field instruments are calibrated or changed and at least once each calendar year, but at intervals not to exceed 15 months?*

Assets Covered 8284, 88965 (1,826)

Result Notes NWN_WUTC_Annual_Calibration_Transducer_Report_2016-2021 and the NWN_WUTC_One_Time_Validation_Transducer_Report_2016-2021 were reviewed.

99. Question Result, ID, References Sat, CR.CRMAM.PLANREVIEW.P, 192.631(e)(4)

Question Text *Are there processes 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?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained on CRM Pg 19.

100. Question Result, ID, References Sat, CR.CRMAM.PLANREVIEW.R, 192.631(e)(4)

Question Text *Do records indicate review of 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?*

Assets Covered 8284, 88965 (1,826)

Result Notes Records reviewed of alarm management plans were reviewed contained in the CRM manual back to 12/12/2018.

101. Question Result, ID, References Sat, CR.CRMAM.WORKLOADMONITORING.P, 192.631(e)(5)

Question Text *Is the process of monitoring and analyzing general activity comprehensive?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Page 20 was reviewed and discussed during the audit with NWN.

102. Question Result, ID, References Sat, CR.CRMAM.CONTROLLERREACTION.P, 192.631(e)(5)

Question Text *Does the process have a means of determining that the controller has sufficient time to analyze and react to incoming alarms?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Page 20: The Third Party vendor documents the results of the analysis and recommendations to manage the workload more effectively and/or to reduce task-related fatigue. NW Natural considers and documents response to the recommendations and identifies the number of Controllers and consoles needed to safety manage workload and the threshold that would lead to adding Controllers and/or consoles.

103. Question Result, ID, References Sat, CR.CRMAM.PERFORMANCEANALYSIS.R, 192.631(e)(5)

Question Text *Has an analysis been performed to determine if controller(s) performance is currently adequate?*

Assets Covered 8284, 88965 (1,826)

Result Notes They use an annual performance management. The Performance and Development document. A 12/17/2020 Controller Workload Assessment was provided. it was conducted by a third party contractor.(4/7/2018)

104. Question Result, ID, References Sat, CR.CRMAM.DEFICIENCIES.P, 192.631(e)(6)

Question Text *Is there a process to address how deficiencies found in implementing 192.631(e)(1) through 192.631(e)(5) will be resolved?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Alarm Auditing and Verification. CRM E-200

105. Question Result, ID, References Sat, CR.CRMAM.DEFICIENCIES.R, 192.631(e)(6)

Question Text *Do records indicate deficiencies found in implementing 192.631(e)(1) through 192.631(e)(5) have been resolved?*

Assets Covered 8284, 88965 (1,826)

Result Notes Deficiencies are reported, recorded, and reviewed. Alarm deficiency logs, items off scan, .etc. are logged. The 2016-2020 log was reviewed. This document was provided in email by the operator and is in the inspection files.

106. Question Result, ID, References Sat, CR.CRMCMGT.EQUIPMENTCHANGES.P, 192.631(f)(1)

Question Text *Is there a process to assure changes in field equipment that could affect control room operations are coordinated with the control room personnel?*

Assets Covered 8284, 88965 (1,826)

Result Notes The SPW and the FOM has procedures for field staff to notify the Control Room before making changes or entering an unmanned site.

CRM Pg 15. also states: P2P Verification is performed after the work has been completed prior to leaving the site when:

- Field equipment is added or moved, including like-for-like replacement that could affect data values.
- Any other change that affects pipeline safety is made to field equipment or SCADA system.

107. Question Result, ID, References Sat, CR.CRMCMGT.CONTROLLERPARTICIPATE.P, 192.631(f)(1) (192.631(f)(3))

Question Text *Are control room representative(s) required to participate in meetings where changes that could directly or indirectly affect the hydraulic performance or configuration of the pipeline (including routine maintenance and repairs) are being considered, designed and implemented?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained in the MOC portion on Page 10 of the CRM Plan.

