

San Diego Gas & Electric**ADVISORY MEMO****Safety Management System (SMS) Program Assessment**

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To: Michael Schneider, VP Risk Management & Chief Compliance Officer, Elizabeth Peters, SMS Manager
Copy: Kevin Geraghty, SVP Electric Operations
From: Chad Slipakoff, Manager Audit Services
Subject: Safety Management System Program Assessment Advisory Report

At management's request, Audit Services performed an advisory review of the San Diego Gas & Electric's (SDG&E) Safety Management System (SMS). The scope was limited to the review of SMS governance framework and certain processes described throughout this document with a primary objective to support a successful launch, including areas where investments maybe necessary to ensure enduring success of the program, such as technology implementation.

SMS Background

SDG&E has promoted safety as a core value for a long time and "safety first" is engrained in its strong compliance culture, starting at the executive level to the frontline. In 2020, SDG&E became one of the first utilities to adopt a SMS for both its gas and electric operations. SDG&E's SMS aligns with the tenets of American Petroleum Institute Recommended Practice (API RP) 1173 but is also adapted to include electric-related tenets, such as wildfire-specific risk mitigation initiatives, to better represent its risk profile. An electric-equivalent standard to API 1173 does not exist, so SDG&E is innovative in this approach.

SDG&E is in the initial stages of implementing its enterprise-wide SMS program and underlying processes. SDG&E's SMS establishes a systematic enterprise-wide framework and cohesive system to manage and reduce risk and promote continuous improvement in safety performance through deliberate, routine, and intentional processes. The SMS encompasses SDG&E's safety initiatives, programs, processes, and committees and, in doing so, enhances them by providing additional oversight, awareness and collaboration by connecting them at the enterprise level. SDG&E is in the process of raising SMS awareness and adoption among its employees and contractors and enhancing safety incident visibility and safety performance metrics reporting. As part of the implementation, SDG&E wanted further insights into the program's overall governance as well as the top "priority" safety processes and plans (appendix D).

Advisory Review Scope and Objectives

Audit Services engaged PwC to support the evaluation of the SMS processes and governance documentation prior to the planned roll-out in 2022, which included a review of other underlying programs, structure, processes, performance metrics, and factors against industry standards and leading external practices from multiple relevant industries. The major categories assessed were as follows:

- Process documentation completeness and simplicity to implement, including but not limited to the SMS Governance Plan, Guide, and priority safety processes
- Coordination with other functions (e.g., asset management, operations, and risk) for successful implementation
- Staffing, resources and support critical to successful and enduring implementation of the SMS
- Safety performance metrics, key performance indicators, dashboards, and drill downs
- Technology, data management governance, and Safety Critical Asset approach (links closely to Asset master data management/governance)
- Enterprise and Operational Unit Risk Register (OURR) Management integration into the SMS processes
- Risk Based Process Safety approach and practices

Summary of Observations

This review is consultative in nature, as such observations and recommendations noted herein and summarized below are primarily considered continuous improvement opportunities. **Overall, the established SMS governance framework, SMS guide, safety processes, and SMS program structure is well designed and, coupled with a technology implementation and funding plan, well positioned for a successful launch of the SMS Program.** Refer to APPENDIX A for detailed observations and recommendations.

- 1) Accelerating a technology implementation plan, and adding resources focused on SMS implementation and future monitoring activities, coupled with cross-functional integration should be considered to promote successful SMS program implementation and continuous improvement
- 2) Opportunities exist to enhance Key Performance Indicators (KPIs), metrics, and dashboards and align data management capabilities by leveraging existing asset integrity management programs to drive continuous improvement
- 3) Consider adopting a “common language” for SMS risk management and establish a formal SMS operational control activity program supported by technology
- 4) Establish a training program for incident investigation/analysis based on risk ranking that drives corrective/preventive actions
- 5) Develop a holistic program assessment project plan and schedule with resource loadings to track commitments and availability

Audit Services appreciates the opportunity to provide this service and thanks the SMS Organization, Risk Management, and Operational groups for their participation, input, and support throughout the review.

