CRM Inspection Experience & Lessons Learned

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CPL's Opportunity

- Align with Control Center Vision
- Enhance pipeline safety by strengthening control room management with improved controller:
  - Training
  - Fatigue Management
  - Alarm Management
  - Adequate information
- Operating Experience: Share critical information, lessons learned, and best practices
- Compliance with regulatory requirements

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CPL's CRM Journey

- **2009** – CPL created its first draft of CRM Plan
  - No dedicated resources – collateral duty of a console supervisor
- **2010** – Elevated as a formal Chevron project with assigned elements leads
  - Development in silos
  - Lacking regulatory expertise and SME's
- **2011** – Enlisted support of regulatory and pipeline consultants
  - Assessment and gap anlaysis
  - Re-focused efforts and developed timeline to meet compliance dates
  - Elements leads assigned to update sections using expertise, gap analysis, and FAQ
  - Periodic check-in meetings with entire CRM team and continual interaction with consultants
  - Final documents sent for review by leadership team, regulatory/compliance, and legal
  - Developed detailed implementation schedule
  - Executed implementations as per PHMSA regulation timeline
- **2012+** - Re-evaluate each element for continuous improvement

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Incorporate by Reference

- Created master document for overall CRM Plan that referenced supporting documents:
  - Specific documents for each CRM Element
  - Core O&M Manuals
- Managed all document revisions and approvals through MS Sharepoint libraries and workflows
- Used 5 Component Model as template:
  1. Purpose and Objectives
  2. Scope
  3. Roles and Responsibilities
  4. Measurement and Verification (Leading / Lagging Measures)
  5. Continuous Improvement and Management Process

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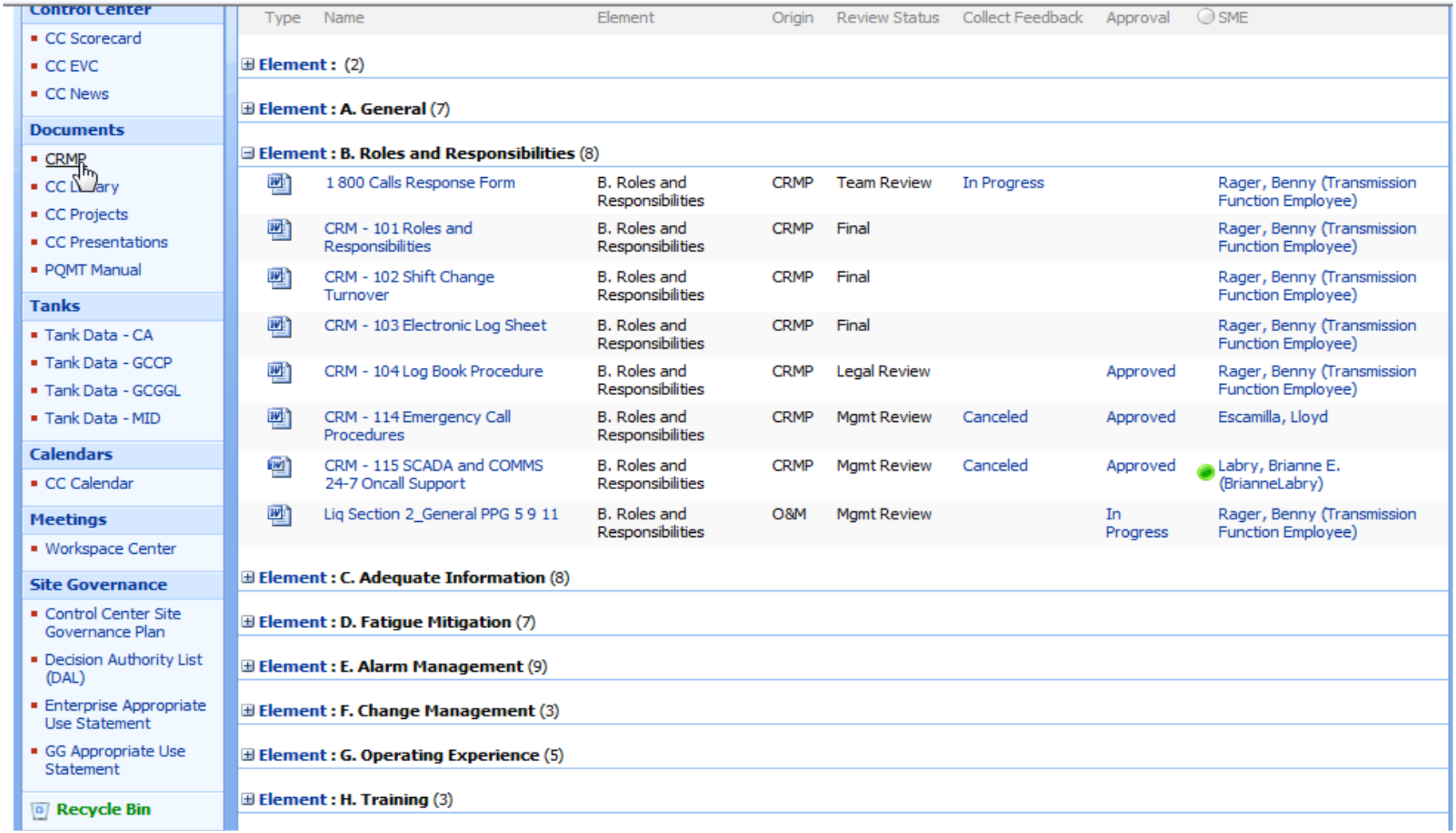
CPL's CRM Documents