Specifically: CRM-E100 Accuracy of Safety Related Alarm Setpoints Used to determine the correct alarm setpoints and prioritize alarms.

CRM-E200 Alarm Auditing and Verification Used for review, identification, and reporting of alarm deficiencies, and making alarm setpoint adjustments as appropriate for changing operational parameters.

CRM-E300 Standardization of Tag Descriptions Used for assigning new and updating existing or inconsistent descriptions.

CRM-E400 Managing Inaccurate Alarms and Unreliable Data Used to identify, report, and promptly correct inaccurate alarms and manage stale or unreliable data.

SPO-303 Standard Practice (Engineering Procedure) Used for outlining the requirements for a written procedure for shutdown, tie-in, and startup procedures that affect transmission and distribution system operations. When work affects a telemetry site monitored by Gas Control, specific steps address the following:

• Equipment taken in and out of service that would affect alarms.

• New or replaced equipment that requires the addition or deletion of tags/alarms.

• When a point-to-point validation is required.

108. Question Result, ID, References Sat, CR.CRMCMGT.CONTROLLERPARTICIPATE.R, 192.631(f)(1) (192.631(f)(3))

Question Text *Do records indicate that control room representative(s) participate in meetings where changes that could directly or indirectly affect the hydraulic performance or configuration of the pipeline (including routine maintenance and repairs) are being considered, designed and implemented?*

Assets Covered 8284, 88965 (1,826)

Result Notes EP-18-075 was a change. A gas controller level 2 or above needs to review these changes to determine how a system change will affect their view in SCADA. This record was 6/28/2018. It was for Washougal on a 4" Class B Main. A record from 1/2/2020 was also reviewed.

109. Question Result, ID, References Sat, CR.CRMCMGT.EMERGENCYCONTACT.P, 192.631(f)(2)

Question Text *Is there a process requiring field personnel and SCADA support personnel to contact the control room when emergency conditions exist?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained in CRM-C300.

3.7. Field personnel contact Gas Control per intervals defined by Gas Control. Field personnel promptly notify Gas Control of abnormal or emergency conditions.

Pg 21 in the plan contains communication procedures.

Communication with Field Personnel

- Field personnel communicate with the Control Room before any equipment is put into local or remote control.
- Field personnel communicate with the Control Room before any equipment is taken out of service or returned to service.
- Field personnel alert the Control Room before personnel enter a SCADA-monitored facility (including but not limited to compressor stations, meter stations, regulator stations, main-line valves, etc.), which are normally unattended.
- Field personnel call the Control Room when making field changes that have the potential to affect Control Room operations.
- **Field personnel communicate with the Control Room immediately upon discovery of an emergency condition.**

- **Field personnel contact Controllers when emergency conditions exist and when making field changes that affect Control Room operations.**
- Field changes or emergency conditions include, but are not limited to:
  - Any 4" or larger class "B" pipeline
  - Any class "C" and above pipeline
  - Any odorization equipment
  - Any LNG facility

110. Question Result, ID, References: Sat, CR.CRMCMGT.FIELDCONTACT.P, 192.631(f)(2)

Question Text: *Does the process require 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Point-to-Point Validation Page 15: A point-to-point validation is conducted between field personnel and the Control Room prior to field personnel leaving the site. Validation of data between SCADA displays and safety related field equipment occurs when:

- Field equipment is added or moved, including like-for-like replacement that could affect data values.

Communication with Field Personnel on Page 21 contains the requirement of field staff to notify the Control Room before making changes or operating assets in the field.

111. Question Result, ID, References: Sat, CR.CRMCMGT.FIELDCHANGES.R, 192.631(f)(2)

Question Text: *Do records indicate field personnel and SCADA support personnel contacted the control room when making field changes (for example, moving a valve) that affect control room operations?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The NWN_WUTC_Annual_Calibration_Transducer_Report_2016-2021 and the NWN_WUTC_One_Time_Validation_Transducer_Report_2016-2021 contain information for field personnel (initials) and the console operator.

