Enterprise Contractor SIF Cause Evaluation Standard

SUMMARY

This standard sets forth the commitment to protect the health and safety of our coworkers, contractors, and hometowns and foster a proactive and engaging organizational safety culture and safety mindset.

This standard describes the requirements, roles, and responsibilities covering the Cause Evaluation process as it applies to Serious Injury or Fatality (SIF)-level incidents involving Contractors/Prime Contractors and Subcontractors documented in the PG&E Corrective Action Program (CAP) and conducted concurrent with PG&E Corporation (Corporation) and its controlled subsidiaries, including Pacific Gas and Electric Company (Utility) (together, PG&E). If PG&E determines that PG&E should conduct the investigation then PG&E's GOV-6102S, "Enterprise Cause Evaluation Standard" must apply.

This standard also guides Contractors/Prime and Subcontractors to pertinent PG&E guidance documents – standards and procedures – that govern the cause evaluation process. Other references to industry-recognized textbooks, templates, training materials, service providers, organizations, accreditation, certification, job aids and websites are provided.

The purpose of PG&E's Cause Evaluation process is to perform cause evaluations on work-related safety issues to:

- Promptly identify causes of performance gaps
- Reduce and eliminate the likelihood for recurrence of serious safety incidents

TARGET AUDIENCE

PG&E Contractors/Prime Contractors and Subcontractor(s), involved in conducting, writing, reviewing, approving, managing, and documenting contractor involved PG&E cause evaluations as well as the other guidance documents covered by this standard. PG&E personnel responsible for contractor onboarding, field safety oversight, and/or incident management.

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REQUIREMENTS

1 Objective

1.1 The objective of this standard is to establish a framework governing the identification, timing, delivery, and documentation of Cause Evaluations relating to Contractor/Prime and Subcontractor safety related incidents to eliminate, prevent or minimize the probability of recurrence of incidents, and to apply continuous improvement measures.

NOTE

The California Public Utilities Commission (CPUC) or its Safety and Enforcement Division (SED) may direct PG&E to undertake any level of cause evaluation for any incident.

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2 Applicability

2.1 This standard is applicable to all cause evaluations including Root Cause Evaluations (RCE), Apparent Cause Evaluations (ACE) and After Action Reviews (AARs) such as Work Group Evaluations (WGE) for Contractors/Prime and Subcontractors involved in incidents classified as Serious Injury or Fatality Actual or Potential, (SIF-A), (SIF-P) level incidents as defined by the Edison Electric Institute (EEI) Safety Classification & Learning Model (SCL).

1. See Power to Prevent SIF | (eei.org).

2.2 Contractors/Prime and Subcontractor(s) are responsible for conducting the appropriate level cause evaluations on their PG&E work-related incidents, per guidance provided in this standard, PG&E's SAFE-3001S, "Enterprise Contractor Safety Management Standard," and per the contractor's own standards and procedures.

2.3 Contractors/Prime and Subcontractor(s) involved may conduct cause evaluations jointly unless PG&E requires that the Contractor/Prime and Subcontractor(s) perform separate cause evaluations.

3 Timeliness

3.1 Once the incident has been categorized as a SIF-A or SIF-P, the Contractor/Prime and Subcontractor(s) will have 30 calendar days to complete the cause evaluation.

1. The due date for the Contractor/Prime and Subcontractor(s) RCE and ACE will be automatically generated in PG&E's CAP system.

    a. The RCE or ACE due dates will be communicated to the Contractor/Prime and Subcontractor(s) by the PG&E Partner.

    b. AAR/WGE due dates will have independent due dates assigned.

2. Due date extension requests for Contractor/Prime and Subcontractor(s) RCE and ACE must be submitted to the PG&E Partner and approved by PG&E's Contractor Specific CARB.

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4 Process Overview

4.1 Reporting Incidents

1. Contractors/Primes and Subcontractors have the responsibility to notify PG&E of all safety incidents per SAFE-3001S, “Enterprise Contractor Safety Management Standard.”

4.2 Classifying Incidents as SIF-A, SIF-P and Non-SIF

1. Once a contractor submits notification of an incident to the appropriate PG&E FA EH&S team, the PG&E EH&S team must then determine if the incident has the potential to be classified as a Serious Injury or Fatality SIF-A, SIF-P-level incident. FA EH&S teams use the High-Energy incident (HEI) threshold criteria to determine if an incident must be submitted for a PG&E FA SIF Review Team (SRT) review:

    a. See Power to Prevent SIF | (eei.org).

    b. See Definitions.

2. If PG&E’s SRT determines the incident

    a. Does not have SIF capacity, and does not require an RCE or ACE, the PG&E FA Corrective Action Program (CAP) Review Teams (CRTs) will determine how the incident must be addressed.

    b. Does have SIF capacity, the SRT will share the SIF classification with the PG&E EH&S team who must ensure the incident investigation is properly addressed and either the RCE or ACE cause evaluation type is selected in CAP.

3. Escalation and De-escalation of Cause Evaluation Designations:

    a. Cause evaluation type can also be designated by PG&Es FA CRTs and can be escalated to a more rigorous cause evaluation type if the Sponsor, Issue Owner, or Corrective Action Review Board (CARB) determines there is a need for additional rigor.

    b. Cause evaluation type can be de-escalated to a less rigorous cause evaluation type with the approval of the issue Sponsor, CARB Chairperson and Enterprise Corrective Action Program (ECAP) Director.

