Revision 6.0

Pacific Gas and Electric Company Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Prepared for

Pacific Gas and Electric Company

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Document Approval and History

Version:	Date:	Author(s):	Lead Reviewer:	Approved by:	Reason for Revision
1.0	2/23/12				Added job descriptions to Appendix C
2.0	5/31/12	Redacted			Added Section 9.10.3
3.0	8/14/12				Added citations to references in Section 11.6, removed document approval and history matrices in every section, and revised formatting and consistency issues throughout.
4.0	9/12/12				Generalized processes that are standardized across PSEP; incorporated additional information required for pipeline replacement, valve automation, and in-line inspection processes; revised customer and government relations; and added Section 14 placeholder.
5.0	9/28/12				Minor changes throughout (for example, 30% -> IFP, etc.) and the addition of Section 14, Contract Administration.
6.0	10/10/12				Changes to terminology throughout to extend applicable strength test processes across the PSEP Program where appropriate. Removed information that has changed or is no longer relevant to the PSEP.

Program Lead: _____
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Strength Test Lead: _____
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PVI Lead: _____
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Scope and Quality: _____
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Page

Contents

CONTENTS, CONTINUED

CONTENTS, CONTINUED

Section **Page**

CONTENTS, CONTINUED

CONTENTS, CONTINUED

Section **Page**

Acronyms and Abbreviations

ABI	automated ball indentation
ACWP	actual cost of work performed
A-ESCP	Activity Specific Erosion and Sediment Control Plan
AMM	avoidance and mitigation measures
ATS	Applied Technology Services
BCWP	budgeted cost of work performed
BCWS	budgeted cost of work scheduled
BMP	best management practice
BOM	Bill of Material
CBS	cost breakdown structure
CCS	Construction Coordination Supervisor
CFR	*Code of Federal Regulations*
CM	Construction Manager
COC	chain of custody
CWA	contract work authorization
DCC	Document Control Center
DCP	Document Control Plan
Design Package	Site-specific Design Package
EDRS	electronic document routing system
EGR	estimated goods receipt
EPA	U.S. Environmental Protection Agency
GAC	granulated activated carbon
GC	General Construction
GIS	geographic information system
GPS	global positioning system
GR	goods receipt
GSO	gas system operations
IFB	issued for bid
IFC	issued for construction
IFP	issued for permit

ACRONYMS AND ABBREVIATIONS

ILI	in-line inspection
IVR	interactive voice response
JE	journal entry
MAOP	maximum allowable operating pressure
MCS	Master Control Schedule
NTP	notice to proceed
OQ	operator qualification
PG&E	Pacific Gas and Electric Company
PMO	Program Management Office
POTW	publicly owned treatment works
PPE	personal protective equipment
Program	Pipeline Safety Enhancement Plan Program
PSEP	Pipeline Safety Enhancement Plan
PVI	pipeline replacement, valve automation, and in-line inspection
QA	quality assurance
QAQC	quality assurance and quality control
QC	quality control
RCP	Regulatory Compliance Partners
RMR	Record of Materials Removed
ROW	right-of-way
RTC	release to construction
SAP	Systems, Applications, and Products in Data Processing
SH&C	Safety Health and Claims
SOP	Standard Operating Procedure
STPR	strength test pressure report
SWPPP	Stormwater Pollution Prevention Plan
SMYS	specified minimum yield strength
strength test	hydrostatic test, hydrotest, and pressure test
Tailboard	brief instructional meeting for open communication
TIC	total installed cost
Water Board	Regional Water Quality Control Board
WBS	work breakdown structure

1.0 Program Overview and Organization

As part of the response to the San Bruno Incident, Pacific Gas and Electric Company (PG&E) developed the Pipeline 2020 Modernization Program initiative. The Pipeline Safety Enhancement Plan (PSEP) Program (Program) is divided into four major workstreams: Strength Testing, Pipeline Replacement, Valve Automation, and In-Line Inspection (ILI). The unified objective of this Program is to modernize the natural gas transmission operations of PG&E, including the following measures:

- Strength test more than 750 miles of pipeline segments.
- Replace more than 150 miles of pipeline segments.
- Upgrade more than 175 miles of pipeline segments to be "piggable," in which an ILI tool known as a pig is inserted into a pipeline to gather detailed information.
- Automate more than 200 valves, validating maximum allowable operating pressure for transmission pipelines in the system.
- Improve the asset management system for pipeline records.
- Develop a more comprehensive emergency response plan.

The order in which PG&E plans to execute work will be based on several constraints, including system hydraulics, customer demand, electric generation impact, timing of availability of records for engineering, timing of ability to obtain permits, material lead times, clearance resources, coordination with other pipeline work, construction resources, and local government preferences. The ability to balance the multiple constraints will be complicated; therefore, the schedule will have little flexibility, and the Program will be managed to meet the proposed schedule as closely as possible. The schedule may be adjusted to keep the Program moving forward if unexpected delays occur, or if existing records are found and validated for a particular pipeline test segment.

This manual identifies and defines the processes, roles, and responsibilities involved in the Program. The processes described in this manual are separated into functional groups of activities and are used as a platform to govern each project. PG&E's utility standards, procedures, forms, and documents are referenced throughout this manual and listed in Appendices A and B. As lessons learned and best practices emerge from the Program, revisions will be incorporated into this manual to better serve the Program in the remaining work and future years.

The references in this manual are actively linked to the reference document itself, both in text and in Appendices A and B, as indicated by blue font. For those viewing this document in print form who would like to link to any referenced documents, the latest online version of this manual can be found on the SharePoint site at the following location:

Strength Test 2012 > Shared Documents > Process Manual and Program Execution Plan

To make revisions, add comments, or ask questions about this manual, check out the document from SharePoint. Turn on "track changes" in the Word "tools" directory, make any proposed changes, save the document, and check it back in. This will alert the document controller that changes have been proposed and allow the document editor to easily locate the revisions. The revisable document can be found on the SharePoint site at the following location:

Strength Test 2012 > Shared Documents > Pipeline Safety Enhancement Plan Process Manual

The Program Management Office (PMO) provides the leadership for the improvement to each of the identified pipeline segments, proves that the pipelines can operate safely at the MAOP established by the test, and creates verifiable records for future reference. The Figure 1-1 organization chart illustrates the PMO for this Program.

The PMO and project teams are organized to execute the individual projects in a matrix management environment. The PMO provides the leadership to execute each discrete project. The Project Coordinators and Project Managers provide the leadership and task coordination for each test segment project (see Appendix C, Job Descriptions). The lead of the Project Coordination group is a member of the PMO and oversees the Project Coordinators for each individual test segment.

1.1 Critical Success Factors

The critical success factors for the Program in 2011 were as follows:

- A Program safety record of zero recordable injuries
- A Program environment record of zero reportable incidents
- Completion of the strength testing or replacement of Priority 1 miles of pipeline segments in 2011 (mileage will be adjusted by year), unless the required documentation of a previous test is found and that segment has been eliminated from the test group
- Creation and storage of the required test documentation
- Application of best practices from work completed in previous years

1.2 Roles and Responsibilities

The roles and responsibilities of the PMO are as follows:

- **Program Sponsor** – Provides overall Program direction and interface with PG&E stakeholders.
- **Workstream Manager** – Provides overall workstream direction and interfaces with PG&E stakeholders.
- **PMO Lead** – Provides the day-to-day Program leadership and coordination for successful delivery.
- **Independent third-party verification** – An independent agency providing certification of work being executed properly.
- **PMO Operations Lead** – Provides leadership and direction of the functional groups to ensure effective communication for timely decision making.
- **Project Scope and Quality** – Leads the development of the project scope. Provides oversight on the quality systems and third-party verification.
- **Reporting** – Produces Program reports and presentations in support of executive communications. Coordinates with the California Public Utilities Commission and other agencies to ensure proper flow of communication.
- **Program Controls** – Develops and manages the schedule and cost aspects of the Program, including forecast updating.
- **Safety** – Responsible for leading, training, and reporting the Program safety performance.

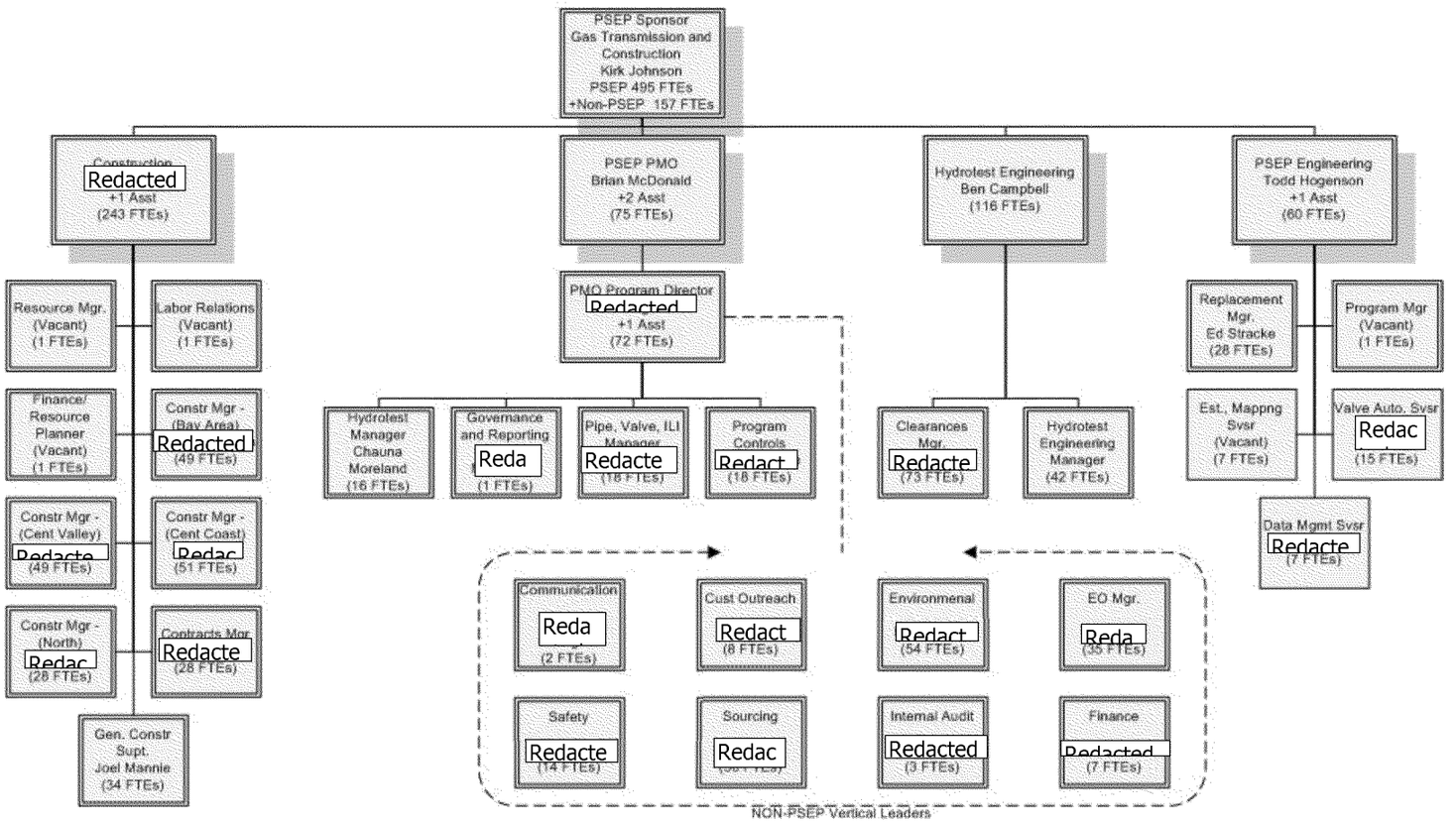

FIGURE 1-1
Program Management Office Organization Chart

- **Planning and Risk Management** – Manages the Gas System Operations (GSO) approval plans and risks associated with the scheduled activities.
- **Project Coordination** – Provides the leadership to a group of Project Coordinators that provide task coordination for each project.
- **Customer Relations** – Manages the customer and community outreach portions of the Program.
- **Corporate Affairs** – Responsible for state and local government communication.
- **Engineering** – Provides the leadership and quality assurance (QA) for the planning, engineering, and design for each project.
- **Environmental and Land Permits** – Applies for and acquires all of the necessary permits required by local, state, and federal law; obtains new land rights, or uses existing land rights as needed.
- **Clearance** – Works with internal GSO to perform the pipeline shutdown, clears the pipeline of natural gas, and makes the pipeline safe and ready for the pipeline improvements.
- **Supply Chain** – Provides all materials and services required by the Program.
- **Construction** – Safely executes the segment work plans.
- **Mapping and Records** – Maintains the final documentation produced by the Program, and ensures that all documents are properly tracked, stored, cataloged, and accounted for.

The Program Responsible, Accountable, Consulted, and Informed (RACI) Chart details the Program roles and responsibilities (see Appendix D).

Appendix C presents more in-depth job descriptions for the Construction Coordination Supervisor (CCS), Project Coordinator, and segment Engineering Lead.

1.3 Safety

The basis of the Program is PG&E's commitment to target zero in safety. Public and individual safety is the primary consideration of this Program and all of its components, stages, and processes. Safety protocols and practices are defined for workers in offices, worksites, and throughout all handling processes. Although safety is addressed specifically in the Safety section of this manual, the scope of safety is applicable to all of the sections.

1.4 PG&E Internal Communication

The PMO communicates the progress of the Program to PG&E employees through articles in the PG&E At Work Bulletin. The May 10, 2011, At Work Bulletin explains gas transmission work and addresses the plan for upgrading pipeline segments throughout the entire service territory. As the scheduled date for each project is confirmed, key stakeholders will be notified by e-mail, soon followed by an article in the At Work Bulletin. As the work progresses and each segment is complete, similar notifications of project results will be sent to key stakeholders. Regular articles in the At Work Bulletin are released that provide the results and identify the next set of scheduled projects. When appropriate, the PMO sends communications regarding specific work groups that will be directly affected by the work. The PMO reporting lead produces various reports and presentations for executive and stakeholder communications.

1.5 Program Internal Communication

To facilitate internal communication within the Program, the various team members must anticipate how their work and actions may affect stakeholders. Each project and Program team member must evaluate the following:

- Identify how the work, project, and Program elements affect specific stakeholders
- Consider ways to mitigate these concerns
- Communicate this information to the discipline lead (a member of the PMO) or the PMO Operations Lead
- Coordinate among the team functions and areas on matters that overlap or are of mutual interest
- Recognize that creative resolution or mitigation of project and Program effects contributes to Program success

Cooperation and communication between members of the Program staff is crucial because of the interrelated aspects of the Program and the complexity of issues presented. Additionally, information needed by one part of the Program team will often be coordinated and compiled by a different part of the Program team. For these reasons, it is important that the Program team establish processes for sharing and jointly considering information as plans are initiated. The following methods are used to communicate progress by the Program staff:

- Participation in regular team meetings composed of all or several functional groups
- Share written summaries of activities (monthly reports and minutes)
- Anticipate cooperation and coordination between the functional teams
- Reach out to others in the Program to ask for or offer input
- Frequent use of impromptu calls and face-to-face discussions
- Participate in informal conversations, e-mails, and phone calls
- Utilize web-based communications

Timely and periodic communication between the project, Program, and functional teams is essential. It is expected that these groups, or representatives from these groups, will meet regularly to review key plans and progress. The frequency of these meetings may vary. Discussion topics will generally include planned, in progress, and completed Program and project activities. Potential solutions to any problems will also be discussed. Risk and change management will be a standard agenda item during team meetings.

Impromptu meetings between functional leads, Project Coordinators/Project Managers, and Program Management Officers will be held as needed. Meeting minutes will be recorded and maintained by document control for future reference. Table 1-1 presents the current Program meeting frequency and topics for regularly scheduled Program, change management, risk, and board meetings.

1.6 Action Items and Needs Lists

Two action items lists will be maintained. The first action item list will be generated from the daily meeting and identifies issues associated with near term tests. The second action items list will be developed during the biweekly meeting or segment lessons learned meetings and focus on forward looking and process improvement.

1.7 Requests for Information

Requests for information from the field construction staff will be a key method for identifying questions or the need for additional information on drawing and specification or procedures. A request for information may also suggest alternative designs, fabrication, or construction methods.

TABLE 1-1
Program Meeting Frequency
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Organization	Frequency	Topic
PMO Leaders and Program Managers/Coordinators	Weekly	Critical items – near-term segment issues
PMO Leaders – Cross Functional Meeting	Twice a Month	Forward looking/process improvements
PMO Leaders Council: • Administration • Operations	Weekly	Hit team updates and procurement strategies
Project Coordinators	Weekly	Schedule/cost management progress update
Segment Teams	As required	Segment kickoff meeting
Segment Teams	As required	Web meeting
Segment Teams	As required	Segment 25% site visit
Segment Teams	As required	Segment 50% site visit
Segment Teams	As required	Segment pre-construction meeting
Segment Teams	As required	Segment lessons learned meeting
Segment Teams	As required	Clearance/test plan/tie-in meeting

1.8 Planning and Scheduling

Figure 1-2 provides a process flow for the daily GSO schedule progress meetings:

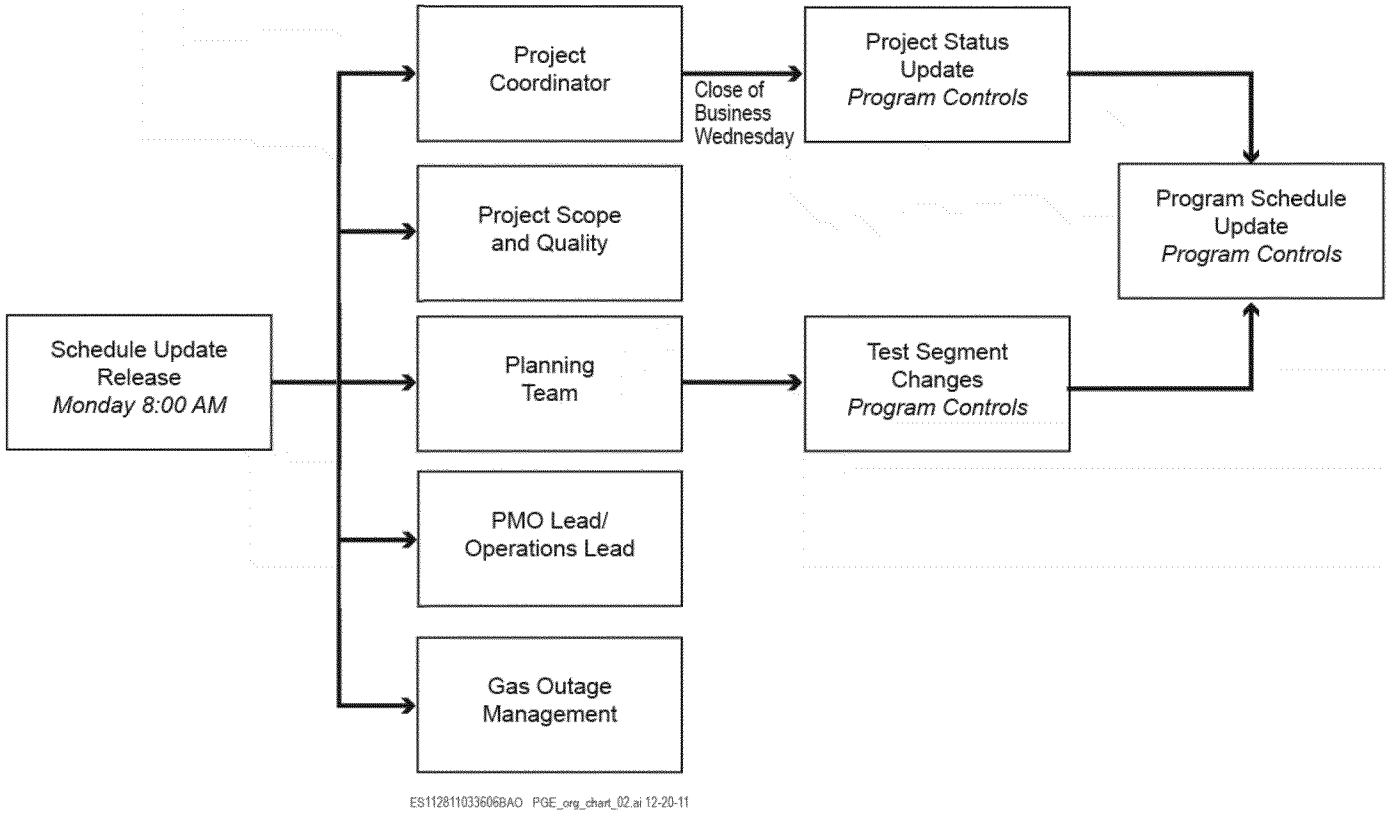

FIGURE 1-2
Testing Schedule Update Process – Strength Test Example

Prior to proceeding on any PSEP project, a record search will be performed for each proposed pipeline segment (see Figures 1-3 and 1-4). If previously existing records are found and verified, the project may not occur for that specific pipeline segment. If records are not found, then work will proceed as scheduled. Figure 1-5 illustrates the records research and project "go/no-go" decision.

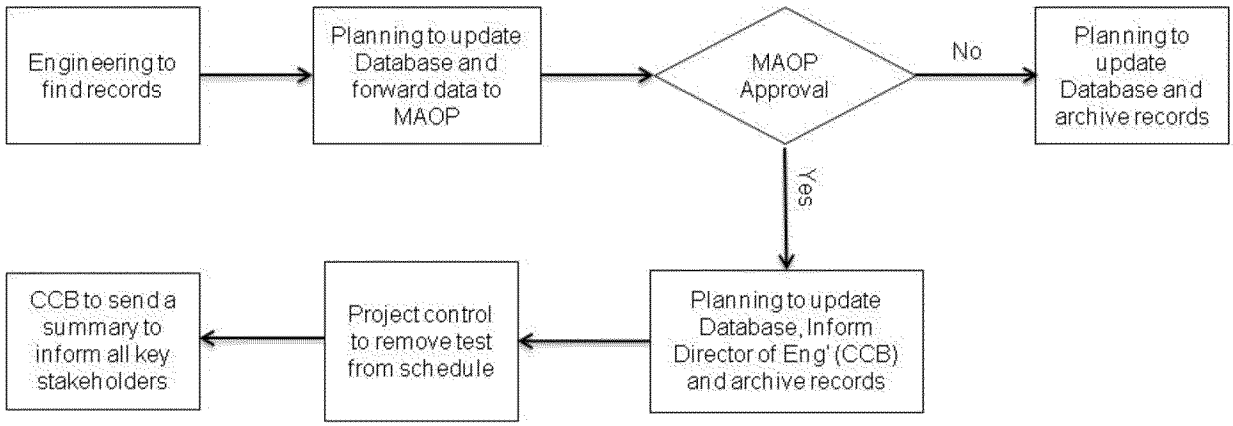

FIGURE 1-3
Maximum Allowable Operating Pressure Records of Verification Process – Strength Test Example

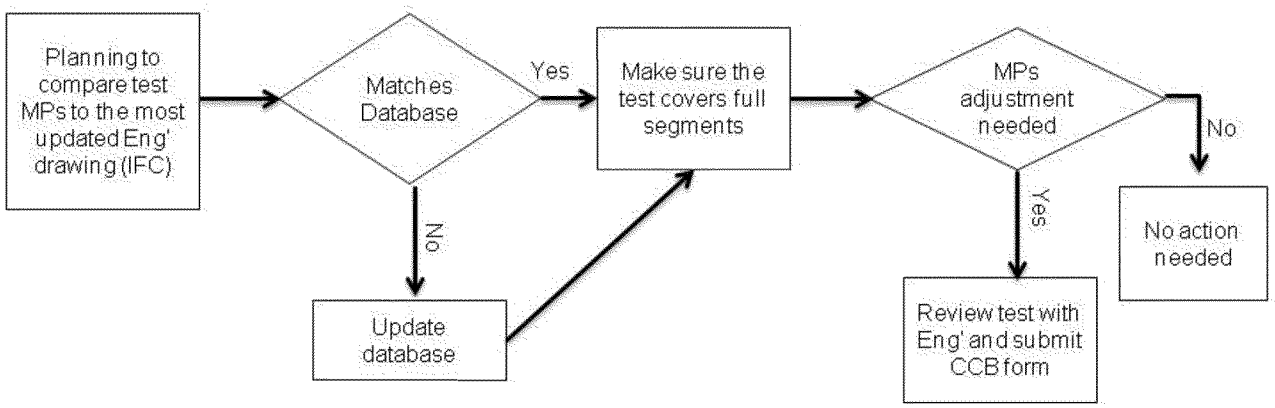

FIGURE 1-4
Bi-monthly Segment and Mile Points Review Process– Strength Test Example

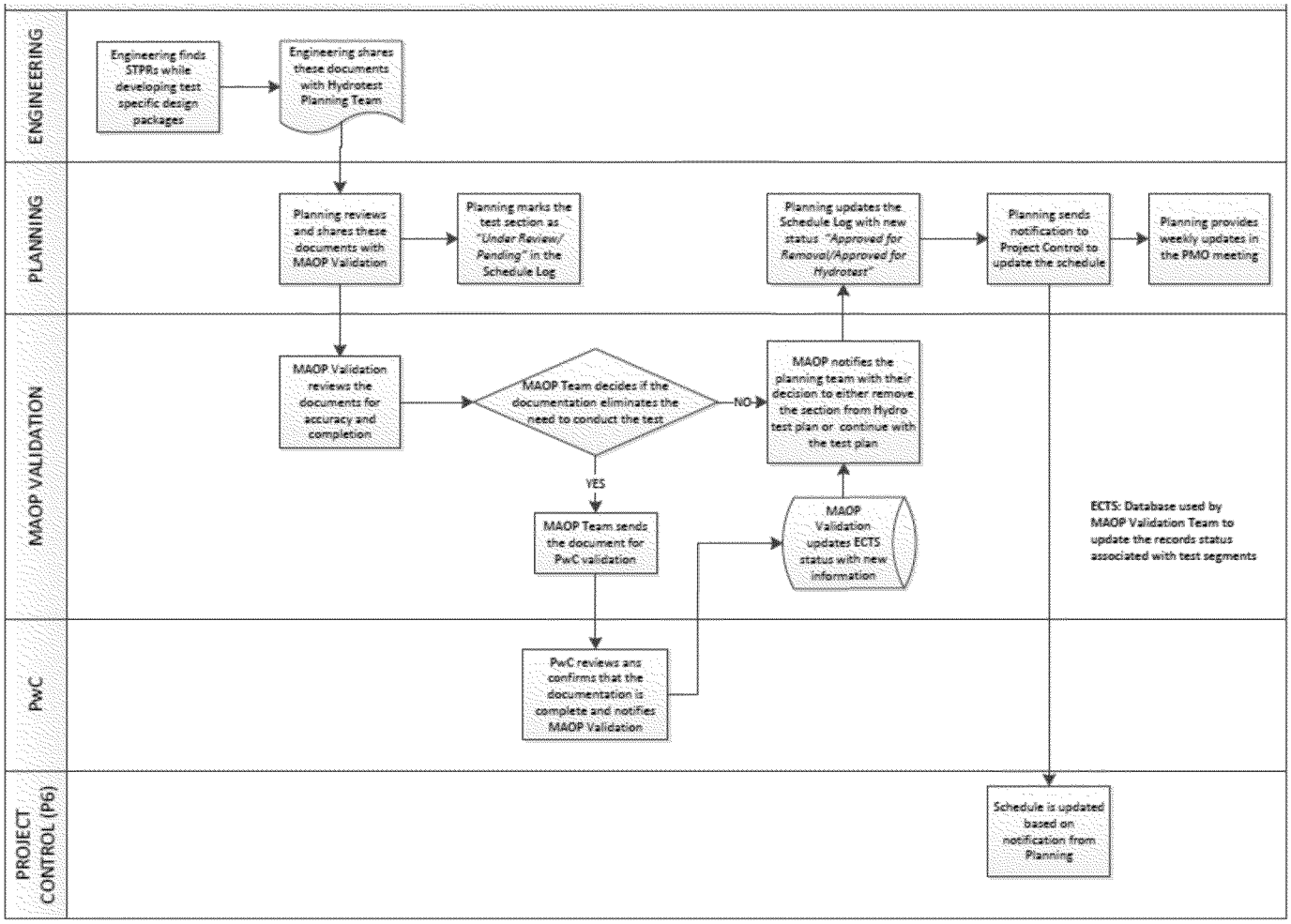

FIGURE 1-5
Test Sections Review and Reconciliation Process between Strength Test Planning and Maximum Allowable Operating Pressure Validation Teams – Strength Test Example

2.0 Safety

PG&E incorporates specific safety procedures throughout all processes and stages of work. A brief instructional meeting for open communication (tailboard) on Utility Standard Practice 22, Safety and Health Program (see Appendix A), must be given to all PG&E employees and contractors involved in supporting all workstreams. These procedures can be accessed in the Code of Safe Practices (refer to the Project Safety Plan) in Appendix A.

2.1 Office Safety and Health Management

In accordance with state and federal regulatory requirements and Utility Standard Practice 22, the Office Safety and Health Management System requires that each department assign a designated safety representative. This representative will implement and maintain the Office Safety and Health Management System in the department, and act as a liaison between safety, engineering, and health services, and the department supervisor.

Departments working primarily in an office-based environment must either use this system or one established by the senior vice president or vice president. Questions are directed to the department's safety engineering and health services safety program consultant. Refer to Safety Health and Claims (SH&C) Procedure 221, Ergonomics Program Procedure, in Appendix A.

2.2 Develop Site-specific Safety Plans

A Site-specific Safety Plan must be established at every worksite by the Safety Department and the site monitor. Each site monitor will have a safety plan binder onsite that contains the required forms and safety information. The Site-specific Safety Plan must include, but is not limited to, the following items and conditions:

- Local emergency contact information (fire, police, medical, and direct line to the dispatch center)
- The local emergency technical rescue response resources, including trench and confined space rescue
- The location of the nearest hospital emergency room
- The identity of the onsite incident commander or person in charge, should an incident occur during construction
- The location of the nearest first aid kit, blood-borne pathogens, and automatic external defibrillator, if available, at the work location
- Evacuation routes by foot and car
- Secondary meeting points and areas of refuge in the event of an emergency
- Identification of any plant or animal life that might be hazardous to employees or public health
- Location hazards, such as slopes, rivers, high traffic volume, overhead lines, subterranean hazards, and open trench vaults

NOTE: Two-way communication must be verified between the incident commander and the local emergency response resources to ensure that all parties are notified of emergency response procedures.

Appendix A includes an example of a Site-specific Safety Plan (refer to the Safety Engineering and Health Services website and the SH&C Procedure 229, First Aid Procedure).

2.3 Identify and Evaluate Safety Hazards

Tasks associated with the work must be reviewed and discussed, and hazards associated with each task must be identified during the pre-site visit. The risk and possible severity of the identified hazards must also be evaluated. Appendix A includes the PG&E-ranked risk and severity of hazards in SH&C Procedure 201, Hazard, Evaluation and Control Procedure.

2.4 Control Safety Hazards

PG&E implements safety controls based on the risk and severity of the tasks identified. Engineering controls will be utilized to mitigate the hazards during the site visit. If engineering controls are not feasible, administrative and personal protective equipment (PPE) controls will be implemented to reduce the risk of injury. PG&E uses a hazard control strategy in accordance with SH&C Procedure 201.

2.5 Review of Safety Controls

The site monitor will review the implemented controls to ensure quality and safety throughout the project. Controls must be reviewed and evaluated to ensure they do not increase hazards associated with other tasks.

3.0 Risk Management and Contingency Planning

The purpose of risk management is to identify potential problems before they occur and to ensure that opportunities to avoid or mitigate risk are taken as early as possible. Risk management enables leaders and team members to act proactively rather than reactively to reduce overall risk potential and impact.

3.1 Risk Management Plan

The Risk Management Plan is defined for the PG&E Program as a whole to ensure a consistent and professional approach to risk management throughout all projects. This plan defines methodologies, work processes, and tasks that are applied to the Program as well as each project. Overall, the plan includes components to accomplish the following:

- Identify potential threats, opportunities, and risk owners
- Evaluate the likelihood and consequences of risks
- Determine the impact of risk programs
- Analyze risk options and develop plans for risk mitigation
- Track risk mitigation activities
- Reassess Program risks regularly

3.2 Programwide Risk

The Risk Register Form in Appendix A, lists overall potential risks to the Program; the potential risk impact on Program schedule, completion, and cost; and resulting risk management actions. The PMO Risk Manager will develop the Risk Register Form with the input of the Program team. The PMO Risk Manager will also provide ongoing risk monitoring and update the Program team by delivering a monthly risk report.

