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**CRM, SCADA, and Leak Detection - CRM General**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Control Room Management Criteria** Do procedures adequately address the process and criteria to determine which facilities are control rooms? (CR.CRMGEN.CRMCRITERIA.P) | | | | | | | | | 192.631(a)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Control Room Management** Are CRM procedures formalized and controlled? (CR.CRMGEN.CRMMGMT.P) | | | | | | | | | 192.631(a)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Control Room Management** Are procedures approved, in place, and implemented? (CR.CRMGEN.CRMIMPLEMENT.R) | | | | | | | | | 192.631(a)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Control Room Management** Are procedures readily available to controllers in the control room? (CR.CRMGEN.CRMPROCLOCATION.O) | | | | | | | | | 192.631(a)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - CRM Roles and Responsibilities**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Roles and Responsibilities** Are there clear processes to describe each controller's physical domain of responsibility for pipelines and other facility assets? (CR.CRMRR.RESPONSIBLE.P) | | | | | | | | | 192.631(b) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Roles and Responsibilities** Are there provisions in place to assure that only qualified individuals may assume control at any console/desk? (CR.CRMRR.QUALCONTROL.P) | | | | | | | | | 192.631(b) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Roles and Responsibilities** If the physical domain of responsibility periodically changes, has a clear process been established to describe the conditions for when such a change occurs? (CR.CRMRR.DOMAINCHANGE.P) | | | | | | | | | 192.631(b) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Controller Authority (Abnormal Operations)** Have processes been established to define the controllers' authority and responsibilities when an abnormal operating condition is detected? (CR.CRMRR.AUTHORITYABNORMAL.P) | | | | | | | | | 192.631(b)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. Roles and Responsibilities** Do processes address a controller's role during temporary impromptu (unplanned) changes in controller responsibilities? (CR.CRMRR.RESPCHANGE.P) | | | | | | | | | 192.631(b) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **6. Roles and Responsibilities** 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? (CR.CRMRR.COMMANDVERIFY.P) | | | | | | | | | 192.631(b) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **7. Overpressure Limits** 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? (CR.CRMRR.PRESSLIMITS.O) | | | | | | | | | 192.631(b)(2) (192.619(a); 192.631(e)(1)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. Controller Authority (Emergency Operations)** 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? (CR.CRMRR.AUTHORITYEMERGENCY.P) | | | | | | | | | 192.631(b)(3) (192.615(a)(8); NTSB P-11-9) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **9. Control Center Evacuation** Do processes specifically address the controller's responsibilities in the event the control room must be evacuated? (CR.CRMRR.EVACUATION.P) | | | | | | | | | 192.631(b)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **10. Communication Failure** 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? (CR.CRMRR.COMMSYSFAIL.P) | | | | | | | | | 192.631(b)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **11. Shift Change Process** Have processes been established for the hand-over of responsibility that specify the type of information to be communicated to the oncoming shift? (CR.CRMRR.HANDOVER.P) | | | | | | | | | 192.631(b)(4) (192.631(c)(5)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **13. Shift Change Process - Documentation** 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? (CR.CRMRR.HANDOVERDOC.P) | | | | | | | | | 192.631(b)(4) (192.631(c)(5)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **14. Shift Change Process - Documentation** 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? (CR.CRMRR.HANDOVERDOC.R) | | | | | | | | | 192.631(b)(4) (192.631(c)(5)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **15. Shift Change Process - Overlap** Do processes require the controllers to discuss recent and impending important activities ensuring adequate overlap? (CR.CRMRR.HANDOVEROVERLAP.P) | | | | | | | | | 192.631(b)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **16. Shift Change Process - Handover Alternative** 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? (CR.CRMRR.HANDOVERALTERNATIVE.P) | | | | | | | | | 192.631(b)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **17. Shift Change Process - Unattended Consoles** Has the operator established an adequate process for occasions when the console is left temporarily unattended for any reason? (CR.CRMRR.UNATTENDCONSOLE.P) | | | | | | | | | 192.631(b)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **18. Shift Change Process - Console Coverage** Do processes maintain adequate console coverage during shift hand-over? (CR.CRMRR.CONSOLECOVERAGE.P) | | | | | | | | | 192.631(b)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **19. Authority to Supersede Controller Action Disallowed - Controllers** Do processes disallow others to have authority to direct or supersede the specific technical actions of a controller? (CR.CRMRR.OTHERAUTHORITYDISALLOW.P) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **20. Authority to Supersede Controller Action Disallowed - Controllers** 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? (CR.CRMRR.OTHERAUTHORITYDISALLOW.R) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **21. Authority to Supersede Controller Action Disallowed - Controllers** 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? (CR.CRMRR.OTHERAUTHORITYDISALLOW.O) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **22. Others with Authority Qualification - Controllers** 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? (CR.CRMRR.OTHERAUTHORITYQUAL.P) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **24. Others with Authority Implementation - Controllers** 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? (CR.CRMRR.OTHERAUTHORITYIMPLEMENT.P) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **25. Others with Authority List - Controllers** Is a list of individuals with authority to direct or supersede the technical actions of a controller readily available to controllers? (CR.CRMRR.OTHERAUTHORITYLIST.R) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **26. Others with Authority Implementation - Controllers** Do records adequately document occurrences of when others authorized to direct or supersede the technical actions of a controller have done so? (CR.CRMRR.OTHERAUTHORITYIMPLEMENT.R) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **27. Others with Authority Implementation - Controllers** Do others authorized to direct or supersede the technical actions of a controller demonstrate an understanding of the process to implement this authority? (CR.CRMRR.OTHERAUTHORITYIMPLEMENT.O) | | | | | | | | | 192.631(b)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Supervisory Control and Data Acquisition**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Adequate Information (API 1165 Compliance)** 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? (CR.SCADA.SYSTEMMOC.P) | | | | | | | | | 192.631(c)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. SCADA Displays** 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? (CR.SCADA.DISPLAYCONFIG.P) | | | | | | | | | 192.631(c)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. SCADA API RP 1165 Human Factors** Has section 4 of API RP 1165 regarding human factors engineering been implemented? (CR.SCADA.1165HUMANFACTORS.O) | | | | | | | | | 192.631(c)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. SCADA Display Dynamics** Has section 9 of API RP 1165 regarding display object dynamics been implemented? (CR.SCADA.DISPLAYDYNAMICS.R) | | | | | | | | | 192.631(c)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **7. SCADA Impracticality** 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? (CR.SCADA.1165IMPRACTICAL.R) | | | | | | | | | 192.631(c)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. Set Points** Does the process adequately define safety-related points? (CR.SCADA.SETPOINT.P) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **9. Set Points** Do records indicate safety-related points have been adequately implemented? (CR.SCADA.SETPOINT.R) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **10. Point-to-Point Verification** Are there adequate processes to define and identify the circumstances which require a point-to-point verification? (CR.SCADA.POINTVERIFY.P) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **11. Point-to-Point Verification** Have required point-to-point verifications been performed? (CR.SCADA.POINTVERIFY.R) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **12. Point-to-Point Verification Extent** Are there adequate processes for the thoroughness of the point-to-point verification? (CR.SCADA.POINTVERIFYEXTENT.P) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **15. Point-to-Point Verification Interval** Do records indicate the point-to-point verification has been completed at the required intervals? (CR.SCADA.POINTVERFIYINTVL.R) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **16. Point-to-Point Verification** Are point-to-point verifications performed adequately when required? (CR.SCADA.POINTVERIFY.O) | | | | | | | | | 192.631(c)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **17. Internal Communication Plan** Has an internal communication plan been established and implemented that is adequate to manually operate the pipeline during a SCADA failure/outage? (CR.SCADA.COMMPLAN.P) | | | | | | | | | 192.631(c)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **19. Backup SCADA System** Is there a backup SCADA system? (CR.SCADA.BACKUPSCADA.O) | | | | | | | | | 