4.3 Types of Evaluations

1. Root Cause Evaluation (RCE)

   a. A formal and rigorous investigation that uses industry accepted analysis methods to determine the root cause(s) of a problem.

   b. Identifies Corrective Actions to Preclude Recurrence (CAPRs) to prevent the problem from recurring because of a same or similar root cause/failure mechanism by implementing changes and/or controls.

2. Apparent Cause Evaluation (ACE)

   a. An evaluation based on data and information pertinent to the evaluation that provides reasonable assurance that the cause of a problem is determined and will be corrected.

   b. Identifies corrective actions (CAs) to reduce the likelihood of an identified problem and resolve a finding or issue by implementing changes and/or controls.

3. WGE

   a. Default evaluation type for all submitted CAPs. WGEs are the appropriate evaluation type for:

      (1) SIF-P issues that do not meet RCE or ACE criteria.

      (2) Non-SIF safety issues deemed important by PG&E.

      (3) Can be used for After Action Reviews (AARs)

4.4 Cause Evaluation Requirements for Contractor Involved SIF-A or SIF-P Designated Incidents

1. For SIF-A incidents involving Contractor/Prime and Subcontractor(s),

   - Both the prime contractor and subcontractor(s), (if there is a subcontractor[s] involved) will conduct a RCE (unless deemed to be conducted jointly per Step 2.3 of this standard)

   - PG&E will conduct an ACE to evaluate PG&E's prime contractor selection process, onboarding management and any involved asset management gaps.

   - The prime contractor will conduct an ACE to evaluate their subcontractor selection process, onboarding management and any involved asset management gaps.

4.4 (continued)

2. For SIF-P incidents involving Contractor/Prime and Subcontractor(s)

   - both the prime contractor and subcontractor(s), (if there is a subcontractor[s] involved) will conduct an ACE (unless deemed to be conducted jointly per Step 2.3 of this standard)

   - PG&E will conduct an After Action Review (AAR), such as a WGE, to evaluate PG&E's prime contractor selection process, onboarding management and any involved asset management gaps.

   - The prime contractor will conduct an AAR, such as a WGE, to evaluate their subcontractor selection process, onboarding management and any involved asset management gaps.

3. Upon successful classification of a SIF incident by the Functional Area (FA) SIF Review Team (SRT), the PG&E FA Enterprise Health and Safety (EH&S) team will share the final cause evaluation classification type and description of the incident with the PG&E Legal team.

4.5 Key Elements of RCEs and ACEs Reports

1. Executive Summary

   a. A brief one to three page succinct description of the incident summary followed by containment actions taken, interim actions in place, causes and proposed corrective actions

   b. The executive summary may contain brief summaries of other elements below. only as necessary.

2. Type of High Energy Present (Hazard Identification Wheel)

3. Essential Controls in Place, Missing or Disabled.

4. A Problem Statement with a description of the following:

   a. Object/Defect

      (1) Object: The item (person, place or thing) that is affected.

      (2) Defect: The expected or require standard of performance (gap, equipment malfunction, human failing, programmatic deficiency, system flaw or organizational weakness).

      (3) Consequence: The immediate pain resulting from the defect.

4.5.4.a (continued)

(4) Significance: The potential future pain if the defect of the condition to remain uncorrected.

OR

b. Standard/Deviation

(1) Standard: A procedure step, policy, rule or other written guidance. that provides guidance and instruction for performing the task.

(2) Deviation: Description of the event that strayed or contradicted the standard. c. Consequence of defect or deviation – immediate consequences.

(3) Consequence: The immediate pain resulting from the deviation.

(4) Significance: The potential future pain if the deviation from the standard remained uncorrected.

5. Containment and Interim Actions Taken

a. Containment Actions provide details about what was done immediately on-site to make the situation safe and prevent recurrence.

b. All reasonable efforts should be made to ensure the site or equipment being used is secured to prevent additional incidents from occurring either on-site or elsewhere in the system. See Definitions (below) for additional discussion about good Containment Actions and what is unacceptable.

c. Interim Actions necessary until CAPRs and CAs are implemented.

6. Extent of Condition (EOC)

a. The process of using the object and defect or standard and deviation from the problem statement to determine EOC factor(s) and whether the actual condition affects the Contractor/Prime or Subcontractor(s)' other programs, processes, equipment and human performance.

b. When an EOC for a same or similar situation is identified for Contractor Prime or Subcontractor(s) within their organization(s), they are expected to address their plan to remedy the EOC in their RCE or ACE report.

c. PG&E will assess EOC potential during their concurrent ACE or AAR/WGE.

4.5 (continued)

7. Causal Analysis

   a. The cause evaluations process requires the use various analysis methods and tools to identify the underlying causes that led to an incident.

   b. Acceptable analysis methods and tools to be used are at the contractor's discretion or at the direction of California Public Utilities Commission (CPUC) or CPUC's Safety and Enforcement Division's (SED) direction.

   c. Requirements for each type are summarized in Appendix A, Cause Evaluation General Requirements by CE Type, Including EFFR and Appendix B, Cause Evaluation References and Resources for Contractors, as well as the DEFINITIONS section.

8. Event Description

   a. A detailed, logical and chronologically written description of the incident including:

      (1) Images of the incident scene.

      (2) Images of key blueprints, diagrams, standards and procedure sections, manufactures operating manuals, hazard stickers and cautions, police reports, hazardous material warnings, sections of job safety and job hazard analysis, work orders, and other job planning and job scope information.

      (3) If appropriate, include a site map that includes approximate locations of personnel, equipment, vehicles, public access, infrastructure (ex. Gas lines, electric conductors, poles).

      (4) A summary of conclusions reached.