3.3 Scope

The scope of this plan is to define the risk management requirements to be implemented by the project team for the Program.

3.4 Purpose

The purpose of this plan is to ensure the following:

- A consistent and professional approach to identifying, managing, and mitigating potential risk elements
- A defined methodology, work processes, and tasks to be undertaken by the Program to reduce the probability of risk impacts
- Documentation for what we do to mitigate risk in a timely manner, ensure successful delivery, and capture lessons learned

The purpose of the Program Risk Management Plan is to identify potential problems before they occur and opportunities while they remain obtainable, so that risk-handling activities may be planned and invoked as needed across the life the Program. The Risk Management products give Program Management the opportunity to act proactively rather than reactively.

The Program team has limited time to reduce the probability of risks. The Program team will have to work proactively to identify and address risks. One key to the success of risk identification is to foster a culture of no surprises within the Program team. The Program team should bring any unfavorable news (e.g., concerns, issues, and unplanned events) to the PMO as early as possible so the PMO can provide guidance to resolve concerns. A major emphasis will be on establishing an "early warning" process.

The Risk Management Plan is focused on strategic Program risks in lieu of Program transactional issues that require immediate action.

This document describes the process to:

- Identify risk events (risks/opportunities/issues) and risk owners
- Rank risks with respect to likelihood and consequences
- Assess the options for risks and develop mitigation plans
- Track risk mitigation efforts
- Conduct periodic reassessment of Program risks

3.5 Definitions

Table 3-1 outlines common terms and definitions included in the Risk Management Plan.

TABLE 3-1
Risk Management Terms and Definitions
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Term	Definition
Program Team	The complete Program team, including PG&E staff and multiple contractors.
DCC	Document Control Center.
Risk Events	Events within the Program that, if unsuccessful, could result in the failure to meet the Program's objectives. Risk events should be defined to a level so that the risk and causes are understood and can be accurately assessed in terms of probability and consequences to establish the level of risk. Risk Events include both threats (negative impact on Program performance) and opportunities (positive impact on Program performance).
Project Risk	Risks that affect multiple Program phases or spans the whole Program structure are subject to scrutiny at the highest levels of Program management. Project risk is associated with the overall status of the Program. Failure to meet cost, schedule, and technical objectives can produce Program risk. In addition, external budget, priority, and customer considerations can produce Program risk.
Schedule Risk	The uncertainty of achieving the Program schedule if none of the technical or cost risks should materialize. Schedule risks are associated with the adequacy of the time estimated and allocated for planning and executing the Program. Two areas bearing on schedule risk are: (1) the risk that the schedule estimates and objectives are unrealistic and/or unreasonable, and (2) the risk that Program execution will fall short of the schedule objectives as a result of failure to mitigate cost, schedule, and performance risks.
Technical Risk	The uncertainty of achieving the Program's requirements for function, performance, and operability within the planned cost and schedule. Technical risks are associated with the ability of the system (i.e., product) design to meet the level of performance required to satisfy operational requirements. Failure to adequately address technical risk generally results in an inability to meet cost and schedule constraints while meeting technical requirements.

TABLE 3-1
Risk Management Terms and Definitions
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Term	Definition
Risk Assessment	The translation of risk data into information for evaluating risk and determining the probability and consequence. A risk assessment (or rating) is the value or level that is given to a risk event based on the analysis of the probability and consequence of the event.
CPM	Critical path method.
WBS	Work breakdown structure.
Qualitative Risk Assessment	Evaluation of the amount of risk by comparative methods.
Mitigation Strategies	Plans and options recommended by the PMO to reduce the impact of risk, either by adding resources or establishing task teams (formed from Program or PMO team members).

3.6 Roles and Responsibilities

The personnel with Program risk management responsibilities are as follows:

- **PMO Sponsor**
  - Provides overall leadership and organizational responsibility for the Program
- **PMO Lead**
  - Leads Program implementation to complete annual goals within budget and on time
- **PMO Operations Lead**
  - Ensures Program management best practices and processes are integrated into PMO structure
  - Provides day-to-day guidance and direction in support of Program objectives
  - Has responsibility for ensuring proper implementation of this procedure and that the Program team members are implementing the Risk Management Program
- **PMO Project Scope, Quality, Planning, and Risk Director**
  - Defines project requirements, scope, and quality requirements
  - Establishes, refines, and monitors project quality requirements and performance
  - Defines approach, data requirements, and process for developing and managing segment characterizations
  - Plans and leads the Risk Management meetings/workshop and ensures that this procedure will be properly implemented and that the Program team members are implementing the Risk Management Program
  - Closely involved and works collaboratively with the Program team to develop the analysis models and resulting submittals and plans

- Performs the risk analysis
- Owns the Risk Register

- **PMO Reporting Lead**
  - Supports PMO Lead in establishing governance, and manages reporting needs (within the Program and California Public Utilities Commission)
- **PMO Project Controls Manager**
  - Monitors financial and schedule performance against Program targets
  - Defines tracking, reporting, and auditing requirements for Program
- **PMO Safety Lead**
  - Establishes and communicates safety objectives
  - Monitors safety performance
- **Lead Project Coordinator**
  - Defines standardized processes, responsibilities, and reporting for individual test segment teams
  - Executes test schedule, monitors and resolves risks, and provides detailed reporting on individual test segments
- **Customer Relations Director**
  - Defines standardized communication process for affected customers and general public relations plan
  - Coordinates customer communications before, during, and after tests; ensures public relations materials are updated
- **Corporate Affairs Director**
  - Ensures that sensitive and/or priority test segments are addressed in the schedule
  - Coordinates government communications with customer and public relations activities
- **Project Engineering Lead**
  - Defines process and data requirements for test segment engineering; defines process for securing approvals
  - Ensures completion of segment engineering and delivery of red-lined as-builts following project completion
- **Approvals Lead**
  - Secures all approvals
- **Clearance Lead**
  - Defines process for writing and preparing clearances
  - Ensures clearances are prepared for all test segments

- **Supply Chain Manager**
  - Defines process for planning and tracking materials
  - Ensures availability of materials in support of schedule
- **General Construction Superintendent**
  - Defines resource requirements (crews, contractors, materials) needed to meet schedule
  - Manages crew work schedules and onsite decision making processes to meet schedule
- **Mapping and Records Manager**
  - Develops process and data requirements for updating mapping and records systems
  - Monitors data collection and refines process and requirements as needed

3.7 Risk Identification

The PMO Risk Manager will organize a dedicated workshop attended by the following:

- PMO Lead
- PMO Operations Lead
- Project Scope, Quality, Planning, and Risk Director
- Land/Environmental Lead
- Engineering Regional Lead
- Construction Manager

The draft Risk Register will form the basis for brainstorming during this workshop. The PMO Risk Manager will complete internal risk identification efforts with individual functional groups before the workshop via polling, checklist, lessons-learned review, or other methods as they may deem appropriate. The workshop will be a 2-hour meeting to minimize impact on Program execution, with a goal of identifying mitigation strategy.

The Risk Management Plan encompasses many aspects of risk that cannot always be defined, measured, or have a direct link to schedule or cost (although an indirect link likely exists) but can be qualitatively assessed.

The goal in managing these risks remains the same – to identify them, identify in some manner their impact on the Program, and then present to Program management with methods to handle these risks early enough to have a positive effect on the Program outcome.

Objectives for identification workshops are as follows:

- Tabulation of known risks (both threats and opportunities).
- Brainstorm identification of previously unknown risks (both threats and opportunities).
- Initial categorization of identified risks. Common categorizations include ownership, phase of Program affected, and timeframe in which risk occurs.
- Initial establishment of risk probability of occurrence and range of variability.
- Initial establishment of risk impact/consequence and the range of variability.

Execution risk types that will be addressed include but are not limited to the following:

- Public Safety.
- Operations.

- Cost.
- Security – including physical security at installation worksite, fabrication and assembly locations, laydown and marshalling yards, and design offices, as well as data and information security.
- Public Image – damage to an organization through loss of its reputation or standing.
- Quality – Program effects of not only installation and materials quality but also execution quality (drawings and processes), and end product quality.

3.8 Risk Register

The PMO Risk Manager will develop a Risk Register that clearly identifies the areas of potential risk, extent of impact on Program completion, and risk management actions.

The PMO Operations Lead will review and recommend approval of the Risk Register submitted by the PMO Risk Manager.

3.8.1 Evaluation

Risks will be evaluated largely by means of qualitative methods. Cost impact, probability of occurrence, and risk impact will be scored qualitatively using the levels show on Figure 3-1.

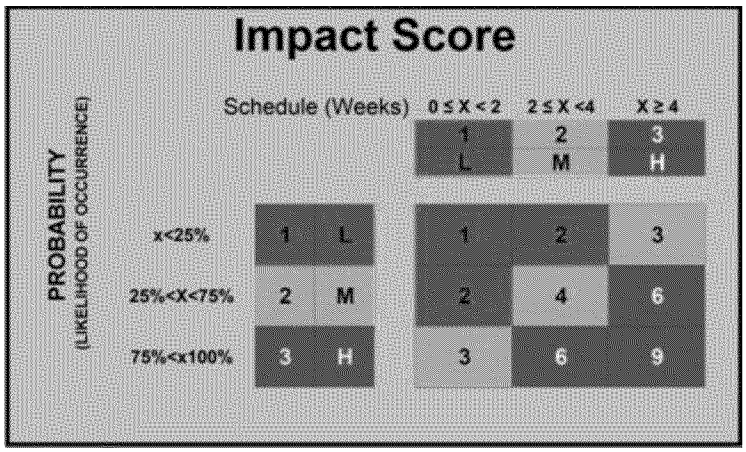

FIGURE 3-1
Risk Impact Score Chart

3.8.2 Handling

Risks that exceed the scoring threshold for action (tentatively, medium or higher) will require options to address the risk. These options typically will consider:

- Mitigation – actions to change the Program execution methods to remove the risk element and thereby remove its effect on the Program.
- Avoidance – adjustment of the Program portfolio to remove the risk element.
- Reduction – efforts to lower the probability of occurrence or to lower the impact.
- Transfer – transferring the risk, often through insurance or contracting.

- Acceptance – absorbing the risk and placing appropriate resources (such as time, funds, and personnel) to handle the risk if or when it occurs.
- Exploitation – largely used for opportunity risks, seeks to enhance the probability of occurrence or amount of impact.

For actionable risks, up to three sound handling methods will be identified. The PMO Risk Manager may identify Program members or task teams to study and recommend mitigation options. Recommendations will be made to the PMO Risk Manager, and the selected method of handling will be recorded in the Risk Register.

3.8.3 Monitoring

The Risk Register will be updated as items are identified in the weekly process meeting or as mitigation strategies are developed.

3.8.4 Risk Closeout and Lessons Learned

All risks associated with Program execution should be evaluated annually for closeout and retirement. In particular, it should be noted as to whether the risk was actually experienced or not. Where realized, qualitative assessment of the effect of mitigation should be recorded.

The qualitative assessment of the impact of the mitigation should be noted in the Program's lessons learned and suggestions developed there for improving the mitigation efforts in the future.

4.0 Government Relations and Customer Communications

The scope and magnitude of pipeline work involved in the Program requires extensive community and elected representative outreach, to inform and engage jurisdictions in which priority work is executed against an aggressive schedule. Because the scope of the Program includes many individual work sites spanning the entire PG&E gas service territory, each location has specific conditions that may cause issues within the jurisdictions in which they are located. The local Government Relations team acts in close coordination with affected jurisdictions and the PSEP team to address and alleviate these issues.

4.1 Outreach Objectives and Strategy

The objectives of customer and community outreach for this Program are summarized as follows:

- Ensure elected officials and communities are well informed about PG&E's Program and well educated about work activities before, during, and after local construction work.
- Assist the project team in achieving project-specific objectives by helping to move requests (permit completion, extended hours, other) through local governments in a timely manner.
- Answer and work through questions and concerns affected jurisdictions may have regarding specific work segments.
- Maintain contact with governmental stakeholders to ensure ongoing two-way communication between PG&E and local governments throughout the entire Program.
- Initiate outreach well ahead of visible PG&E onsite presence.
- Ensure that local officials or elected individuals are well informed and know what to expect during the work.
- Work with local elected officials on specific project issues that arise as a result of the work and the aggressive schedule.

Local governments want to be well-informed of any work taking place in their community, any potential impacts, what to expect, and when work will be complete. Government Relations helps jurisdictions understand the context of the transmission pipeline work being performed. Ultimately, this outreach effort helps demonstrate the progress PG&E is making to modernize gas transmission lines and keep our elected individuals informed of work to upgrade the pipeline system to keep customers safe.

4.2 Timeline of Outreach and Government Relations Support

The local Government Relations team meets with jurisdictions affected by planned work well ahead of the mobilization date. These initial meetings hold a dual purpose: (1) educate the local jurisdiction regarding what to expect during work, which discusses specifics regarding areas affected by individual work segments, and (2) gather information needed to assist in the team's encroachment permitting process. During these meetings, questions from jurisdictions are answered, and Government Relations representatives emphasize the flux in the schedule, the aggressive timetable for completing work, and the fact that so many projects are interlinked. The goal of these meetings is to have the city or county understand the need for quick and helpful resolution of requests.

Throughout the process, local Government Relations representatives work with those elected in their communities to distribute pre- and post-test letters, IVR information, information regarding venting (location, time, and duration of pre- and post-project vents), and other activity to local governments. The local Government Relations team also helps package information requests from local jurisdictions, present to city council meetings regarding pipeline work, and act as the information center for local elected representatives.

4.3 Customer Impact and Communications

The magnitude of pipeline work involved in the Program requires extensive customer and community outreach to both inform and engage public support to achieve the objectives of the Program. Because the scope of the Program has so many individual sites spread across the entire service territory, each location must be evaluated for site-specific conditions that may cause adjustments to the typical customer and community outreach schedule.

4.4 Outreach Objectives and Strategy

The objectives of customer and community outreach for this Program are summarized as follows:

- Ensure customers, and communities are well-informed about PG&E's Program, and well-educated about field activities before, during, and after local construction work
- Provide multiple methods for customers to have questions answered, particularly regarding any safety concerns
- Ensure ongoing two-way communications between PG&E, customers, and the community
- Initiate outreach well ahead of visible PG&E onsite presence and ensure that there are no surprises to customers or the community

Customers and local communities want to be well-informed of what work will be taking place in their community, how it affects them, what they can expect, and the timing. The general public wants to understand the context in which transmission pipeline work will be performed. Ultimately, this outreach effort helps demonstrate the progress PG&E is making to modernize gas transmission lines and restore customer confidence in natural gas as a safe energy source.

Outreach activities are tailored to each pipeline project and local situation. Go/no-go decisions are made to move forward with key outreach steps triggered by operational milestones. As a result, the outreach efforts are coordinated with each individual pipeline segment and managed out of the PMO.

Figure 4-1 illustrates a comprehensive outreach schedule designed to address all plausible situations in the local community and surrounding area. The local community for each individual pipeline segment will be evaluated to determine which outreach effort is appropriate to implement, given the specific situation.

4.5 Media Relations

Prior to onsite activities, the Construction Manager Director conducts a tailboard to provide an overview of communication sensitivity and how to handle the appearance of media and onlookers. Any non-PG&E observers with questions, including media and customers, are given media cards with hotline contact information or directed to the designated onsite point-of-contact or the local energy solutions and services manager. Site visitors must be pre-approved and authorized to visit the location, and must follow the guidelines in accordance with the Site Visitor Guide.

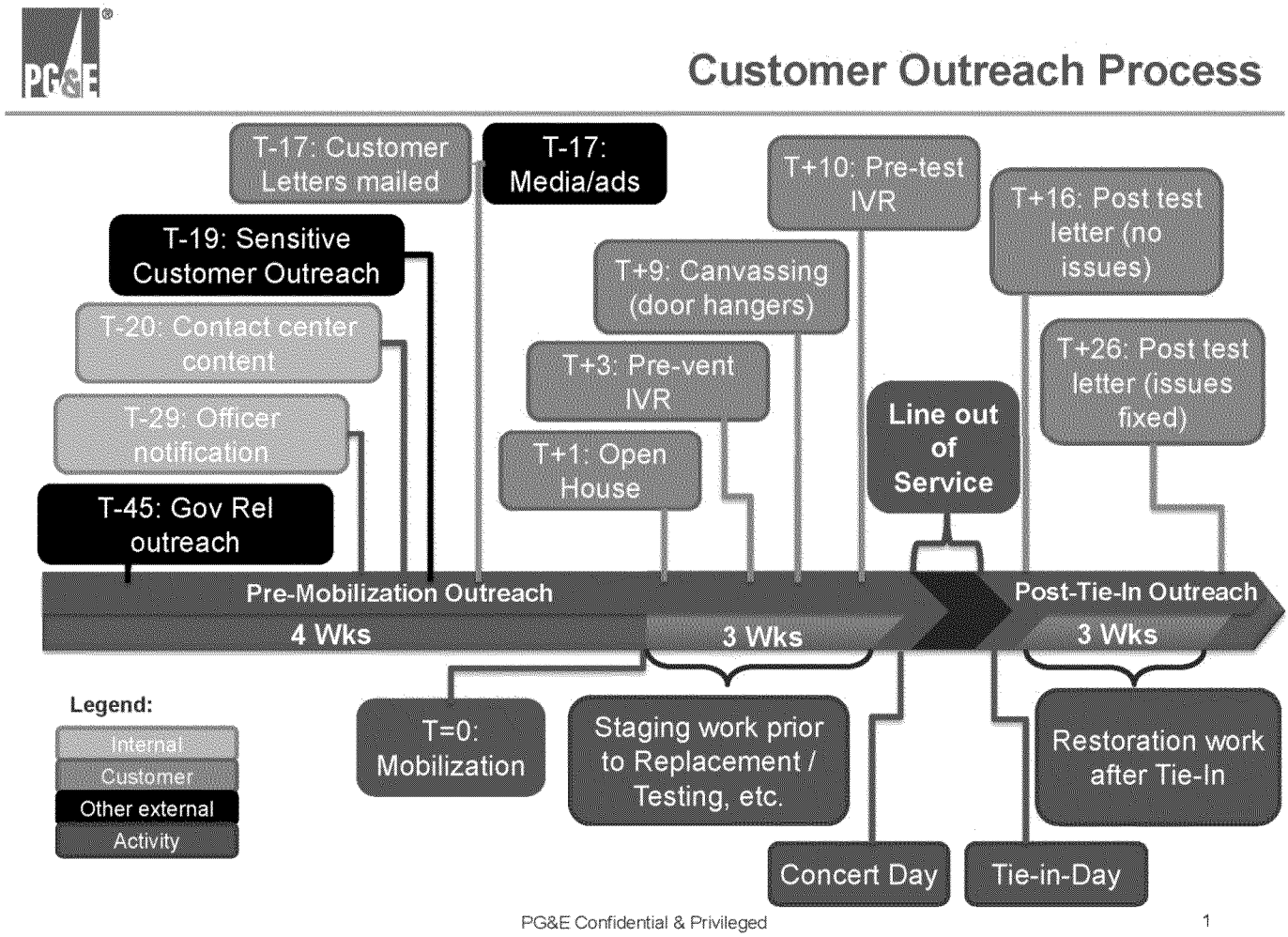

FIGURE 4-1
Customer Outreach Timeline

4.6 Customer Communications

A number of different outreach touch points are available for customers, such as Customer Impact use letters (pretest, post-test), interactive voice responses (IVRs), open houses, canvassing, and onsite staffing the day of the test. Customer communications help inform customers of the overall work process, such as the dates of major milestones, the nature and extent of the work, and safety precautions. Customers will also be notified after work is complete and the pipeline is returned back into service.

4.7 Crew Communications

Customer Impact will deliver the 5-minute meeting below to all construction crews on the first day of construction.

5 Minute Meeting

February 10, 2012

Topic:

Gas Transmission Customer Service and Safety

AUDIENCE:

All employees working on the Gas Transmission System

Why It Matters To You

This tailboard identifies appropriate conduct for PG&E's representatives, including PG&E employees and contractors. Everyone working on PG&E's gas transmission system will be in the public spotlight and represents the company. Each PG&E employee and contractor should remain aware of all impacts construction projects may have on our customers. Help minimize customer inconvenience by working safely and courteously.

Key Discussion Points

Immediately report any unplanned release of odor or natural gas

If you notice the release of natural gas or the release of odor, immediately alert others about the situation. The first step is to ensure that a PG&E inspector is made aware of the issue. That individual is responsible for working with the Project Coordinator, who will contact Customer Impact and Government Relations.

Safety Rules:

Observe all PG&E safety rules for yourself and others by taking the following actions:

- Always put safety first.
- Look for, and act to resolve, unsafe situations.
- Help and encourage others to act safely.
- Do not allow customers, public officials, or members of the media onto the job site without first receiving approval from Customer Impact, Government Relations, or External Communications. Even with proper approval to be on the job site, no one will be allowed without ALL of the following: (1) appropriate PPE, (2) a proper safety tailboard orientation, and (3) an escort.
- Use of alcohol is never permitted onsite.
- Ensure all open pipes are capped and secure prior to leaving the site to prevent the escape of mercaptan odor.

- Ensure all signage clearly marks the construction site and clearly communicates the work being performed.

Customer Courtesy Rules:

- Treat every work site as if it was in YOUR neighborhood.
- Be respectful of customers' property, and avoid blocking driveways or property access, unless absolutely necessary.
- Keep language professional (you never know who might be listening).
- Work only during permitted/approved hours, and be sensitive to noise and odors.
- When working extended hours, please be aware of your surroundings and the possible impacts our construction might have on customers (noise, smell, traffic pattern).
- Check with safety personnel regarding the decibel levels in your work area (normal conversation is 70 decibels).
- Immediately report to the Construction Manager (by e-mail or phone call) delays or changes in work schedule (PG&E inspector should contact the Project Coordinator, who will contact Customer Impact and Government Relations).
- Idling vehicles may be disruptive to customers please be aware and turn off engines when possible.
- Loud music should be avoided at all times.
- No fighting (with customers or each other).

For Additional Information, Contact:

Jill Egbert, Manager Customer Impact, 916.402.3579

5.0 Environmental Compliance, Land Rights, and Permits

Prior to finalization of the Work Plan, PG&E will apply for and acquire all necessary permits, as required by local state and federal law, and obtain new land rights or use existing land rights as needed.

5.1 Property Owner Notifications

Before a line is cleared and work begins, the PG&E Customer Care team will notify all property owners in the vicinity of the project by sending out a series of letters with the project dates, the nature and extent of the work involved, and all applicable safety precautions.

5.2 Existing Land Rights

PG&E is the owner of various land rights for the construction, operation, and maintenance of company-owned facilities. A Land Agent will review the geographic information system (GIS) Land Rights Library and pull any existing documentation for each work site to compare to the system map. For maintenance projects, such as strength testing, PG&E will use existing land rights whenever possible. PG&E will review and confirm these land rights prior to construction.

5.3 Temporary Working Areas

When necessary, temporary construction easements, leases, permits, or other land rights will be obtained to use private or public land for the temporary work sites. The temporary working area will be identified, including the amount of space required for construction crews and equipment. Once identified, PG&E's Customer Care team and a Right-of-way (ROW) Agent negotiate with the property owner to obtain the required temporary rights prior to construction.

5.4 Franchise Rights

PG&E has entered into franchise agreements with the cities and counties in its service territory that grant PG&E the right to install, operate, and maintain its gas and electric facilities within public streets and highways. If a site-specific encroachment permit is required to work within public ROW, Engineering will apply for encroachment permits and work with the local jurisdiction to revise drawings and develop traffic control plans as necessary.

5.5 General Best Management Practices

If no site-specific permitting is required, PG&E will implement standard best management practices (BMPs) for each site. These include items such as erosion control, cleanliness of work sites, and contact information if wildlife enters the worksites. A pre-construction tailboard will be conducted by the designated compliance representative to review the proposed measures prior to each segment going to construction.

5.6 Environmental Permitting

PG&E will be required to comply with all applicable local, state, and federal environmental laws and regulations. Certain laws and regulations apply to the construction, replacement, expansion, or re-location of company-owned

facilities, and depending on site-specific conditions, apply to inspection and maintenance activities as well. The specific regulations and permit requirements that apply to work on any particular segment of pipeline or station are dependent on a range of factors, including the jurisdiction of the agency, site conditions at the project location, and the scope of work.

The scope of the environmental review for each project include desktop reviews and field visits by trained personnel, such as biologists, permit specialists, and cultural resources specialists. Actual impacts at each location dictate the level of permitting required to comply with the applicable environmental regulations. PG&E Environmental Planners will obtain all of the necessary permits for this activity.

5.7 Release to Construction

After obtaining all required permits and land rights, and after customers have been notified of the pending construction, the Land and Environmental team will issue a release to construction (RTC) letter to the Project Coordinator, which contains any site-specific permit or land requirements, contacts, or any other applicable measures. Figure 5-1 shows the RTC process.

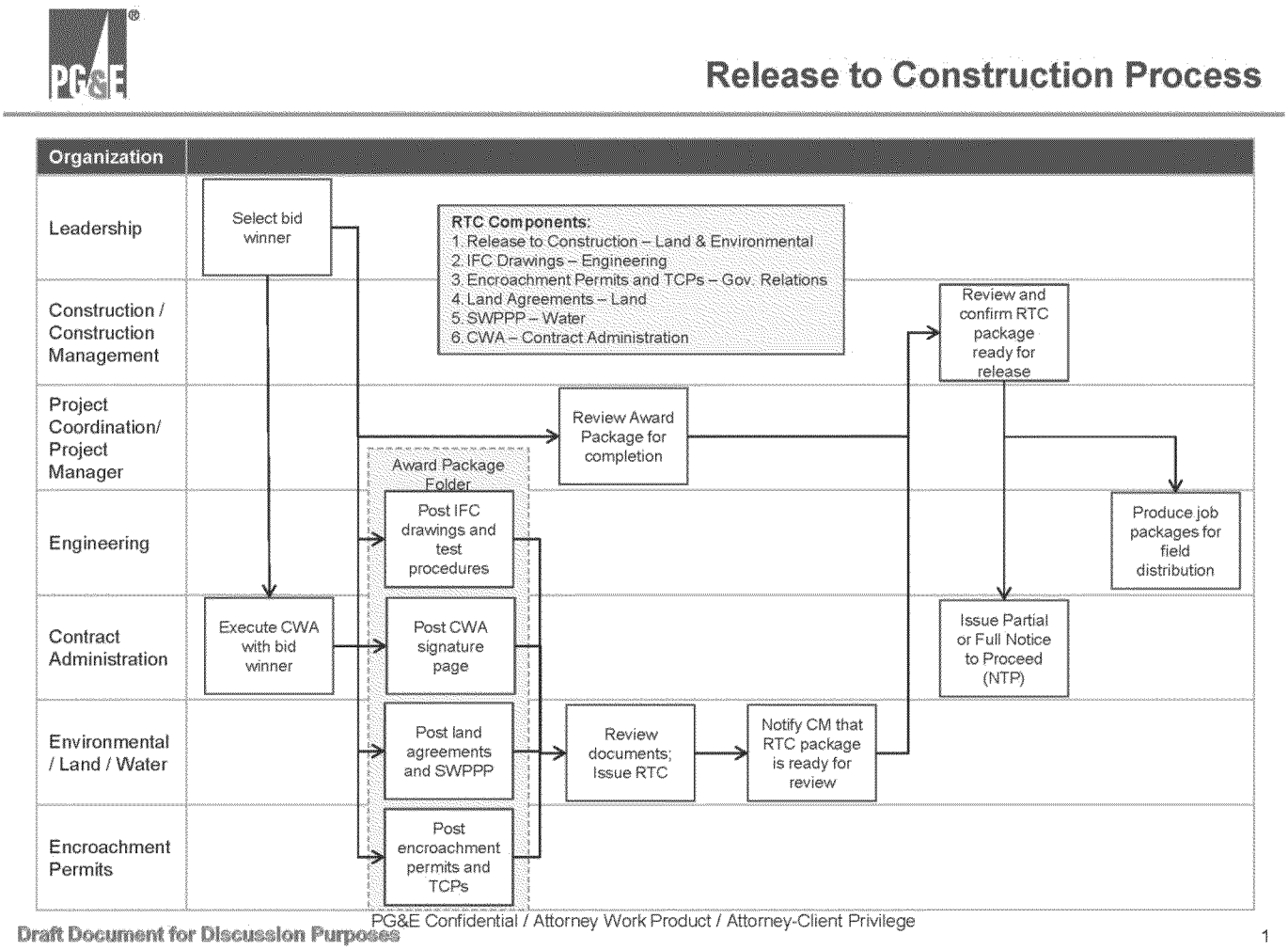

FIGURE 5-1
Release to Construction Process

5.8 Environmental Compliance Management Plan

A site-specific Environmental Compliance Management Plan will be developed to cover the general compliance activities and responsibilities for the Program. Site-specific compliance measures and responsibilities will be identified in the RTC letter and the project tailboards will be delivered by the designated compliance representative. These measures include holding onsite training for sensitivity to particular habitat or endangered species, water quality, and all of the specific needs of the specific test site.

5.9 Environmental Monitoring

PG&E will provide and maintain all of the required environmental monitors onsite. The role of the environmental monitor varies by site, and can include looking for specific species in the area, making sure the construction crew applies BMPs and environmental compliance, and reports weekly on the status of the test site. The requirements for each site are determined by the specifics of the site, as well as any site-specific permit requirements and overall BMPs, such as PG&E's Environmental Stewardship Initiative.

5.10 Restoration of Job Sites

After all construction and testing has finished, the construction crew must restore the test site to its original condition. The site monitor will verify that all post-construction restoration is performed and all issues are resolved.

Components of the RTC include the following:

- RTC – Land and Environmental
- Issued for Construction (IFC) Drawings – Engineering
- Encroachment Permits and Traffic Control Plans – Government Relations
- Land Agreements – Land
- Stormwater Pollution Prevention Plan (SWPPP) – Water
- Contract Work Authorization – Contract Administration

6.0 Engineering

Extensive planning and design work will take place long before any each project is executed. When developing the engineering documentation for each project site, communication between all Program departments will be essential to ensure that the requirements of all aspects of the Program are identified and satisfied by the proposed designs.

The engineering activities for each project to be conducted will result in the creation of the Site-specific Design Package (Design Package). Other aspects of the Program will also be considered during the design phase, and result in safety plans, notifications, permits, and supply chain material requirements.

6.1 Design Package Development

The engineering deliverable for each pipeline segment will be the Design Package. Most of the effort from engineering goes into the design drawing for the Design Package, which will be developed in a four stage process: base map drawing, issued for permit (IFP), issued for bid, and issued for construction (IFC). Figure 6-1 illustrates the key stages involved with developing the Design Package, and Figure 6-2 shows the engineering process.