192.631(c) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **22. Backup SCADA Testing** Is the backup SCADA system tested at least once each calendar year at intervals not to exceed 15 months? (CR.SCADA.BACKUPSCADATEST.R) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **23. Backup SCADA Verification** 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? (CR.SCADA.BACKUPSCADAVERIFY.P) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **24. Backup SCADA Verification** 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? (CR.SCADA.BACKUPSCADAVERIFY.R) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **25. Backup SCADA Adequacy** 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? (CR.SCADA.BACKUPSCADAADEQUACY.R) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **26. Backup SCADA Transfer** Do processes adequately address and test the logistics of transferring control to a backup control room? (CR.SCADA.BACKUPSCADATRANSFER.P) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **28. Backup SCADA Testing** 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? (CR.SCADA.BACKUPSCADAFUNCTIONS.R) | | | | | | | | | 192.631(c)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Fatigue Management**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Fatigue Risk Reduction** Does the fatigue mitigation plan adequately address how the program reduces the risk associated with controller fatigue? (CR.CRMFM.FATIGUERISKS.P) | | | | | | | | | 192.631(d) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Fatigue Quantification** Do processes require that the potential contribution of controller fatigue to incidents and accidents be quantified during investigations? (CR.CRMFM.FATIGUEQUANTIFY.P) | | | | | | | | | 192.631(d) (192.631(a); 192.631(g)(1)(i)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Fatigue Mitigation Manager** 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? (CR.CRMFM.FATIGUEMANAGER.P) | | | | | | | | | 192.631(d) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. Scheduled Shift Length** 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? (CR.CRMFM.SHIFTLENGTH.R) | | | | | | | | | 192.631(d)(1) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **6. Establishing Shift Length** Does the operator factor in all time the individual is working for the company when establishing shift lengths and schedule rotations and that periods of time off that accommodates 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? (CR.CRMFM.SHIFTLENGTHTIME.R) | | | | | | | | | 192.631(d)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **7. Scheduled Time Off Between Shifts** 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? (CR.CRMFM.SCHEDULEDTIMEOFF.R) | | | | | | | | | 192.631(d)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. On Call Controllers** 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? (CR.CRMFM.ONCALLCONTROLLER.P) | | | | | | | | | 192.631(d) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **9. On Call Controllers** For controllers who are on call, do records include shift schedules, when calls were made to the on call employee, and how long the individual worked? (CR.CRMFM.ONCALLCONTROLLER.R) | | | | | | | | | 192.631(d)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **10. Maximum Hours of Service** 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? (CR.CRMFM.MAXHOS.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **11. Documented Time Schedule** 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? (CR.CRMFM.DOCSCHEDULE.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **12. Time Off Following Successive Days Worked** 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? (CR.CRMFM.DAYSOFF.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **13. Day Only Work Hours** 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.? (CR.CRMFM.WORKHOURS.R) | | | | | | | | | 192.631(d)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **15. Off Duty Hours When Limits Reached** 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? (CR.CRMFM.OFFDUTYHOURS.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **16. Shift Holdover** Does the daily HOS limit and 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? (CR.CRMFM.SHIFTHOLDOVER.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **17. Specific Fatigue Countermeasures During Times of Heightened Risk** 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? (CR.CRMFM.SPECIFICCOUNTERMEASURES.P) | | | | | | | | | 192.631(d)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **18. Deviations from HOS Limits** Is there a formal process for approving deviations from the maximum HOS limits? (CR.CRMFM.HOSDEVIATIONS.P) | | | | | | | | | 192.631(d)(4) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **19. Fatigue Education** Does the program require that fatigue education/training is required for all controllers and control room supervisors? (CR.CRMFM.FATIGUEEDUCATE.P) | | | | | | | | | 192.631(d)(2) (192.631(d)(3); 