9. Operating Experience – Internal and External

   a. The process of reviewing all relevant internal operating experience (OE) of the contractor/prime and subcontractor(s) involved past events that are same or similar to the problem under investigation.

4.5.9 (continued)

b. Operating experience is most effective when previous similar evaluations performed in the past 3 years are queried to gain insight for past causes and corrective actions.

(1) To gain helpful insight for the identification of causes and corrective actions for the current issue.

(2) Determine whether previous RCEs, ACEs or Contractor Prime/Subcontractor cause evaluations failed to identify the current issue.

(3) Identify trending data.

(4) Review improvement or oversight process, e.g. management observations, assessments or internal audits which may be relevant to the issue being evaluated to determine if they should have identified the issue sooner.

c. The process of reviewing external operating experience (OE) that are same or similar to the problem under investigation.

(1) Industry recognized partners.

(2) Industry recognized sources such as NERC, FERC, CPUC, NTSB.

(3) Vendor bulletins and notices (tools and equipment).

10. Causes and Corrective Actions Detail

a. Causes must have a logical correlation to problem being solved the analysis tools and methods used.

(1) Must focus on what occurred and what failed, (not who failed), or human error.

(2) Must identify what essential controls failed, were disabled or were missing.

(3) Correcting the cause will eliminate or greatly reduce a repeat event.

(4) Will be assigned a NERC cause code when entered into PG&Es CAP by a PG&E partner.

4.5.10 (continued)

b. Corrective Actions must be related to a specific Cause (Root, Apparent or Contributing, to ensure they are appropriate and address each Cause. One Cause may have multiple Corrective Actions but must never have less than one Corrective Action. Each Corrective Action must have several elements:

(1) Must be SMART - Specific, Measurable, Achievable, Relevant and Timely (time bound).

(2) Must be assigned to a specific person (CAPR or CA owner).

(3) Must include a due date.

(4) Must prioritize direct controls at the highest level possible such as elimination, substitution, engineering controls, over administrative and PPE controls

(5) It is strongly suggested that a table or matrix is used to display this information.

11. Extent of Cause (EOCa) – Required for RCEs Only

a. The process of using the object and object/defect or standard/deviation from the problem statement and cause statements to determine EOC factor(s) and whether the actual causes could potentially affect the Contractor/Prime or Subcontractor(s)' other programs, processes, equipment and human performance.

b. When an EOCa for a same or similar situation is identified for Contractor Prime or Subcontractor(s) within their organization, they are expected to address their plan to remedy the EOCa in their RCE or ACE report.

c. PG&E will assess EOCa potential during their concurrent ACE or AAR/WGE.

12. Effectiveness Review Plans (ERPs) and Effectiveness Review Report (EFFR)

a. ERPs and EFFRs must be done to industry standards and reviewed and approved by a PG&E contractor specific Corrective Action Review Board (CARB).

4.5.12 (continued)

b. Effectiveness Review Plans

(1) ERPs describe the methods, attributes, success criteria, timeliness (a best practice would be using the MAST method) to be used to determine whether the CAPRs and CAs were effective and have or have not eliminated the problem and causes of the problem.

- Verification and validation are examples of effectiveness checks.

(2) ERPs are a required element of an RCE or ACE report and are approved during the RCE/ACE report approval process.

- Voting is concur, concur with comments and do not concur.

c. Effectiveness Review Report

(1) EFFRs must be completed within the time specified in the Effectiveness Review Plan (ERP). Typically this is 6 months after the completion and implementation of the last CAPR or CA.

(2) Effectiveness is not obtained by verifying CAPRs and CAs have been completed or there is no recurrence of the cause.

(3) Effectiveness has been achieved when the success criteria outlined in the ERP is met.

(4) Effectiveness at this time is measured mostly through observations based on a defined set of criteria or attributes.

(5) EFFRs require CARB for review approval.

- Voting is concur, concur with comments and do not concur.

4.5 (continued)

13. List of Attachments identifying documents to be uploaded to CAP.
    a. Examples:
        - Initial and Final Communications
        - RCE charter
        - Evidence of approval signatures, including date of approval and report revision
        - Final RCE or ACE report with all key elements
        - Photos and other evidence documents
14. Appendices
    a. Examples:
        - Analysis Tool Worksheets
        - Interview Process and Summary Worksheet
15. Cause Evaluation Team and Credentials
    a. List of the Contractor/Prime and Subcontractor(s), cause evaluation Sponsor/Approver(s), and subject matter expert (SME) participants.
    b. Name(s) of the shop steward included for RCEs/ACEs involving represented employee.

5 Training Requirements

5.1 Contractors may use independent party experts cause evaluators provided by a number of credentialed providers listed in Appendix B, Cause Evaluation References and Resources for Contractors.

6 Communications

6.1 Final Communications

1. Contractors will be required to provide a Final Communication with the causes, CAPRs and CAs.

    a. Work with PG&E FA EH&S teams to prepare a Safety Flash, Advisory, or Awareness as appropriate. This document will be shared PG&E enterprise-wide, both internally and externally to PG&E contractors/subcontractors, to ensure all parties are aware of the incident and what the lessons learned were to prevent recurrence.

2. Contractors are to be available to brief PG&E leadership, FA EH&S teams, and possibly other contractors with the outcome of their cause evaluations.