6.2 Records Research and Scope of Work Validation

Engineering will gather the available records for each pipeline segment and the surrounding areas according to pipeline segments that have been identified in the planning phase of the Program. The information required to produce the initial design typically includes the following items:

- Implementation Plan review to ensure the identified project will be most efficient and that consideration will be given to any other scheduled PSEP work
- Verification of identified segment for accuracy and completeness
- As-built drawings, job estimates, and STPRs (strength test only)
- The most current pipeline features list
- Transmission and distribution plat sheets
- The operating map
- Operating diagrams for affected stations

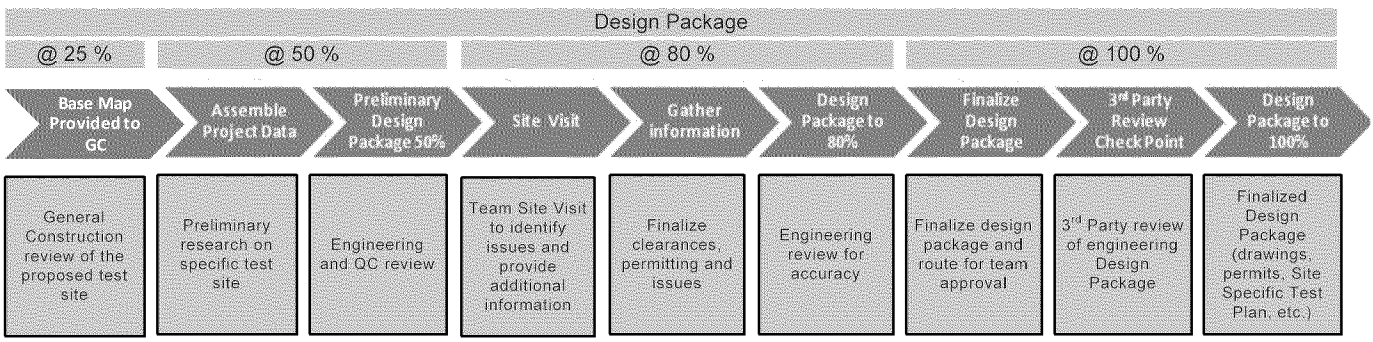

FIGURE 6-1
Design Package Development Process – Strength Testing

Draft Document for Discussion Purposes

PVI Design Process (Page 1)

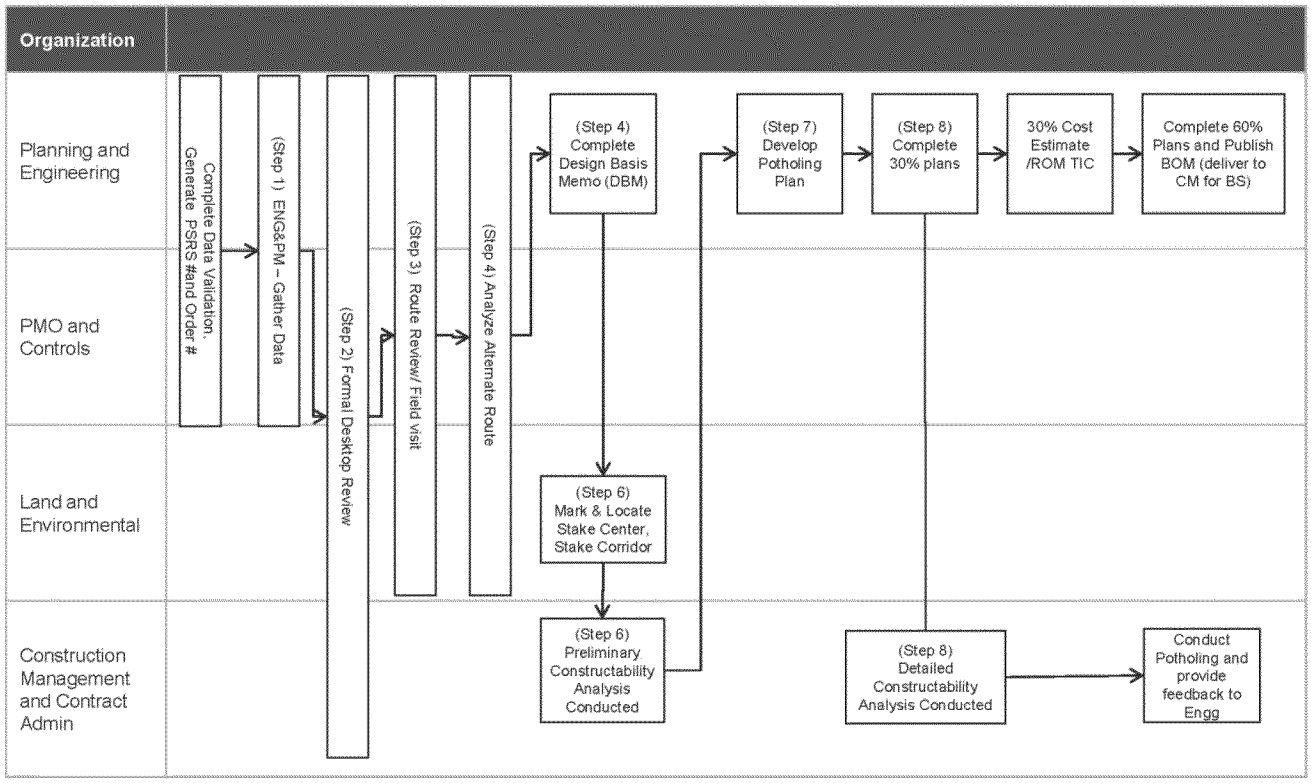

FIGURE 6-2
Engineering Process

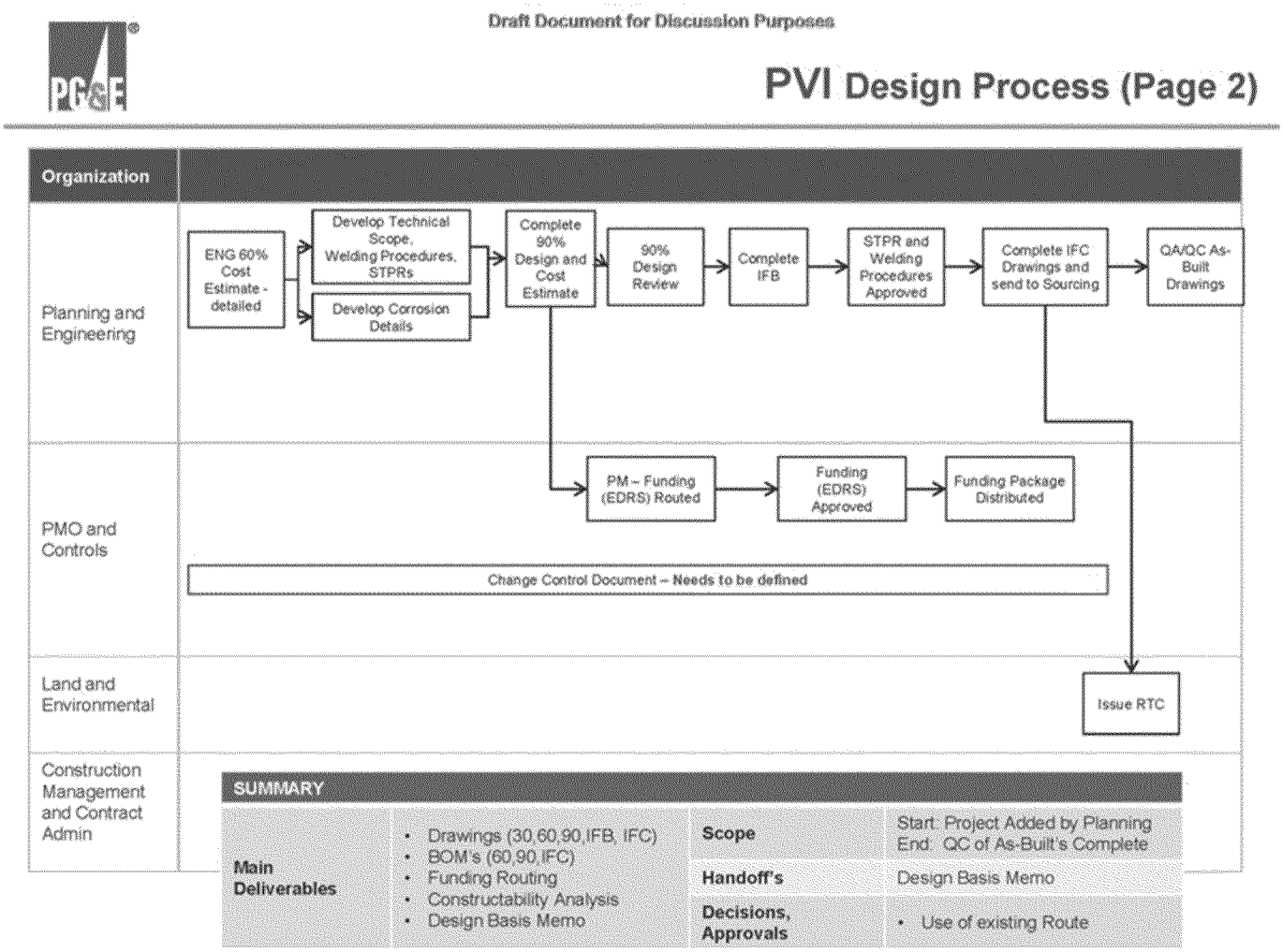

FIGURE 6-2 (CONTINUED)
Engineering Process

Engineering has created the Design Basis Form to summarize the initial research and validation (see Figure 6-3). This form provides data used to determine the segment endpoints. It also describes the pipeline characteristics, identifies known appurtenances, and notes any potential conflicts or issues to be resolved. The Design Basis Form for each job will be posted to the SharePoint site and updated when significant changes to the pipeline segment or status occur.

Pacific Gas and Electric Company

HYDROTEST DESIGN BASIS
TIM-180-12

GTS

LEAD ENGINEER: Redacted **ENGINEER:** Redacted

DIVISION/DISTRICT: Diablo **DATE: 09/28/12**

GENERAL INFORMATION

Redacted

	NAME	CONTACT NO	
		CELL	OFFICE
PIPELINE ENGINEER:	Redacted	Redacted	925-974-4106
DISTRIBUTION ENGINEER:			925-674-6329
TRANSMISSION PLANNER:			916-408-3296
LOCAL PLANNER:			925-674-4542
T&R SUPERVISOR:			---
CLEARANCE WRITER:			---

IDENTIFICATION OF DESIGN, PERMITTING, LAND/ENVIROMENTAL, TEMP GAS ISSUES

☐	CALTRANS ENCROACHMENT ROUTE:	☐	SIGNIFICANT ELEVATION Δ
☐	MAIN LINE VALVES	☐	INTERNAL/EXTERNAL CORROSION THREAT
☐	MULTIPLE CLASS LOCATIONS	☐	STATIONS? (Work inside reg/meter stations) Specify:_____
☐	RIVER/CREEK/WATERWAY CROSSINGS	☐	TEMPORARY GAS REQUIRED (CNG/LNG)
☒	ENCROACHMENT PERMITS	☐	PIGGABILITY (Obstacles to pigging) Specify:
☐	TAPS	☐	CLEARANCE PCF REQUIRED? Size:_____
☐	SPANS	☐	LEAK HISTORY?

See "Notes" section on page 3 for details

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FIGURE 6-3
Design Basis Form – Strength Test Example

Pacific Gas and Electric Company

HYDROTEST DESIGN BASIS TIM-180-12

GTS

HYDROTEST SEGMENTS

	SEGMENT	MP1	MP2	FOOTAGE	CLASS LOC.	WATER (Gallons)	YEAR	OD	WT	GRADE	SEAM
DOWNSTREAM	Redacted										
TEST SECTION											
UPSTREAM	Ends in C Street Station										
		6076				25829.17					

TAP LIST

	MP\TAP #	O.D.	DR #	STATION/TAP NAME	TEMP GAS REQUIRED?	SEASONAL DEMAND
DOWNSTREAM	Redacted					
TEST SECTION	No taps within test section					
UPSTREAM	No taps downstream of test section					

MAIN LINE VALVE CONFLICT ISSUES LIST

MP	LOCATION/STATION NAME	O.D.	TYPE	RATING (ANSI/etc.)	REPLACE (Y/N)
No Mainline Valves within test section					

NOTE: Mainline valves are located at MP 34.66 and 35.78. The mainline valve spacing is compliant with 49 CFR 192.179.

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FIGURE 6-3 (CONTINUED)
Design Basis Form – Strength Test Example

Pacific Gas and Electric Company | **HYDROTEST DESIGN BASIS TIM-180-12** | GTS

NOTES/COMMENTS:

Operating Map: 384512 Sheets 1 of 2
Operating Diagrams: Redacted

Test Summary:

Redacted

Clearance Points:

- Redacted
-

Piggability Issues:

- Redacted

Valves: No existing valves within test section

Temporary Gas Requirements:

Redacted and

Data Validation Completed: N

Data Validation Dig Required: N

PFL(s) Reviewed/Utilized for MOR:

- PFL-191-1_MP32.45-35.60_14Aug11

Design History:

-

PREPARED BY: Redacted	DATE:	REVISION:
APPROVED: Redacted	DATE:	

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FIGURE 6-3 (CONTINUED)
Design Basis Form – Strength Test Example

6.3 Desktop Review Meeting

Desktop reviews are a cross-functional meeting to review each segment and conduct preliminary engineering planning prior to creating a base-map drawing. Functions that will be represented and provide key input for design considerations include PMO and Controls, Land and Environmental, Construction Management, Sourcing, and Customer Care. Meetings will be held in the Division offices, with a Genesys connection for those who want to participate remotely. Table 6-1 presents the accountability matrix.

TABLE 6-1
Accountability Matrix
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Function	CM/LI	CT	PM/PC	GCS	DT
Organize and conduct 50% constructability review job walks and capture GCS and CM constructability comments. Ensure GCS for the region and that CM are available to attend.	C		R	C	I
Provide concise written narrative specifically outlining the GC requirements for bell holes (i.e., clearance under pipe to bottom ex., from side of pipe to wall, from weld to wall, location of braces relative to welds, and types of shoring, specifically listing any requirements that the contractor must meet.	I	I	I	R	I
Include above GC Bell hole requirement language in every bid spec and contract document.	I	A	R	I	I
Review every job package and assess the size, number, and locations of the bell holes specified on the drawings. Propose changes if bell holes shown are inadequate prior to completion of 90% and IFB set. Communicate any required changes to PM and DT.	C	I	I	R	I
Schedule and coordinate 30-day pre-clearance meetings, verify key participants are available, and record and communicate plan and specific sequence to key stakeholders.	I		R	C	I
After contractor has been selected and brought on board, communicate clearance plan, specific work sequence, and other clearance-specific GC requirements with successful contractor and key stakeholders.	I		R	I	
Modify drawings and incorporate constructability review comment concerning bell holes size, tapping and plugging locations, tie-in locations, cut and cap locations, and venting location.	I	I	A	I	R
Update schedule weekly (daily for strength test), and provide realistic and achievable schedule target dates.	C	I	R	C	I
Provide enough float in project schedule to allow bell holes to be completed a minimum of 24 hours prior to the time GC is scheduled onsite.	C	I	R	C	I
Three days prior to when GC is scheduled onsite, CM/LI to communicate daily with GCS and PM/PC to advise of work progress and confirm upcoming GC schedule date.	R		I	I	
Monitor and drive the work onsite to verify bell holes are excavated and shored to listing Occupational Safety and Health Administration and GC requirements and that the work will be ready for GC to perform in accordance with the clearance schedule.	R		I	I	
Inspect the site and bell holes 24 hours before the time GC is scheduled onsite. Verify that site, bell holes, and required equipment and materials are adequate to support GC work. If not, work with CM to make any changes by the contractor within the available 24 hours. If changes cannot be made within 24 hours, work with the PM/PC to reschedule clearance and deploy crew on other projects.	C		C	AR	

Notes:

Source: PG&E

CM = Construction Manager
CT = Contracts Team
DT = Design Team
GC = General Construction

TABLE 6-1
Accountability Matrix
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

GCS	=	GC Supervisor
IFB	=	Issued for Bid
LI	=	Lead Inspector
PM/PC	=	Project Manager/Project Coordinator
R	=	Responsible
A	=	Accountable
C	=	Consulted
I	=	Informed

6.3.1 Prepared Handouts for Discussion

- Relevant operating diagrams
- Relevant D-Plat sheets
- Validated Detail Sheet
- Justification:
  - Project status reporting system number, order number
  - Anticipated year of work completed
  - Approximate mileage and size of (E) pipe
  - Mileposts
- Google Earth images with GIS information overlaid (keyhole markup files, such as Google Earth)
- PSEP overview map(s) showing completed work and 2013 and 2014 test and replacement work (in layers)

6.3.2 Agenda

1. Safety (PM leading meeting)
2. Introductions of attendees (PM leading meeting)
3. PSEP overview (PSEP Engineer)
4. Brief preview of project to include the following (PSEP Engineer):
   a. Physical location of project
   b. Validated data sheet
   c. Status update of any scope already completed or planned in the future, including pipeline replacement, valve automation, ILI, or strength test
5. Google Earth images/GIS projected on screen for discussion of initial route review (PSEP Engineer)
6. Overview of existing route (PSEP Engineer), including the following:
   a. Existing land rights
   b. Easements/land acquisition
   c. Biological/cultural
   d. Jurisdictional permitting
   e. Historical construction issues (such as water tables, permit restrictions, customer issues, and soil issues)
   f. Clearance issues

g. Customer issues on route

h. Identification of betterment and gas transmission/division planned work in the area (such as high-pressure regulator replacement, reliability work, and capacity)

7. Alternate routes (if applicable)
8. Construction window and preferred construction time period (earliest start, latest finish, optimum timing)
9. Identification of team representatives (A) and smaller, team-to-walk route (B)
10. Schedule route review (typically within 2 weeks of kickoff meeting)

Meetings will be scheduled by the Engineering Manager who should forward meeting announcements onto PMs and requisite participants before each kickoff. Meeting announcement with an agenda will include expectations for the kickoff meeting, required pre-work, and the expected attendees.

6.4 Base Map Drawing

The first engineering deliverable will be a base map drawing that will show the proposed test segment as identified in the Implementation Plan. The drawing template will be populated at this stage with the preliminary plan view and elevation profile to show the entire project, zoomed-in details of the proposed tie-in, replacement, inspection, or test-head locations, staging areas, property lines, and other known utilities in the area. Following approval from the lead engineer, the drafter will post the 25% design drawing to the SharePoint Site. The base map drawing will be used by the project team before and during the 25% tabletop discussion to identify the location and the proposed test segment, and identify potential issues as early as possible.

6.5 Issued for Review/Permits

The 50% level indicates that the design drawings have been approved for release to the project team for informational gathering purposes, basic requirements of initial permit segments, and finalization of the layout. The 50% design drawing will incorporate more details on the plan view, R-stations, vicinity sketch, proposed locations, tap, staging areas and other relevant site-specific details. The tap locations will be incorporated with sufficient detail to produce the Bill of Material (BOM) for all new materials required to complete the project, return to service, and be on-hand for contingency purposes.

Prior to the site walk, the 50% drawing will be posted to the SharePoint site, indicating the status as “issued for review.” The engineer and Project Coordinator will review the drawing with other team members, as required to address any identified issues. If any issues remain or new issues are identified, they will be added to the list of items to investigate during the 50% site walk, which will be coordinated with the appropriate personnel to resolve the issues.

6.5.1 Site Walk

The purpose of the site walk will be to gather site-specific information necessary to complete the Design Package and provide an opportunity for the project team to inspect the site and look for details that will affect permit, access, or environmental compliance obligations. The Project Coordinator will verify complete items and track outstanding issues. The Project Coordinator Checklist contains a complete list of information to be obtained. When all of the requested information is gathered, it will be submitted to engineering for incorporation into the design drawings. At this stage, all the details for any necessary permits will be identified. The drawings will be

issued for permits, and permit applications will be proposed and filed with all appropriate jurisdictions. In addition to addressing all permit-related issues, the design drawing will be enhanced as follows:

- Identify potential safety concerns and solutions
- Confirm access to and size of staging areas
- Confirm environmental impacts are manageable/mitigatable
- Verify/determine tie-in location details and pipe specifications
- Identify the water source and discharge plan
- All tap location details and specifications started, complete by 80%
- Prepare initial BOM and contingency BOM Show profile elevations of existing pipeline

The team members typically required for the 50% site walk include a safety representative, engineer and/or lead engineer, Project Coordinator, CCS (or other knowledgeable construction representative), Water Specialist, and an environmental/land representative. Personnel teams required to attend the site walk may vary and include Public Outreach, Government Relations, or any Program staff appropriate to address any potential issues for the site-specific conditions.

6.5.2 Issued for Permit

If the work locations, staging areas, or any part of the project disrupts the local traffic, Engineering will work with the Permit team to develop drawings that illustrate the proposed encroachment location(s). Following approval from the lead engineer, the drafter will post the IFP drawing to the SharePoint site. This can be a repetitive process, based on permit agency requests. The Permit team will then submit the application with the local officials to obtain the permit(s) that will allow the work to be performed.

6.6 Issued for Bid

The 80% level will be achieved after the project team conducts the site visit, processes the gathered information, incorporates comments from construction and other team disciplines, and addresses any observations or concerns regarding the proposed test site. Engineering will update the design drawings to incorporate the following:

- The test head details defining the configurations and materials to be used
- Material of Record, BOM, and contingency BOM updates
- Details for isolation of each tap location (strength test only)
- The completed profile sheet, showing stationing, elevations, pressure control points, all appurtenances, and the strength test pressures and ramp pressures (strength test only)
- The construction details are completed showing location, material callouts, design criteria, existing pipe specs, and data stamps for all valves to be replaced
- The indicated water volume and shown Baker Tanks (strength test only)
- The locations requiring examination, inspection, and non-destructive testing are detailed and the drawing notes elaborate on the requirements

6.6.1 Data Validation Database Updates

After the drawing elements are incorporated at the 80% level and the bid package documents have been generated, the pipeline features list and other line segment research will be incorporated into the Data Validation

Database. The PG&E PSEP created a database used to compile the pipeline research performed on every transmission line in the system. PSEP Engineering manages the database and provides training to engineers when significant improvements change the methods used to record the researched data. The database will be located at the following location on the PG&E network: \\walnutcrk01\LocalShared\Implementation Plan\Database\Master - ImplementationPlan_12152011_updated 1.13.12.xlsx

6.6.2 Bid Package Preparation (Issued for Bid)

Qualified primary contractors will be provided with the information prepared for accomplishing each project through a competitive bid process. Engineering will post the 80% issued for bid design drawing and the preliminary document to the SharePoint site and notify the Project Coordinator/Project Manager when they are available. The master schedule will track the date when each Bid Package will be available within the respective Bid Package folder on the SharePoint site.

Along with the issued for bid drawing and work procedure, Engineering will tailor the Specific Conditions document to callout the line, mile points, job number, a summary of proposed work and other details related to the specific job. Engineering will then send the tailored Specific Conditions document to the Project Coordinator who will review the document for completeness and accuracy. When satisfied with the document contents, the Project Coordinator will add the milestone schedule dates to the table within the Schedule section of the document, indicating the schedule for the job show, bids due, contract award, mobilization, clearance, tie-in, site restoration, and project closeout. The contractors will use this information, along with the rest of the Bid Package, to build a proposed work schedule.

Prior to the job show and bid walk, Engineering will work with Sourcing and Estimating to complete the Bid Sheet. The Bid Sheet will provide a breakdown of work into line items that support the estimating process and define the groupings of work to be used for status reporting from the contractors while work is in progress. The work will be separated into the various sites and tasks, including mobilization, excavation, tap isolation, and site restoration. Within the Bid Sheet, all of the capital work will be identified and isolated into a separate section for bidding and tracking purposes. Engineering will post the Bid Sheet to the SharePoint site prior to the bid walk. The Bid Sheet will be considered when reviewing the bid walk questions and issues list. Sourcing will use the Engineering Bid Sheet and the questions and issues from the bid walk to create the digital form (using Power Advocate software) that the contractors will use to provide their bid pricing breakdown. The questions and clarifications will be reviewed to assist improvements with future Bid Package preparations.

6.7 Test Procedure – Strength Test Only

Engineering will prepare a Strength Test Procedure Form for each strength test, which includes detailed procedures for conducting each strength test. Templates of the Strength Test Procedure Form are posted on the SharePoint site. In accordance with the cleaning requirements and other site-specific details, the appropriate Test Procedure Template will be downloaded, as specified in the Strength Test Procedure User Guide (*being revised*), and modified for each specific test site according to the User Guide. Each step in the Strength Test Procedure will be sequenced step-by-step and will require sign off to verify that each task was accomplished. The Strength Test Procedure will be created in compliance with the PG&E documents A-37, Strength Testing Procedure and A-34, Piping Design and Test Requirements, in Appendix A.

The Strength Test Procedure will require input and signatures from several functional group lead team members. The assigned engineer will serve as the liaison with each functional group lead to gather the required details for completing the Procedure Form.

The primary contractor awarded the work will have several roles to perform that are defined in the Strength Test Procedure. To facilitate the bid process, the Strength Test Procedure will be released as a draft copy with test-specific details defining the water source and handling, cleaning requirements, any planned reuse of test water, and other requirements.

6.8 Pressure Reports – Strength Test Only

The STPR will be used by Engineering to compile the test-specific design data for the pipeline material within each test segment identified on the IFC drawing; list the test segment elevations for each component; and determine the test duration and the minimum, maximum, and spike test pressures required for the strength test.

The STPR template will be set up so the top half will be completed by Engineering and the bottom half will be completed in the field with the indicated and calculated test pressures. At the time of release of this manual, the STPR template will be revised by PG&E. It is recommended to check the PG&E Technical Library periodically to confirm the most recent versions of the PG&E templates are being used.

An independent third-party engineering organization, Kiefner and Associates, will provide a review of the proposed test pressures (minimum, maximum, and spike) when the PMO or other PG&E engineering representatives request this review process. Kiefner and Associates will review the proposed test pressures, long seam type, and year installed and compare the historical Mill test pressure against the specified test pressures. The test pressures will either be approved, or new test pressures will be recommended.

6.9 Design Package Complete

Following contract award, the contractor contact information and cleaning chemical/pig specifications will be incorporated. If the contractor has additional requests/proposed changes, those will be reviewed and either incorporated or discussed to explain why the specific requirement will not be changed.

The Out of Engineering Checklist will be used to confirm that all final details are incorporated into the Design Package. The hardcopy original IFC drawing will be produced and signed by the assigned engineer. The documents will then be presented to the engineer (professional engineer) responsible for performing the final review and providing the final authorization, including stamping and signing the drawing). The Strength Test Procedure Form will also be completed and routed for signatures from the various functional group representatives.

After all authorization and signatures are collected, the completed Design Package will be presented to PG&E Construction Management for completeness and distribution approval. A Transmittal Form outlining all the documents included in the Design Package and a Distribution/Routing Slip indicating the number of copies to be supplied, and to whom, will be included when e-mailing the Design Package to Construction Management. After Construction Management forwards the Design Package onto the PG&E Contracts Department, Engineering will post the design drawing, work procedure, and STPR (strength test only) to the SharePoint site, and distribute as indicated.

The transmitted Design Package will include the following documents:

- Distribution/routing slip
- IFC engineering drawings
  - Material of Record
  - BOM
  - Contingency BOM
- GIS markups

- STPRs
- Welding procedures
- Operating maps and diagrams
- Chain of Custody (COC) Procedure
- Record of Materials Removed (RMR) COC Form
- Dew Point Test Form
- Design Change Notices, as required
- Contractor operator qualifications (OQs), if required
- Weld testing summary, blank
- Test Procedure Form (strength test only)
- STPRs (strength test only)
- Form A, blank (strength test only)
- Form H, blank with Completion Guide (strength test only)

In instances where the information benefits the Construction testing crew, portions of the approved Design Package will be transmitted in advance of the completed package. When sending an incomplete transmittal, the omitted document(s) will be listed as absent with the date the document(s) will be provided. The process will otherwise remain the same as previously detailed. Each function should receive a full set of drawings. Table 6-2 provides an example drawing specifications for pipeline replacement, valve automation, and ILI.

TABLE 6-2
Pipeline Replacement, Valve Automation, and In-line Inspection Example
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Description	60% Review	Full Size	Half Size	Disk
4 Full and 2 Half	PM	2		
	A&B Harris	1	1	
	Contr. Eng.	1		
	Corros. Eng.		1	
	Estimating			
6 Full and 2 Half	90% Review	Full Size	Half Size	Disk
	PM	4		
	A&B Harris	1	1	
	Contr. Eng.	1		
	Corros. Eng.		1	
	Estimating			
6 Full and 2 Disks	IFB	Full Size	Half Size	Disk
	PM	4		2
	A&B Harris	1		
	Contr. Eng.	1		
	Corros. Eng.			
	Estimating			
10 Full and 2 Disk	IFC	Full Size	Half Size	Disk
	PM	1		
	A&B Harris	1		
	Contr. Eng.	1		
	Corros. Eng.			
	Estimating	1		2
	CM	5		
	Survey	1		

7.0 Quality Assurance and Quality Control

7.1 Independent Certification

PG&E uses independent third–party organizations to provide quality oversight of the Program according to the nature and importance of the work performed. An industry certified quality assurance and quality control (QAQC) organization will approve the quality procedures and certify that each individual project will be performed in accordance with the designed Engineer Plan. The certification organization will report directly to PG&E's Program Sponsor.

7.2 Construction Inspection, Quality Control, and Quality Assurance

Construction inspection services will be applied to construction activities provided by third-party construction contractors. Construction Inspectors will confirm the procedures and results for key field activities, including but not limited to, the following activities:

- Materials tracking and accuracy relative to bill of materials
- Trenching
- Welding and weld map preparation
- X-ray tracking
- Surface preparation
- Coating
- Backfill
- Compaction
- Site restoration
- Red-line drawings (dimensions, field changes, stationing, and latitude/longitude) and documents in accordance with field changes
- As-built record keeping
- Procurement of land rights, assignment of GC, and design completion prior to notice to proceed (NTP)
- Ability of contractor to follow procedure
- Rate of passed main-line/tie-in welds following initial inspection

Inspectors will follow and document construction as well as critically track and record problems observed during strength testing, pipeline repairs, installation of automated valves, and ILI. All pipeline segments identified and removed for repair, as well as segments removed for testing, will be recorded and tracked using the COC Procedure and form, as outlined in the Construction Clearance section of this manual.

Quality control (QC) sampling will be applied to critical Program process steps. An experienced third-party contractor will randomly sample the process results of select projects, starting with 100% of the projects at the

commencement of each individual workstream, to confirm that all of the engineered and documented project activities are completed to PG&E standards. As the required measurement results are solidly confirmed, sampling rates will be reduced to levels that maintain full confidence in results. Process activities that struggle to achieve expected results must be sampled more frequently, as determined by the importance of the results and the usefulness of the quantitative data. The QC contractor will measure and record the key process activities, maintaining a database of these records for analysis. QC will focus on all activities in the work execution process, from construction preparation, installation, and restoration, to as-built mapping.

The independent QA organization will certify the quality procedures for the Program. QA will use referenced PG&E standards and procedures to ensure that proper rigor is applied to critical strength test process steps, and use industry standard disciplines (such as the American Society of Quality and American Society of Mechanical Engineers) to confirm that quality procedures have been effectively applied to the Program.

7.3 Quality Procedures

Quality measurements will occur at key steps throughout the project lifecycle, with particular emphasis during the engineering package development; construction set up; installation, replacement, and inspection; tie-in; restoration; and final documentation.

Quality checkpoints have been developed with consideration for the Project Construction Checklist and Work Plan. Construction and Engineering have created several progress hold points to confirm results of critical project milestones. These hold points frequently reflect areas of quality concern and potential quality results measurement. As the construction checklist is modified or updated, related quality activities will be changed as required.

Points of process review and quality measurement are at the following critical steps:

- Development of the Design Package (focus at 50 and 100%)
- Project initiation (pre-construction review of quality expectations)
- Work procedure documentation
- Drying (if necessary), tie-in, and restore construction inspection activities
- As-built records and mapping/GIS

7.3.1 Design Package Development

The Design Package includes the following components:

- Design drawings
- BOM
- Weld procedures
- Operating maps and diagrams
- Material staging plans
- Test Procedures (strength test only)
- STPRs (strength test only)

Engineering will be responsible for project package quality through issuance to Construction. As the project package is developed by Engineering (Section 8) data quality will be checked and recorded at both the 50 and 100% status. Engineering ultimately completes the Out of Engineering Checklist in Appendix A; the checklist will then be issued to Construction and another quality assessment will be performed.

7.3.2 Construction Inspection

Construction inspection will be applied over the scope of fieldwork and includes the following activities:

- Site preparation
- Clearance
- Pretest, set up, and fill pipe (strength test only)
- Pressurize and test (strength test only)
- Depressurize and de-water (strength test only)
- Capital improvements – pipeline/valve replacement
- Inspection/camera work (specific to ILI)
- Tie-in and restore site
- As-built documentation

The Construction Inspector will be responsible for checking and recording key results of the construction contractor activities.

The Project Construction Guide will be used to track critical deliverables and hold points. These activities help define areas of concern for quality results. Quality reviews will occur over these milestones to develop an understanding of the potential issues, impact, and frequency. The following quality procedures are evaluated to ensure issues are being appropriately captured:

- During the site preparation activities, the pipeline will be exposed and data will be collected. PG&E Forms A and H will be used to inspect the pipe, coating, and soil characteristics, and automated ball indentation (ABI) tests will be performed and recorded to verify the accuracy of the records for the exposed pipe specified minimum yield strength. Quality sampling of these data will be tracked.
- A clearance will be performed to isolate the pipe segment. As existing pipe pieces are removed, material tracking and testing activities will be performed, and quality sampling of these data will be tracked.
- Fabrication of components will commence and Construction Inspectors will record results. Quality sampling procedures will be applied as they currently exist for general construction QAQC, including welding and x-ray tracking.

For a more detailed description, please see the Gas Transmission Construction Quality Field Manual, Level I.