192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **20. Review of Fatigue Education/Training Program Effectiveness** 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? (CR.CRMFM.FATIGUEREVIEW.P) | | | | | | | | | 192.631(d)(2) (192.631(d)(3); 192.605(a); 192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **21. Fatigue Mitigation Strategies** Does fatigue education address fatigue mitigation strategies (countermeasures), how off-duty activities contribute to fatigue and recognizing the effects of fatigue? (CR.CRMFM.FATIGUESTRATEGY.P) | | | | | | | | | 192.631(d)(2) (192.631(a)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **22. Fatigue Education** Is periodic fatigue education/training documented for all controllers and control room supervisors? (CR.CRMFM.FATIGUEEDUCATE.R) | | | | | | | | | 192.631(d)(2) (192.631(d)(3)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **24. Fatigue Training Content** Has controller and supervisor training to recognize the effects of fatigue been documented? (CR.CRMFM.FATIGUECONTENT.R) | | | | | | | | | 192.631(d)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Alarm Management**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Alarm Procedures** Is the alarm management plan a formal process that specifically identifies critical topical areas included in the program? (CR.CRMAM.ALARM.P) | | | | | | | | | 192.631(e) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Alarm Malfunction** Is there a process to identify and correct inaccurate or malfunctioning alarms? (CR.CRMAM.ALARMMALFUNCTION.P) | | | | | | | | | 192.631(e)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Alarm Review** Does the review of safety-related alarms account for different alarm designs and all alarm types/priorities? (CR.CRMAM.ALARMREVIEW.P) | | | | | | | | | 192.631(e)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Controller SCADA Performance** Does the review of safety-related alarms account for console differences that could affect individual-specific controller qualification and performance? (CR.CRMAM.CONTROLLERPERFORMANCE.P) | | | | | | | | | 192.631(h) (192.631(e)(1)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. Managing Stale or Unreliable Data** Does the review of safety-related alarms include specific procedures and practices for managing stale or unreliable data? (CR.CRMAM.STALEDATA.P) | | | | | | | | | 192.631(e)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **6. Monthly Analysis of SCADA Data** 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? (CR.CRMAM.MONTHLYANALYSIS.P) | | | | | | | | | 192.631(e)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **7. Correction of SCADA Problems** Does the alarm management plan include a process for promptly correcting identified problems and for returning these points to service? (CR.CRMAM.PROBLEMCORRECTION.P) | | | | | | | | | 192.631(e)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. Alarm Point Verification** Do records verify that monthly reviews and analysis of alarm points have been performed? (CR.CRMAM.ALARMVERIFY.R) | | | | | | | | | 192.631(e)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **9. Alarm Setpoint Process** Is there a formal process to determine the correct alarm setpoint values and alarm descriptions? (CR.CRMAM.ALARMSETPOINTS.P) | | | | | | | | | 192.631(e)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **10. Controls on SCADA Settings** 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? (CR.CRMAM.SETTINGCONTROL.P) | | | | | | | | | 192.631(e)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **11. Alarm Value Verification** 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? (CR.CRMAM.ALARMVALUEVERIFY.R) | | | | | | | | | 192.631(e)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **12. Alarm Management Plan Review** 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? (CR.CRMAM.PLANREVIEW.P) | | | | | | | | | 192.631(e)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **13. Alarm Management Plan Review** 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? (CR.CRMAM.PLANREVIEW.R) | | | | | | | | | 192.631(e)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **14. Measuring Work Load** Does the CRM program have a means of identifying and measuring the work load (content and volume of general activity) being directed to an individual controller? (CR.CRMAM.WORKLOAD.P) | | | | | | | | | 192.631(e)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **15. Monitoring Work Load** Is the process of monitoring and analyzing general activity comprehensive? (CR.CRMAM.WORKLOADMONITORING.P) | | | | | | | | | 192.631(e)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **16. Controller Reaction to Incoming Alarms** Does the process have a means of determining that the controller has sufficient time to analyze and react to incoming alarms? (CR.CRMAM.CONTROLLERREACTION.P) | | | | | | | | | 192.631(e)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **17. Analysis of Controller Performance** Has an analysis been performed to determine if