112. Question Result, ID, References: Sat, CR.CRMEXP.REPORTABLEINCIDENTREVIEW.P, 192.631(g)(1)

Question Text: *Is there a formal, structured approach for reviewing and critiquing reportable events to identify lessons learned?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM Pg 23

Pipeline safety incidents which meet the criteria established in 49CFR Part 191 are reviewed by the Incident Review Council (IRC). This council is comprised of key members of the management team that have oversight responsibilities for operating and maintaining the integrity of the natural gas system. The IRC meets as required to review and evaluate company emergency response activities related to reportable incidents.

113. Question Result, ID, References: NA, CR.CRMEXP.REPORTABLEINCIDENTREVIEW.R, 192.631(g)(1)

Question Text: *Do records indicate reviews of reportable events specifically analyzed all contributing factors to determine if control room actions contributed to the event, and corrected any deficiencies?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: They provided a form that would be used, the Reportable Incident Review Form, that has been developed to be used to review controller actions. They have not had any events for Federal Reportables.

114. Question Result, ID, References: Sat, CR.CRMEXP.LESSONSLEARNED.P, 192.631(g)(2) (192.631(b)(5))

Question Text: *Does the program require training on lessons learned from a broad range of events (reportable incidents/accidents, near misses, leaks, operational and maintenance errors, etc.), even though the control room may not have been at fault?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM Pg 23 and 24

115. Question Result, ID, References: Concern, CR.CRMEXP.LESSONSLEARNED.R, 192.631(g)(2) (192.631(b)(5))

Question Text: *Has operating experience review training been conducted on lessons learned from a broad range of events (reportable incidents/accidents, near misses, leaks, operational and maintenance errors, etc.)?*

Assets Covered: 8284, 88965 (1,826)

Result Issue Summary: **2. 49 CFR §192.631 Control room management.**

(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:

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

Finding(s):

Records were not provided or available to demonstrate that lessons learned from the operator's experience such as reportable incidents/accidents, near misses, abnormal operations, leaks, operational and maintenance errors, etc. were incorporated into the training program. Lessons learned from these experiences are required to be incorporated into the CRM program.

Result Notes: Records were not provided or available to demonstrate that lessons learned from the operator's experience such as reportable incidents/accidents, near misses, abnormal operations, leaks, operational and maintenance errors, etc. were incorporated into the training program. Lessons learned from these experiences are required to be incorporated into the CRM program.

116. Question Result, ID, References: Sat, CR.CRMTRAIN.CONTROLLERTRAIN.P, 192.631(h)

Question Text: *Has a controller training program been established to provide training for each controller to carry out their roles and responsibilities?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM Pg 24

117. Question Result, ID, References: NA, CR.CRMTRAIN.CONTROLLERTRAIN.R, 192.631(h)

Question Text: *Has a controller training program been implemented to provide training for each controller to carry out their roles and responsibilities?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: No such event occurred, or condition existed, in the scope of inspection review.

The operator provided the training standards. Records were mentioned that could be provided from 2017, but no recent trainees have completed the training program during the time frame of this inspection.

118. Question Result, ID, References: Sat, CR.CRMTRAIN.TRAININGREVIEW.P, 192.631(h)

Question Text: *Have processes been established 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The training content has been reviewed annually. Records provided were from 2018 was the CRM audit checklist 12/12/2018. They also provided 12/9/2020.

119. Question Result, ID, References: Sat, CR.CRMTRAIN.TRAININGREVIEW.R, 192.631(h)

Question Text: *Have processes been implemented 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: The training content has been reviewed annually. Records provided were from 2018 was the CRM audit checklist 12/12/2018. 12/19/2019 was reviewed and the operator also provided 12/9/2020.

120. Question Result, ID, References: Sat, CR.CRMTRAIN.TRAININGCONTENT.R, 192.631(h)

Question Text: *Does training content address all required material, including training each controller to carry out the roles and responsibilities that were defined by the operator?*

Assets Covered 8284, 88965 (1,826)

Result Notes The training content was reviewed and backup SCADA training was also addressed.