7.3.3 Test Procedure – Strength Test Only

The following site-specific Strength Test Procedure will be used to track and record the critical deliverable of this stage of the process, including many hold points, to confirm that results meet expectations:

- A certified test company will perform the actual strength test and record critical data (handwritten in ink) to complete each test. This company will be responsible for completing the required test documentation, with the assistance of PG&E field engineers.
- A separate company will use the recorded data to analyze the pipeline test and confirm test results. These pipeline experts (Regulatory Compliance Partners [RCP]) use specialized tools to provide additional validation of pipeline strength data.
- A third-quality certified contractor will act as QA for each individual strength test, certifying that each test will be accurately executed and recorded from the time of pressurization. QA will confirm that the test preparations were completed as planned by using details from the design drawings, STPRs, construction

inspection process records, Strength Test Procedure, and QC measurements. QA will publicly certify that each strength test was completed in accordance with industry and PG&E standards.

- In Stage 1 of the as-built documentation, the original test records (handwritten, dated and signed in ink), temperature and pressure charts, dead weight test log, and STPR(s) will be combined with redlined plan and profile sheets of the design drawing, RCP report, and calibration certificates. These records and the critical supporting data undergo a quality check to confirm the required PG&E records are accurate and complete. The contractors should be onsite during this review.

After the strength test, the pipeline will be depressurized and all water removed before the pipeline is tied back into service (tie-in) and the site is restored.

7.3.4 Depressurize, Dry, Tie-in, and Restore – Strength Test Only

Construction Inspection will record the results of these activities, including welding, x-ray, surface preparation, and coating repairs. Inspectors will record backfill and compaction, as required. Quality sampling of these activities and data will be tracked.

Stage 2 of the as-built documentation, while the tie-in and restore activities are underway, the critical documentation will continue to be developed. Contractors are responsible for providing accurate and complete redline drawings (including amended BOM), signed weld inspection stamps, weld maps, radiographer's daily inspection sheets, signed forms (Form A, Form H, and COC), and confirmation of completed relevant procedures. The contractors should be available for record corrections during this review. Figure 7-1 illustrates the QAQC process.

7.3.5 Records

As-built packages, submitted from the field, will undergo a quality review prior to submittal to mapping. The drawings and engineering documents will be reviewed for accuracy and complete reporting of data. Documents within each stage will be compared to verify consistency of reported data. Project Engineering participates in the quality assessment of these project records before they are delivered to Mapping. Mapping will confirm that the submitted documentation is complete and legible. After Mapping incorporates the project data into the various software programs, QA and the project engineer will review the software updates to confirm that the necessary project data and details are accurately recorded.

Additional as-built documentation consists of personnel logs, site restoration, permits, and other site-specific documentation that does not directly apply to the pipeline record keeping requirements should be retained as well.

For a more detailed description, see the Gas Transmission Construction Quality Field Manual, Level I.

NOTE: Existing PG&E GC Quality Procedures are being introduced to the contractor projects. New quality checkpoints are currently under development and review.

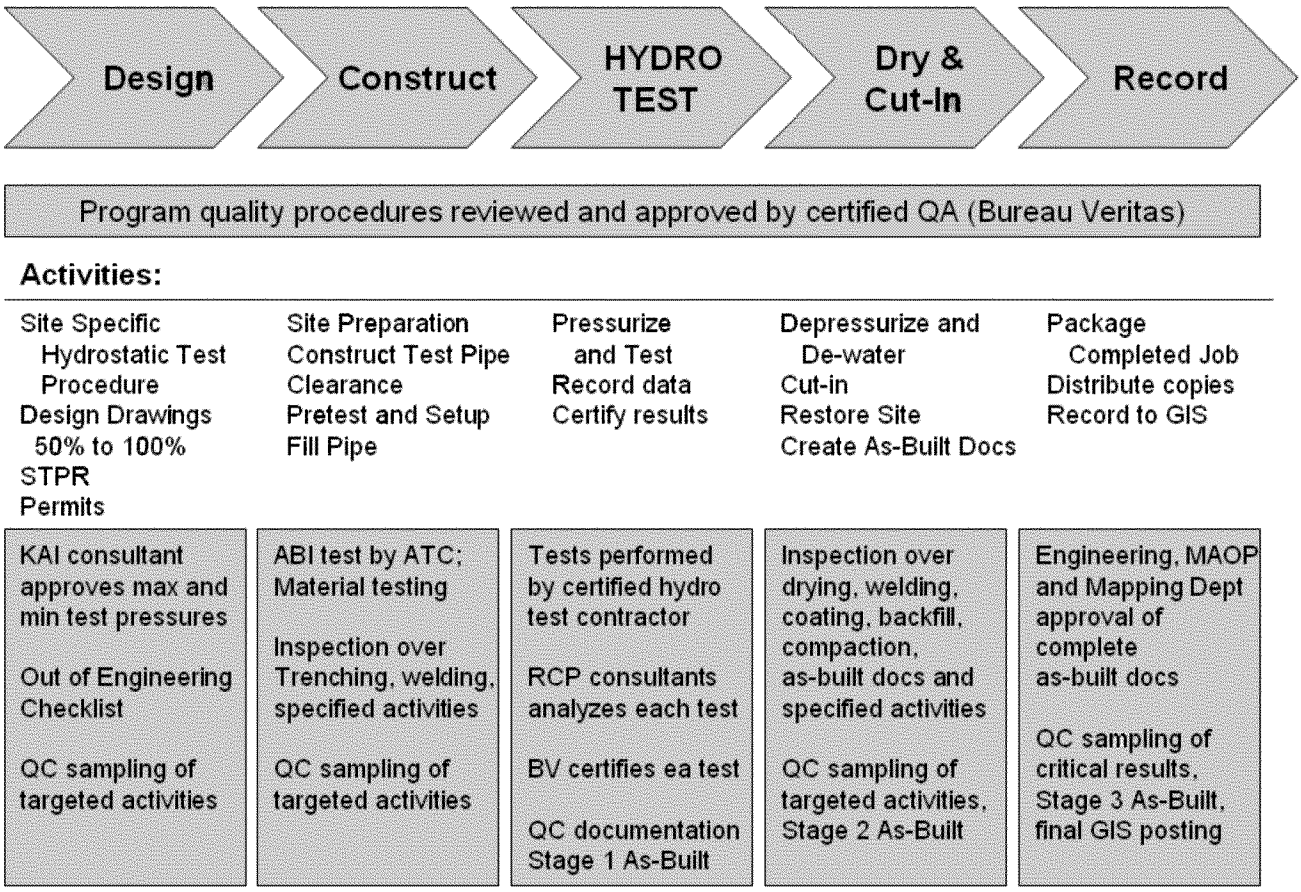


FIGURE 7-1
Quality Assurance and Quality Control Program Process Flow Chart Strength Test Example

7.4 Culture of Quality

PG&E Gas Transmission and GC will apply QAQC to new pipeline construction after significant development work. All contractors are encouraged to embrace quality, as has been required for safety. If any aspect of process results or material features is noticed as out-of-the-ordinary or concerning, involved workers must bring this to the attention of Inspection and/or QC. Questions about the appropriateness of procedures must also be addressed.

Pipeline workers must be comfortable with Inspection and QC participation in reviewing results. Any measurements that are out of range will be immediately discussed with the foremen and workers. Workers will be provided with the tools needed to measure and confirm their own results to meet quality expectations.

Program management must introduce the quality activities to all employees involved in the Program. Only with strong adoption can the quality program deliver the required effectiveness.

8.0 Environmental Operations and Emergency Response

At each specific work site, PG&E employees and contractors must practice environmental awareness and safety. This includes awareness of wildlife, natural environment, work conditions, construction site safety, possible contamination during testing, and proper disposal of test materials.

8.1 Environmental Awareness

PG&E is committed to being an environmental leader, and demonstrates this through safe and considerate work practices. Before working onsite, PG&E workers will receive an environmental awareness training tailboard, during which they will receive the Pipeline Hydrotest Program Environmental Awareness Training Brochure in Appendix A. This includes a information on understanding and respecting biological and cultural resources, preparing for fire protection, consideration of water quality, and the appropriate handling of hazardous material.

8.2 Construction Site and Work Conditions

During project work, the construction site must be set up and maintained according to the BMPs, as outlined in the Activity-specific Erosion and Sediment Control Plan (A-ESCP) requirements in Appendix A, and the segment SWPPP. This ensures that the work site will be a safe and controlled environment for construction workers, minimizing the risk for accidents. Typical activities performed might include the following:

- Establish clear work area
- Establish lay down, staging, or vehicle parking areas
- Construct a stabilized construction entrance and exit
- Install dumpsters and other waste management facilities at least 50 feet from an inlet
- Provide for removable dumpster covers
- Procure covers for stockpiles from trenches or excavations
- Construct a concrete waste washout if concrete will be used during construction
- Make sure spill control kits are onsite and available
- Check equipment and vehicles daily for signs of drips and leaks, and provide drip pans as necessary
- Store all soluble materials under cover or in clearly marked containers on pallets
- Establish proper locations for temporary or portable sanitary and septic waste systems, if necessary
- Demobilize after removing all temporary BMPs

NOTE: Areas of soil disturbance will be stabilized and coordinated with the property owner(s) (see A-ESCP Good Housekeeping and Small Urban Excavation Projects in Appendix A).

8.3 Stormwater and Discharge Water Management

In support of this initiative, Standard Operating Procedures (SOPs) have been developed to facilitate a systematic, consistent, and cost-effective approach for managing stormwater and the discharge water generated during the project. These SOPs describe procedures for planning, coordinating, and monitoring water collection and discharges associated with each project (see Water Management SOPs in Appendix A). The SOPs establish the following:

- Data requirements, methods, and management procedures for characterizing water and waste associated with the testing program

- Stormwater management procedures required for compliance with the National Pollutant Discharge Elimination System for construction and land disturbance activities
- Monitoring, communication, and response requirements in the event of a release during strength testing
- Data collection, permitting, and discharge requirements for discharge of water to land or a publically owned treatment works (POTW)

The six SOPs that have been developed include the following:

- Test Water Management Plan
- Waste Management Plan
- QA Work Plan for Analytical Samples and Sampling Procedures
- SWPPP and Leak Plans
- Document Management and Closeout

The procedures described in these SOPs apply to Water Specialists, SWPPP Inspectors, Environmental Inspectors, field samplers, and supervisors involved in strength testing, and employees that perform environmental inspections, including Environmental Field Specialists.

8.3.1 Sampling of Test Source Water – Strength Testing Only

PG&E's Environmental Operations team will analyze samples of the water source to be used for the test projects. Local water sources have to be identified and selected in order of preference: potable water, agricultural well, stream, irrigation ditch, pond water, and so forth to select the cleanest source available to avoid introducing potentially corrosive contaminants into the pipeline. Analyses will be selected based on the source, such as municipal supply, groundwater, or surface water, to document water quality and anticipate discharge permitting issues.

8.3.2 Sampling of Pipeline Liquids for Contamination – Strength Testing Only

The pipeline will be cleaned prior to introducing the strength test water by forcing a clearing pig through the pipeline with compressed air. This is intended to push any particles or accumulated fluids out of the pipeline. Cleaning may expel pipeline liquids, which will then be characterized according to prior experience and appropriate analyses, and managed in accordance with applicable federal, state, and local regulations. For all waste determination, PG&E follows the sampling methodology in U.S. Environmental Protection Agency's (EPA) National Technical Information Service SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods and 40 *Code of Federal Regulations* (CFR) 136 (40 CFR 136) in Appendix A.

A contingency plan for leaks or spills of strength test water will be prepared for each test segment that identifies potential points of discharge to storm sewers or waterways, and specifies equipment, materials, and methods to contain and recover leaked or spilled strength test water. Source water and leak characterization sample quality will provide the basis for responding to leaks or spills as soon as possible to prevent delays.

PG&E's policy is to treat the water used in a strength test, or any contaminants resulting from cleaning a pipeline, as hazardous material until lab testing can be completed to accurately characterize the medium. Field sampling will be done per EPA's method SW-846 and 40 CFR 136, which state that sampling must be random and representative of the waste. Additionally, SW-846 establishes testing criteria and methods for waste characterization, which are written on PG&E's Form 62-6406, Record of Material Removed from Existing Natural Gas Transmission Pipeline in Appendix A. COC procedures will also be established to accurately track the samples through the analysis process. A laboratory accredited by the California Environmental Laboratory Accreditation Program will be used for all sample testing.

8.3.3 Test Water Disposal Strength Testing Only

The preferred strength testing water disposal method is to discharge the water to a local POTW. The water must meet POTW's discharge requirements and permits. Because POTW discharge is not an option, water management alternatives will include transporting the strength testing water offsite to a permitted disposal facility or discharging the water to land or surface water, in accordance with Regional Water Quality Control Board (Water Board) requirements and under a permit or authorization from the Water Board. Water Board permit requirements vary by region.

strength testing water will be filtered with micron filters and granulated activated carbon (GAC) to eliminate pipeline odors prior to discharge. The GAC system, at a minimum, will be sized to the amount of water that needs to be cleaned. A representative sample of the strength testing water will be taken before and after carbon treatment and analyzed to document compliance with discharge requirements. strength testing water will not be discharged until PG&E confirms with the POTW that the carbon-treated water meets the discharge requirements.

8.3.4 Non-water Spills

An Environmental Field Specialist will be identified in the Work Plan to coordinate the Non-water Spill Emergency Response Procedure. This procedure will be followed in the event of a non-water spill if the facility does not have a Spill Prevention, Control, and Countermeasure Plan on file. All spill response equipment must be onsite before the start of construction, and all spill response vendors must be notified of and verify the need for standby spill response services before construction begins. Vendors must also be on standby for the duration of the construction process.

9.0 Supply Chain

PG&E employees and contractors will maintain a complete record of pipe, valves, and fittings for all stages of the project. A specified party will be responsible for handling, marking, and identifying pipe throughout every stage of the project and prior to each instance of pipe being cut. Tracking of pipes, valves, and fittings will start before delivery to the warehouse and continue through the return of any unused pipe.

9.1 Pre-delivery

PG&E GC Gas will maintain and update the materials requirements in SAP's plant maintenance module (PG&E's financial system). PG&E Warehouse Operations will coordinate and deliver the pipe to the warehouses.

NOTE: A process to record the materials and construction of each piece of pipe in the SAP system will be developed by Procurement.

9.2 Warehouse

PG&E GC Gas will release the materials via SAP. PG&E Warehouse Operations and/or the pipe warehouse vendor will receive the materials and stock the warehouses.

After manufacturing, the pipe vendor will place a unique identification number on the inside of each joint of every pipe. As the pipe is loaded for delivery, the warehouse will create a ticket showing the length, wall thickness, grade, and heat number for each joint.

9.3 Delivery to Job Site

PG&E Warehouse Operations will coordinate the delivery of materials to the job site. Either the construction contractor or the trucking contractor will deliver materials to the job site. The construction contractor will confirm the delivery and receipt of the materials.

Additional pipe, valves, and fittings and joint tracking information will be recorded as the materials are unloaded at the job site. Each joint will be assigned a number showing the order in which the pipe was unloaded. Each joint number will be further defined with the length, diameter, wall thickness, heat number, and serial number (bar code). This information will be kept on a stringing report. The continuity and consistency of stringing report numbers will be maintained by having a single point-of-contact supervise the unloading and assign stringing numbers.

9.4 Placement in the Pipeline Route

The construction contractor will move the pipe from the job site to the pipeline route.

Before the pipe is delivered to and installed in the route, the appropriate stringing report number will be painted on each end of the pipe. To ensure the numbers are visible no matter how the pipe will be turned, the numbers will be large and painted on three sides of both ends of the pipe.

Cut pipe that will not be placed into the ground will be marked with the stringing number and assigned a numeric suffix. This stringing number and suffix method will be used to mark every pipe, no matter how many times the pipe will be cut, to ensure each joint will be traceable.

9.5 Placement of Pipe

PG&E GC Gas will cut the pipe. The construction contractor will place new pipe into the pipeline. PG&E GC Gas will weld the joints.

After pipe is placed into the ground, each weld will be identified and recorded into three types of documents: weld map, x-ray record, and as-built drawings. Each weld will be identified with the stringing report number of the two pipe joints welded. For example, if joint 1 will be welded to joint 2, the weld identification number will be "1-2." Fittings such as elbows will be numbered in the same manner, using the stringing report number plus a suffix to indicate a cut. All welds and fittings will be recorded on the weld map and identified on the as-built drawings by global positioning system (GPS).

9.6 Handling of Removed Pipe

Sections of removed pipe will be identified, marked, and moved using the methods previously outlined in this section and in Section 10.5.6, Marking, Removing, and Moving Pipe.

The construction contractor will follow the directions outlined in Section 9.10 to deliver the removed pipe to PG&E's removed pipe storage facility.

9.7 Repair of Pipe

PG&E GC Gas will make the repairs, cuts, and welds to the pipe.

A weld repair map and weld log will track each repair made to the pipe. The weld log will show the date and reason the weld was rejected, the name of the welder, and whether the weld was repaired or cut out. Repaired weld numbers will be amended with the suffix "R."

9.8 Lab Testing of Removed Pipe

PG&E Applied Technology Services (ATS) will receive the sample, performs lab tests, and document the results. After testing is complete, the trucking contractor will ship the sample to the storage facility, and PG&E ATS will review and scan the test results, and ship the hard copies to Walnut Creek.

Sections of removed pipe will be identified and marked using the methods previously outlined in this section. PG&E ATS will update the RMR COC Form.

9.9 Reconciliation

Contractors will reconcile all material at the end of each project. For reconciliation, the BOM ordered for the project will be compared to the materials used, as determined by the as-built drawings, and the materials remaining in the project yard. Pipes more than 10 feet long and useable fittings will be returned to the warehouse. Contractors will dispose of pipes less than 10 feet long and unusable fittings, and credit PG&E for the salvage value. Reconciliations showing a discrepancy of more than 0.5% will be investigated.

9.10 Material Return

9.10.1 Return or Disposal of Unused Pipe

After reconciliation, the construction contractor will pack materials, coordinate delivery of returnable materials from the job site to the warehouse in Port of Stockton (for pipe) or Modesto (for all other unused materials), and

work with PG&E Materials Distribution to ship the materials back to the warehouse. The construction contractor will also update usage for reusable materials and scrap end of life materials.

PG&E Materials Distribution will receive the returned materials, and PG&E Supplier Quality will perform a QC inspection on all of the returned parts. PG&E Materials Distribution will then update inventory in the Surplus Inventory Spreadsheet. All parties will send final project documentation to the Job Closeout Desk in Walnut Creek.

9.10.2 Returns of Removed Pipe

The construction contractor will pack pipe, coordinate the delivery of removed materials from the job site to the warehouse in Modesto, and work with PG&E Materials Distribution to ship the materials back to the warehouse.

Removed materials will be stored according to the procedures highlighted in Section 10.5.6, Marking, Removing, and Moving Pipe (COC).

Figures 9-1 and 9-2 present flow charts outlining additional detail about the parties responsible and accountable, and those who must be consulted and informed.

9.10.3 Procedures for Handling Pipe and Fitting Materials Previously Used for Strength Testing – Strength Test Only

1. Material issued and used for strength testing will evaluated by the assigned field engineers prior to, or at the conclusion of, each strength test to validate the actual percent of specified minimum yield strength (SMYS) that a pipe, cap, elbow, reducer, or other fitting to be reused was tested to, in accordance with the following:

    a) If tested to less than 72% of SMYS, then that material may be reused repeatedly for strength testing as long as no physical impacts or handling damage occurs to that component for the remainder of the Program. These components will all be marked “STRENGTH TEST ONLY” with long-lasting, sun-resistant stencil in a contrasting color after or before the first test in which it will be used.

    b) If tested to 72% or more of SMYS, then the requirements of PG&E Gas Standards and Specifications (A-37, page 3) will apply to that pipe, cap, elbow, reducer, or other fitting. The material will be marked “STRENGTH TEST ONLY” in contrasting, long-lasting paint and will be noted in the same spray paint adjacent to the “STRENGTH TEST ONLY” stencil as “1 TEST TO 72%” or “2 TESTS TO 72%” each time it has been subject to a strength test at or above 72% of SMYS. After the third test of 72% or greater of SMYS, the Field team will make that material non-functional by cutting a hole in it.

2. Any material that will be considered to be damaged or as having reached its maximum life based on the number of tests, will be defaced, made non-functional by cutting a hole in it, scrapped in place, and NOT returned to a PG&E materials facility.

3. All pipe that has undergone strength testing (regardless of the SMYS exposure percentage) will not be returned to a material facility, except as outlined in Item 4 for scrapping. It will be used as outlined in Item 1 until it will be damaged or meets the maximum tests at or above 72% of SMYS, or until the testing is complete and the yards are closed, then it will be made non-functional by cutting a hole in it and scrapping it onsite (if 10 feet or less in length). If pipe is longer than 10 feet or impractical to scrap onsite, then note “STRENGTH TESTED” in 6-inch (or larger) lettering on the pipe and contact the Investment Recovery group.

4. Isolation caps and fittings may be returned to Modesto Pipe Facility as long as they have never been subjected to strength testing above the MAOP. Those tested in that fashion will be defaced in accordance with the instructions in Item 2. Fittings or isolation caps that have been subjected to strength testing, but not above MAOP, will be stamped on the name plate and stenciled as a “STRENGTH TEST ONLY” article. This material

must also be inspected by the field engineer to ensure it will not be damaged prior to return to the Modesto Pipe Facility. Isolation caps and fittings returned to the Modesto Pipe Facility will not be put back into "pickable" inventory and will be placed in a separate area from normal inventory with the "STRENGTH TEST ONLY" stencil visible when possible. This material will only be reissued to other strength test jobs.

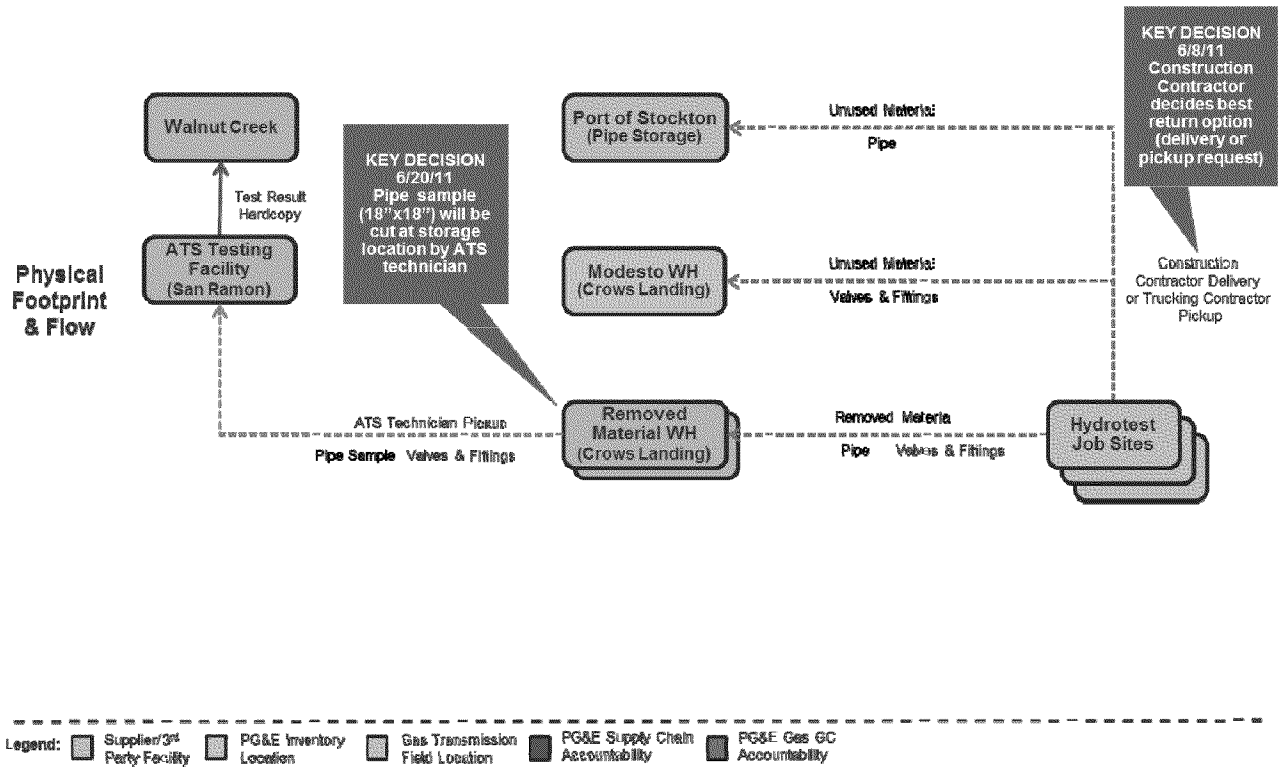


FIGURE 9-1
To-be Returns (Unused and Removed) Flow Chart

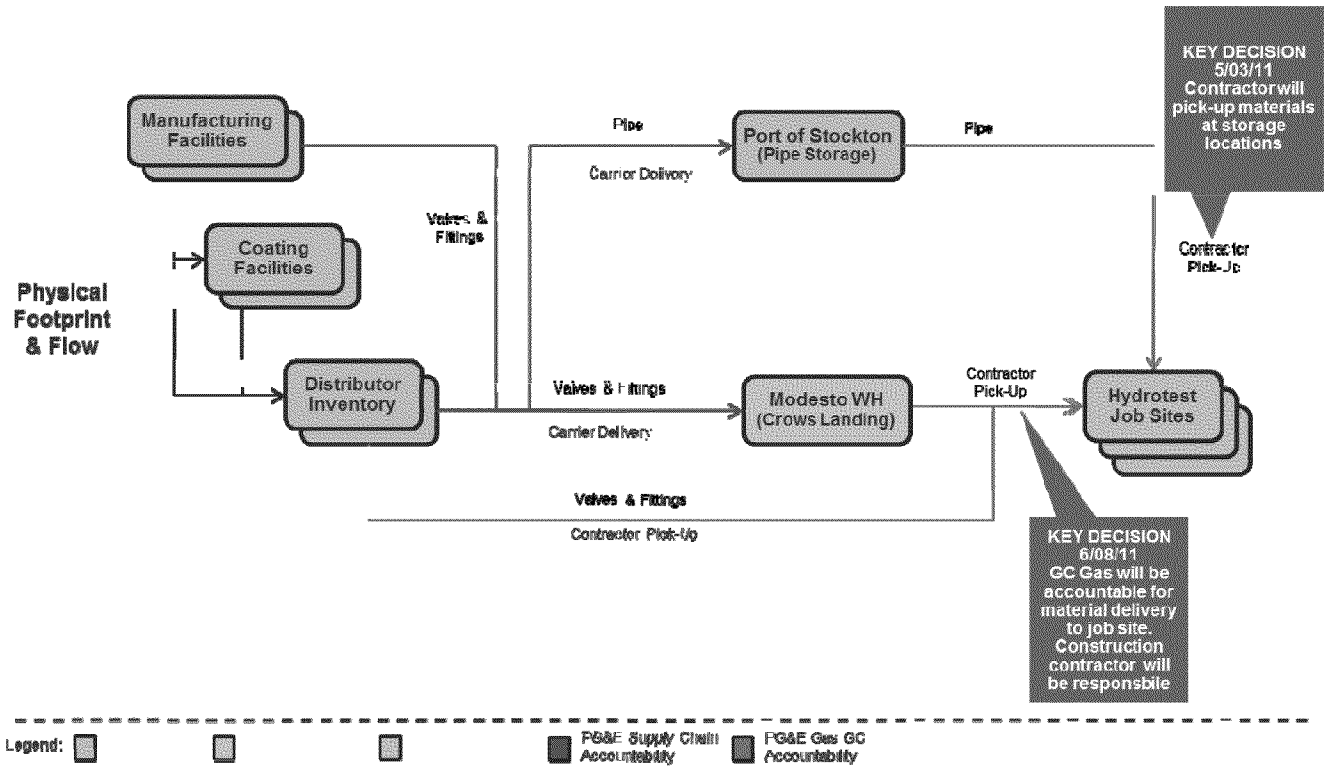


FIGURE 9-2
To-be Delivery Flow Chart

10.0 Construction Management

The excavation of gas facilities, inspection, shut-down, clearance, tie-in, patrolling requirements, pipe wrap handling, return to service, and other aspects of physically accessing the pipelines and associated duties are well-documented procedures included in this manual as reference documents and cited in each specific section. The construction management process follows the requirements, as defined in the Appendix A reference documents.

Procedures specific to these PSEP requirements are further defined and controlled in the Work Plan for each specific planned project. Figure 10-1 outlines some of the key activities involved in performing a project.

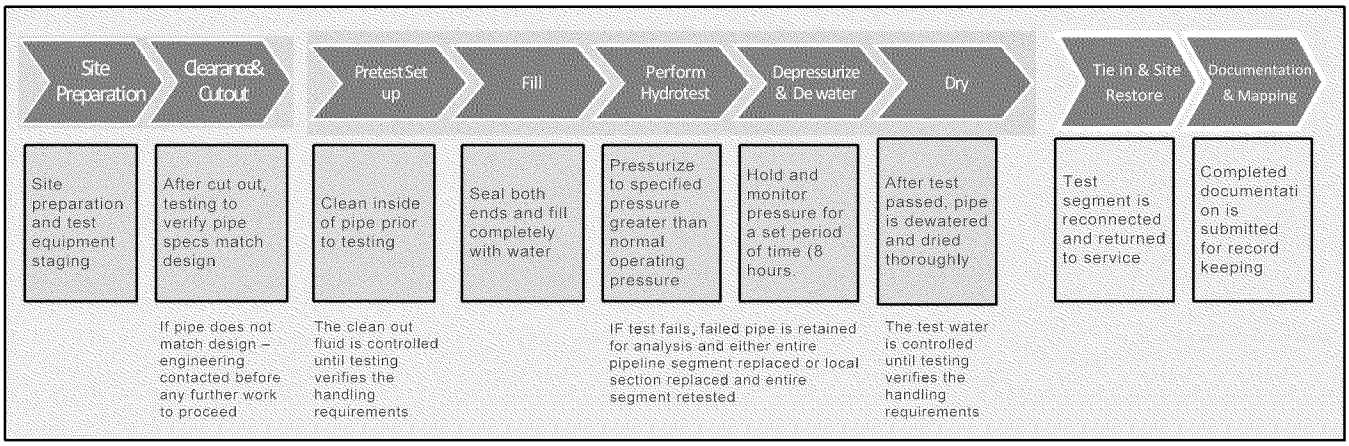


FIGURE 10-1
Construction Phase Strength Test Example

10.1 Staffing

Acquiring contractors for site preparation will be done in accordance with the supply chain's Requisition to Pay Procurement Manual, as specified in the sub-process, Identify Suppliers & Create Selection Criteria (see Appendix A). This process will ensure that contract personnel associated with the test are qualified. Contract and operations personnel qualifications for conducting pressure tests will vary depending on the certification requirements of regulation, code, or operator standards and procedures.

Any work on gas lines that requires OQ will be done by either PG&E OQ personnel or by contractors verified by PG&E to meet the OQ requirements. If necessary, personnel will attend PG&E Technical Academy for OQ certification in specified areas of work, such as purging, gas detection devices, and standby.

A Clearance Supervisor must be clearly designated for all clearances. The Clearance Supervisor must remain responsible and available during the duration of the clearance. The Clearance Supervisor will be responsible for confirming the welding pressure and submitting the clearance 2 weeks prior to site excavation. Planning will be needed to test for contaminants in the pipe. Any liquids that are found will be sampled and sent to the lab for testing by Environmental Operations, and contained until disposal disposition is provided.

10.2 Preliminary Review Meeting

Prior to any onsite work, a preliminary clearance, tie-in, and review meeting will be held to review the end-to-end site-specific project, including site preparation, clearance, tie-in, and restoration procedures. This will help key

team members understand their roles and responsibilities and provide an opportunity for input. The following individuals should attend this meeting:

- Project Manager/Coordinator
- Clearance Supervisor
- Transmission System Planner
- Local Distribution Planner
- GSO clearance representative
- Construction Foreman supervising and performing the tie-in
- Construction Foreman supervising and performing the Strength Test Procedure
- Construction Manager
- Test Supervisor
- Inspector

This meeting will be held a minimum of 3 weeks before the actual clearance to review the clearance application draft, the pipe cut tie-in plan, the work procedure, and the restoration to service. The meeting will cover the following topics:

- Determination of whether a welding clearance will be needed for a pipeline liquids check prior to cutting the pipeline
- Review of clearance application draft and approvals needed for a clearance
- Review of planned pipe cutting and tie-in procedure
- Review of the work procedure
- Review of return to service procedure

10.3 Site Visitors

Prior to visiting the test site, an outside visitor must receive approval and authorization for a site visit from the CCS. All visitors must follow the Site Visitor Guide, including the appropriate use of PPE and an onsite contacts list.