controller(s) performance is currently adequate? (CR.CRMAM.PERFORMANCEANALYSIS.R) | | | | | | | | | 192.631(e)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **18. Alarm Deficiency Resolution** Is there a process to address how deficiencies found in implementing 192.631(e)(1) through 192.631(e)(5) will be resolved? (CR.CRMAM.DEFICIENCIES.P) | | | | | | | | | 192.631(e)(6) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **19. Alarm Management Deficiencies** Do records indicate deficiencies found in implementing 192.631(e)(1) through 192.631(e)(5) have been resolved? (CR.CRMAM.DEFICIENCIES.R) | | | | | | | | | 192.631(e)(6) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Change Management**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Field Equipment Changes** Is there a process to assure changes in field equipment that could affect control room operations are coordinated with the control room personnel? (CR.CRMCMGT.EQUIPMENTCHANGES.P) | | | | | | | | | 192.631(f)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Controller Participation in System Changes** 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? (CR.CRMCMGT.CONTROLLERPARTICIPATE.P) | | | | | | | | | 192.631(f)(1) (192.631(f)(3)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Controller Participation in System Changes** 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? (CR.CRMCMGT.CONTROLLERPARTICIPATE.R) | | | | | | | | | 192.631(f)(1) (192.631(f)(3)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Emergency Contact with Control Room** Is there a process requiring field personnel and SCADA support personnel to contact the control room when emergency conditions exist? (CR.CRMCMGT.EMERGENCYCONTACT.P) | | | | | | | | | 192.631(f)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. Coordination of Field Changes** Does the process require field personnel and SCADA support personnel to contact the control room when making field changes (e.g., operating a valve, O&M inspections/calibrations, RTU/PLC modifications) that affect control room operations? (CR.CRMCMGT.FIELDCONTACT.P) | | | | | | | | | 192.631(f)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **6. Coordination of Field Changes** Do records indicate field personnel and SCADA support personnel contacted the control room when making field changes (e.g., operating a valve, O&M inspections/calibrations, RTU/PLC modifications) that affect control room operations? (CR.CRMCMGT.FIELDCHANGES.R) | | | | | | | | | 192.631(f)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Operating Experience**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Reportable Incident (Review)** Is there a formal, structured approach for reviewing and critiquing reportable events to identify lessons learned? (CR.CRMEXP.REPORTABLEINCIDENTREVIEW.P) | | | | | | | | | 192.631(g)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Reportable Incident (Review)** 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? (CR.CRMEXP.REPORTABLEINCIDENTREVIEW.R) | | | | | | | | | 192.631(g)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Lessons Learned** 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? (CR.CRMEXP.LESSONSLEARNED.P) | | | | | | | | | 192.631(g)(2) (192.631(b)(5)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Lessons Learned** 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.)? (CR.CRMEXP.LESSONSLEARNED.R) | | | | | | | | | 192.631(g)(2) (192.631(b)(5)) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Training**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Controller Training Program** Has a controller training program been established to provide training for each controller to carry out their roles and responsibilities? (CR.CRMTRAIN.CONTROLLERTRAIN.P) | | | | | | | | | 192.631(h) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **2. Controller Training Program** Has a controller training program been implemented to provide training for each controller to carry out their roles and responsibilities? (CR.CRMTRAIN.CONTROLLERTRAIN.R) | | | | | | | | | 192.631(h) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. Training Program Review** 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? (CR.CRMTRAIN.TRAININGREVIEW.P) | | | | | | | | | 192.631(h) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **4. Training Program Review** 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? (CR.CRMTRAIN.TRAININGREVIEW.R) | | | | | | | | | 192.631(h) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. Content of Training Program** Does training content address all required material, including training each controller to carry out the roles and responsibilities that were defined by the operator? (CR.CRMTRAIN.TRAININGCONTENT.R) | | | | | | | | | 192.631(h) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **6. List of AOCs for Training** Has training been conducted on the abnormal operating conditions that are likely to occur simultaneously or in sequence identified by the operator? (CR.CRMTRAIN.AOCLIST.R) | | | | | | | | | 