7 CARB and Report Approval Processes

7.1 A contractor specific Corrective Action Review Board (CARB) comprised of PG&E Functional Area Directors and Managers/Superintendents is the governing body to review the report elements and vote accordingly:

- Concur – A logical correlation could be made from the problem statement, causes and corrective actions. The conclusions were substantiated by the analysis methods used.
- Concur with Comments – The report requires some level of editing and must be returned to CARB for approval.
- Do Not Concur – A logical correlation could not be made from the problem statement, causes and corrective actions. The conclusions reached were not substantiated by the analysis methods used.

7.2 Cause evaluation reports will not be considered for CARB until the report has been reviewed, approved and signed (wet signature or electronic), assigned a revision #, and dated by the Contractor/Prime and Subcontractor(s).

7.3 Contractor/Prime and Subcontractor and/or cognizant representative are expected to attend and present their findings to CARB.

8 Best Practices Leading to Success

8.1 Obtain approval for your problem statement from the PG&E Partner during the beginning phase of the cause evaluation.

8.2 Use two or more analysis methods and show your work.

8.3 Draw a logical correlation from the problem statement to the causes and corrective actions and the effectiveness review plan.

8.4 Develop SMART corrective actions at the highest level of control achievable (see hierarchy of control).

8.5 Conduct peer reviews throughout the process and a final review before submitting to PG&E.

8.6 Be prepared to present – contractor sponsor should demonstrate their knowledge and involvement of the work, the incident, and the cause evaluation process elements.

8.7 Involve an independent third party expert, if needed (see Appendix B, Cause Evaluation References and Resources for Contractors).

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9 Roles and Responsibilities

9.1 Refer to Table 1. Roles and Responsibilities Matrix.

Table 1. Roles and Responsibilities Matrix

Responsibility	PG&E Contractor Safety Director or Delegate	PG&E Partner and/or PG&E ACE Sponsor	PG&E Team Lead for PG&E ACE	Contractor/ Prime and/or Subcontractor(s) Sponsor of the cause evaluation	PG&E Cause Evaluator (CE)	PG&E Contractor Specific CARB Members	PG&E FA CAP Mgr.
Has oversight of PG&Es contractor cause evaluation process	X						
Assures PG&E is informed timely of Contractor/Prime and Subcontractor SIF-A and SIF-P potential incidents				X			
Assures Contractor/Prime and Subcontractor(s) safety incidents are added to PG&E's CAP system and are evaluated for SIF-A or SIF-P Potential by the appropriate PG&E FA Safety Review Team (SRT)		X					
Provides coaching to Contractor/Prime and Subcontractor(s) during the cause evaluation process AND ensures deliverables are completed with quality		X					
Provides overall leadership of the ACE evaluating contractor selection process, onboarding management and any involved asset management gaps. ACE to be done in accordance with PG&E's internal GOV-6102S, "Enterprise Cause Evaluation Standard"		X					
For Contractor SIF-P ACEs - Performs an After Action Review (WGE) of the Contractor/Primes subcontractor(s) selection process, onboarding management and any involved asset management gaps.				X			

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Responsibility	PG&E Contractor Safety Director or Delegate	PG&E Partner and/or PG&E ACE Sponsor	PG&E Team Lead for PG&E ACE	Contractor/ Prime and/or Subcontractor(s) Sponsor of the cause evaluation	PG&E Cause Evaluator (CE)	PG&E Contractor Specific CARB Members	PG&E FA CAP Mgr.
For Contractor SIF-A RCEs - Performs an After Action Review (WGE) of PG&Es Contractor/Primes selection process, onboarding management and any involved asset management gaps.		X					
Facilitates communication/knowledge sharing between Contractor RCE and PG&E ACE team.		X			X		
Performs the SIF-A RCE, SIF-P ACE or WGE, of contractor involved incident within the expectations of GOV-6103S				X			
Ensures both PG&E cause analysis or AAR/WGEs proceed in a timely manner.		X	X	X			
Secures the necessary Contractor resources to investigate and resolve the problem				X			
Responsible for drafting, completing and providing their own cause evaluation reports.				X			
Responsible for ensuring Contractor's cause evaluation process and report have met the requirements of GOV-6103S		X				X	
Provide oversight, review, and approval of all PG&E RCEs, ACEs, and EFFRs.			X			X	
Ensures the SIF Response Investigation Final Communication Protocol completed for the respective contractor and parallel PG&E cause evaluation		X	X	X			
Responsible to ensure implementation and compliance to the standard within their responsible FA.		X					

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10 Records

10.1 CAP issues and associated records must be retained by PG&E per GOV-7101S, "Enterprise Records and Information Management Standard."

10.2 PG&E CAP is the system of record for RCEs, ACEs, and WGEs.

END of Requirements

DEFINITIONS

After Action Review (AAR): A structured review, such as a WGE, or de-brief process for analyzing what happened, why it happened, and how it can be done better by the participants and those responsible for the project or event. It is a technique for improving process and execution by analyzing the intended outcome and actual outcome of an action and identifying practices to sustain, and practices to improve or initiate, and then practicing those changes at the next iteration of the action

Analysis Methods: Analysis methods and tools to identify the underlying causes that led to an incident. Examples include Human Factors Analysis and classification System (HFACS), Barrier Analysis, Comparative Timeline, Factor Tree Analysis and Fault Tree Analysis.

CAP: Corrective Action Program. Provides personnel with a process to identify, evaluate, resolve, and document issues, incidents and event. The issues are assessed for risk, evaluated, and any resulting corrective and preventive actions are tracked to completion.

Capacity: High-energy incident where an essential control was in place that provided coworker(s) the ability to recover without life-threatening, altering, or fatal injury.

Cause: A condition such as an action, error, omission, or trigger that produces an unwanted incident and explains why it occurred.