10.4 Site Preparation

After contractors have been selected, Engineering will release the Design Package, and the PG&E Contracts Department will issue the RTC letter. The primary contractor will then perform the site preparation, as needed, according to site conditions, as outlined in the letter and the Design Package.

10.4.1 Pre-construction Site Walk (as needed)

In the event that work, environmental, or permit limitations become complicated or require further review, PG&E may designate the need for a pre-construction site walk. The pre-construction site walk will be the final walk prior to construction mobilization to review permit conditions, encroachment permit(s), and site work restrictions. The final walk will be attended by segment-specific staff, including construction management staff (including the foreman), Project Coordinator, inspector, ROW Agent, Subject Matter Experts (e.g., biologist and cultural specialist, as needed by segment conditions), Water Quality Specialist, Environmental Inspector, and representatives of the construction contractor.

10.4.2 Conduct Tailboard

Tailboard meetings will be conducted prior to the start of the job, and as conditions change throughout the job. The tailboard held before site preparation will describe the details of the work procedure for the crew performing the site preparation, including safety, environmental compliance, and the objective of the work to be completed.

10.4.3 Excavation and Reconciliation of Missing Data

Excavation will be performed in accordance with the following utility procedures and references (see Appendix A):

- Utility Procedure WP4412-05, Excavation Procedures for Damage Prevention
- Utility Standard S4415, Excavation Safety
- Utility Procedure TD-4412P-06, Handling Excavators, Contractors, and the Public Working Unsafely Around Utility Facilities
- Utility Procedure WP4412-03, Marking and Locating PG&E Underground Facilities

If trench water encountered during excavations must be removed, the groundwater will be characterized and either transported to a permitted disposal facility in accordance with applicable federal, state, and local requirements; discharged to a POTW under permit; or land–applied as an authorized non-stormwater discharge under the California Storm Water General Construction Permit or other regional Water Board permits or waivers.

After the pipe coating has been removed, Advanced Technology Corporation's ABI technique will be performed, according to the ABI Assessment Procedure in Appendix A, to verify yield strength. The overall pipe diameter, wall thickness, and longitudinal seam type will also be recorded using Form A, Data Element Check Sheet and Form H, Direct Examination Data Sheet (see Appendix A).

The pipe sample material will be sent to a testing laboratory in accordance with the COC procedure, as described in Section 9, Supply Chain. The ABI yield results will be reviewed against the as-built documentation. Engineering will confirm that the ABI tested values match or exceed the as-built values. The results will then be posted in the SharePoint site, in the "T-40/Engineering Documents" folder.

If the materials of record details on the design drawings do not agree with the findings of the verification task during site preparation, then testing will not commence, and engineering will be notified. Engineering must review the findings and amend the Strength Test Procedure as necessary to accommodate these unexpected details.

10.4.4 Clearance

The clearance stage will be composed of the PG&E clearance activities necessary to perform the clearance that shuts down the pipeline, clears the pipe of any natural gas (blowdown), and makes the pipe ready for the construction activity. Clearance will be handled in accordance with PG&E's WP4100-10.

Conduct Initial Clearance Review Meeting

The initial clearance review meeting will be held 3 weeks prior to clearance. The Project Coordinator will discuss the clearance process and any potential issues with the Construction Manager, Clearance Supervisor, Clearance Execution team, Transmission System Planner, Tie-in Supervisor, GSO clearance representative, and, if needed for the site, the liquefied natural gas/compressed natural gas (LNG/CNG) lead and distribution planner.

Conduct Pre-clearance Meeting, Construction Clearance Review, and Day-of Tailboard

The pre-clearance meeting will be conducted by the Clearance Supervisor, Gas Control, Tie-in Supervisor, Communications Lead, site PMO Safety Lead, Construction Supervisor, Construction Inspector, and the Construction Manager prior to performing the clearance process and cutting the pipe. This meeting must be conducted with an approved clearance, and should be held 2 to 4 days prior to pipeline clearance.

A review of the clearance process will be conducted by the Tie-in Supervisor and Clearance Supervisor prior to the approved clearance process.

The day-of tailboard will be held at the beginning of the work process, immediately preceding the implementation of clearance. This tailboard will cover the following:

- Confirm all work assignments
- Ensure that proper tagging is ready and GSO approval has been received
- Ensure that clearance activities are coordinated
- Address safety concerns
- Review the objectives of clearance
- Review communication methods that will be used during clearance

Before beginning any work, the Safety team will conduct a safety tailboard; additional tailboards will be conducted as conditions or the task change.

Request Clearance

The Clearance Supervisor will request clearance from Gas Control to begin the open clearance process using Form F100-10-4 Attachment 4, Application for Gas Clearance (see Appendix A).

Gas Control will also update the master clearance board.

Perform Open Clearance Process

The clearance crew will perform the open clearance process as follows:

- Notifying local governments and first responders
- Walking down affected equipment
- Placing tags on all clearance points (man-on-line, caution, information)
- Positioning all isolation points as necessary for clearance work

After the open clearance process is performed, the Clearance Supervisor will notify Gas Control to hand off the pipe to the construction Tie-in Supervisor. At that time, Gas Control will also update the master clearance board.

Perform Shutdown Procedure

The shutdown procedure will involve the clearance crew performing the following activities:

- Purging gas facilities in accordance with WP 4100-10 subsection 3 D, Blown Gas
- Installing and operating air movers according to A-38, Procedures for Purging Gas Facilities and A-38.1, Installation and Operation of Air Movers (see Appendix A)
- Cutting and capping the pipe in accordance with PG&E's Utility Procedure WP4100-01, Hot and Cold Work Methods for Natural Gas Pipeline Shutdown and Tie-in (see Appendix A), which establishes procedures for working on natural gas pipelines during shutdowns, cut-offs, and tie-ins
- Isolating the segment

10.4.5 Marking, Removing, and Moving Pipe (Chain of Custody)

The COC for removed pipe will begin when the pipe is cut, and continue throughout until the delivery of the pipe to the storage facility.

After the strength test site has been prepared, the open clearance and shutdown procedures will be performed, and the construction crew will remove the cutout sections of the pipe as part of the work preparation. The Construction Manager will ensure that the pipe segments are marked with the following information:

- Transmission Line Number (e.g., TL 132)
- The top of pipe noted at the top center of the pipe (e.g., TOP)
- Gas direction of flow noted with an arrow (e.g. direction of flow •)
- Mile point from project overview for the location (e.g., 40.8350)
- Nearest street address (e.g., 1500 Crest Drive)
- Date removed (e.g., 05/26/2011)

The cutout sections will be transported to the storage facility. Prior to transporting the pipe to storage, the Construction Manager will ensure that digital photos of the removed sections are taken and the RMR COC Form has been updated. This form must include the information marked on the pipe and any additional identifying information. Before transport, the completed RMR COC Form will contain the following information:

- Transmission line number
- The top of pipe
- Gas direction of flow
- Mile point from project overview
- Nearest street address
- Date removed
- GPS coordinates taken from the project job package (e.g., 122.44229d/37.64087d Lat Long/North American Datum of 1983)
- Location description from the project overview (e.g., camera insertion location #1)
- Full name of the employee coordinating pipe removal and transportation

After arriving at the storage facility, PG&E ATS personnel will perform initial tests. A PG&E ATS representative will oversee and coordinate the cutting of the pipe sample at the storage facility and deliver samples from the PG&E Materials Facility to a test facility. The pipe will be marked before the test segment is cut and the RMR is complete.

PG&E ATS will complete a Child COC Form for every test sample (coupon) to track the COC when the pipe sample is moved from storage to ATS, from ATS to any third-party testing locations, from third-party testing locations back to ATS, and from ATS back to storage (where it will be stored with the original segment). Figure 10-2 tracks the COC for pipe that will be removed from test locations.

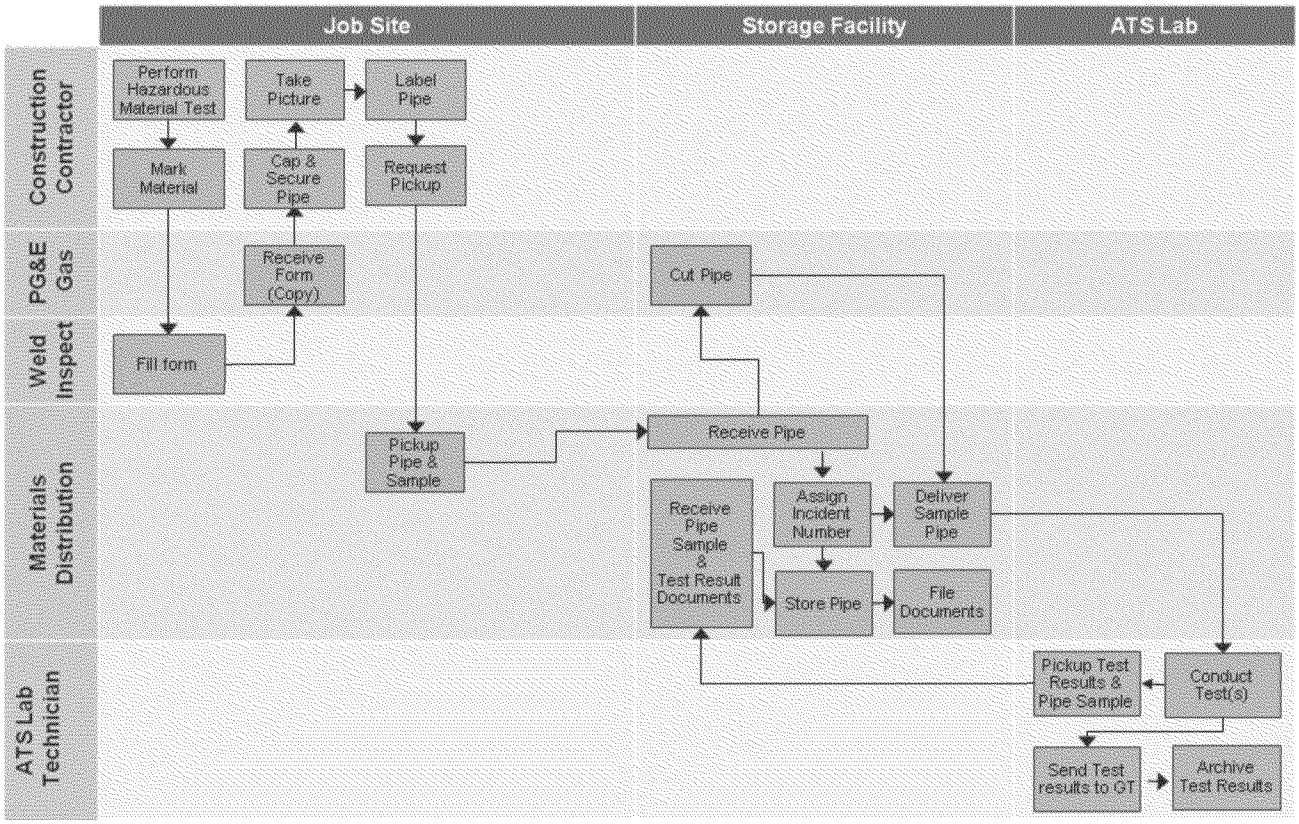


FIGURE 10-2
Removed Materials Chain of Custody Process

Additional information about pipe movement can be found in the Supply Chain section of this manual.

10.4.6 Offsite Pipe Tests

When the pipe segment arrives at the testing facility, it will be tested for yield strength, hardness, pipeline composition, fracture toughness and Charpy energy ("Charpy" refers to a test for pipe material hardness/ strength). Test samples will be as close as possible to full size, considering the wall thickness. PG&E ATS will conduct a comparison of the field ABI test results to the lab test to determine whether to continue with the ABI test in future strength tests. After testing, the pipe will be stored in a locked storage container, or a secure, roped area, and the location will be noted on the RMR COC Form.

10.4.7 Ruptured and Replaced Pipe

In the event of a rupture during the actual strength test, PG&E will cut out the pipe joint with the failure and use the COC procedures to route the pipe to ATS or another designated testing facility to analyze the failed section and determine the cause of the failure. The resulting report will be sent to Program Engineering and the third-party engineering organization for review and development of a repair plan. The determined quantity of pipe will be replaced with new pipe, and the entire segment will be retested (see Advanced Technology Corporation ABI Test, Form F100-10-4 and PG&E's Utility Procedure WP4330-02, Removal and Control of Liquids from Pipelines and Maintenance and Operation of Associated Gas Conditioning Equipment in Appendix A).

10.5 Test Support Operations – Strength Test Only

After the clearance process is complete, strength testing can commence. Prior to the actual testing, the support operations must be in place and detailed in the Strength Test Procedure.

At the first hold point, the test supervisor must sign off and verify that all PG&E employees and contractors that are performing the covered tasks on the ROW are qualified in accordance with 49 CFR 192, Subpart N (see Appendix A).

The test supervisor will be responsible for ensuring that each emergency responder is familiar with the patrolling and incident reporting requirements for the specific test site. The incident commander, emergency spill responders, and the patrol lead must be identified and listed in the Strength Test Procedure. The identified patrol will be responsible for maintaining communication with the test supervisor, patrolling the line, and monitoring intersections for the duration of the strength test. The incident commander will be responsible for calling and reporting the incident to the appropriate emergency responders, as detailed in the Strength Test Procedure.

After the test supervisor has verified that all emergency response is onsite and aware of their role requirements, the Strength Test Procedure will be signed off.

10.5.1 Spill Response

In the Strength Test Procedure, spill response equipment will be identified and staging locations will be established. All spill response equipment must be onsite. Equipment will vary by site and may include straw bales, silt fences, vacuum trucks to be on standby during the fill and test stages, sand bags, straw wattles, and plastic sheeting, as detailed in the procedure for each specific test site.

The test supervisor must verify and sign off that the Emergency Response team has been briefed on their roles, the communication plan, incident objectives, and the location of response equipment.

10.5.2 Equipment

Pigging equipment must be identified for the initial run (clear pipeline of liquids/debris), the pipeline fill, and the drying pigs, and recorded in the Strength Test Procedure. The pigging equipment must accommodate a possible pipe diameter transition in the pipeline segment being tested.

Testing equipment must be identified and the description, location, and calibration recorded in the Strength Test Procedure in accordance with A-37. Test equipment will include, but will not be limited to, the following:

- Deadweight tester
- Primary temperature recorder
- Secondary temperature recorder
- Pressure recorder
- Pressure gauge
- Ambient thermometer
- Dew point meter

After the test supervisor has verified that all equipment is onsite and approved, the hold point in the Strength Test Procedure will be signed off.

10.5.3 Roles and Responsibilities

Roles and responsibilities must be identified and detailed in the Strength Test Procedure for the construction foreman, the test contractor, the third-party witness, Customer Care, Patrolling, the Water Specialist, and the gas quality engineer.

10.6 Pre-fill Operations – Strength Test Only

Before the pre-fill process can begin, the test supervisor must conduct a tailboard review of the Strength Test Procedure with all of the personnel involved in the testing. After the tailboard, the pre-fill procedures will commence according to the steps detailed in the site-specific Strength Test Procedure.

10.6.1 Water Testing

The Water Specialist will ensure that the test supply water will be sampled and analyzed for contaminants, such as chlorine, pH level, chloride, and other content as detailed in the Strength Test Procedure. The test supervisor must sign off that the test water has been sampled.

10.6.2 Pre-fill Operations

The pre-fill operation steps will be detailed for each specific site in the Strength Test Procedure.

Dry pigging will be performed to verify that the pipeline is clear of obstructions. If free liquids are collected, samples will be provided to the PG&E gas quality engineer. When clearing runs are complete, the pipeline segment will be set up in test configuration and prepared to fill with water.

10.7 Fill Operations – Strength Test Only

The pipeline segment will be filled with water and the pipe pressurized with the fill pump. The pressure for the stand up test will be recorded in the Strength Test Procedure.

10.8 Temperature Equilibrium – Strength Test Only

All pipeline components must be monitored for the amount of time specified in the Strength Test Procedure, allowing the temperature to reach equilibrium. During the allotted time, checks will search for leaks, and the pressure reading will be recorded in the Strength Test Procedure. If the recorded pressure differs significantly from the previously recorded pressures, checks for leaks will continue and Engineering will be contacted.

10.9 Test Operations – Strength Test Only

The test sequence of operations will be detailed in the Strength Test Procedure. The test equipment will be connected and precautions taken to establish a safe test site.

Pressure will be raised in the pipeline, at a slow and smooth rate up to a specified percentage of the minimum test pressure, and held for 1 hour. After the test supervisor has checked all visible connections for leaks and allowed the pressure to stabilize, they must sign off on the hold point.

Pressurization will then continue to the specified ramp up pressure and held for a 0.5 hour. The pressure will then be reduced to between the minimum and maximum test pressure at the test site and held for the amount of time specified in the Strength Test Procedure. The pressure, temperature, and added or subtracted volume will be documented at 15-minute intervals for the remainder of the test.

Pressure, temperature, and volume readings will be provided to the test certification company. Prior to pressure reduction, the test supervisor must verify that the certification organization has certified the test and sign off on the hold point.

10.10 Dewatering Operations – Strength Test Only

Safety precautions will be taken when releasing the water at test pressure. When opening any valves or appurtenances, the operator must adjust their body position to stand clear of the line of fire. Test pressure will be relieved by first opening a small tap valve before initiating the full water removal process. All pressurized water will be discharged into the vacuum truck.

Discharge piping will be connected to route the discharge water, typically into the array of baker tanks staged at the discharge end of the test segment. After the test supervisor has verified that all piping connections are secured with rigid piping, they will sign off on the hold point. Dewatering the line will begin by propelling the poly pig, which will already be in the line, with compressed air. The test water will remain in the baker tanks for either reuse or disposal. Representative test water will pass through the 25-micron filters and GAC units so that samples can be taken for analysis. After the applicable regulatory authority grants permission, the water will be discharged as allowed by the permit requirements.

10.11 Drying Operations – Strength Test Only

After dewatering is complete, the test heads will be removed and the pig traps installed. The pig traps will be connected to the air compressor and the baker tanks or a vacuum truck at the opposite end to catch residual water. Poly pigs will be sent through the pipe to remove any residual water from the dewatering operation. Multiple pig runs may be required. The Construction Manager will determine when pigging will no longer be required.

Dryers will then be set up and connected to the pig traps. Foam pigs will be propelled from end-to-end with dry air until the specified dew point level is achieved. An electronic dew point meter will be used to measure and confirm the dew point. After the drying procedure is complete, the test supervisor will signs off on the hold point in the Strength Test Procedure. The dew point measurements will be recorded in the Dew Point Test Form (see Appendix A).

At the conclusion of the drying operation, the drying heads will be removed and the ends of the pipeline sealed to keep the pipeline free of dirt, water, and other contaminants.

10.12 Site Tie-in and Restoration

Several groups are involved with the steps required to restore the site, including GC, Transmission and Regulation (T&R)/District Gas Transmission and Maintenance, Gas Control, Primary Contractor, X-ray Contractor, and the Construction Management/Inspector.

10.12.1 Conduct Pre-tie-in and Restore Tailboard

The Construction Manager/inspector will conduct a tailboard to review tie-in/restore site procedures before these activities begin. The pre-tie-in and restore tailboard will address when the pipe will be turned over to GC for tie-in (when CG turns the line back to T&R/District Gas Transmission).

10.12.2 Tie-in and Restore Site Activities

The activities for tying in and restoring the site include the following:

- Tie-in pipeline segment (GC)
- X-ray new joint/pipeline (X-ray Contractor)
- Prepare to turn off clearance (GC)
- Notify Gas Control that GC is ready to take back the pipeline
- Mark and identify all newly placed pipe, as noted in Section 9.4, Placement in the Pipeline Route
- Position all isolation points as necessary to close clearance work
- Remove all tags
- Report ready to turn off clearance
- Update/complete master clearance board (Gas Control)
- Restore site (Primary Contractor)
- Coat all bare piping
- Backfill with appropriate fill material
- Restore site (e.g., pave)
- Prepare as-built package redlines
- Add signed results of test and restoration to as-built package

The Water Specialist will perform a final site inspection after the site is restored and stabilized to obtain photographic documentation for preparing the Construction General Permit Notice of Termination.

10.12.3 Project Closeout

The following includes items that will need to be supervised by the PM for a project to be financially closed; Figure 10-3 shows this process:

- Construction Contractor – submit final invoice.
- Construction Management – confirm work is complete.
- Contract Administration – drive execution of contract change orders.
- Land and Environmental – submit environmental release letter.
- Support Function – complete mapping of As-Built Packages.
- PM – complete closeout checklist (see Figure 10-4)

For projects greater than $1 million, it is required that the PM complete the Project Closeout Checklist (Figure 10-4). The date should be noted for required items.

Following completion, the document should be submitted to the PG&E Gas Operations Closeout desk for processing. The source for each required item is listed in the document.

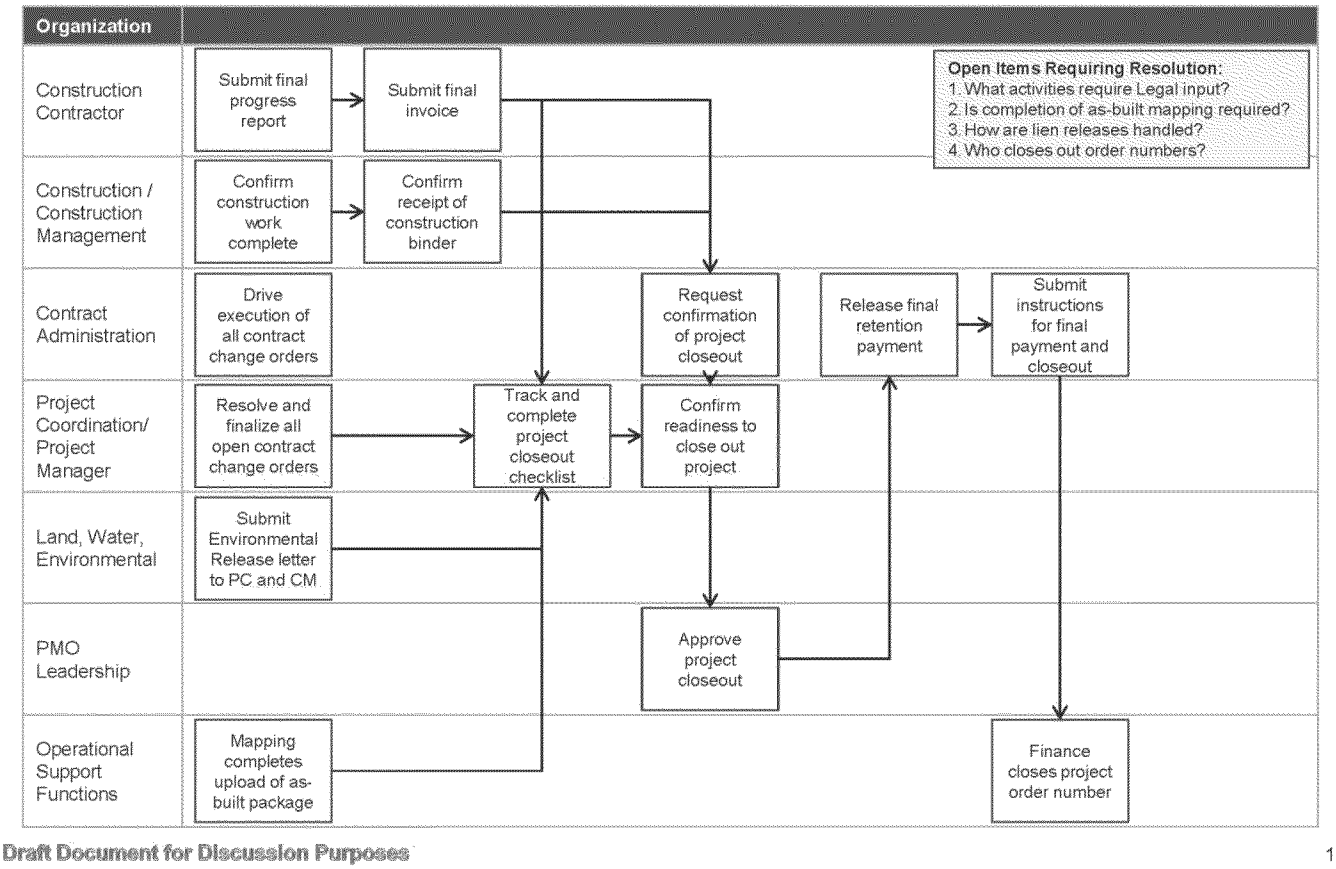


FIGURE 10-3
Project Closeout Process

PG&E Gas Operations Project Close Out Checklist

This checkout list applies to all projects impacting PG&E assets with budgets greater than $1M.

Project: _____ Order #: _____
Location: _____ PSRS #: _____
Project Manager: _____

Please note date of completion of all project close out required items (denoted by an asterik):

Item[1]	PSEP[2]	Pipeline	Station	Notes
Job Estimate	*	*	*	
Construction Binder	*	*	*	
Environmental Release Letter	*			
System Update with Operative Date	*	*	*	Required in both PSRS and SAP?
As-Built Mapping	*	*	*	
Design Drafting			*	
Pipeline Engineer Review	*	*	*	Includes review of both as-builts and STPRs
Final Contractor Payments	*	*	*	
Contract Change Orders	*	*	*	Includes resolution of all pending change orders
Third Party Billing	NA			Applies to progress billing, if applicable
Final Retention Payment	*	*	*	Applies to construction contractor, if applicable

Upon completion, please submit checklist to PG&E Gas Operations Close Out Desk for processing:
Attention: Karen Rayos, 375 N. Wiget Lane, Suite 200, Walnut Creek, CA 94538

References for PG&E Gas Operations Project Close Out Checklist

[1]Source of project close out checklist items:

Item	Hydrotest	PSEP	Pipeline	Station	Contact
Job Estimate	GTS	PG&E Estimating			GTS: Ken Takada; PG&E: ?
Construction Binder	Construction Management				
Environmental Release Letter	PG&E Environmental Planning				
System Update with Operative Date	?				
As-Built Mapping	PG&E Mapping				
Design Drafting	PG&E Engineering?				
Pipeline Engineer Review	PG&E Engineering				
Final Contractor Payments	PG&E Contract Administration				
Contract Change Orders	PG&E Contract Administration				
Third Party Billing	PG&E Contract Administration				
Final Retention Payment	PG&E Contract Administration				

[2]PSEP refers to PG&E's Pipeline Safety Enhancement Program, which includes hydrostatic test, replacement, valve automation, and ILI work. For some of the project close out process, hydrotest will be addressed separately

For PG&E Project Close Out Desk Use Only:

To: _____
PSRS #: _____
Date: _____
Open Items: _____
No Open Items: _____
Released Status: _____
Tech Complete Status: _____
Filed in Records Date: _____

FIGURE 10-4
Gas Operations Project Closeout Checklist

10.13 Documentation and Mapping

After testing and site restoration, Engineering and Construction Management will verify that the as-built redline package is accurate and complete in accordance with the As-built Checklist. The package must be completed before the contractors and the inspector leave the site. The as-built drawings will include all of the strength test dig locations, including repair locations showing horizontal field stationing information, orientations, and GPS coordinates. The redline package will then be handed over to Mapping, and the drawings and the asset records will be updated.

11.0 Program Controls

The Program Controls Plan will define the methods that will be used to effectively control schedule and cost performance for the Program. The Program Controls Plan will consist of the following documents:

- Program Schedule Management Procedure
- Cost Management Procedure
- Change Management Procedure

11.1 Purpose

The Program Controls Plan will outline management of the Program schedule through the phases of schedule development, baselining, monitoring, and reporting.

11.2 Scope

This procedure will address all processes and activities related to the development, baselining, monitoring, and reporting of the Program schedule. It will specifically outline how the Program schedule will be developed and updated on a daily and weekly basis, and demonstrate how the schedule can identify current status, measure performance, and give advance notice of potential slippage and critical future issues.

11.3 Definitions

Table 11-1 presents definitions that will be included in the Program Controls Plan.

TABLE 11-1
Program Control Plan Definitions
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Term	Abbreviation	Definition
Interface		A dependency (physical or temporal) that exists between two (or more) projects.
Milestone		A point in time that identifies the start or completion of a series of activities.
Schedule		A series of logic-linked, time-phased activities that define how a project will be implemented.
Work Breakdown Structure	WBS	A hierarchical structure used to breakdown the Program scope of works for planning and scheduling purposes.
Cost Breakdown Structure	CBS	A hierarchical structure that breaks down the Program works into manageable packages to reflect the way work will be costed.

11.4 Responsibilities

The PG&E strength testing scheduling manager will have overall accountability for monitoring implementation of responsibilities. The Scheduling team will be responsible for the following:

- Development and maintenance of the Master Control Schedule (MCS) Program Plan (Level 0)
- Development and maintenance of the MCS Program Year Plans: Program Year Plans 2011 through 2015 (Levels 1 and 2)

- Development and maintenance of the MCS critical path method summary (Level 3)
- Development and maintenance of the project segment schedules (Level 4)
- Development and maintenance of the detailed MCS (Level 5)

11.5 Procedure

11.5.1 Schedule Hierarchy

The Program is composed of a set of five schedules. The Program Plan (Level 0) will include a high-level summary and will be created to represent the overall schedule onto a single sheet for high-level program reporting and communication. The schedule will incorporate each plan year of strength testing 2011 through 2015.

The Program Year Plan (Level I and 2) will focus on the test segments for each plan year. In 2011, the Program scheduled 235 miles of pipeline segments, with the focus to accomplish at least 152 miles. The remaining test segments will be divided for plan years 2012 through 2015. Planned test segments comprise each year plan; Project Coordinators will be assigned by test segment to manage scope, schedule, and cost of the test segment.

A critical path method (Level 3) will represent the entire scope, cost, and timescale of the plan year. Figure 11-1 presents the hierarchy of schedules.

11.5.2 Work Breakdown Structure

The MCS has been developed in accordance with the PG&E work breakdown structure (WBS), which encapsulates the full scope of the Program. It is composed of five levels and has been developed with the Cost Management team to enable coincidence with the cost breakdown structure (CBS) at Levels 1, 2, and 3 (see Table 11-2).

Further details on the design and management of the WBS can be found in the Program WBS Management Procedure (PGE-PC-PR-0011).

11.5.3 Schedule Development

The primary input to the MCS will come from the project segment schedules.

The principal outputs will be as follows:

- Quantitative data for the PG&E data warehouse
- Qualitative data for period reports
- Schedule data to support the Strategic Planning Procedure (PGE-PC-PR-0008)

The schedule will be developed to a point where it can be baselined alongside scope, cost, and risk. It will then be periodically updated, monitored, and reported.

11.5.4 Schedule Requirements

For the project segment schedules to be used as inputs to the MCS, it will be imperative that the schedules conform to certain structural and processing criteria. These criteria will be implemented by the Program Scheduling team and communicated to the Project Coordinators; therefore, they will be kept to a minimum to allow the Project Coordinators sufficient flexibility in managing their schedules. These criteria are defined in Standard Form/Template A.