121. Question Result, ID, References Sat, CR.CRMTRAIN.AOCLIST.R, 192.631(h)(1)

Question Text *Has a list of the abnormal operating conditions that are likely to occur simultaneously or in sequence been established?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained on Pg 8 (Abnormal operating conditions requiring alarm system modifications follow Management of Change (MOC) processes.), 12 - 13 of the CRM manual contains the main AOC topic. OP-N-301-03 is an OQ procedure that addresses this as well.

122. Question Result, ID, References Sat, CR.CRMTRAIN.TRAININGABNORMAL.P, 192.631(h)(1)

Question Text *Does the training program provide controller training on recognizing and responding to abnormal operating conditions that are likely to occur simultaneously or in sequence?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 24.

- Training Methods One or more of the following methods may be used for training:
- On-the-job (OJT) training for observation, practice, and performance of work tasks.
- Table-top drills.
- Incident drills for Emergency Response.
- Field site visits.
- Review of infrequently used procedures in advance of application of the procedures.
- **Review of list of operating scenarios that are likely to cause simultaneous AOCs or multiple AOCs in sequence and provide guidance on how to recognize and handle these situations.**
- Operator Qualification.
- Monthly meetings.

123. Question Result, ID, References Sat, CR.CRMTRAIN.TRAINING.O, 192.631(h)(2)

Question Text *Does the training program use a simulator or tabletop exercises to train controllers how to recognize and respond to abnormal operating conditions?*

Assets Covered 8284, 88965 (1,826)

Result Notes The operator provided a simulation of 'What ifs". No gas areas, cold days, explosions, too much gas, low odorant, .etc.

124. Question Result, ID, References Sat, CR.CRMTRAIN.TRAINING.R, 192.631(h)(2)

Question Text *Do records indicate the training program used a simulator or tabletop exercises to train controllers how to recognize and respond to abnormal operating conditions?*

Assets Covered 8284, 88965 (1,826)

Result Notes Any new controller completes those at the time of the training. No new controllers since 2017.

125. Question Result, ID, References Sat, CR.CRMTRAIN.COMMUNICATIONTRAINING.P, 192.631(h)(3)

Question Text *Does the CRM program train controllers on their responsibilities for communication under the operator's emergency response procedures?*

Assets Covered 8284

Result Notes Pg 11 and 24

126. Question Result, ID, References Sat, CR.CRMTRAIN.SYSKNOWLEDGE.P, 192.631(h)(4)

Question Text *Does the training program provide controllers a working knowledge of the pipeline system, especially during the development of abnormal operating conditions?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 24.

- Training Methods One or more of the following methods may be used for training:
- **On-the-job (OJT) training for observation, practice, and performance of work tasks.**
- Table-top drills.
- Incident drills for Emergency Response.
- **Field site visits.**
- Review of infrequently used procedures in advance of application of the procedures.
- **Review of list of operating scenarios that are likely to cause simultaneous AOCs or multiple AOCs in sequence and provide guidance on how to recognize and handle these situations.**
- Operator Qualification.
- Monthly meetings.

127. Question Result, ID, References: Sat, CR.CRMTRAIN.INFREQOPSLIST.R, 192.631(h)(5)

Question Text: *Has a list of pipeline operating setups that are periodically (but infrequently) used been established?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: They have infrequent procedures for items such as re-delivery of gas. This is in the controller training manual. This happens so infrequent that thye did not have records for the time period of this inspection.

128. Question Result, ID, References: Sat, CR.CRMTRAIN.INFREQOPSREVIEW.P, 192.631(h)(5)

Question Text: *Do processes 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?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: CRM Pg 24.

- Training Methods One or more of the following methods may be used for training:
- On-the-job (OJT) training for observation, practice, and performance of work tasks.
- Table-top drills.
- Incident drills for Emergency Response.
- Field site visits.
- **Review of infrequently used procedures in advance of application of the procedures.**
- Review of list of operating scenarios that are likely to cause simultaneous AOCs or multiple AOCs in sequence and provide guidance on how to recognize and handle these situations.
- Operator Qualification.
- Monthly meetings.