Advisory Clients:

SMS Organization

Risk Management

SDG&E Operations

Audit Services:

Kate Collier (VP, Audit Services)

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APPENDIX A: Detailed Observations & Recommendations

#	Observation	Recommendation(s) and Potential Improvement Opportunities
1) Accelerating a technology implementation plan, and adding resources focused on SMS implementation and future monitoring activities, coupled with cross-functional integration should be considered to promote successful SMS program implementation and continuous improvement		
1a)	<p>While the foundational documents are strong, components of the SMS program are manual, and technology is not fully utilized to support workflow, monitoring and reporting across the SMS program.</p> <p>Critical SMS processes may become manually intensive and are not likely sustainable with existing processes. For example, supervisors are asked to track reported safety concerns, manually in an MS Excel spreadsheet. Further automating processes will eliminate administrative burden and decrease risk of errors associated with workflow, data, monitoring and reporting.</p>	<p>Identify critical and necessary technology resources, with funding, to support improved program efficiencies and effective implementation including, process automation, lessons learned repository, smart phone portal to communicate to/from employees, and development of dashboards. Opportunities exist to prioritize technology and develop an implementation plan with milestones and KPIs to monitor the rollout plan.</p> <p>Opportunities exist to expand the near-miss mobile app as a single-entry source for safety related employee and contractor communications, including stop-the-job notification, hazard reporting, and security and safety incidents. Integrating drop-down capabilities could transform real-time automation capabilities for incident triage, routing, and reporting.</p>
1b)	<p>The current SMS decentralized organizational structure and program resource strategy could be augmented by implementing cross-functional staffing strategy inclusive of succession planning.</p> <p>A significant focus on implementation activities, process and monitoring controls is currently underway. Successful implementation will be contingent upon ensuring adequate resources are in place. Managing staffing and resources is not just part of the SMS core team (two FTEs), but also those key roles throughout the organization that are foundational to the overall SMS program effort.</p>	<p>Continue to evaluate SMS resources through additional headcount coupled with technology enhancements to enable continued successful program sustainability. Given the decentralized SMS organizational structure, strong operational and leadership engagement (i.e., regular involvement and highly visible), a sufficiently staffed core SMS program team is key to successfully implementing the SMS processes in 2022 and beyond.</p> <p>Consider developing a robust staffing strategy inclusive of succession planning for key roles throughout the organization. Robust contingency planning for "SMS Champion" roles as identified in the SMS Governance Plan is key for the program to endure organizational change.</p>
1c)	<p>The SMS program could be further integrated with support functions, including Finance and Human Resources as well as further integration with emergency response drills and exercises.</p> <p>Opportunities exist to strengthen ties with other critical functions by implementing SMS metrics and participating in emergency response events and activities that are closely tied to these functions.</p>	<p>Consider further integrating the SMS with Finance and Human Resources, which will allow for visibility into metrics associated with staffing, budgeting, spend and succession planning.</p> <p>Additionally, integrating closely with emergency response as part of the SMS drills and exercises will build stronger linkage, continuous improvement, and more cohesion between critical functions.</p>
2) Opportunities exist to enhance Key Performance Indicators (KPIs), metrics, and dashboards and align data management capabilities by leveraging existing asset integrity management programs to drive continuous improvement		
2a)	<p>An SMS safety data governance and data quality program tied to the asset integrity management (AIM) master data governance program could be further leveraged.</p> <p>Asset management has a foundational data governance framework that can be leveraged with the right</p>	<p>Consider further development and integration of a safety data governance and data quality program linked to the asset integrity management master data governance program. A strong data foundation will further drive the risk-based decision making and reliable metrics for continuous</p>