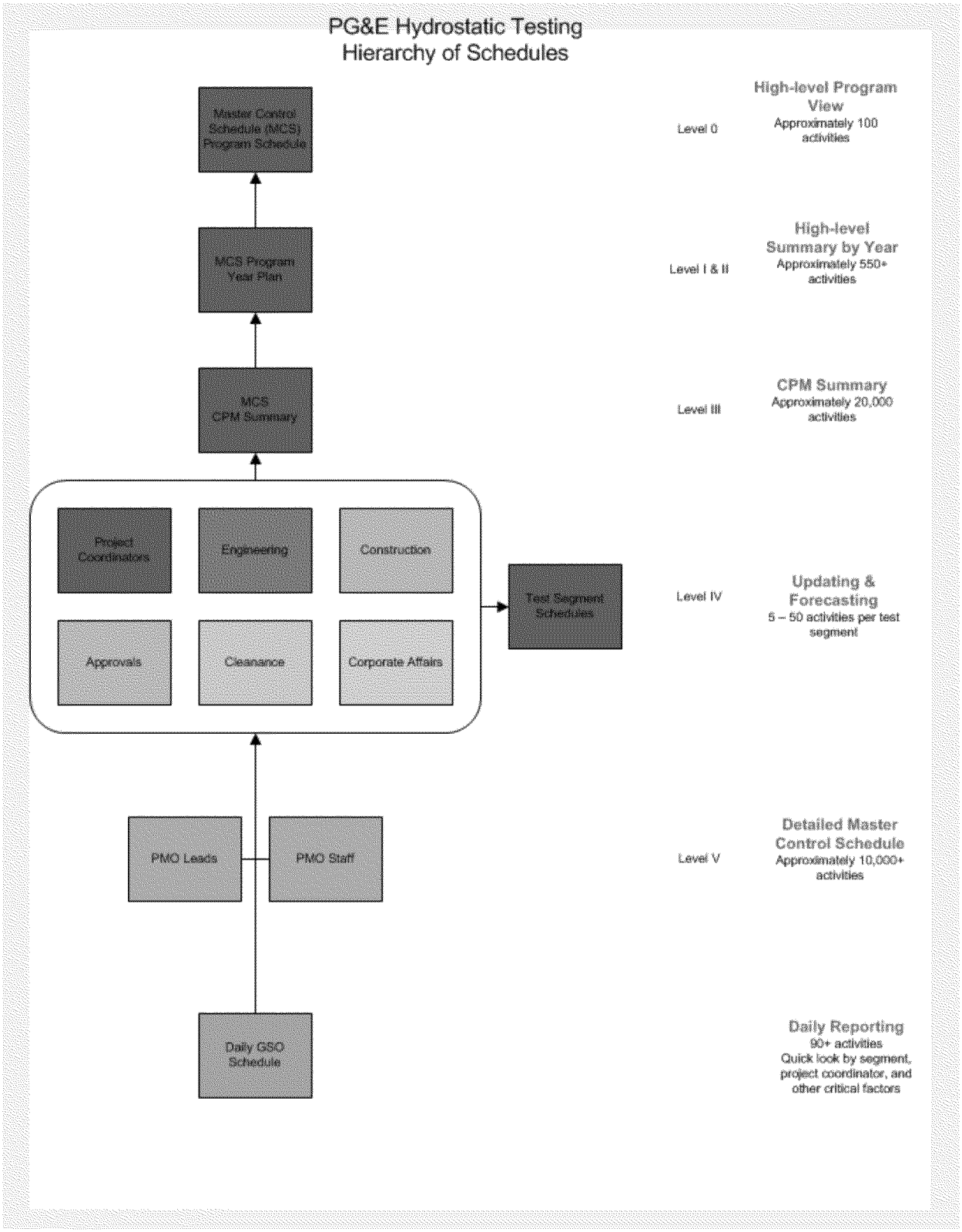


FIGURE 11-1
Hierarchy of Schedules

TABLE 11-2
Master Control Schedule – Strength Test Example
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Level	Description	Example
0	Program	PG&E Strength Testing 2020
1	Region	Central Valley
2	Test Segment	Redacted
3	Functional Area	Engineering/design
4	Phase	Preliminary engineering

11.5.5 Schedule Baseline Process

The key element in the development of the baseline will be scope, and the "freezing" of the scope at a given configuration will be a predecessor to finalizing cost and schedule.

The configured scope and cost must be communicated to the Project Coordinators for appropriate schedule updating; these schedules will be key components in revising the MCS to align with the baseline (see Procedure PGE-PC-PR-0004, Change Control and Baseline Maintenance).

This process must allow for the time needed if a forecast with baseline is required.

The output will include a suite of reports and data, developed during the Program to address (at a minimum) the following:

- Key milestones
- Key interfaces
- Access management
- Critical path analysis
- Planned value

A process map and description for this process are included in Standard Form/Template C1 and C2.

11.5.6 Period Update Process

The daily and weekly update process will be coordinated within the Program reporting cycle. This process will also involve the receipt of the project segment schedule updates from each Project Coordinator and the roll up of progress from these schedules into the MCS.

The output will include a suite of reports and data, developed during the Program to address (at a minimum) the following:

- Key milestones
- Key interfaces
- Critical path analysis
- Earned value (schedule performance)

A process map and description for this process are included in Standard Form/Template D1 and D2.

11.5.7 Schedule Change Process

In accordance with the Change Control Procedure (PGE-PC-PR-0004), scope, cost, or schedule change must be communicated to the Program Scheduling team for appropriate project segment schedule updating; these schedules will be the key components in revising the MCS to align with the baseline plus the change.

The time required to follow this process must be allowed for in any forecast.

The output will include a suite of reports and data, developed during the Program to address (at a minimum) changes to the following:

- Key milestones
- Key interfaces
- Critical path analysis
- Planned value

A process map and description for this process are included in Standard Form/Template E1 and E2.

11.6 Reference Documents

The following documents were consulted in developing this manual:

- *Construction Extension to the PMBOK@ Guide Third Edition, Second Edition* (Project Management Institute, 2007)
- *Practice Standard for Earned Value Management, Second Edition* (Project Management Institute, 2011)
- *Practice Standard for Project Configuration Management* (Project Management Institute, 2007)
- *Practice Standard for Scheduling, Second Edition* (Project Management Institute, 2011)
- *Practice Standard for Work Breakdown Structures, Second Edition* (Project Management Institute, 2006)

Procedures for the following management processes jointly support the integrated approach to the following Program controls:

- Program Controls Strategy (PGE-PC-PR-0002)
- Cost Management (PGE-PC-PR-0005)
- Program Schedule Management (PGE-PC-PR-0007)
- WBS Management (PGE-PC-PR-0011)
- Program Risk Management (PGE-PC-PR-0003)
- Value Management (PGE-PC-PR-0010)
- Change Control and Baseline Maintenance (PGE-PC-PR-0004)
- Reporting (PGE-PC-PR-0009)
- Strategic Planning Management (PGE-PC-PR-0008)
- Master Control Schedule Commentary (PGE-PC-PR-0012)

11.7 Standard Forms and Templates

This manual includes the following forms and templates:

- Project Schedule Requirements
- Schedule Baseline Process Map (Figure 11-2)

- Schedule Baseline Process Description (Figure 11-3)
- Period Update Process Map (Figure 11-4)
- Program Schedule Period Update Process (Figure 11-5)
- Schedule Change Process (Figure 11-6)
- Schedule Change Process Description (Figure 11-7)
- Relationships Chart

11.8 Project Schedule Requirements

Each Project Coordinator/Project Manager will be required to maintain an integrated schedule of tasks to a level of detail that will both support their internal management requirements and the requirements of the Program. The project segment schedule requirements are goals. If these goals are not achievable, the PG&E and relevant Project Coordinator/Project Manager will agree to a compromise.

Criteria that should be achieved whenever possible to satisfy the requirements of the Program are discussed below.

The project segment schedule should accomplish the following:

- Be developed and maintained using the latest version of Primavera's Enterprise planning software
- Use only calendars that are approved by the PG&E head of Program Controls
- Consist of logically linked activities with the critical path clearly defined
- Be fully coded to the Program WBS and any other such codes, as requested by the PG&E head of Program Controls
- Include milestones, as requested by the PG&E head of Program Controls
- Avoid the use of negative lag or negative lead times whenever possible
- Minimize the use of constrained dates whenever possible

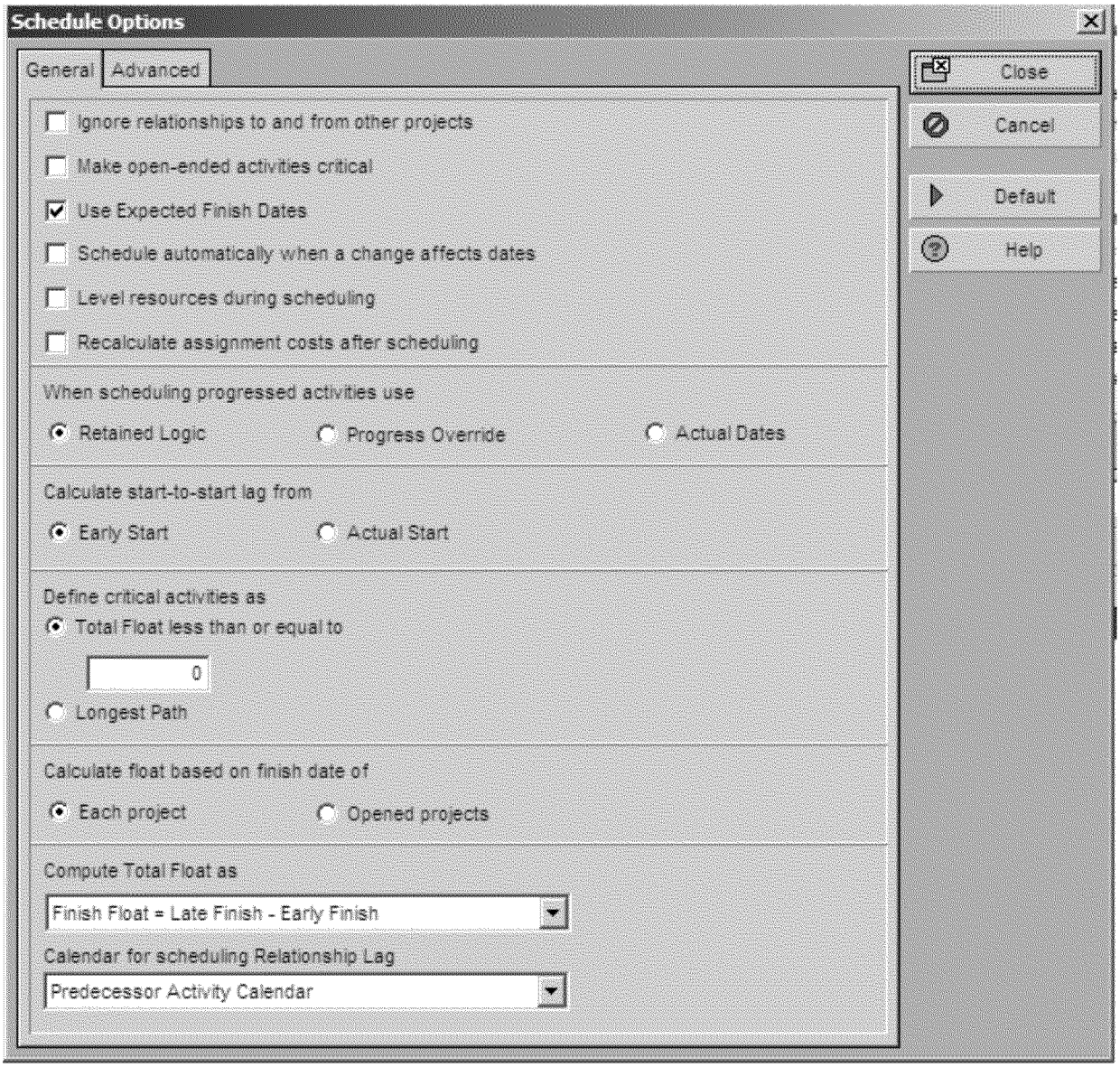
Activities and milestones in the project segment schedule should not be renamed, either by changing the activity identification or changing the activity name in such a way that the scope of the activity is altered.

The weekly project segment schedule should include the following:

- Show progress in coordination with Program Controls to the data date each period with actual start and/or finish dates, and notate physical percentage completion of in-progress activities. All future dates and durations will be reforecast each period where known changes occurred.
- Be submitted by the Project Coordinator/Project Manager as source data to PG&E within 3 days following the data date.
- Be accompanied by a period report, including (at a minimum) the following:
  - Project status narrative
  - Cost and schedule performance earned value metrics
  - Key milestones
  - Anticipated final cost
  - Risks and issues

PG&E PMO will provide the following to each Project Coordinator/Project Manager:

- PG&E Strength Testing Program Calendar
- Program WBS
- Program Reporting Cycle
- Default Primavera Calendars
- Default PG&E Strength Testing Coding Structure:



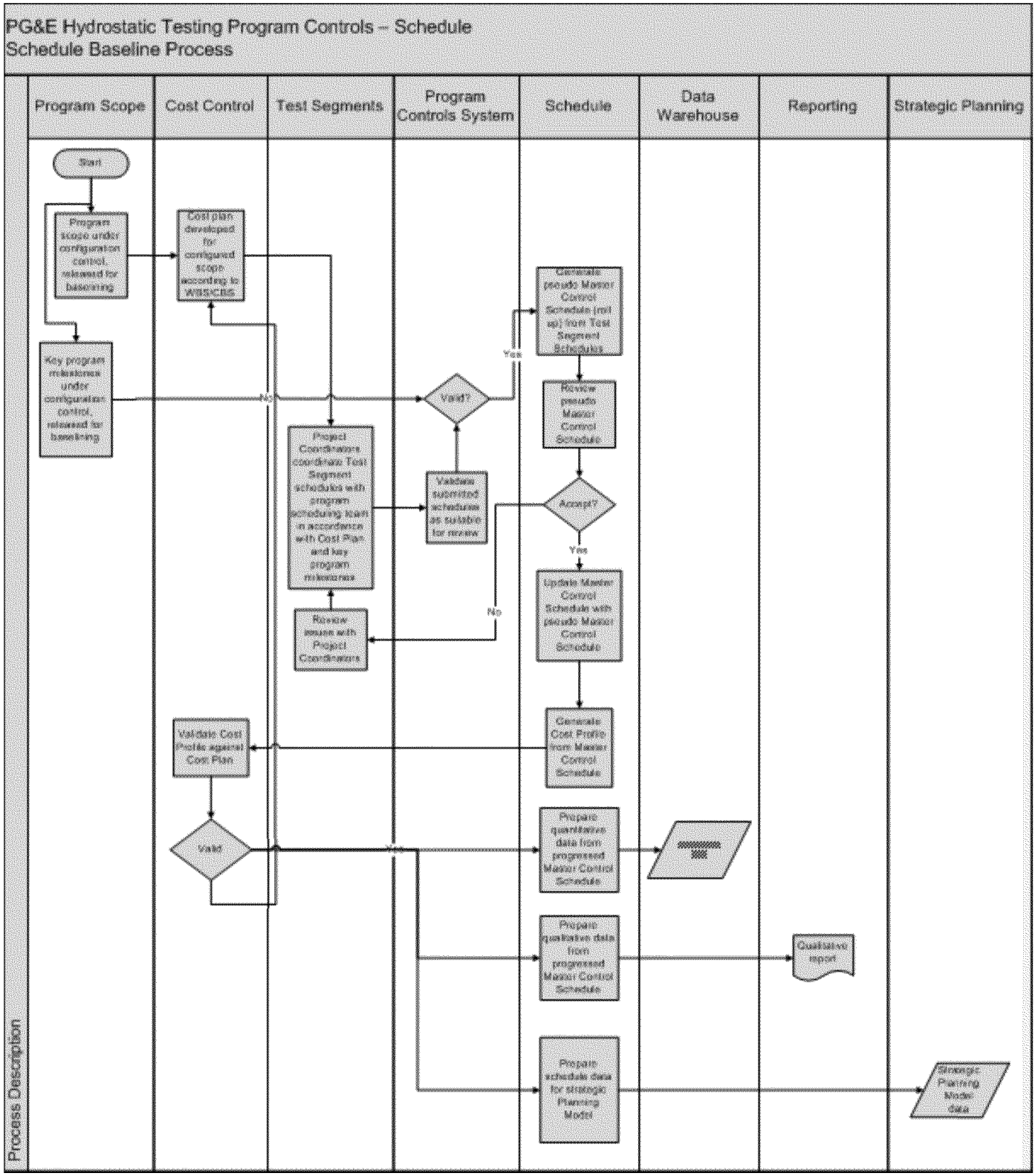


FIGURE 11-2
Schedule Baseline Map

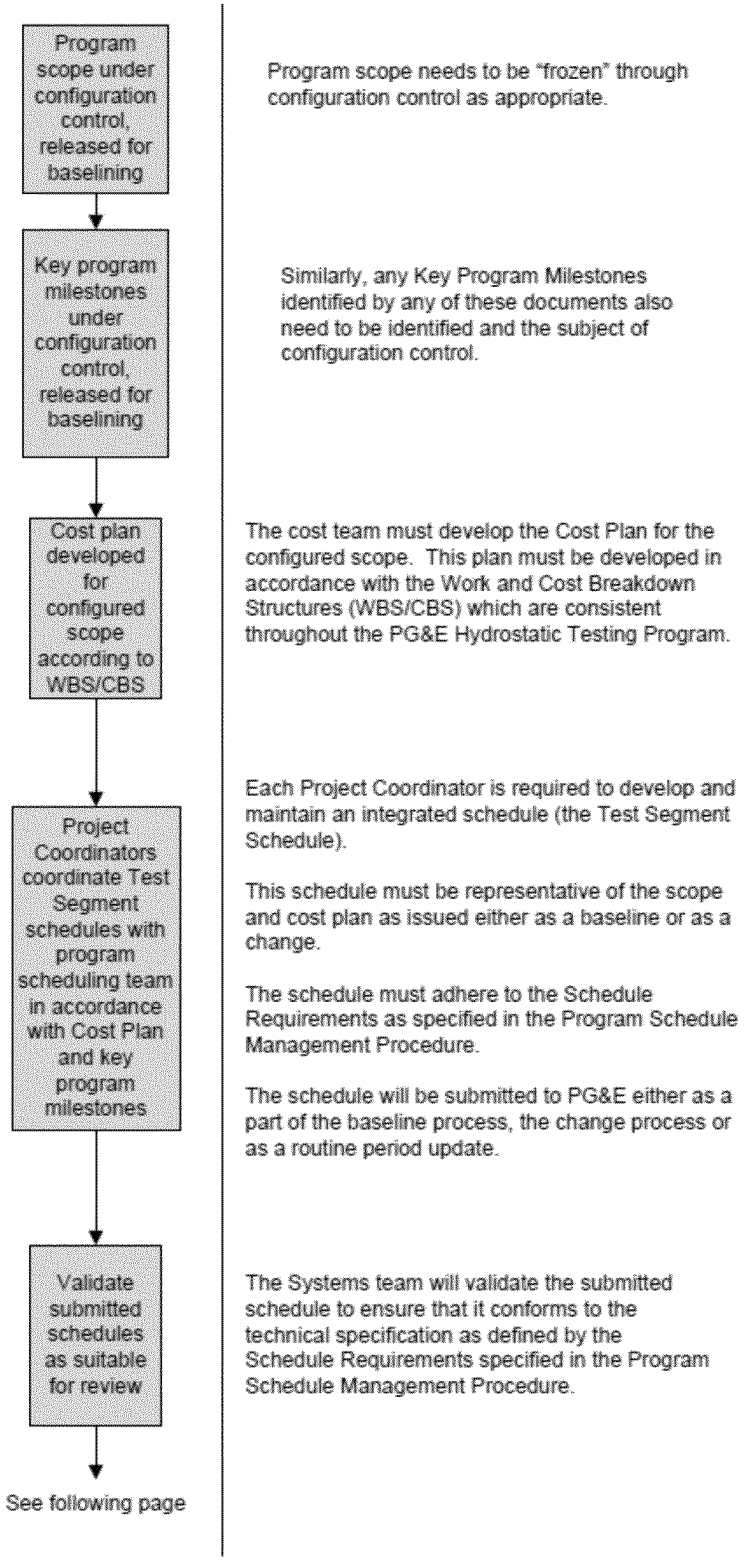


FIGURE 11-3
Schedule Baseline Description

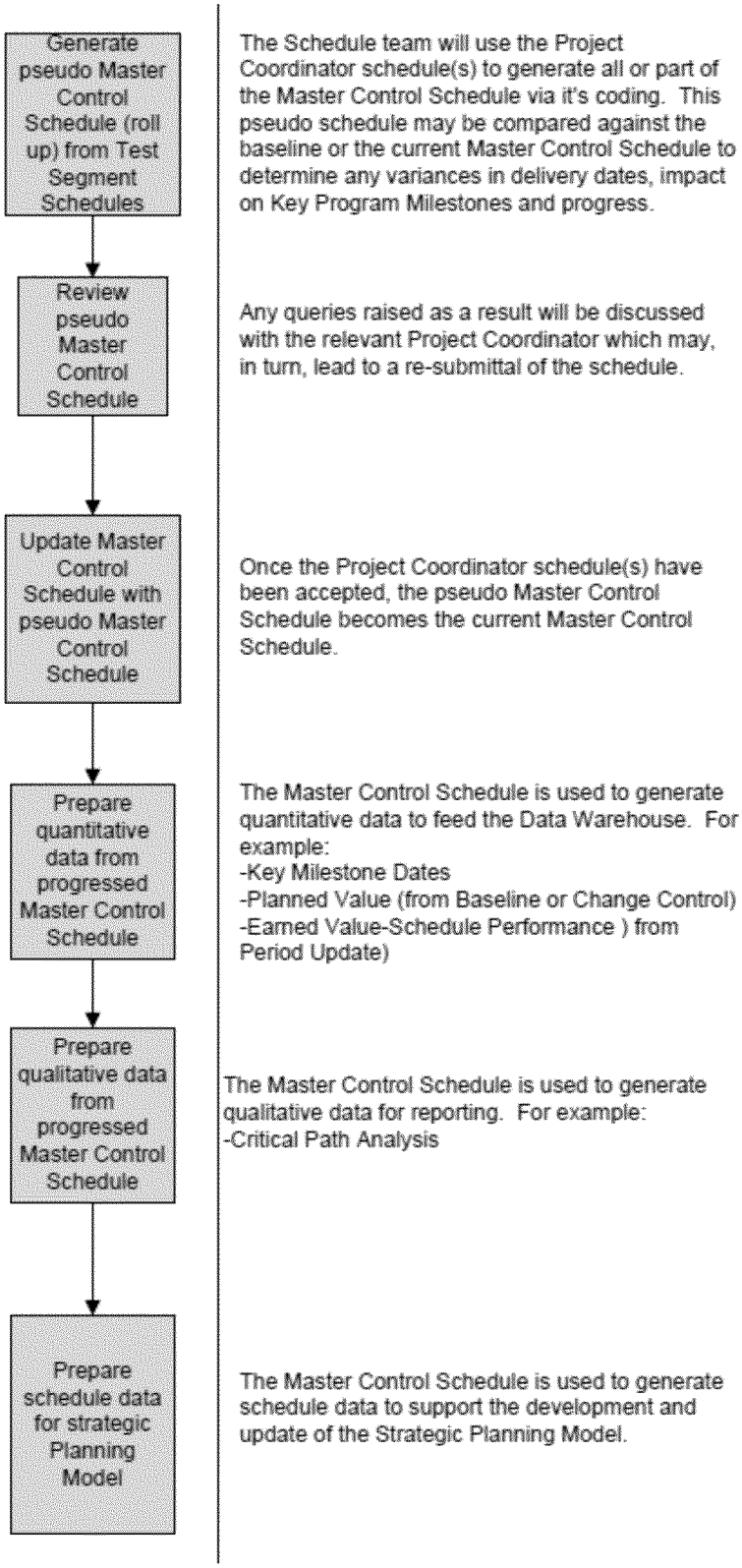


FIGURE 11-3 (CONTINUED)

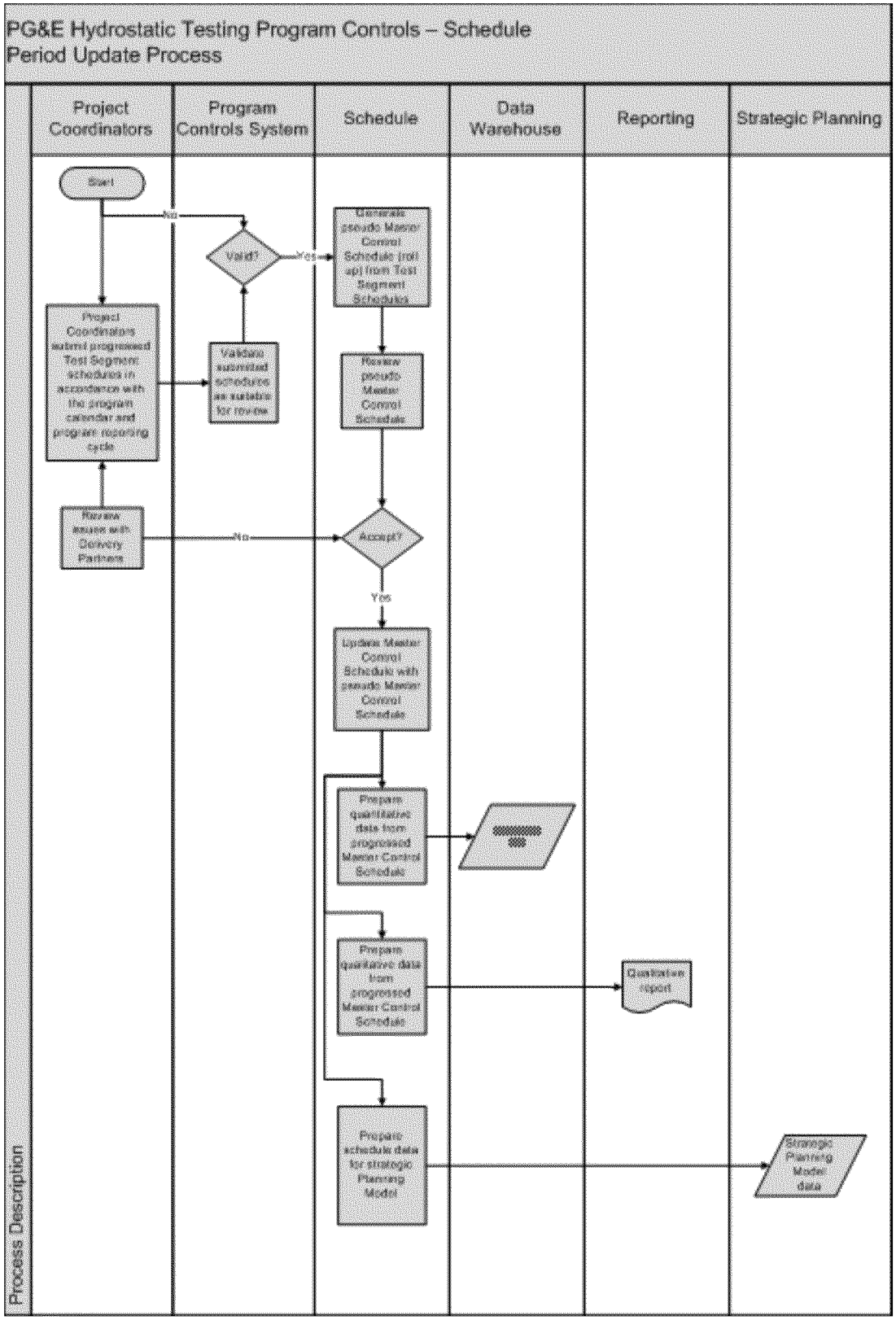


FIGURE 11-4
Period Update Process Map

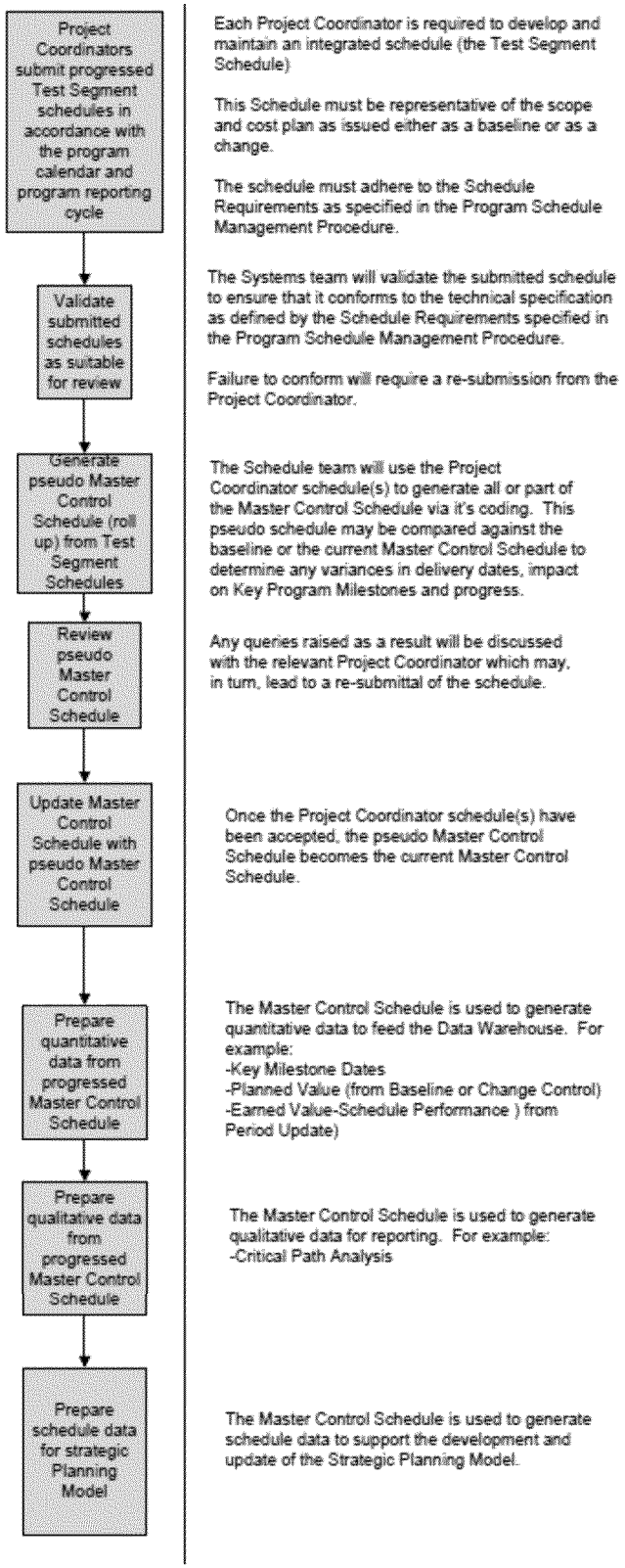


FIGURE 11-5
Program Schedule Period Update Process

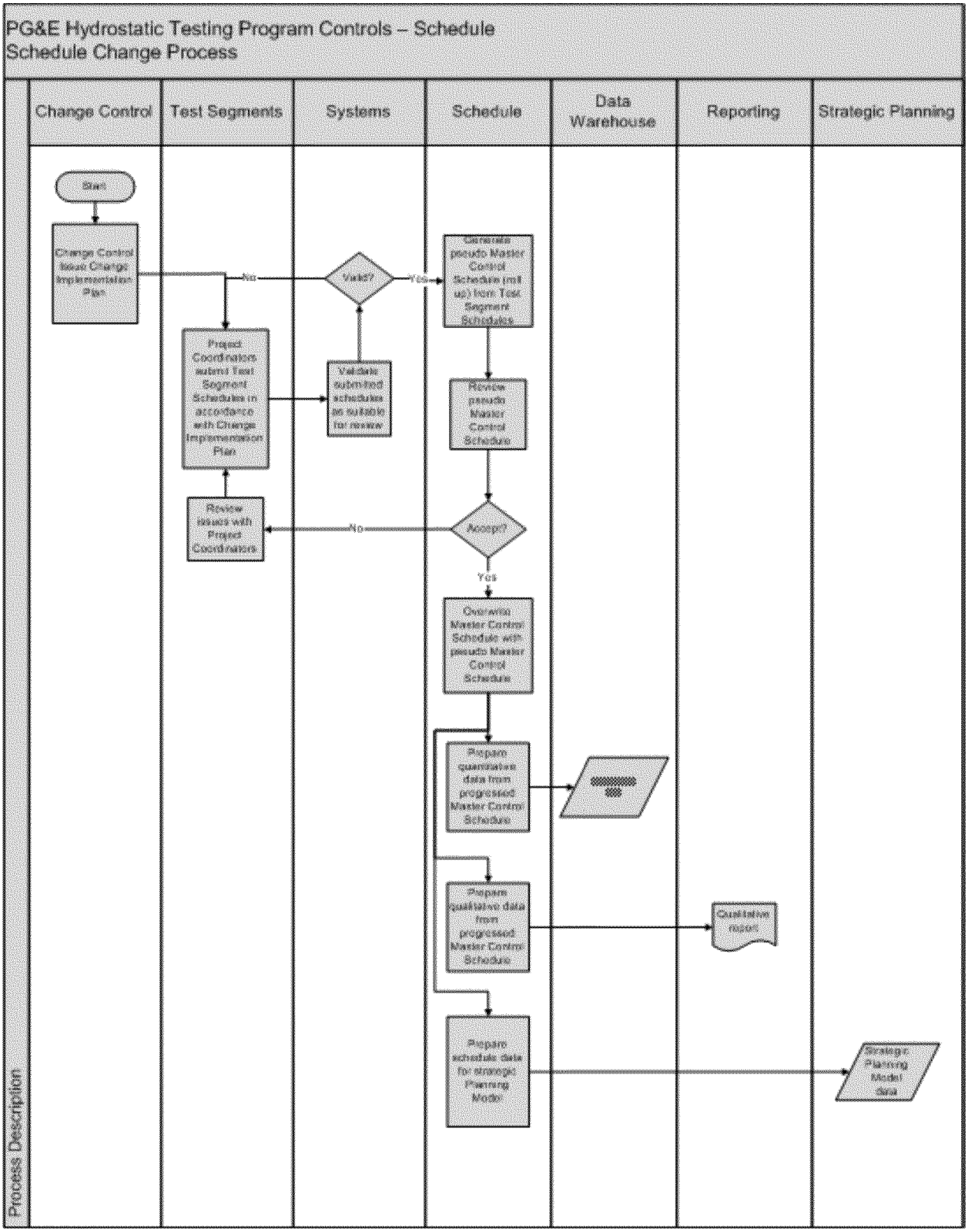


FIGURE 11-6
Schedule Change Process Map

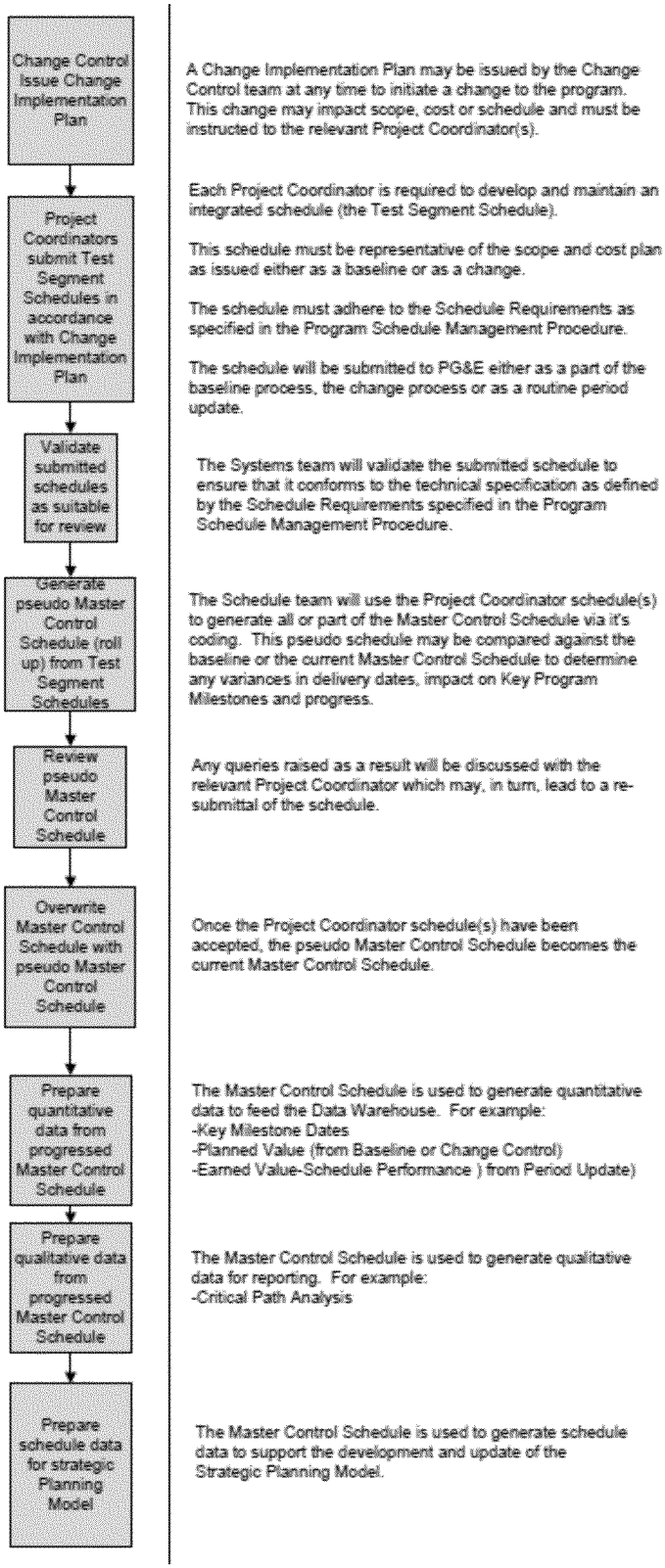


FIGURE 11-7
Schedule Change Process Description

11.9 Cost Management Procedure

11.9.1 Purpose

This manual establishes Program approach to facilitate an effective Cost Management Procedure to validate financial data for the Program.