129. Question Result, ID, References: Sat, CR.CRMTRAIN.TEAMTRAINPERSONNEL.P, 192.631(h)(6)

Question Text: *Do processes establish who, regardless of location, operationally collaborates with control room personnel?*

Assets Covered: 8284, 88965 (1,826)

Result Notes: Pg 21 in the plan contains communication procedures.

Communication with Field Personnel

- Field personnel communicate with the Control Room before any equipment is put into local or remote control.
- Field personnel communicate with the Control Room before any equipment is taken out of service or returned to service.
- Field personnel alert the Control Room before personnel enter a SCADA-monitored facility (including but not limited to compressor stations, meter stations, regulator stations, main-line valves, etc.), which are normally unattended.
- Field personnel call the Control Room when making field changes that have the potential to affect Control Room operations.
- Field personnel communicate with the Control Room immediately upon discovery of an emergency condition.

- Field personnel contact Controllers when emergency conditions exist and when making field changes that affect Control Room operations.
- Field changes or emergency conditions include, but are not limited to:
    - Any 4” or larger class “B” pipeline
    - Any class “C” and above pipeline
    - Any odorization equipment o Any LNG facility

130. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINFREQ.P, 192.631(h)(6)

Question Text *Do processes define the frequency of new and recurring team training?*

Assets Covered 8284

Result Notes Pg 21 - Controller training is updated as necessary to reflect changes to system operations.

Pg 23 - Controllers receive training on incidents that impact Control Room operations including lessons learned from a broad range of events including ‘near misses’.

Pg 24 - The design of the Training Program is intended to provide initial and refresher training to ensure proficiency in the following areas but not limited to:

- Natural Gas Overview
- NW Natural Basics
- The Role of Gas Controller
- Control Room Operations
- Gas Controller Best Practices / Fatigue Training
- CRM and Regulatory Compliance

The FRMS training plan has this detain about frequency of training and refreshers:

4.3.2 NWN has also secured materials and methods for ensuring refresher training as well as materials that will be sent home to provide information to families and friends of controllers. NWN has subscribed to the Working Nights newsletter, distributed by Circadian Technologies. The Working Nights newsletter covers new topics each month in a printed format that is mailed directly to the home of each controller. 19 Regularly scheduled refresher training on shiftwork and fatigue mitigation strategies will be conducted for each controller and Control Room Supervisor on an annual basis (typically once per calendar year, not to exceed 15 months), above and beyond the periodic safety meetings that may include fatigue topics and the monthly newsletter. One of the resources that NWN will utilize in providing the shiftwork and fatigue training is an online program developed by Circadian Technologies. The training covers the key topics recommended by PHMSA and includes a quiz to support comprehension. All refresher training will be documented by date, content and records maintained per Company policies and procedures.

The High Performance HMI Philosophy Document and Style Guide has verbiage and steps to train controllers when there is an HMI change and review feedback from use.

131. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINCOMPLETE.P, 192.631(h)(6)

Question Text *Do processes address all operational modes and operational collaboration/control?*

Assets Covered 8284, 88965 (1,826)

Result Notes CRM Pg 24

Training Methods One or more of the following methods may be used for training:

• On-the-job (OJT) training for observation, practice, and performance of work tasks.

• Table-top drills.

• Incident drills for Emergency Response.

• Field site visits.

• Review of infrequently used procedures in advance of application of the procedures.

• Review of list of operating scenarios that are likely to cause simultaneous AOCs or multiple AOCs in sequence and provide guidance on how to recognize and handle these situations.

• Operator Qualification.

132. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINEXPERIENCE.P, 192.631(h)(6)

Question Text *Do processes include incorporation of lessons learned from actual historical events and other oil-gas industry events?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 23 of the manual has a section on "Operating Experience"

Pipeline safety incidents which meet the criteria established in 49 CFR Part 191 are reviewed by the Incident Review Council (IRC). This council is comprised of key members of the management team that have oversight responsibilities for operating and maintaining the integrity of the natural gas system. The IRC meets as required to review and evaluate company emergency response activities related to reportable incidents. Incident review considers Control Room actions and impact on emergency response activities and outcomes, including determining if the Control Room actions contributed to an event.