- **Root Cause:** The cause identified during a Root Cause Evaluation (RCE). If corrected, it would preclude the event from recurring.
- **Apparent Cause:** The cause identified during an Apparent Cause Evaluation (ACE). If corrected, it would reduce the likelihood of the event recurring.

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Cause Evaluation: A structured process used to determine, document, and communicate the cause or reason how and/or why an incident, issue or error occurred.

- **Apparent Cause Evaluation (ACE):** An evaluation based on data and information pertinent to the evaluation that provides reasonable assurance that the cause of a problem is determined and will be corrected.

- **Root Cause Evaluation (RCE):** A formal and rigorous investigation that uses industry-accepted analysis methods to determine the root cause(s) of a problem. The RCE identifies required corrective actions that prevent or reduce the likelihood of a recurrence of the problem for the same or similar root cause(s).

- **Work Group Evaluation (WGE):** A WGE uses the work group's judgment and experience to provide a logical account of the facts that identify the likely cause(s) that, when corrected, should minimize recurrence. A WGE is an option for completing an After Action Review.

Containment Action: Containment Actions are temporary or interim stopgap measures to prevent the recurrence or spread of a problem until the root or apparent cause can be identified and eliminated. The underlying problem is identified and eliminated through apparent or root cause analysis. Containment Actions are closed once CAPRs and CAs are developed, and are not relied on as the final solutions, but as a bridge to the next step. CAP Actions – INTR – are created for each.

Examples of strong Containment Actions are:

- Isolate defective units.
- Install temporary physical barriers.
- Inventory purge / quarantine
- Tool/Equipment / PPE modifications or substitutions
- Personnel qualifications evaluation and modification of assignments
- Add inspection steps and/or supervisory, PIC (person in charge), QP (Qualified Person) oversite.
- Modify the work method and process parameters.

Containment Actions are not:

- Report the accident/incident.
- Isolate the accident/incident site

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Containment Actions are not: (continued)

- Gather evidence
- Obtain/Utilize EMS as appropriate.
- Inform management, family of injured worker
- Notify the Nurse Hotline
- Initial Incident Reports (IIRs)
- Email communications, 5MMs, SIF Initial communications
- Tailboards
- All company or all department safety standdowns
- Temporary pause of the job, crew, equipment, or tool.
- Compile an investigation team
- Complete an Initial Incident Report (IIR)
- Report to authorities, regulatory agencies, as required
- Communicate immediately known information to the broader effected group via tailboard, 5MM, all hands safety meetings, safety stand downs

Contractor/Prime Contractor: Company directly hired by PG&E to complete a specific scope of work (SOW) or service. This term also applies to all subcontractors, at any tier, which have been retained by a primary PG&E contractor to provide a service for PG&E related project work.

Subcontractor: Subcontractors are contractors that have been retained by a prime contractor to provide services on behalf of PG&E. Additionally, the term may include an individual or group of people used to work on a PG&E project.

Corrective Action (CA): (1) A solution meant to reduce or eliminate an identified problem, including any action taken to resolve a finding or issue by implementing changes or controls to preclude recurrence. (2) Restores an unacceptable or adverse condition to an acceptable condition or capability.

Interim Corrective Action: An action taken after analysis is performed that is temporary in nature until final corrective actions are implemented.

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Corrective Action Review Board (CARB): A PG&E senior level management cross functional area board that provides oversight for review of Contractor/Prime Contractor and Subcontractor SIF Actual and SIF Potential RCE and ACE cause evaluations. Includes FA representatives from Regulatory Compliance & Quality Assurance, Safety, Asset Strategy, Operations, and CAP.

Corrective Action to Preclude Recurrence (CAPR): An action taken to preclude an issue from occurring again (or minimize its likelihood) because of the same failure mechanism.

ECAP: Enterprise Corrective Action Program. The PG&E group is responsible for implementing and maintaining the Corrective Action Program (software and supporting tools) used to track worker-reported deficiencies and items requiring attention for safety, performance, or other reasons.

Effectiveness Review Evaluation (EFFR): A documented review to determine that the intended or expected results were achieved after implementation of corrective actions and confirm that new problems or unintended consequences were not introduced by implementation of the actions.

Effectiveness Review Plan (ERP): A plan created during the CE process to verify that the intended or expected results were achieved after implementation of corrective actions. The plan includes the following: methods used to verify the actions met the desired outcome, attributes to be monitored and evaluated, success criteria, and expected timeline to perform the effectiveness review.

Essential Control: A physical object that specifically targets the high-energy source, eliminates a person’s exposure to it, or builds the capacity to safely recover from a high energy incident. – It is effective even when people make mistakes (unrelated to the installation of the control)

Examples include LOTO, machine guarding, de-energization, hard physical barriers, fall protection, and cover-up. Examples of what they are not include training, warning signs, rules, cones, and experience because they are susceptible to unintentional human error. Specialized PPE such as arc flash suits, insulated non-conductive gloves, and OUV DOT helmets are considered essential controls. Most standard non-specialized PPE are not considered essential controls because they are not specifically targeted to a high-energy source.

Exposure: Condition where high energy is present with no incident in the absence of a direct control.

Extent of Cause (EOCa): The process of using the problem statement to determine EOCa factor(s) and whether the actual causes could potentially affect other programs, processes, equipment, and human performance within the Contractor/Prime or Subcontractor(s) company, other contractors who work for PG&E or PG&E

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Extent of Condition (EOC): The process of using the problem statement to determine EOC factor(s) and whether the actual condition could potentially affect other programs, processes, equipment, and human performance within the Contractor/Prime or Subcontractor(s) company, other contractors who work for PG&E or PG&E.