The many benefits to operating a structured and proactive approach to cost management at a Program level include the following:

- Delivery of the Program within budget constraints
- Improved and informed decision making
- Enhanced knowledge and understanding of the Program
- Identification and management of the most commercially viable Program solutions
- Provision of consistent cost data for project and Program reporting
- Focused management effort and allocation of resources

11.9.2 Scope

This manual provides the basis for implementing Program cost management. It details the systems, processes, procedures and tools required to identify, collect, integrate and analyze all cost data related to the Program (including references to other processes crucial to successful cost management). The Cost Management Procedure applies to all projects and functional groups in the Program.

The following cost management processes are included in the procedure:

- Cost management principles
- Roles and responsibilities
- Cost reporting
- Budgeting
- Financial controls

The Program Cost Management Procedure aims to reflect best practice, establishing an integrated cost management service across the Program, relative to both the functional groups of PG&E and other Program procedures (Planning, Change Management, and Risk) via the Program Controls systems and toolsets.

Figure 11-8 outlines the core and supporting elements of the Cost Management Procedure.

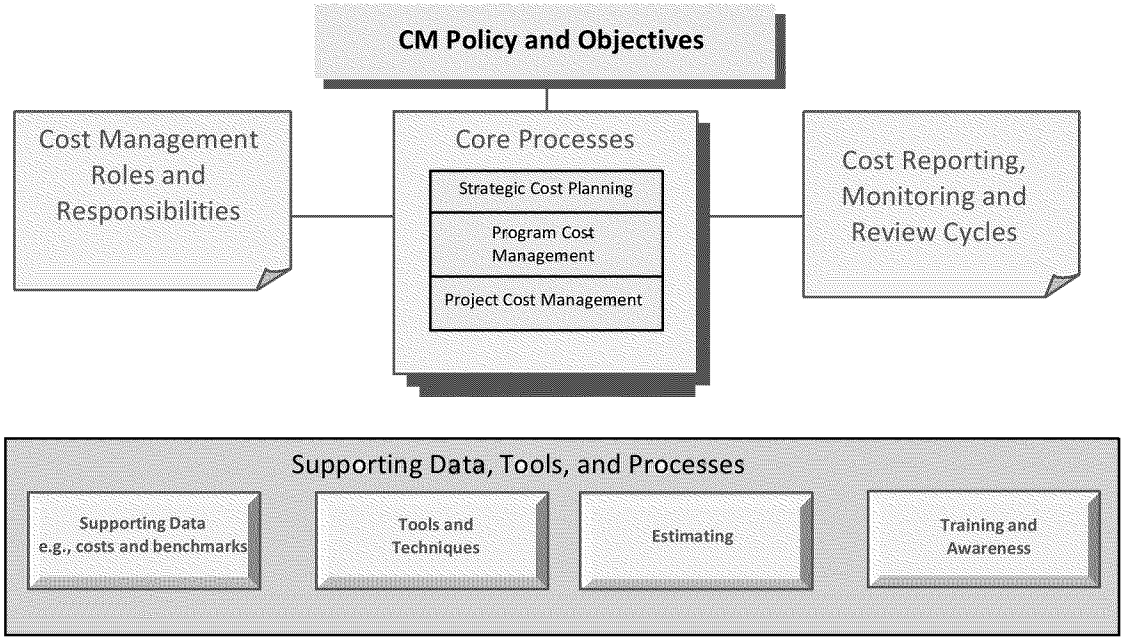


FIGURE 11-8
Cost Management Framework

11.9.3 Definitions

Table 11-3 presents definitions that will be included in the Cost Management Procedure.

TABLE 11-3
Cost Management Procedure Definitions
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Term	Acronym	Definition
Accruals		Costs of the work performed to date that have been incurred (or committed) but have not yet been invoiced, also defined as the delta between Actual and invoices processed on the accounting system. Negative accrual reduces the Actual by any committed amounts that are not related to (or do not represent) the costs of the work performed to date.
Annual Budget		The approved budget for a financial year.
Total Installed Cost	TIC	The anticipated final outturn cost of a budget item(s) (e.g., contract, workstream, or project). Also used to describe the outturn cost of the entire Program.
Baseline Budget		Established via the Initial Control Baseline. The processes will establish the first baseline budget, and the associated baseline schedule and scope of works.
Authorized Budget		The authorized expenditure limit for an element of the Program.
Budget		The expenditure limit of a test segment.

TABLE 11-3
Cost Management Procedure Definitions
PG&E Pipeline Safety Enhancement Plan Process Manual and Program Execution Plan

Term	Acronym	Definition
Contingent Liabilities		The cost of work incurred plus any sums due to a contractor/supplier for loss of profit if the contract is broken (by PG&E). NOTE: Liability is not the same as work done.
Contract		A contract awarded by PG&E for the provision of works, supplies, or services.
Contract Award		Value of contract at award stage.
Contract Commitment		Contract commitment means contract award plus approved contract changes.
Contractor		The company contracted by PG&E to undertake works, supplies, or services.
Cost Breakdown Structure	CBS	A hierarchical structure used to break down the Program scope of works for cost management purposes.
Actual Cost of Work Performed	ACWP	The estimated amount of costs of work incurred up to the relevant calculation date.
Budgeted Cost of Work Scheduled	BCWS	Total of planned budget expenditure for work scheduled in a given period.
Budgeted Cost of Work Performed	BCWP	Total of budgeted cost of work completed in a given period.
Invoiced Amount		Amount invoiced for payment, excluding taxes.
Program Budget		Total budget for the Program (see budget).
Program Manager Lead		The person within PG&E responsible for cost management of part of the Program.
Work Breakdown Structure	WBS	A hierarchical structure used to break down the Program cost and scope of works for planning and scheduling purposes. Established via the Program WBS Management Procedure – CRL-PC-PR-0011.

11.9.4 Roles and Responsibilities

This section summarizes responsibilities for the activities carried out to enable Program cost management and reporting.

11.9.5 Hierarchy of Cost Management

The Program's PMO Lead will be responsible for managing and reporting cost information associated with the entire PG&E Program. The Program's PMO Lead will be supported by the Program's PMO Operations Lead.

For effective management and reporting, project controls will require cost management information to be provided from contractors, functional groups, and others in a controlled hierarchical manner in accordance with the agreed WBS.

For this reporting structure to work effectively, all cost information must be captured in accordance with agreed requirements.

11.9.6 Roles and Responsibilities

The personnel with primary cost management responsibilities in this procedure are as follows:

- **Project Manager/Coordinator** – Primary responsibility to coordinate project activities to enable timely and accurate report of project segments progress and status. In addition, the Project Coordinator is responsible for periodically updating the project data in PMO toolset (COBRA).
- **Program PMO Operations Lead** – Primary responsibility for overview of Project Coordinators' report of project segments progress and performance. The Program PMO Operations Lead will provide oversight and guidance for periodic reports in the agreed format, as well as access to financial information requested in this procedure.
- **Planning and Scheduling Lead** – Interface with Project Coordinators to ensure that the Change Control procedure is followed and Project data are consistent with Change to be incorporated in COBRA.
- **Project Coordinator Analyst** – Interface with Project Coordinators to load data into PSRS toolset.

11.9.7 Procedures

This section defines the principles and purpose of Program cost management, the overall approach to cost control, and identifies where key data will be held. It highlights interfaces between Program management systems, and information required from the contractors, functional groups, and others to ensure timely and accurate reporting by Project Coordinators.

A chief goal of the Program cost management function is to provide the correct information at the right time to the right people in the right format. To accomplish this, reporting on Programwide systems must be carried out in accordance with the Program requirements.

The Planning and Scheduling group, in conjunction with Project Coordinators, will provide the following types of information:

- Accurate and consistent
- Integrated with other Program Controls systems and reports (schedule, change management, and risk)
- Holistic (full visibility of all appropriate allowances, including appropriate contingencies)

This type of detail will allow areas of concern to be highlighted on an exception basis.

11.9.8 Approach

At the Program level, the approach to cost management will be handled by the Project Coordinators, Planning and Scheduling, and functional leaders as follows:

- Implement Cost Management Procedures across the Program
- Challenge and confirm the accuracy of financial information within the defined scope across the Program
- Monitor the delivery of Cost Management services at the project level to ensure compliance with both PG&E and Program Management procedures
- Support Project Coordinators in the use of the Cost Management procedures

11.9.9 System Architecture

The key tools proposed for Program cost management are as follows:

- Primavera – schedule
- COBRA – project management reporting system
- SAP – financial management system
- Change management
- Risk

All reports will provide output that can be seamlessly uploaded into the Program Control data set via electronic data transfer.

11.9.10 Work Breakdown Structure

Cost management will be reported to the PMO in accordance with the Program WBS Procedure.

11.9.11 Program Management Cost Reporting Output

Cost reporting will be at the following three primary levels:

- Program level
- Regional level
- Functional and project segment levels

At each agreed level the following financial information will be provided:

- Program baseline budget
- Budget transfers
- Approved changes
- Original project/test segment budget; estimate at completion
- Total installed cost
- Estimate to complete
- Actual cost

In addition, the following performance measurement information will be provided:

- Budgeted cost of work performed
- Budgeted cost of work scheduled
- Schedule performance indicator and cost performance indicator

11.9.12 Program Cost Reporting Inputs

This section defines the procedures that will be followed by contractors to periodically produce cost management reports for the Program.

Scope

Program reporting will be supported by and generated from reports produced by the Planning and Scheduling teams. For seamless information flow, supporting reports will be produced in accordance with the agreed WBS and will be consistent with the terms defined in this procedure.

This procedure applies to all contracts for the provision of works, supplies, and services within the Program.

Responsible Parties

The following describes the roles and corresponding responsibilities for handling Program cost reporting activities:

- **Project Coordinators**
  - Prepare the cost forecasts and periodic reporting in accordance with PG&E's policies to ensure consistency of cost reporting practice across the Program
  - Validate estimates and cost reports and incorporate them into a separate cost report
  - Issue cost reports to the Planning and Scheduling group, in agreed format, in accordance with the reporting calendar
  - Sign off the cost report
- **Program Planning and Scheduling Lead**
  - Coordinate reports from all Project Coordinators and project coordinator analysts
  - Conduct high-level review of the cost reports and highlight any major variances that may affect the estimate at completion
  - If appropriate, raise an internal (PMO) early warning process and/or include in trending exercise
  - Issue Program cost reporting

Information Required

Cost reports must be produced to a level of detail and in a format approved by the PMO Lead and PMO Operations Lead.

The Planning and Scheduling Lead will provide reasonable supporting information pertaining to the figures and assumptions used in the cost report. A full and complete audit trail for each cost report (including all resource analyses, sources of information, budget quotations, or other build-ups) will be maintained to ensure that all figures inserted into the cost report are transparent and auditable. If requested, copies of this information will be provided to the Program PMO Lead and PMO Operations Lead.

The cost report could include, but not be limited to, the following:

- Original Program baseline budget
- Approved changes
- Current project/test segment budget
- Actual cost of work performed (ACWP)

At a minimum, cost performance should be measured via the following key metrics:

- Budgeted cost of work performed
- Budgeted cost of work scheduled
- Estimate at completion forecast
- Variance at completion
- Schedule performance indicator
- Cost performance indicator

11.9.13 Program Baseline Budget

The overall Program baseline budget and any changes thereto, will be approved and advised by the PMO Lead and PMO Operations Lead, and cascaded periodically to PG&E Finance via the appropriate level of the WBS to provide Project Coordinators with clear provisions for delivery. The guidelines for the Program baseline budget will be as follows:

- The overall baseline budget will be established at a high level.
- Any changes thereto will be approved and advised by the PMO Lead.
- Baseline Controls will recast the budget to reflect the WBS baseline budget. This will be done through coordination with the Project Coordinator Analyst and functional groups such that a time-phased baseline budget aligns with the WBS.

11.9.14 Cost Verification

Scope

This section applies to all contracts for the provision of works, supplies, and services within the Program, and sets out the procedures for verifying the following:

- Actual cost incurred
- Payments due
- Final accounts of contracts and projects across the Program

Cost verification applies to all direct and indirect costs of the following:

- Project segments
- PMO costs overhead, management, legal, finance, engineering, and H&S
- Land and property acquisition
- Procurement

Program management cost verification will apply to all contracts awarded on the Program and any subsequent subcontracts.

Expectations

The following describes the roles and corresponding expectations for verifying costs:

- **Project Coordinators and project coordinator analysts:**
  - Undertake cost verification of the ACWP, amounts due, and final account assessments
  - Notify the Planning and Scheduling group of any deductions and/or adjustments that exceed 20% from the contractor's applied amount
  - As requested, provide reasonable supporting information, in respect to the figures and assumptions used for the assessment, about the amount due and final account
  - Maintain a full and complete audit trail to ensure that all figures are transparent and auditable, and as requested, provide copies of this information to the Planning and Scheduling group
  - Sign off of the amounts reported

- **Program PMO Operations Lead:**
  - Support the Project Coordinators and provide guidelines to ensure consistency and sharing of lessons learned
  - Undertake ad hoc audits to ensure the process and procedures of cost verification and cost audits are completed
  - Review and notify the Program PMO Lead of variances that may have a significant impact on the reported Program baseline budget
- **Project Coordinator Analyst:**
  - Responsible for sign off of the figures reported by the Project Coordinator

Verification of Actual Cost of Work Performed

"Actual costs" refers to the estimated amount of work costs incurred. This includes the following elements (see Figure 11-9):

- Interim payments (actual amounts paid out)
- Accruals (costs that have been properly incurred but are not yet invoiced)

FIGURE 11-9
Actual Costs

It is vital that accruals are realistic so that that cost performance indicators relying on actual costs will be informative and accurate.

Requirements of the actual cost assessment will be as follows:

- When possible, the assessment will agree with the external party (supplier).
- When possible, the assessment will be substantiated by one or more of the following:
  - Calculations demonstrating the value of the estimated cost of work and accrued amount
  - Cost reports from external parties
  - Progress reports and as-built programs that identify the progress achieved
- The assessment will be collated at an agreed WBS level.

11.9.15 Cost Audit

Financial Audit (Internal and External)

A financial audit will be necessary to accomplish the following:

- Ensure costs are reported and commercial transactions made in accordance with PG&E procedures, controls and good business practice
- Ensure business risks are properly identified and effectively managed
- Investigate allegations of fraud and corruption and advise appropriate disciplinary, civil, or criminal proceedings

The following present key issues regarding financial audits:

- Internal audits may be undertaken at any time. Generally, reasonable notice will be given but in some instances it may be unannounced.
- Statutory external audits of financial statements, annual year-to-date costs, expenditure, and accruals may be undertaken shortly after the end of each financial year.
- Ad hoc external audits during the financial year may also be undertaken.
- Full cooperation with both internal and external auditors will be required at all times.
- Files and records (both hard copy and electronic) will be kept updated at all times to assist the audit process and minimize non-conformances.

Cost Audits

Cost audits are more thorough verification processes that provide a detailed verification of actual costs and often include review of confidential information. Cost audits provide the following benefits:

- Unbiased examination and evaluation of supplier financial statements
- Examination of records of financial accounts to check accuracy
- Adjustments or correction of the accounts after examination
- Allow PG&E to exercise its right to satisfy auditors that the supplier is operating in accordance with the contractual agreements
- Identify innocent non-compliance (not just deliberate and fraudulent non-compliance)
- Impartial and objective review that will support the needs of PG&E in satisfying the requirements of stakeholders
- Set up PG&E for the audits to be undertaken internally
- Deterrent for fraudulent claims

The cost audit process will depend on the type of contract and the terms and conditions as contracts will be procured using different procurement arrangements. Generally, when working under a cost reimbursable contract, all parties have already agreed to adhere to the contractual obligations, which likely include the following:

- Share information and communicate openly, being receptive to cost audit, validation of amounts due, and other checks and balances deemed necessary
- Provide clear and defined cost data
- Actively and continually improve the procedures and processes of the cost audit
- Measure and report on the compliance of the procedures and processes

Each cost audit should be tailored by contract and account for the following factors:

- Scheme value
- Scheme duration
- Turnover per month
- Past supplier performance

This will determine the type of audit, including the following:

- Depth (arbitrary, 80/20, full disclosure, forensic challenge)
- Timing (spot, interim, and final)
- Investigative audit (Note: Special circumstances may result in a broader review of issues found within the initial audit.)

11.10 Change Management Procedure

Change control is the process by which any change to the scope, requirements, schedule, or baseline budget of the agreed Program baseline is managed. The process considers key potential effects of change, including health, safety and security, environment, and commitments.

Change will be defined in accordance with the Program control baseline in force at the time the change is considered. Approved change will form the basis of re-baselining the Program.

11.10.1 Change Control Process – Pre-construction Phase

Any position on the project team can identify an issue that may have a potential for project change and bring it to the attention of the PM. The process flow diagram in Appendix A, Figure 1, shows the complete process for a PSEP change request.

Identifying Changes

Changes will be primarily identified by Workstream Managers, Engineering, Construction Managers, Project Managers, Project Coordinators, or general contractors but can be requested by any position in PSEP. Any identified change requires a completed project change request (PCR) in the scope to bid phases of a project. Additional supporting information may be provided as needed. Changes during the construction phase are Potential Change Orders (PCO). Changes are defined by the thresholds in Table 11-4.

TABLE 11-4
Draft Pipeline Safety Enhancement Plan Change Control Decision Authorities

			Cost		
	Scope	**Schedule**	**Project**	**Workstream**	**Program**
Executive VP	Approve any change to annual or Phase I overall deliverables	Approve annual delivery schedule changes or overall Phase I delivery schedule changes		Change of base capital or expense for a workstream >$20M	Tier 3 advice letter for additional recovery
VP of PSEP	Review and advise Executive VP of any change to annual or Phase I overall deliverables	Review and advise Executive VP of annual delivery schedule risks or Phase I schedule risks		Changes to base capital or expense for workstreams or program <$20M	
Change Control Board a. PSEP PMO Program Director b. TEST Workstream Manager c. TEST Engineer Director d. PVI Workstream Manager e. PVI Engineer Director	Approve changes that move scope between workstreams Approve changes that move scope between Integrity Management and PSEP Review and make recommendations on changes that change Phase I total miles or valve deliverables	Any change in operative year	Meets scope or schedule criteria and >$1M and within approved capital and expense budgets, within contingency, for the PSEP program Projects >$20M will be submitted through the Executive Project Committee process	Review and escalate changes to base capital or expense for workstreams and program	
Workstream Managers	Approve scope changes that do not move segments to other workstreams Ensure that annual goals of miles and valves are met	Estimated date of return to operations changes >2 weeks during construction Schedule baseline set at 60% design milestone (PVI) or 50% strength test	PVI: >6% max $1M Strength test: >$10K max $1M Budget baseline set at 60% design milestone, or 50% strength test	Manage within base capital, base expense, and contingency releases	Not applicable
Engineers, Project Managers, Project Coordinators	Manage approved scope	Manage within milestone thresholds	Monitor forecast; manage within cost change threshold	N/A	Not applicable

Recording Changes

All changes in the scope to bid phase are recorded in the PSEP Change Management Log by the Change Control Team. Each change must have a completed PCR and supporting documentation attached. A DV change form may be required for a change and should be submitted at the same time as the PCR. The CCT will assign a unique ID to each change and archive all documentation provided into the SharePoint. The PSEP Change Management Log will be updated when a PCR is submitted and after the request has been approved/rejected. If applicable, the engineering team will update the PSEP Database with all approved changes.

Construction Phase changes are received by the Construction Manager, Project Manager, or contract administrators and saved with project documentation. If approved, potential change orders are logged in the company supplier relationship management system and routed for final approval as amendments to construction contracts.

Approving Changes

Changes that have been added to the PSEP Change Management Log will be routed by the CCT to the appropriate approval party. The parties of approval for scope to bid phase changes are the Workstream Manager, the Change Control Board (CCB), VP of PSEP and Executive VP. The reviewing party has the authority to agree or disagree with the change request. Potential Change Orders during the construction phase of a project will be routed according to the PG&E delegation of authority for contract change orders.

If the change request is approved then the change will be implemented. The PSEP Change Management Log will reflect scope to bid phases decisions made by the approving party by updating the change's status to "approved" and communicating outcomes. These updates will be done by the CCT. If the change needs to be reflected in the PSEP database then the CCT will also notify the database manager and the database manager will make the change in the PSEP database. If at any time during the approval process the change request is rejected, the change can be revised or cancelled by the approving party or the change requestor. The PSEP Change Management Log will update the change's status to "rejected" and the CCT will inform the PM.

11.10.2 Change Control Process – Construction Phase

Construction phase change orders will be recorded in the supplier relationship management system by the contract management team.

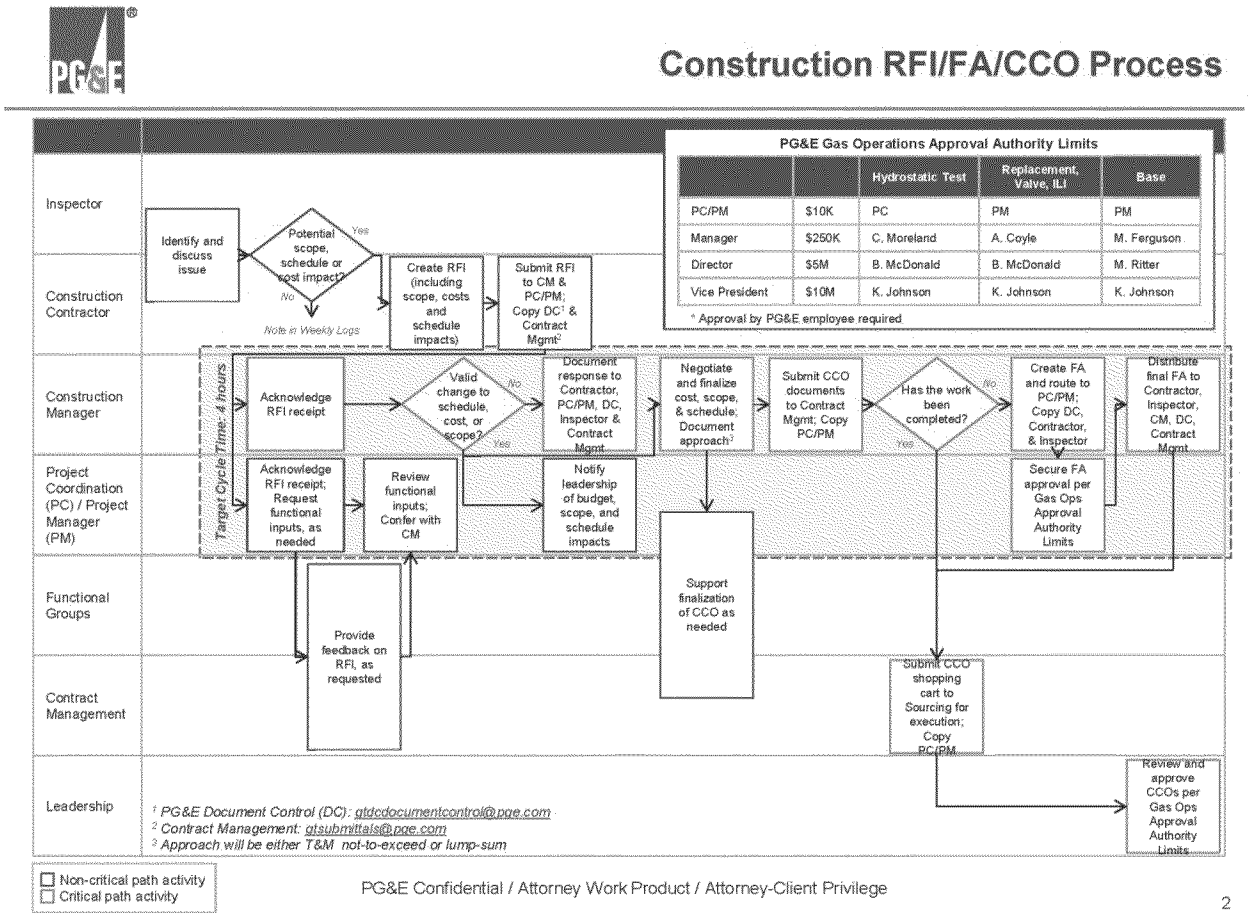


FIGURE 11-10
Gas Operations Request for Information and Field Authorization Process

12.0 Document Controls

The Program Document Control Plan (DCP) will define the document management policy, work processes, and responsibilities of the Program, including the PMO, consultants, and contractors. The DCP will require recording, tracking, storage, and control of all Program management, administrative, design, and construction project documentation. The DCP will address the following (see the Document Management Plan in Appendix A):

- Organization
- SharePoint site
- Document management workflow (see Figure 12-1)
- Distribution
- Transmittals
- Administration

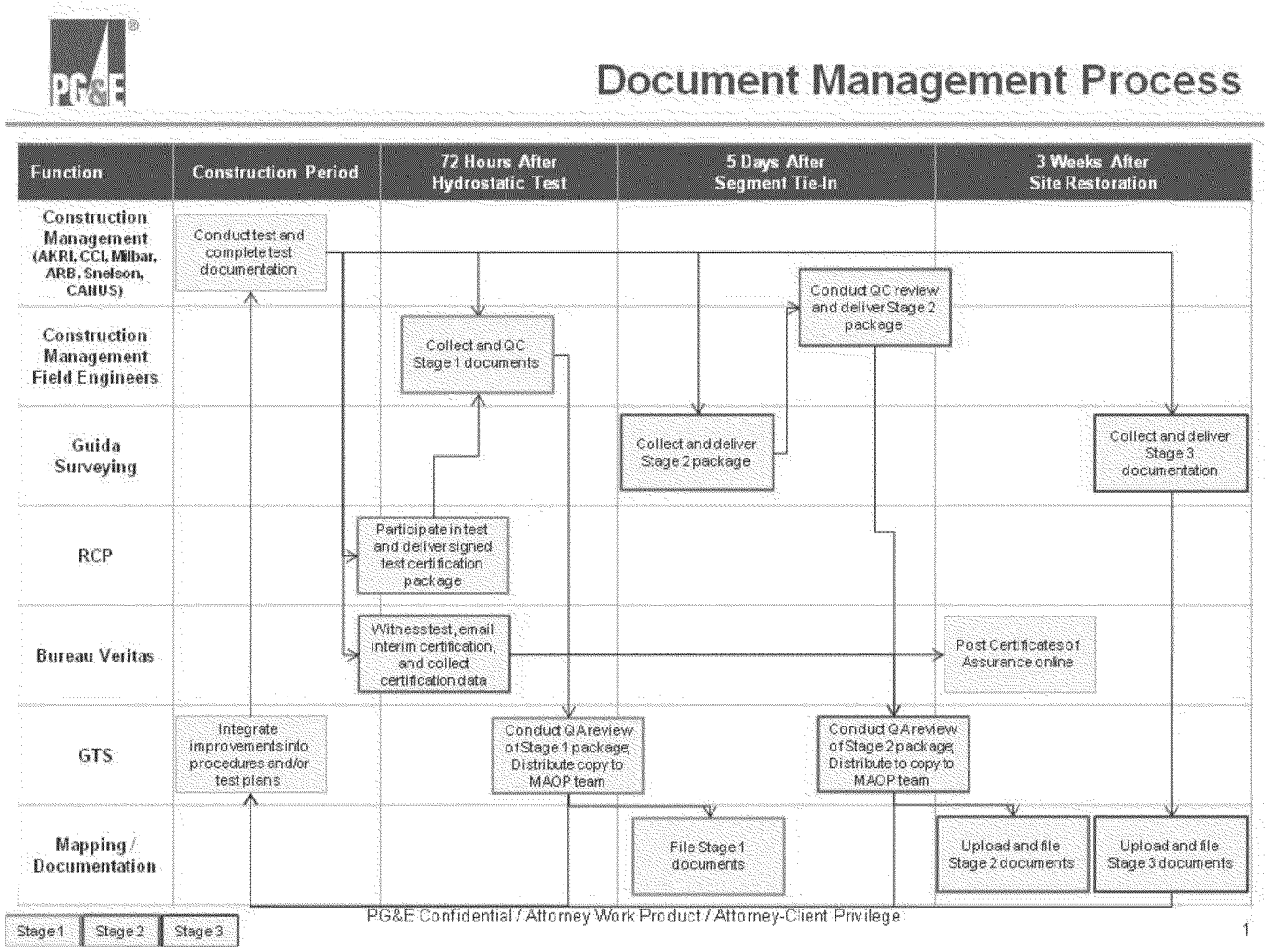


FIGURE 12-1
Document Management

13.0 Mapping and Records

After a project is completed for each pipeline segment and the segment has been returned to service, the completed job package paperwork (as-built or redline package), which reflects actual field conditions, will be consolidated by Engineering and submitted to Mapping for review and processing.