Control Center
- CC Scorecard
- CC EVC
- CC News

Documents
- CRMP
- CC Library
- CC Projects
- CC Presentations
- PQMT Manual

Tanks
- Tank Data - CA
- Tank Data - GCCP
- Tank Data - GCGGL
- Tank Data - MID

Calendars
- CC Calendar

Meetings
- Workspace Center

Site Governance
- Control Center Site Governance Plan
- Decision Authority List (DAL)
- Enterprise Appropriate Use Statement
- GG Appropriate Use Statement

Recycle Bin

Type	Name	Element	Origin	Review Status	Collect Feedback	Approval	SME
Element : (2)							
Element : A. General (7)							
Element : B. Roles and Responsibilities (8)							
	1 800 Calls Response Form	B. Roles and Responsibilities	CRMP	Team Review	In Progress		Rager, Benny (Transmission Function Employee)
	CRM - 101 Roles and Responsibilities	B. Roles and Responsibilities	CRMP	Final			Rager, Benny (Transmission Function Employee)
	CRM - 102 Shift Change Turnover	B. Roles and Responsibilities	CRMP	Final			Rager, Benny (Transmission Function Employee)
	CRM - 103 Electronic Log Sheet	B. Roles and Responsibilities	CRMP	Final			Rager, Benny (Transmission Function Employee)
	CRM - 104 Log Book Procedure	B. Roles and Responsibilities	CRMP	Legal Review		Approved	Rager, Benny (Transmission Function Employee)
	CRM - 114 Emergency Call Procedures	B. Roles and Responsibilities	CRMP	Mgmt Review	Canceled	Approved	Escamilla, Lloyd
	CRM - 115 SCADA and COMMS 24-7 Oncall Support	B. Roles and Responsibilities	CRMP	Mgmt Review	Canceled	Approved	Labry, Brianne E. (BrianneLabry)
	Liq Section 2_General PPG 5 9 11	B. Roles and Responsibilities	O&M	Mgmt Review		In Progress	Rager, Benny (Transmission Function Employee)
Element : C. Adequate Information (8)							
Element : D. Fatigue Mitigation (7)							
Element : E. Alarm Management (9)							
Element : F. Change Management (3)							
Element : G. Operating Experience (5)							
Element : H. Training (3)							

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Adequate Information

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

(1) **Implement sections 1, 4, 8, 9, 11.1, and 11.3 of API RP 1165** (incorporated by reference, see § 192.7) whenever a SCADA system is added, expanded or replaced, unless the operator demonstrates that certain provisions of sections 1, 4, 8, 9, 11.1, and 11.3 of API RP 1165 are not practical for the SCADA system used;

(2) **Conduct a point-to-point verification** between SCADA displays and related field equipment when field equipment is added or moved and when other changes that affect pipeline safety are made to field equipment or SCADA displays;

(3) **Test and verify an internal communication plan to provide adequate means for manual operation** of the pipeline safely, at least once each calendar year, but at intervals not to exceed 15 months;

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

(5) Establish and **implement procedures for when a different controller assumes responsibility**, including the content of information to be exchanged.