If the IRC determines that Control Room actions may have contributed to an event, a supplemental review will be conducted by Gas Control.

The review will document and correct, where necessary, deficiencies related to Control Room operations including, but not limited to:

- Controller fatigue
- Field equipment
- Operation of any relief device
- Procedures
- SCADA system configuration
- SCADA system performance

Controllers receive training on incidents that impact Control Room operations including lessons learned from a broad range of events including 'near misses'.

133. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINEXERCISE.R, 192.631(h)(6)

Question Text *Do records indicate that training exercises were adequate and involved at least one qualified controller?*

Assets Covered 8284

Result Notes The training exercises are documented and they provided a copy from 2019 3/11-3/13. They had controllers there each day.

134. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINEXERCISE.O, 192.631(h)(6)

Question Text *Does implementation of a control room team exercise demonstrate performance in accordance with regulatory and process requirements?*

Assets Covered 8284, 88965 (1,826)

Result Notes We did not directly observe a Control Room training excercise. The training exercises are documented and they provided a copy from 2019 3/11-3/13. They had controllers there each day.

135. Question Result, ID, References Sat, CR.CRMTRAIN.TEAMTRAINIDENTINDIVIDUAL.R, 192.631(h)(6)

Question Text *Do records demonstrate that individuals identified as of January 23, 2018 received team training by January 23, 2019?*

Assets Covered 8284, 88965 (1,826)

Result Notes 03/22/2021 Reviewed Team Training that multiple departments including Gas control, Storage Plants, Engineering, RMC, Gas Supply Sys Ops, Scada and Telecom participated. Dated 3/11/19, 3/12/19 and 3/13/19 and they did have at least one controller for each training.

136. Question Result, ID, References Sat, CR.CRMCOMP.SUBMITPROCEDURES.P, 192.631(i)

Question Text *Are there adequate processes to assure that the operator is responsive to requests from applicable agencies to submit their CRM procedures?*

Assets Covered 8284, 88965 (1,826)

Result Notes Pg 25 of the plan contains this:

Compliance Validation 192.631(i)

NW Natural Gas Control is responsible for making changes to this Plan and ensuring that changes are available for review during federal and state pipeline safety compliance inspections. Additionally, NW Natural submits their procedures to the applicable federal or state pipeline safety regulatory agencies upon request, no later than 30 days from the date of the request or otherwise specified by the agency. The Manager of Code Compliance is responsible and accountable for compliance with requests from PHMSA or other applicable agencies.

137. Question Result, ID, References Sat, CR.CRMCOMP.SUBMITPROCEDURES.R, 192.631(i)

Question Text *Has the operator been responsive to requests from applicable agencies to submit their CRM procedures?*

Assets Covered 8284, 88965 (1,826)

Result Notes The operator has provided its CRM procedures to Washington when requested. They do so when there is a significant change to the manual.

138. Question Result, ID, References Sat, CR.CRMCOMP.CRMCOORDINATOR.R, 192.631(i)

Question Text *Is there an individual that is responsible and accountable for compliance with requests from PHMSA or other applicable agencies?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained in the CRM procedures.

139. Question Result, ID, References Concern, CR.CRMCOMP.RECORDS.P, 192.631(j)(1)

Question Text *Are records management processes adequate to assure records are sufficient to demonstrate compliance with the CRM rule?*

Assets Covered 8284, 88965 (1,826)

Result Issue Summary 3. **49 CFR §192.631 Control room management.**

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

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

Finding(s):

The procedure is lacking sufficient detail. The Compliance and Deviations section in NWN's CRM manual discusses creating records and storing them for 5 years, but that is the entirety of the procedure. It states "Documentation and records are retained for a minimum of five (5) years."