13.1 Completed Job Packages

The completed job package from each project will contain the redline package from the Field team, including marked-up field drawings, data on the facilities, and other associated information. A complete list of materials to be submitted in a completed job package is included in the As-built Checklist in Appendix A.

After the package is received, it will be reviewed for completeness and legibility by the principle mapper. If additional information or clarification is required, the mapping department will contact Engineering and/or the Project Coordinator to resolve the issue. After the review is complete, the mapping and recording process will begin.

13.2 Quality Control

At this point, the assigned mapper will perform data entry, make drawing updates, and incorporate field information into mapping records. QC will be performed by a third party on the GIS operation maps and diagrams. After data is entered and the drawings are updated, the principle mapper will review the changes as part of a second QC step.

NOTE: QC procedures are under development.

13.3 Data Entry and Storage

PG&E will store the redline package data, as both electronic and as hard-copy files. Electronic copies will be posted and updated in the electronic database and the GIS. Hard copy job files will be stored in PG&E's records facility at the Walnut Creek, California, location.

14.0 Contract Administration

Redacted

14.1 Bid Package Components

Redacted

14.2 Bid Evaluation Criteria – Round 1

14.2.1 Qualitative Bid Submittal Scoring

Redacted

[1] Items required prior to bid release.

Bid Package Preparation and Contractor Selection Process

Redacted

[a]Representatives will participate in entire bid selection meeting.

Note:

PVI = pipeline replacement, valve automation, and in-line inspection

Redacted

Redacted

Bid Selection Process

Redacted

Redacted

Redacted

Redacted

Appendix A
Reference Documents

Appendix A: Reference Documents

Best Management Practices

A. Activity Specific Erosion and Sediment Control Plan (A-ESCP) Good Housekeeping

B. Activity Specific Erosion and Sediment Control Plan (A-ESCP) Small Urban Excavation Projects

Forms

C. Dew Point Test Form

D. Record of Material Removed Chain of Custody Form

E. Form F100-10-4 Attachment 4, Application for Gas Clearance

F. Strength Test Procedure Template

G. Strength Test Procedure User Guide

H. Risk Register Form

I. RMP-09 Forms

J. Form A, Data Element Check Sheet

K. Form H, Direct Examination Data Sheet

L. Transmittal Form

Gas Standards and Specifications

M. Gas Standards and Specifications

N. A-34, Piping Design and Test Requirements

O. A-37, Strength Testing Procedure

P. A-38, Procedures for Purging Gas Facilities

Q. A-38.1, Installation and Operation of Air Movers

Safety Practices and Procedures

R. Code of Safe Practices

S. Project Safety Plan

T. Safety Engineering and Health Services

U. Safety, Health and Claims Procedure 201, Hazard, Evaluation and Control Procedure

V. Safety Health and Claims Procedure 221, Ergonomics Program Procedure

W. Safety, Health and Claims Procedure 229, First Aid Procedure

X. Sample Site-specific Safety Plan

Y. Utility Standard Practice 22, Safety and Health Program

Z. Utility Standard S4415, Excavation Safety

Utility Procedures

AA. Utility Procedure TD-4412P-06, Handling Excavators, Contractors, and the Public Working Unsafely Around Utility Facilities

BB. Utility Procedure WP4100-01, Hot and Cold Work Methods for Natural Gas Pipeline Shutdown and Tie-in

CC. Utility Procedure WP4100-10, Gas Clearance Procedures for Facilities Operating Over 60 PSIG

DD. Utility Procedure WP4330-02, Removal and Control of Liquids from Pipelines and Maintenance and Operation of Associated Gas Conditioning Equipment

EE. Utility Procedure WP4412-03, Marking and Locating PG&E Underground Facilities

FF. Utility Procedure WP4412-05, Excavation Procedures for Damage Prevention

Manuals, Checklists, and Plans

GG. ABI Assessment Procedure

HH. As-built Checklist

II. At Work Bulletin

JJ. Construction Coordinator Supervisor Job Description

KK. Document Management Plan

LL. Program Responsible, Accountable, Consulted, and Informed Chart (Appendix D)

MM. Out of Engineering Checklist

NN. Pipeline Hydrotest Program Environmental Awareness Training

OO. Project Coordinator Checklist

PP. Project Coordinator Job Description

QQ. Requisition To Pay Procurement Manual

RR. Segment Engineering Lead Job Description

SS. Site Visitor Guide

TT. Stormwater and Discharge Water SOPs

Outside Resources

UU. Advanced Technology Corporation Automated Ball Indentation (ABI) Test

VV. Code of Federal Regulation Title 40--Protection of Environment,
Chapter I--Environmental Protection Agency, Subchapter D--Water Programs, Part 136--Guidelines Establishing Test Procedures for the Analysis of Pollutants

WW. Code of Federal Regulation Title 49--Transportation, Subtitle B--Other Regulations Relating To Transportation, Chapter I--Pipeline and Hazardous Materials Safety Administration, Department of Transportation, Subchapter D--Pipeline Safety, Part 192--Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

XX. National Technical Information Service SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

Appendix B
Supplemental Reference Documents

Appendix B: Supplemental Reference Documents

Forms

A. Form 61-0532, Hot Work Permit

B. Form 75-53, Nondestructive Testing of Welds on Facilities Designed to Operate at 20% or More of SMYS and Piping Systems Located on Bridges and Operating at a Pressure Exceeding 200 psig Job Summary

C. Form FA-34-A, Emergency Pipe Test Information Form

Gas Standards and Specifications

D. A-34.1, General Requirements Work Reportable to the California Public Utilities Commission

E. D-22, Arc Welding Procedure Requirements: All Stress Levels

F. D-40, Weld Inspection

Utility Procedures

G. Utility Procedure TD-4110P-06, Field Inspections of Gas Facilities

H. Utility Procedure TD-4413P-01, Procedure for Reportable Gas Incidents

I. Utility Procedure WP4330-03, Hydrocarbon Dew Point Testing

J. Utility Procedure WP4412-04, Field Meets and Standby - Damage Prevention

K. Utility Procedure WP4414-04, Assessing and Working with Hazardous/Gaseous Atmospheres

L. Utility Procedure WP4710-02, Contaminated Soil and Material Handling Procedures

M. Utility Procedure WP4711-01, Gas Pipe Wrap Removal, Handling, and Disposal Procedures

N. Utility Procedure WP4900, Gas Transmission and Distribution Design Change Procedure

O. Utility Standard S4412, Preventing Damage to Underground Facilities

P. Utility Standard D-S0353 S4112, Physical Inspection of Pipelines, Mains and Services

Manuals, Checklists, and Plans

Q. Construction Guide

R. Gas Mappers Manual

Appendix C
Job Descriptions

Appendix C: Job Descriptions

Biologist and Cultural Specialist

Purpose of Job

- Provides biological and cultural resource support for all test segments
- Performs data searches for all known sensitive sites
- Works with local tribes or agencies as necessary
- Performs biological assessments for all test sites
- Provides monitoring as needed for all test sites
- Documents any issues uncovered during the projects

Principal Accountabilities

- Coordinates with the Land Planner
- Provides support for all permit applications
- Participates in all 25 and 50% field walks
- Follows up on all negotiated conditions, including site restoration and compensations

Main Challenges of Job

- Performing assessments in accelerated timeframes
- Performing site visits when sites have not be finalized
- Monitoring for long hours

Key Relationships

- Segment Project Coordination team
- Land Planner and Construction teams
- Discipline team members
  - Engineering
  - Land/Environmental
  - Clearance
  - Water Specialist
  - Construction
  - Customer Care
  - Supply Chain
  - Planning
  - Corporate Affairs
  - Mapping/Records

Construction Coordinator Supervisor

Purpose of Job

- Functions as PG&E representative on the construction site
- Oversees the construction contractor, testing, and test inspection
- Is the single point of contact for construction field activities

Principal Accountabilities

- Functions as incident commander and PG&E representative in the field
- Attends 25 and 50% review meetings – provides recommendations on the locations for the tanks, staging, bell holes, and digging
- Is the single point of contact to communicate with construction contractors
- Ensures contractors follow their safety plans, the project environmental/land permits, and PG&E safety rules and processes
- Oversees inspection of the construction contract work
- Communicates any engineering and design issues with Project Coordination and Engineering
- Requests a PG&E General Construction field engineer to come to the site to verify the content of the test data for accuracy and completeness
- Captures the as-built information – assembles and provides as-built package to engineering
- Verifies work performed – first step in the change order/request for information process

Main Challenges of Job

- Ensuring job site safety and environmental/land permit compliance
- Providing timely reports of job site activities and progress
- Working with the Project Coordinator to manage/coordinate the completion of construction, testing, as-built activities, and site restoration on schedule and within budget

Key Relationships

- The segment project team members – especially the Project Coordinator and engineer
- The Program Management Office and leaders of the functional teams
  - Project Coordination
  - Engineering
  - Planning
  - Land/Environmental
  - Customer Care
  - Corporate Affairs
  - Clearance
  - Supply Chain
  - Mapping/Records

Environmental Inspector

Purpose of Job

- Provides field-level environmental compliance inspection
- Communicates environmental compliance observations
- Supports appropriate and timely resolution of compliance concerns
- Coordinates daily with appropriate segment-specific staff, construction staff, and Specialty Monitors
- Reviews upcoming scheduled activities for potential environmental compliance challenges
- Supports RTC variance development and processing

Principal Accountabilities

- Coordinates with Land Planner and Specialty Monitors
- Coordinates with the Construction Coordination Supervisor, qualified Stormwater Pollution Prevention Plan practitioner, and Water Specialist
- Reviews segment plans and permits before mobilization
- Attends the pre-mobilization site walk, and discusses environmental compliance implementation
- Conducts and documents kickoff environmental training and additional training as needed
- Coordinates with crews to mark access and work area limits
- Inspects and documents environmental compliance using the Program Environmental Compliance Management Plan and segment RTC
- Verifies that work occurs within designated areas, and complies with environmental requirements

Main Challenges of Job

- Educating crews on importance of environmental compliance as a key Program success factor
- Supporting environmental compliance in the context of changing schedule, plans, and permits
- Managing multiple communication paths with field staff and segment teams

Key Relationships

- Environmental Compliance Coordination team
- Land Coordination team
- Water Coordination team
- Segment Project Coordination team
- Construction team

Land Planner

Purpose of Job

- Obtains all discretionary permits and clearances required for the construction, operation, and maintenance of PG&E's facilities
- Coordinates all the cultural and biological studies for permit acquisition, and works with other departments to develop protection and mitigation measures
- Issues RTC letters to Project Coordinators for all test segments
- Negotiates and communicates to agency personnel about projects
- Is the main point of contact for land permitting for individual segments

Principal Accountabilities

- Coordinates all segment activities for land and environmental services
- Manages environmental compliance for all test segments

- Participates in 25 and 50% field walks
- Manages all permit compliance conditions, including after-project mitigation or restoration

Main Challenges of Job

- Acquiring permits in accelerated timeframes
- Overseeing compliance on numerous jobs while working under tight schedules
- Tracking all releases to keep projects on schedule

Key Relationships

- Segment Project Coordination team
- Segment Construction Coordination Supervisor
- Discipline team members
  - Engineering
  - Land/Environmental
  - Clearance
  - Water Specialist
  - Construction
  - Customer Care
  - Supply Chain
  - Planning
  - Corporate Affairs
  - Mapping/Records

Project Coordinator

Purpose of Job

- Leads the segment project teams and facilitates communication among the functional groups, project team members, and Program Management Office
- Coordinates development of original schedule for regional segment tests
- Facilitates the individual test segment Engineering, Land/Environmental, Government Relations, Customer and Outreach, Gas System Operations, Supply Chain/Sourcing, and Liquefied Natural Gas/Compressed Natural Gas activities from inception to site restoration
- Works with functional teams to keep the test segment on schedule from inception to full site restoration
- Responsible for the project segment schedules and provides regular input and updates to the Planning and Scheduling group for all segment project schedules from inception to site restoration
- Verifies the team members are aware of the schedule constraints and development of a plan to produce all deliverables in accordance with the schedule, and facilitates or proposes revised schedule
- Verifies that Land/Environmental and Supply Chain have the information they need to issue the following letters:
  - Release for Construction – Land and Environmental
  - Notice to Proceed – Contracts
- Recommends any project schedule changes (through the life of the project) to the Program Management Office
- Is the central point of communication for assigned project(s)
- Accountable for project forecasts and cost tracking, reporting each assigned segment progress against the funded amount

Principal Accountabilities

- Coordinates all test segment activities (e.g., facilitates team communication, bringing team members together)
- During construction, provides input and maintains constant communication with Construction Coordination Supervisor to facilitate communication between the field personnel and the Program Management Office
- Develops and maintains a project team roster that will be stored on SharePoint
- Leads a segment project kickoff meeting (this may be via web meeting or conference call)
- Leads a 50% review meeting at the field site; the Project Coordinator will facilitate the discussions with the team to confirm all constructability decisions have been made and issues addressed (laydown and tanks identified) prior to the completion of the site visit
- Schedules and facilitates the pre-clearance review meeting typically 3 weeks prior to the scheduled start of clearance
- Facilitates the review and approval of field/construction changes by the project team
- Provides a daily status report on each segment project
- Provides the Land Group with a work scope description at each location to facilitate land release
- Notifies the Program Management Office status of ramp tests and strength tests, including when test begins, when ramp is completed, and when the overall test is completed

Main Challenges of Job

- Facilitating communication among the functional groups, project team members, and the Program Management Office in a timely manner
- Dealing with fast-paced projects and leading teams through problem-solving efforts on active projects
- Facilitating project handoffs to Construction for fieldwork
- Facilitating required permitting needs to ensure timely delivery

Key Relationships

- Test Segment Project Coordination team
- Test Segment Construction Coordination Supervisor
- Safety Supervisor
- Program Management Office and leaders of the functional teams
  - Engineering
  - Land/Environmental
  - Clearance
  - Construction
  - Customer Care
  - Supply Chain
  - Planning
  - Corporate Affairs
  - Mapping/Records

Right-of-Way Agent

Purpose of Job

- Obtains all temporary and permanent land rights to facilitate the Program
- Negotiates and provides compensation to landowners for temporary laydown areas

- Notifies certain customers of proposed activities (those directly affected)
- Works with Customer Care to manage challenging property owners
- Works with Customer Care and Claims to facilitate post-construction restoration
- Works with the Land Planner on RTC letters

Principal Accountabilities

- Coordinates with Customer Care and Land Planning
- Manages negotiations with property owners from start to finish
- Participates in all 25 and 50% field walks
- Follows up on all negotiated conditions, including site restoration and compensations

Main Challenges of Job

- Acquiring land rights in accelerated timeframes
- Negotiating with no leverage
- Tracking all negotiations to ensure construction is in compliance

Key Relationships

- Segment Project Coordination team
- Customer Care
- Discipline team members
  - Engineering
  - Land/Environmental
  - Clearance
  - Water Specialist
  - Construction
  - Customer Care
  - Supply Chain
  - Planning
  - Corporate Affairs
  - Mapping/Records

Segment Engineering Lead

Purpose of Job

- Develops engineering and design documents for the strength testing of pipeline segments

Principal Accountabilities

- Creates all test segment base map drawings from existing geographic information system for 25% review; these will include GIS property lines, pipeline segments, and pipeline taps (the endpoints not established at this point in time)
- Decides on the segment endpoint locations
- Develops the pipeline features list based on all benchmarked projects and makes design drawings for the pipeline segment that will be tested
- Develops the Material of Record (existing materials)
- Identifies the sections of pipe to be removed and tested

- Revises the 25% drawings to a 50% level and provides the drawings for the 50% review; the drawings will include location of segment ends, pipe removal quantities, how test heads will be installed, taps, and excavation
- Redlines the drawings and documents comments from the team during the 50% review meeting in the field; this should include at a minimum the areas of impact: laydown, spoil, tanks, filter location, access and parking, impacts on listed threatened or endangered species, obstructions, and valves to be removed
- Actively participates in the 50% field visit
- Develops and issues the STPR
- Provides the calculations to set the maximum and minimum test pressures
- Identifies segment splits on the basis of elevation changes
- Incorporates all 50% comments that were developed during the 50% field visit
- Writes the segment-specific test procedure; other functional groups provide input
- Releases the 80% drawings and test procedure for final comment by Construction, Environmental/Land, and Project Coordination; 3 days maximum are allocated for comment
- Finalizes and issues the drawings and test procedure for construction at the end of the 3-day comment period
- Distributes the IFC drawings to Supply Chain
- Develops and requests encroachment permits if required
- Completes the Pre-test Design Package Checklist
- Sends the maximum and minimum test pressures to Kiefner and Associates for approval
- Provides an advanced Bill of Material to Supply Chain at 50% to purchase test materials
- Provides pre-planning for pipe failures during the strength test by preparing lists of contingency materials for Supply Chain to order
- Provides consultation during construction; any field changes are implemented following the design change procedure (PG&E)
- Verifies that the contents of the as-built package provided by Construction meet the needs of Mapping/Records, and obtains the as-built package from Construction, and issue it to the following:
  - 1 copy to Mapping/Records
  - 1 copy to Maximum Allowable Operating Pressure Validation group
  - 1 copy maintained with Hydrotest

Main Challenges of Job

- Obtaining comments and input to any document issues (25, 50, or 80%)
- Project handoffs to Construction
- Verifying and receiving as-built information from the field

Key Relationships

- Segment project team members
- Program Management Office and leaders of the functional teams
  - Engineering
  - Land/Environmental
  - Clearance
  - Construction
  - Customer Care
  - Supply Chain
  - Planning
  - Corporate Affairs
  - Mapping/Records

Water Specialist

Purpose of Job

- Leads the Stormwater and Wastewater team and facilitates communication among the Stormwater and Wastewater team, Project Coordinators, and other project team members about water management
- Facilitates the stormwater and wastewater planning and permitting required for each segment strength test from inception through the end of construction
- Manages permitting activities so that the necessary stormwater permits are in place prior to mobilization activities
- Applies for the necessary permit and/or authorization to discharge the excavation groundwater and strength test water
- Communicates and assists to resolve stormwater or wastewater issues
- Facilitates communication with applicable regulatory agencies to obtain necessary water-related permits

Principal Accountabilities

- Coordinates stormwater and wastewater planning and permitting activities
- Attends site review meetings as appropriate to understand source water location, develop strength test water discharge approach, and collect information for the permit application
- Specifies source water analytical requirements based on source information obtained from the construction contractor, coordinates with the Project Chemist, and schedules source water sampling prior to the strength test
- Maintains segment status based on site review meetings and communications with Field Specialist, Project Coordinator, and contractor foreman, and documents status on SharePoint tracking tool
- Confirms PG&E Government Relations approval for agency communications
- Tracks segment schedule
- Leads wastewater and excavation dewatering management planning and permitting, including permit/discharge requirements, sample collection and analysis, fees, schedule, and coordination
- Coordinates with permitting entity, Field Specialist, and contractor to minimize construction delays related to excavation dewatering

- Develops relationships with publicly owned treatment works permitting staff to assist with wastewater discharge permitting activities
- Confirms that project registration documents and contingency plans have been prepared and SMARTS (Stormwater Multiple Application and Report Tracking System) uploads have occurred prior to mobilization
- Communicates discharge requirements and conditions to the Carbon Coordinator and tracks arrangements for carbon treatment, water storage, and waste hauling (if required), and identifies and elevates water management issues
- Develops and maintains sampling and discharge coordination plan and schedule with Project Coordinator, Field Specialist, and engineering test procedure developer to include analysis of permitted discharge flow rate, permitted discharge schedule, strength testing volume, and onsite storage capacity to avoid final clearance delays and minimize tying up portable storage tanks
- Coordinates review and management of analytical data, assigns responsibilities for collecting data to satisfy discharge permit conditions, and confirms compliance with discharge permit requirements
- Observes the initial discharge to confirm discharge authorization and compliance with permit requirements and notifies publicly owned treatment works or applicable agency of discharge activities
- Follows up with construction contractor on flow volumes and average rate to confirm compliance with discharge permit requirements
- Enters discharge permit documentation into SharePoint and confirms entry of Stormwater Pollution Prevention Plan and leak contingency documentation into SharePoint
- Responsible for closing out or documenting closeout of discharge permit and stormwater permit, including reporting and fees
- Confirms that Stormwater Annual Report and Notice of Termination have been prepared

Main Challenges of Job

- Facilitating adequate communication between the Stormwater and Wastewater team, Project Coordinator, and other project team members on water management issues/concerns
- Dealing with fast-paced projects with minimal lead time to communicate with applicable regulatory agencies and obtain approved discharge permits/authorizations
- Obtaining timely approval from Government Relations to communicate with applicable regulatory agencies about wastewater discharge options
- Dealing with turnaround time required by regulatory agencies to review and issue necessary permits/authorizations
- Obtaining analytical data from water samples in a 24-hour turnaround to provide approval for discharge of the strength water

Key Relationships

- Project Coordinator
- Field Specialist
- Carbon Coordinator

- Segment Project Coordination team
- Segment Construction Coordination Supervisor
- Functional team members
  - Engineering
  - Land/Environmental
  - Clearance
  - Construction
  - Customer Care
  - Mapping/Records
  - Planning
  - Corporate Affairs
  - Mapping/Records

Appendix D
PG&E Pipeline Safety Enhancement Plan Program RACI Chart

PG&E Pipeline Safety Enhancement Plan Program RACI Chart

R=Responsible - leads the work
A=Accountable - approval required - only one per activity
C=Consulted - person(s) that are required to provide input on the activity
I=Informed - person(s) that are informed an activity is in progress (invited or issued a copy)

Task #		Program Sponsor	PMO Lead	Independent Third Party Verification	Administrative Support	Project Scope & Quality Lead	Reporting	PMO Operations Lead	Project Controls Lead	Safety	Planning & Risk Management	Project Coordination	Customer Care	Government Relations/Corporate Affairs	Environmental Compliance, Permits, & Land Rights	Engineering	Supply Chain	Construction	Clearance	Mapping & Records	Encroachment
1.0	**Safety**																				
1.1	Develop Program Safety Plan						A	I	R		C				I		I				
1.2	Develop Site Specific Safety Plans						A	I	R		C				I		I				
1.3	Segment Emergency Response Protocol						A	I	R		C				I		I				
1.4	Conduct Safety Tailboard							I	A		C				I		R				
2.0	**Risk Management and Contingency Planning**																				
2.1	Develop Risk Management Plan	I	A			I		C			R				C	C		C	C			
2.2	Monitor Risk and update Project Schedule Risk Model	I	A			I		C			R				C	C		C	C			
2.3	Review effectiveness of Risk mitigation and handling efforts	I	A			I		C			R				C	C		C	C			
2.4	Review ongoing status of current vs. forecasted outcome	I	A			I		C			R				C	C		C	C			
2.5	Oversee Risk closeout	I	A			I		C			R				C	C		C	C			
2.6	Develop Contingency Plans	I	A			I		C			R				C	C		C	C			
3.0	**Project Coordination**																				
3.1	Schedule and lead project kickoff webcast		A			C				I	C	R	I	I	C	C	C	C	C			
3.1	Communicate with project team regarding 25% site visit status		A							I	C	R	I	I	C	C	C	C				
3.2	Communicate with project team regarding 50% site visit status		A							I	I	R	I	I	C	C	I	C				
3.2	Communicate with project team regarding 80% design point status		A							I	I	R	I	I	C	C	I	I				
3.2	Communicate with project team regarding 100% design point status		A							I	I	R	I	I	I	C	I	C				
3.2	Communicate with project team regarding release to construction status		A							I	I	R	I	I	I	C	I	C	C			
3.2	Communicate with project team regarding notice to proceed status		A							I	I	R	I	I	I	C	I	C	C			
3.2	Communicate with project team regarding pre-test construction status		A	C						I	I	R	I	I	I	C	I	C	C			
3.21	Communicate with project team regarding clearance status		A	C						I	I	R	I	I	I	C	I	C	C			
3.22	Communicate with project team regarding test status		A	C						I	I	R	I	I	I	C	I	C	C			
3.23	Communicate with project team regarding tie-in and return to NOP status		A	C						I	I	R	I	I	I	C	I	C	C			
3.24	Communicate with project team regarding Engineering document review status		A							I	I	R	I	I		C	I	C				
3.25	Communicate with project team regarding post-test construction status		A							I	I	R	I	I	I	C	I	C				
3.26	Communicate with project team regarding Mapping & Records' receipt of documentation		A								I	R				C	I					
3.27	Complete Project Coordinator Checklist		A									R										
3.28	Update Master Schedule		A					R				C				I						
3.17	Advise PMO of potential delays to schedule and/or cost of project		A								I	R				C	I	I	I			
4.0	**Government Relations and Customer Communications**																				
4.1	Identify and meet government regulations for site													I	R							
4.2	Follow the T-Schedule to notify customers												I	R	I			I				
4.3	Conduct Media/Customer Relations tailboard												C					R				
4.4	On-site media response		I					I					I	R				I				

PG&E Pipeline Safety Enhancement Plan Program RACI Chart

R=Responsible - leads the work
A=Accountable - approval required - only one per activity
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5.0	**Environmental Compliance, Land Rights, and Permits**																				
5.1	Obtain all local, state and federal permits													R							
5.2	Obtain new land rights for segment access/construction activities													R							
5.3	Obtain site specific encroachment permits (if required)										R		C		I		C			A	
5.4	Release to Construction letter													R							
5.5	Environmental Compliance Management Plan						A							R							
5.6	Conduct Environmental Compliance/Awareness Tailboard													A			R				
5.7	Assign site specific Environmental Field Specialist (monitoring/sampling)													R			I				
6.0	**Engineering**																				
6.1	Segment Engineering Kick-off Meeting							I							R						
6.2	Segment Design Package/Test Plan Issued for 50% Review					A					I			I	R		I				
6.3	Segment Design Package/Test Plan Issued for 80% Review					A					I			I	R		I				
6.4	Segment Design Package/Test Plan Issued for Construction			I		A		I		I	I	I	I	I	R	I	I	I			
6.5	Independent 3rd Party Drawing Review			R		A									C						
6.6	Approval of pipeline coating deviations														A		R				
6.7	Determine method of segment repair after failure		A												R		C				
6.8	Prepare As-built Package including signed test results and restoration										C				A		R		C		
6.9	Hydrostatic Test Final Documentation Process (PSRS/GIS/GEMS)		A								C				A		R		C		
6.1	Researching and compiling relevant documentation of previous work																				
7.0	**Quality Assurance and Quality Control**																				
8.0	**Environmental Operations and Emergency Response**																				
8.1	Test water sample for contaminants													R			I				
8.2	Approval for test water disposal method													R			I				
8.3	Non-water Spill Emergency Response Procedure													R			I				
8.4	Notify and receive verification of standby spill response services													C			R				
9.0	**Supply Chain**																				
9.1	**Delivery**																				
9.1.1	Maintain /Update materials requirement in sap														C	R	C				
9.1.2	Coordinate delivery of materials to warehouses (inbound)															R					
9.1.3	Deliver materials to Port of Stockton & Modesto WH															R					
9.1.4	Release materials in SAP															R					
9.1.5	Receive materials & stock															R					
9.1.6	Coordinate delivery of materials to job site (outbound)															C	R				
9.1.7	Deliver materials to job site															C	R				
9.1.8	Confirm delivery/receipt of materials at job site															I	R				
9.2	**Removed Material**																				
9.2.1	Identify, remove & mark materials at job sites					I					I				A		R				
9.2.2	Perform field test & log results																R				
9.2.3	Review field test results																				
9.2.4	Pack materials & request pick-up																R				
9.2.5	Coordinate pickup of materials from job site																R				
9.2.6	Pick up materials & ship materials to storage facility															R	I				

PG&E Pipeline Safety Enhancement Plan Program RACI Chart

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9.2.7	Receive & stock materials															R	I	I			
9.2.8	Cut pipe sample & fill chain of custody form																R				
9.2.9	Coordinate shipment of sample to test facility															R					
9.2.10	Ship sample to testing facility															R					
9.2.11	Receive sample & and update chain of custody form															R					
9.2.12	Perform lab test & document test results																				
9.2.13	Coordinate shipment of sample to storage facility															R					
9.2.14	Ship sample to storage facility															R					
9.2.15	Review, scan chain of custody & test results; send hardcopy test results to Walnut Creek		I													I	I				
9.3	**Reusable Material**																				
9.3.1	Pack materials and request pick up																R				
9.3.2	Coordinate pickup of materials from job site															R	C				
9.3.3	Pick up materials and ship to Stockton or Modesto															R	C				
9.3.4	Receive materials at warehouses															R					
9.3.5	Perform QC inspection for returned materials															R	I				
9.3.6	Update usage for reusable materials & scrap EOL materials															R					
9.3.7	Update inventory in SAP															R					
10.0	**Construction**																				
10.1	Schedule Construction resources and status progress						C				I						R				
10.2	Clearance Request										I	C					R	A			
10.3	Performs Clearance										I						C	R			
10.4	Pre-construction tailboard meeting										I						R				
10.5	Performs Shut-down Procedure										I						R				
10.6	Pipeline coating inspection										I						R				
10.7	Removed pipe section marking and labeling										I						R				
10.8	Pipe Section Field Inspections - Diameter, Wall Thickness, Long Seam, Yield Strength										I						R				
10.9	Pre-test and Set-up										I	C					R				
10.1	Test Equipment Certificates of Calibration										I						R		C		
10.11	Pre-test Water Sample										I						R				
10.12	Clean Pipe										I						R				
10.13	Fill Pipe										I						R				
10.14	Pressurize and Test										I						R				
10.15	Emergency Response										I						R				
10.16	De-pressurize, de-water										I						R				
10.17	Dry pipeline										I						R				
10.18	Tie-in and Restore Site										I						R				
10.19	Test/Safety Procedure Review Tailboard Meeting										I						R				
10.2	Hydro-Test Witness & Final Report			A							I						R				
10.21	Segment Internal Video Inspections										I										
10.22	Identify Incident Commander										I						R				
10.23	Notification of Test Pressure Holding										I						R				

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10.24	Conduct Depressurization/De-watering Tailboard Meeting										I						R				
11.0	**Clearance**																				
11.1	Conduct Pre-Clearance Tailboard Meeting		I	I				I		I		I	C	C		C		C	R			
11.2	Request clearance for a segment		I									I						R	C			
11.3	Update master clearance board		I							I		I							R			
11.4	Open clearance process		I									I							R			
11.5	Notify Gas Control to hand off the pipe to Construction Tie-In Supervisor		I									I							R			
11.6	Perform Shutdown Procedures		I									I							R			
11.7	Handle and label removed pipe											I						R				
11.8	Notification of Clearance Completion		I	I		I		I		I	I	I	I	I		I		I	R			
12.0	**Document Control**																					
12.1	Define document management policies, processes, and role responsibilities for program PMO, consultants, and contractors							R								I						
12.2	Ensure proper recording, tracking, storage, and control of all documents relating to program management, administration, design, and construction					C		R		C	C	C	I		C	C	I	C	C	C		
12.3	Administer SharePoint site		I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I			
12.4	Manage distribution of documents		I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I			
13.0	**Program Control**																					
13.1	Schedule management, statusing, and revisions for Hydro-Test Program	I	A	I		I		R	C	I		I	I	I	I	C	I	I	I	I		
13.2	Conduct forecasting for program	I	A			C	I	R	C	I	I	C	I	I	I	C	I	I	C	I		
13.3	Plan and oversee staffing across program	I	A			C	I	R	C	I	I	I	I	I	I	I	I	I	I	I		
13.4	Set, track, and report Key Performance Indicators (KPIs) across program	I	A			I	I	R	I	I	I	I	I	I	I	I	I	I	I	I		
13.50	Conduct program wide reporting	I	A	I		I	I	R	I	I	I	I	I	I	I	I	I	I	C	I		
14.0	**Mapping and Records**																					
14.1	Add forms, redlines, documents, photos, etc. to the job package, ultimately returned to Mapping and Records																C		R			
14.2	Add test results to job package, ultimately returned to Mapping and Records																C		R			
14.3	Convey completed and signed-by-engineering job package to Records and Mapping														A		R		I			
14.4	Review job package for completeness														R		C		A			
14.5	Enter data, update drawings, and incorporate field data from completed job package into GIS and mapping records		I					I			I				R				A			
14.6	Archive hard copy and electronic files																					

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