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SCADA Graphics – Add, Expand, Replace

- **New** pipeline systems migrated onto the existing SCADA platform will be integrated into the graphics scheme of the existing console receiving the new asset
- **New** SCADA system added as a stand-alone console, then the added graphics would be modified for compliance with specified sections of API 1165
- **Extension** of the current SCADA system to an existing console to support new operations would not necessitate the application of API 1165 for sake of maintaining consistency
- **Moving** individual pipeline systems across consoles will not require re-design to meet the full recommendations of API1165, but will require display modification to be consistent with the console receiving the displays
- When the existing SCADA system is **replaced**, the SCADA displays will be designed to implement the specified recommendations of API 1165, to the extent as technically achievable by the functionality of the new SCADA system.
- **Upgrade** of the current SCADA system that does not require the redesign of the current SCADA displays, such as upgrades to hardware components or targeted software applications will not require the implementation of the full recommendations in API 1165.

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CPL's Definition of 'Safety-Related'

Safety Related Devices (analog or discrete)	Safety Related Alarms
	PLM Threshold / Leak Detection Alarm
Relief Valve	Relief Alarm / Flow to Flare
Over Pressure Device	Shutdown / Lockout (top level)
Tank Level Device	Tank / Sump Level Alarms
Hazardous Gas Detector	Hazardous Gas Alarms
	Safety/Environmental Alarms identified in AOA as major or severe consequence

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Alarm Severity Determination – Impact Matrix

MTR Class	No Consequence	Minor / Moderate	Major	Severe
Personnel (Safety)	No Injury	First aid or slight health effect. No disability or lost time recordable.	Lost time recordable or reversible health effect. No disability.	Lost time, permanent disability, severe injury, or loss of life.
Public or Environmental	No Effect	Minimal exposure. Release does not cross fence line. Source eliminated. Negligible financial consequences.	Visible/indicated flaring event. Public exposed to hazards. Medical aid or damage claims. Environmental contamination causing non-permanent damage.	Uncontained release of materials with major environmental and 3rd party impact. Public exposed to life threatening hazards, disruption of services, property damage. Extensive clean up.
Repair Cost and/or Downtime	No Loss	< $10k or ~1 hour lost production	$10k-$100k or ~½ day lost production	Cost > $100k or ~1 day lost production

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SCADA Redundancy and Backup Testing

- **6-week Mode Switches**
  - Functional testing of the Strategic Backup Site (SBS) approximately every six weeks
  - Switch from the primary facility to the backup control center, operate for at least an hour, then switch back to primary site
  - Controller operates as normal, thereby verifying communications, execution of commands to field devices, acknowledgement of alarms, logging of events, etc.
- **Annual Business Continuity Plan (BCP) Testing for SBS**
  - Manned occupation of the SBS performed at least once every calendar year, usually covering a full 12 hour shift
  - Entire emergency plan is executed (including travel, logistics, communications, and testing of all critical business applications)
  - Evidence of backup test documented in SAP-PM
- **Lessons Learned**
  - Review lessons learned after each test, with action plans developed to address any outstanding issues and reviewed in the next pre-planning meeting

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Measurement & Verification

- **Leading Measures**
  - Improved Leak Detection measured via Pipeline Controller response time in detecting and taking corrective action on PLM and deviation alarm occurrences.
  - Improved Pipeline Controller competency measured via competency assessments
  - Number of Pipeline Controller Qualifications completed within 6 training months
  - Number of Lessons Learned shared in Training Sessions
- **Lagging Measures**
  - Number of CRMP compliance related violations/citations
  - Pipeline Controller training requirement compliance
  - Control Center response to leak indication within 130%
  - Number of incidents investigated with a root cause identified as lack of Pipeline Controller training
- **Verification**
  - The process owner annually verifies that each Pipeline Controller meets program requirements and reports results to Pipeline Leadership Team
  - The process owner annually verifies the number of CRMP compliance related violations/citations to determine if any were issued due to program deficiencies.

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Annual Reviews

- Element Leads initiate annual review of documents and processes
- Assemble multi-discipline team
  - Element Lead/Program Manager
  - Subject Matter Experts
  - CRMP Manager
  - Control Center Manager
  - Sr VP Asset Management
- Results are documented in SAP-PM
- Formal record filed as part of annual corporate compliance documentation
- Use PHMSA Inspection Questions to self-audit
- Evaluate leading/lagging measures

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Lessons Learned

- Self-audit against the PHMSA Inspection Checklist (paste links to company processes for quick reference)
- All hyperlinks imbedded within procedures should work correctly
- Electronic documents should be backed up and available in event of emergency, or alternatively provide hard-copies clearly marked with latest revision date
- Include exact language “not to exceed 15 months”
- Clearly document criteria used for control room determination
- Clearly define and differentiate between safety-related point and safety-related alarm
- Document where you will document what your process documents you are going to do...
- Document what you are going to do
- Do what your process documents you’re going to do!

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Q & A

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