	competency available to the SMS program. This is critical to define data quality and ensure ISO8000 and ISO9000 intent is met, and foundational decision making is based on "good" data.	improvement. Leading SMS programs use a tiered ranking systems that include safety critical assets for continuous monitoring and preventive maintenance. As an example, master data set focused on assets can be utilized by Safety to identify if equipment is not maintained and when assets are aging to potentially prevent incidents.
2b)	<p>The SMS Quality Management Plan currently has over 160 individually identified metrics/KPIs, which are designed to measure effectiveness of each tenet of the SMS but may be unsustainable without an automated system to support workflow, monitor and report across the SMS program.</p> <p>The 2022 Safety Management Action Plan identifies 17 KPIs (APPENDIX C) that are a reasonable starting point. Additional opportunities exist to refine metrics from conditional or 'status' items to metrics that are well-defined measured indicators to help make informed decisions and track performance.</p>	<p>Consider defining possible KPIs and metrics with dashboards and drill downs capabilities by leveraging the AIM, safety and other data sources. We recommend considering integration of the foundational SMS KPIs and metrics (APPENDIX B) that focus on leading indicators.</p> <p>Continue evolving towards achieving metrics available at the department and employee-level with appropriate roles impacting the safety of the organization. Front-line metrics that measure core aspects of the operation and how safety is performing before issues manifest is common among leading SMS programs and needed as part of the maturing SMS effort.</p>
3) Consider adopting a "common language" for SMS risk management and establish a formal SMS operational control activity program supported by technology		
3a)	<p>A formal SMS control activity program inclusive of control owners, activity tracking, and validation requirements could be further developed.</p> <p>Significant effort and investment to update Operating Unit Risk Registers (OURRs) and aligning with the Enterprise Risk Registers (ERRs) has been a focus in 2021. Identification of control owners is foundational to an "auditable" system as well as meaningful metrics and KPI monitoring with dashboards and visibility into the control "monitoring" through data and analytics for continuous improvement.</p>	<p>Consider expanding OURRs beyond risk/risk owners to controls/controls owners to further drive adoptions and sustainability of SMS performance improvement.</p> <p>Expansion of OURRs to include controls in place in addition to anticipated mitigations further supports tracking of safety related control activities, including preventative maintenance, inspections, training, etc. A control is existing action taken or a system or process in place that contributes to the reduction of inherent risk to an acceptable residual risk.</p> <p>Sustainable SMS programs leverage risk registers enabled by technology that are built upon a control assessment framework focused on operational control activities that are monitored through workflow and dashboard reporting with drilldown capabilities at the business / asset / equipment level. Metrics and trends allow control owner supervisors to provide meaningful feedback on performance.</p>
3b)	<p>A "common language" of risk could be adopted for the SMS program. Leading SMS programs have a foundational framework and approach to risk that is adopted as a "common language" where terms and terminology (as well as definitions and meanings) are understood throughout the organization, referred to as "from the boardroom to the shop floor."</p>	<p>Consider adopting a "common language" of risk to implement risk terms and definitions consistent with it as part of the OURL and SMS efforts. The SMS function could have a significant role in the development, which includes terminology for specific risk and control terms and phrases. This is useful in establishing data consistency and improved drill downs and dashboards.</p>
4) Establish a training program for incident investigation/analysis based on risk ranking that drives corrective/preventive actions		
4)	<p>A training program for incident investigation/analysis that is formally based on risk ranking and driving a</p>	<p>Establish a clearly defined training program for incident investigation/analysis and subsequent corrective and</p>

	<p>subsequent corrective and preventive action (CAPA) program could improve consistency companywide.</p> <p>SDG&E has implemented robust efforts on the SIF program and Asset Management has a form of causal factor analysis, which are very strong foundational pieces that need to be woven together and evolved into a program that is supportive of standardized CAPA program.</p>	<p>preventive action (CAPA) program throughout the company. This could include a well-developed form to be completed, or a standard technique (bow-tie analysis, 5-why's, TapRoot) as appropriate that is consistently applied across the organization. The SIF program includes training and analysis, which could be broadened into other process safety investigation areas. Organizations have used multiple techniques depending on the heightened awareness of the issue but having trained teams and stable methodology are key to drive consistency in the CAPA process.</p>
5) Develop a holistic program assessment project plan and schedule with resource loadings to track commitments and availability		
5)	<p>A holistic assessment project plan and schedule including integration with the two lines of defense and third-party inspections could facilitate additional Safety oversight.</p>	<p>Consider building out an assessment project plan and schedule with resource loadings inclusive of internal and external reviews to provide a holistic view of the program.</p> <p>Development of a project plan to understand commitment by those resources performing internal and external assessments including FERC, NERC, Cal OSHA, PUC and other "regulatory visits" provides a critical view for the organization. Leading organizations use a tracking mechanism to gauge and understand commitments and availability to the effort as necessary and appropriate. As the company continues to evolve the SMS program, it could consider an assessment against the Chemical Process Safety (CCPS) risk-based process safety (RBPS) as supplemental guidance for a widely used process safety framework.</p>

APPENDIX B: Recommended Foundational SMS KPIs and Metrics (60)