Functional Area (FA) SRT Team: PG&E teams established to review and classify MVIs, injuries, and near hits reported through PG&E CAP and tracked in the PG&E CAP system.

Hazard Identification Wheel: The hazard identification wheel represents the potential hazard categories that may be encountered when performing your job. Use the wheel to quickly identify the potential hazard condition and associated symbol.

High-Energy: Energy source across the energy forms gravity, motion, mechanical, electrical, pressure, sound, radiation, biological, chemical, and temperature where the physical energy when released or transferred to an unprotected person, would most likely result in a life altering, threatening, or fatal injury (a condition where the physical energy exceeds 500 ft-lb).

High-Energy Incident: An instance where the worker(s) lost control of a high-energy source, and a worker(s) came in contact with or in proximity to the high-energy source

- Contact is defined as an instance when the high-energy is transmitted to the human body.
- Proximity is defined as a circumstance where the boundary of the high-energy exposure:
- Is within 6 feet of a worker who has unrestricted egress

  OR
- Is within any distance to a worker in a confined space, or the worker cannot escape the high-energy source

  OR
- Encroaches within the minimum hazard boundary distance outlined in the job task procedural guidance

High-Energy Serious Injury or Fatality (HSIF): Incident where a worker lost control of a high-energy source in the absence of a direct control that resulted in a fatality, life-threatening or altering injury to a worker.

High-Energy Serious Injury or Fatality (HSIF) Potential: A high-energy incident with the absence of a direct control where a fatality, life-threatening, or altering injury is not sustained.

Human Factors Analysis and Classification System (HFACS): A human error framework designed to systematically examine underlying human causal factors and to improve accident

investigations focused on four levels of failure: 1) Unsafe Acts, 2) Preconditions for Unsafe Acts, 3) Unsafe Supervision, and 4) Organizational Influences.

Incident: An unplanned sequence of events that results in or could result in undesirable consequences related to safety.

Independent Party Expert: Consulting subject matter expert (SME) with the authority and expertise in organizational safety culture. They may have specialized educations, experience, qualifications, or certifications required to perform organizational culture, assessments, analyze results, and generate cause evaluation reports.

Interim Corrective Action: An action taken after analysis is performed that is temporary in nature until final corrective actions are implemented. Containment actions may evolve into interim actions if the containment action must remain until the final corrective actions are implemented.

Issue: An unwanted or undesired condition adverse to safety, quality, or performance. This can also be an improvement opportunity.

Low-Energy Serious Injury or Fatality (LSIF): Incident where a worker lost control of a low energy source that resulted in a fatality, life-threatening or altering injury to a worker.

Low Severity: Incident where a worker lost control of a low energy source and did not result in a fatality, life-threatening, or altering injury to a worker.

MAST: Methods, Attributes, Success Criteria and Timeliness used to determine the effectiveness of CAPRs and CAs.

Near Hit: An unplanned incident that did not result in harm or injury to employees, contractors, or the public but had the potential to do so.

Operating Experience (OE or OpEx): The process of reviewing all relevant internal operating experience (OE) of the Contractor/Prime and Subcontractor(s) involved past events that are same or similar to the problem under investigation. The process of reviewing relevant external operating experience (OE) using industry recognized partners, vendors, and databases.

Success: When a worker did not lose control of a high-energy source and had a direct control present

Serious Injury or Fatality Actual (SIF Actual or SIF-A): A work-related high-energy incident from work at or for PG&E resulting in any of the following to employees, contractors, or directly supervised contractors:

- A fatality – work related fatal injury or illness.
- A life-threatening injury or illness that required immediate life-preserving action that if not applied immediately would likely have resulted in the death of that person.

- A life-altering injury or illness that resulted in a permanent and significant loss of a major body part or organ function.

Serious Injury or Fatality Potential (SIF Potential or SIF-P): A high-energy incident in the absence of a direct control where a fatality or life-threatening or altering injury is not sustained.

Subject Matter Expert (SME): Individual with knowledge and experience in the functional area of work being investigated for the incident or issue.

IMPLEMENTATION RESPONSIBILITIES

PG&E Director, Enterprise Corrective Action Program (Executive CAP Sponsor) is responsible for revising, approving, and issuing this document.

Contractor Prime and Subcontractor(s) are responsible for assuring the Enterprise Contractor Cause Evaluation is implemented withing their organization(s).

Each PG&E FA officer and director are responsible for assuring the Enterprise Contractor Cause Evaluation Standard is implemented within their organization.

PG&E Directors, managers, and supervisors are responsible for communicating the standard to all employees and ensuring their employees understand and properly implement the requirements of this standard.

PG&E Internal Audit (IA) may conduct periodic reviews of the PG&E investigation process per the approved annual IA schedule.

PG&E legal will be notified of and may conduct periodic review of the PG&E and contractor investigation process.

GOVERNING DOCUMENT

GOV-03, “Corrective Action Program Policy”

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

PG&E records are company assets that must be managed with integrity to ensure authenticity and reliability. Each Line of Business (LOB) must manage Records and Information in accordance with the Enterprise Records and Information (ERIM) Policy, Standards and Enterprise Records Retention Schedule (ERRS). Each Line of Business (LOB) is also responsible for ensuring records are complete, accurate, verifiable and can be retrieved upon request. Refer to GOV-7101S, “Enterprise Records and Information Management Standard” for further records management guidance or contact ERIM at Enterprise_RIM@pge.com.