Northwest Natural has an entry in the manual to reference CRM records creation and storage, but needs to be more clearly defined. The operator was not able to provide, during the inspection, a storage location, or any further information on where the records are stored or how they can be retrieved.

Result Notes The procedure is lacking sufficient detail. The Compliance and Deviations section in NWN's CRM manual discusses creating records and storing them for 5 years, but that is the entirety of the procedure. It states "Documentation and records are retained for a minimum of five (5) years."

Northwest Natural has an entry in the manual to reference CRM records creation and storage, but needs to be more clearly defined. The operator was not able to provide, during the inspection, a storage location, or any further information on where the records are stored or how they can be retrieved.

140. Question Result, ID, References Sat, CR.CRMCOMP.RECORDS.R, 192.631(j)(1)

Question Text *Are records sufficient to demonstrate compliance with the CRM rule?*

Assets Covered 8284, 88965 (1,826)

Result Notes Annual field test records for the Sherwood backup SCADA were tested from 2016-2020. The CRM Alarm Audit Log was checked for 2016-2020. It contains signatures of the SCADA Engineer and the Control Room Supervisor. The One Time and Annual Transducer reports were also reviewed for 2016-2020.

141. Question Result, ID, References Concern, CR.CRMCOMP.ELECTRONICRECORDS.R, 192.631(j)(1)

Question Text *Are electronic records properly stored, safeguarded, and readily retrievable?*

Assets Covered 8284, 88965 (1,826)

Result Issue Summary 4. **49 CFR §192.631 Control room management.**

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

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

Finding(s):

Records are saved for 5 years per the operator. Although the operator was able to provide a control room log from 5/3/2019 as requested, the information was stored on a system that was not readily available during the inspection. Secondary "mirrored" copies were not available without logging in at a production console. This can present issues if the main control room is disabled and the records are not available at the backup control room.

It is understood that security issues can arise from connecting remotely to a console while sharing information over shared teleconferencing. The operator should have redundancy and the capability either at a backup control room location or in another database that is not connected to the live SCADA system available. Records could then be reviewed as they are requested during an inspection rather than having the operator poll the system and return with information at a later time. This would also provide for greater transparency during the inspection process.

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142. Question Result, ID, References Sat, CR.CRMCOMP.DEVIATIONS.P, 192.631(j)(2)

Question Text *Are there processes to demonstrate and provide a documented record that every deviation from any CRM rule requirement was necessary for safe operation?*

Assets Covered 8284, 88965 (1,826)

Result Notes This is contained on Pg 26 as referenced in previous IA questions.

143. Question Result, ID, References Concern, CR.CRMCOMP.DEVIATIONS.R, 192.631(j)(2)

Question Text *Were all deviations documented in a way that demonstrates they were necessary for safe operation?*

Assets Covered 8284, 88965 (1,826)

Result Issue Summary **5**. **49 CFR §192.631 Control room management.**

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

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

Finding(s):

There was no documentation available of any deviations or the lack thereof. The absence of any statement containing "no deviations" makes it difficult to determine whether there were no deviations for the inspection time period, if they were not being documented, or if the operator cannot locate where they are stored.

For example, the National Pipeline Mapping System (NPMS) requires operators to submit updated pipeline mapping information on an annual basis. If there are no changes, they are documented with a submission and a statement for the record of "No Changes."

Result Notes There was no documentation available of any deviations or the lack thereof. The absence of any statement containing "no deviations" makes it difficult to determine whether there were no deviations for the inspection time period, if they were not being documented, or if the operator cannot locate where they are stored. For example, the National Pipeline Mapping System (NPMS) requires operators to submit updated pipeline mapping information on an annual basis. If there are no changes, they are documented with a submission and a statement for the record of "No Changes."

GENERIC.GENERIC: Generic Questions

144. Question Result, ID, References Sat, GENERIC.GENERIC.GENOBSERVE.O, N/A

Question Text *Generic question - please provide context in result notes.*

Assets Covered 88965 (1,826)

Report Parameters: Results: all

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