Leadership and Communication	
Frequency with which upper management visits the facility /assets	Percentage of meetings that address SMS and include upper management
Percentage of managers and supervisors who are trained on and reinforce a safety culture	Frequency and emphasis of SMS topics in management communications
Training	
Percentage of workers trained on their SMS responsibilities	Number of subject matter experts providing training
Comparison of expenditures to budget for activities SMS training	Number of exceptions to training requirements
Percentage of directors trained on their SMS responsibilities	Percentage change in the training budget
Oversight and Responsibility	
Number of annual drills and exercises with SMS involvement	Number of succession plans in place for executive and leadership
Number of identified safety critical roles vs. plan	Number of SMS Champions vs. plan
Number of succession plans in place for safety critical roles	
Policies and Procedures	
Number of procedures updated annually	Number of SMS procedures in implementation
Staff hours spent developing, reviewing and approving procedures	Number of SMS procedures fully implemented
Critical Asset Management	
Number of identified safety critical assets	Safety critical assets with continuous monitoring being performed
O&M spend on safety critical assets	Safety critical assets with defined inspection, testing, and preventive maintenance (ITPM) program identified
Capital spend on safety critical assets	Safety critical assets with defined ITPM program implemented
Internal Controls	
Number key safety controls identified	Key safety controls with the ability to test and measure design and operating robustness
Key safety controls with the ability to test and measure design and operating effectiveness	Number of new key safety controls identified in the past year
Key safety controls with the ability to test and measure design and operating efficiency	
Change Management	
Number of Management of Changes (MOC) performed/initiated each month	The percentage of personnel involved in the MOC process who believe the process is effective
The monthly average of action request identified as a change	The average backlog of active MOCs
The number of changes processed on an emergency basis	
Assessment and Auditing	
Number of SMS assessment and audit findings	Percentage of SMS assessment and audits having few significant findings
Percentage of SMS assessments completed per a defined schedule	Number of SMS audits conducted by each team member
Incident Management	
Number of hazard identification, risk analyses that are completed	Actual and potential losses from an incident

Number of qualified hazard identification, risk analysis leaders and participants	Asset/Facility performance
Hazard identification, risk analysis resource demands and team efficiency	Number of trained / qualified investigation leaders
Incidents percentage with training and performance root causes	Number of corrective actions identified, implemented successfully
Repeat incident causes	Number of preventive actions identified, implemented successfully
Continuous Improvement	
Number of identified SMS improvement efforts for the year	Technology spend to support SMS data management
Resources and investment related to SMS effort	Technology spend for SMS
Resource and Performance Management	
Percentage of employees receiving rewards or corrections related to fulfilment of SMS responsibilities	Number of qualified personnel in their defined SMS role
Addressing SMS goals in performance plans for managers and staff	SMS Capital budget (planned to actual)
Frequency of waivers of qualification requirements	SMS Operational and Maintenance budget (planned to actual)
Percentage of contractors considered for future work	

APPENDIX C: 2022 Safety Management Action Plan KPIs (17)

1. Number of targeted Safety in Motion training sessions performed	2. Number of additional Safety in Motion trainers identified and onboarded
3. Number of employees surveyed for feedback regarding SMS implementation	4. Number of Near Miss Reports submitted
5. Number of follow-up communications demonstrating safety improvements from submitted Near Miss Reports	6. Number of "Stop the Job" incidents reported and/or reviewed at ESS/GSS
7. Number of safety observations performed (field and office)	8. Number of Class 1 Contactor targeted safety inspections performed (based on risk)
9. Number of Class 1 Contractor targeted safety observations performed (based on risk)	10. Number of After-Action Review Reports prepared following emergency incidents
11. Number of field districts/locations where SMS process implemented	12. OSHA/LTI/DART/CMVI recordable (all)
13. OSHA recordable (strain and sprain incidents only)	14. Contractor safety rate
15. Excessive Speed Alerts (Speeding over Posted 10 mph 2 minutes/1000 miles.)	16. Significant Injury Fatality (SIF)-potential exposures identified (EEI model)
17. SIF-potential CMVI exposures identified	

APPENDIX D: 2022 Priority SMS Safety Processes and Plans (19)

1. Process to Share Safety Performance with External Stakeholders in Proximity to Equipment	2. Process for Continuous Safety Improvement
3. Process for Employees and Contractors to Raise Risk and Safety Concerns	4. Process to Review Leading Indicators
5. Process to Review Operational Performance and the Impact on Safety	6. Process for Regular Review of the Safety Management System
7. Process to review employee and contractor safety programs to measure their effectiveness for continuous improvement	8. Process for Management of Safety Management System Documents

9. Process for Management of Change for Safe Continuation of Operations	10. Process to Identify and Manage External Stakeholders as Effective Safety Partners
11. Process to Utilize Incident Evaluation Findings and Lessons Learned	12. Process for Conducting Regular Assessments of The Conditions of The Operating Systems
13. Process to Communicate the Importance of the Safety Management System	14. Process to Identify Necessary Maintenance and Testing Procedures for Safety-Critical Assets
15. Process to Establish and Maintain Safety-Related Reporting and Feedback	16. Process for Monitoring Data and Information Received from Reporting and Feedback Systems
17. Quality Management Plan	18. Process to Consistently Manage and Assess the Effectiveness of Safety Training and Awareness Programs
19. Employee Safety Incident Notification Process	