Enterprise Contractor SIF Cause Evaluation Standard

REFERENCE DOCUMENTS

Developmental References:

- GOV-6101S, “Enterprise Corrective Action Program Standard”
- Inter-Departmental Administrative Procedure (IDAP) OM7.ID3, “Root Cause Evaluation”
- Inter-Departmental Administrative Procedure (IDAP) OM7.ID4, “Cause Evaluations”

Supplemental References:

- GOV-6101P-08, “Corrective Action Program Procedure”
- GOV-6101P-09, “CAP Review Team (CRT) Procedure”
- GOV-6102P-11, “Effectiveness Review Plan (ERP) and Effectiveness Review (EFFR)”
- GOV-7101S, “Enterprise Records and Information Management Standard”
- RISK-6305P-02, “Electric Incident Investigations (EII) Procedure,"
- SAFE-1004S, “Safety Incident Notification and Response Management”
- SAFE-1100P-01-Att01, “Request to De-escalate a SIF Classification”
- SAFE-1100S, “Serious Injury and Fatality (SIF) Standard”
- SAFE-1100S-Att01, “SIF Determination Flowchart”
- SAFE-3001S, "Enterprise Contractor Safety Management Standard"
- SAFE-3003S, “Public Safety Incident Standard”

APPENDICES

- Appendix A, Cause Evaluation General Requirements by CE Type, Including EFFR
- Appendix B, Cause Evaluation References and Resources for Contractors

ATTACHMENTS

- GOV-6103S-Att01, “Contractor Corrective Action Review Board (CARB) Charter”

Enterprise Contractor SIF Cause Evaluation Standard

DOCUMENT RECISION

This document supersedes GOV-6103S, “Enterprise Contractor Cause Evaluation Standard,” Rev. 1, dated 01/30/2024.

DOCUMENT APPROVER

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REVISION NOTES

Where?	What Changed?
This Revision, Rev. 0 (04/18/2024)	
Converted Standard Throughout Definitions Document ownership	SAFE-3004S rev. 0 supersedes GOV-6103S rev. 1 Clarified responsibilities of contractors. Reviewed and edited for clarity and consistency, including minor editorial updates. Added Section 3, Timeliness, Section 7, CARB and Report Approval Process, and Section 8, Best Practices Leading to Success. Updated definitions section. Updated Approver and Contact
Revision 1 (01/30/2024)	
Throughout	Converted to the new Guidance Document Management (GDM) template, including minor editorial updates.
References	Updated
Document Approver and Document Contact	Updated
Appendices	Removed flowcharts and replaced SIF Determination Flowchart with references to SAFE-1100S-Att01.
Attachments	Added new Attachments 1 through 2

Appendix A, Cause Evaluation General Requirements by CE Type, Including EFFR

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Requirements	RCE	ACE	WGE	ERP/EFFR
Team member training	Per , GOV-6103S and contractor requirements	Same as RCE	Same as RCE	Same as RCE
Analysis Tool Type	Minimum two. See Appendix B, Cause Evaluation References and Resources for Contractors	Minimum two. See Appendix B, Cause Evaluation References and Resources for Contractors	As determined by contractor	N/A
Timeline Start Date	30 days begins after CARB approval of the Charter with Problem Statement and Containment Actions	30-days CAP “Complete Report” action (Date Created)	As determined by contractor	As prescribed in the ERP section of the CE report
Timeline End Date	CAP “Complete Report” action (Date Completed)	CAP “Complete Report” action (Date Completed)	Discretion of PG&E FA and issue owner	As prescribed in the ERP section of the CE report
Report Format	Contractor determined	Same as RCE	Same as RCE	Same as RCE
Cause Evaluation Report/EFFR Approvers	- Cause Evaluator - Cause Evaluation Team Lead - Sponsor SIF: VP or higher Non-SIF: Director or higher	- Cause Evaluator - Cause Evaluation Team Lead - Sponsor SIF: Director or higher Non-SIF Issue Owner	Issue Owner	Included in report approvals
ECAP Director Quality Review	Required for all	Required for public, contract, PG&E SIF A or P	Not Required	Not Required (although ERP is required in the cause evaluation report review)
CARB Review	Required for all	Required for public, contract, PG&E SIF A or P’s	Not Required	Required
Communications Final SIF Alert Communications per SAFE-1004S	SIF: Required Non-SIF: Not Required	SIF: Required Non-SIF: Not Required	Optional - Not Required	Optional – Not Required

Appendix B, Cause Evaluation References and Resources for Contractors
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A list references and resources to develop understanding of the required elements in causal evaluation. These provide general information without specific instruction or endorsement from PG&E or its affiliates.

Bibliography	Author/Link
Root Cause Analysis Handbook, A Guide to Efficient and Effective Incident Investigation. ABS Consulting.	Lee N. Vanden Heuvel, Donald K Lorenzo, Laura O. Jackson, Walther E. Hanson, James J. Rooney and David A Walker
Root Cause Analysis, Second Edition – The Core of Problem Solving and Corrective Action	Duke Okes
A Human Error Approach to Aviation Accident Analysis, The Human Factors Analysis and Classification (HFACS) System	Douglas A. Wiegmann and Scott A. Shappell
Harvard Business School Online Root Cause Analysis: What it is & How To Perform One	Root Cause Analysis: What It Is & How to Perform One | HBS Online
Root Cause Analysis	Root cause analysis - Wikipedia
Cause Evaluation Services/Workshops/Resources/Training	**Author/Link**
WD Associates®	Cause Evaluation (teamwd.com)
Exponent®	Accident & Failure Investigation | Exponent
TapRoot® Root Cause analysis Training	Mark Paradies https://www.taproot.com/
American Society for Quality (ASQ)	Root Cause Analysis (RCA) Tools & Learning Resources | ASQ
North American Electric Reliability Corporation (NERC)	NERC cause analysis methods for NERC entities
Harvard Business School Online Root Cause Analysis: What it is & How To Perform One	Root Cause Analysis: What It Is & How to Perform One | HBS Online
Tableau® from Salesforce: Root Cause Analysis Explained: Definition, Examples, and Methods	Root Cause Analysis: Definition, Examples & Methods | Tableau