192.631(h)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **7. Controller Training and Qualification** Does the training program provide controller training on recognizing and responding to abnormal operating conditions that are likely to occur simultaneously or in sequence? (CR.CRMTRAIN.TRAININGABNORMAL.P) | | | | | | | | | 192.631(h)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. Controller Training and Qualification** Do records indicate the training program used a simulator or tabletop exercises to train controllers how to recognize and respond to abnormal operating conditions? (CR.CRMTRAIN.TRAINING.R) | | | | | | | | | 192.631(h)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **9. Controller Training and Qualification** Does the training program use a simulator or tabletop exercises to train controllers how to recognize and respond to abnormal operating conditions? (CR.CRMTRAIN.TRAINING.O) | | | | | | | | | 192.631(h)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **10. Communication Training** Does the CRM program train controllers on their responsibilities for communication under the operator's emergency response procedures? (CR.CRMTRAIN.COMMUNICATIONTRAINING.P) | | | | | | | | | 192.631(h)(3) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **11. Working Knowledge of Pipeline System** Does the training program provide controllers a working knowledge of the pipeline system, especially during the development of abnormal operating conditions? (CR.CRMTRAIN.SYSKNOWLEDGE.P) | | | | | | | | | 192.631(h)(4) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **12. List of Infrequently Used Pipeline Setups** Has a list of pipeline operating setups that are periodically (but infrequently) used been established? (CR.CRMTRAIN.INFREQOPSLIST.R) | | | | | | | | | 192.631(h)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **13. Review of Procedures Prior to Use** 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? (CR.CRMTRAIN.INFREQOPSREVIEW.P) | | | | | | | | | 192.631(h)(5) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **14. Control Room Team Training - Personnel** Do processes establish who, regardless of location, operationally collaborates with control room personnel? (CR.CRMTRAIN.TEAMTRAINPERSONNEL.P) | | | | | | | | | 192.631(h)(6) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **16. Control Room Team Training - Completeness** Do processes address all operational modes and operational collaboration/control? (CR.CRMTRAIN.TEAMTRAINCOMPLETE.P) | | | | | | | | | 192.631(h)(6) (ADB-2014-02) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **20. Control Room Team Training - Identified Individuals** Do records demonstrate that individuals identified as of January 23, 2018 received team training by January 23, 2019? (CR.CRMTRAIN.TEAMTRAINIDENTINDIVIDUAL.R) | | | | | | | | | 192.631(h)(6) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

**CRM, SCADA, and Leak Detection - Compliance Validation and Deviations**

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **1. Submittal of Procedures** Are there adequate processes to assure that the operator is responsive to requests from applicable agencies to submit their CRM procedures? (CR.CRMCOMP.SUBMITPROCEDURES.P) | | | | | | | | | 192.631(i) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **3. CRM Coordinator** Is there an individual that is responsible and accountable for compliance with requests from PHMSA or other applicable agencies? (CR.CRMCOMP.CRMCOORDINATOR.P) | | | | | | | | | 192.631(i) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **5. CRM Records** Are records sufficient to demonstrate compliance with the CRM rule? (CR.CRMCOMP.RECORDS.R) | | | | | | | | | 192.631(j)(1) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **8. Deviation Records** Were all deviations documented in a way that demonstrates they were necessary for safe operation? (CR.CRMCOMP.DEVIATIONS.R) | | | | | | | | | 192.631(j)(2) | | | | | | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | | Sat+ | Sat | Concern | Unsat | NA | NC |  |  | |  |  |  |  |  |  |  | | | Notes | | | | | | | | |

Except as required to be disclosed by law, any inspection documentation, including completed protocol forms, summary reports, executive summary reports, and enforcement documentation are for internal use only by federal or state pipeline safety regulators. Some inspection documentation may contain information which the operator considers to be confidential. In addition, supplemental inspection guidance and related documents in the file library are also for internal use only by federal or state pipeline safety regulators (with the exception of documents published in the federal register, such as advisory bulletins). Do not distribute or otherwise disclose such material outside of the state or federal pipeline regulatory organizations. Requests for such information from other government organizations (including, but not limited to, NTSB, GAO, IG, or Congressional Staff) should be referred to PHMSA Headquarters Management.