Internal

Appendix B, Cause Evaluation References and Resources for Contractor
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Analysis Tools	Methodology
Interviews	Interviewing personnel, participants and witnesses, promptly following the event. Retain interview data as confidential information and should not include any personal identifying information. Designate interviewee data with functional title only.
Barrier Analysis	Used to identify physical and administrative barriers and controls to prevent inappropriate actions that are either in place or missing for human and equipment failures. A process for finding out what is keeping people from behaving in a specific (desired) way. Barrier analysis is a root cause analysis method that considers the pathways through which a hazard can affect a target in order to characterize the performance of actual or potential barriers/controls interposed to protect the target. Barrier Analysis – Bill Wilson (bill-wilson.net) LL20210202_RCA_Tools_Barrier_Analysis.pdf (nerc.com)
Human Factors Analysis and Classification System -HFACS	A method designed to identify factors that influence task performance. This method is not intended to be used as a stand-alone tool but should be included with other methods for human factor related events only. HFACS, Inc | The HFACS Framework
Comparative Timeline	A tabular, most chronological, presentation of the evidence and other relevant information related to an event.
Fault Tree Analysis (FTA)	Fault tree analysis (FTA) is a graphical tool and one of the more useful tools in Lean Six Sigma problem investigations. FTA explores the causes of system-level failures. Fault tree analysis prioritizes the risks in a way that allows the highest risks to be resolved first. It uses Boolean logic to combine a series of lower-level events, and it is basically a top-down approach to identify the component level failures (basic events) that cause the system level failure (top events) to occur. When combined with other Lean Six Sigma tools, fault tree analysis helps the team focus on the most important input variables to the key output variables in a given process. FTA is a top-down approach to identifying the component-level failures that cause the system-level failure to occur. The 6 Top Root Cause Analysis Tools to Identify Problems (businessmap.io), and Fault tree analysis - Wikipedia
Factor Tree Analysis -Causal Factor Tree Analysis (CFTA)	In general, this tool is commonly used in high-risk industries, like aviation, nuclear power, and chemical manufacturing industries, however, it is also applied in many other industries where a thorough understanding and investigation of accidents/incidents is required. Therefore, it remains a widely used risk management tool by many industries. Risk Prevention: How To Build A Causal Factor Tree Analysis Chart? (blog-qhse.com) Display visual structure of casual factors. Emphasis is on the actions and conditions. A representation similar to an organization chart that shows the chains of factors affecting a particular consequence. The tree begins with the consequences and continues through the direct intermediate factors to the deepest identifiable underlying factors The factor tree is intended to examine factors which contribute to effects. The factor tree is NOT intended to resolve issues.

Internal

Appendix B, Cause Evaluation References and Resources for Contractor
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Analysis Tools	Methodology
Fault Tree Analysis	Display human or equipment faults from initiation top level in easily understood loge tree. A Fault tree analysis - Wikipedia Fault Tree is a failure analysis in which an undesired state of a system is analyzed using a system of logical thought to combine a series of lower level events.
Modified MORT (Management Oversight and Risk Tree) (ABS System)	A comprehensive, analytical process that provides a method for structuring an investigation and determine the cause factors and root causes(s) of an incident. This is accomplished by using the ABS Consulting “SOURCE” analysis process. Used for evaluating events that involve inappropriate human behaviors as well as programmatic and organizational issues.
Equipment Performance Evaluation	Specific to determining an equipment failure. Evaluation requires engineering level of knowledge.
Change Analysis	Used for both human performance and equipment failure-related events Used to compare an activity that has been successfully performed to the same activity when performed unsuccessfully. Also used to analyze why similar components or personnel experience different failure rates. Good to understand an investigation in a different perspective because it focuses on what is different about this situation versus other times
Task Analysis	For human performance events. Identify deficiencies in training, procedures, or procedure adherence. Helps the evaluator who is not a Subject Matter Expert (SME) understand the task.
Missed Opportunity Matrix (MOM)	Provides insight into how many opportunities there were to avoid an event. Only intended to identify all the opportunities were average individuals may have had the potential to change the course of events.
Event and Casual Factors Chart (E&CF)	Multi-faceted problems with complex causal factor chain. Used for both human performance and equipment failure related events. Organized information to show the exact sequence of events relevant conditions and causal factors. Generally considered the most effective cause analysis technique. Provides a visual depiction of what occurred, enabling recognition where facts important to understanding the event are missing. Good tool for explaining what occurred and why to other parties.
The Five Whys (WGEs only) – not acceptable for RCE/ACE	The Five Whys method is inappropriate for any complicated event, but it is actually quite useful when used on minor problems that require nothing more than some basic discussion of the event. Unlike most of the other methods, it identifies causal relationships, but still subscribes to the root cause myth of first finding the root cause and then assigning solutions. It should never be used for formal incident investigations but is perfectly acceptable for informal discussions of cause.

Internal