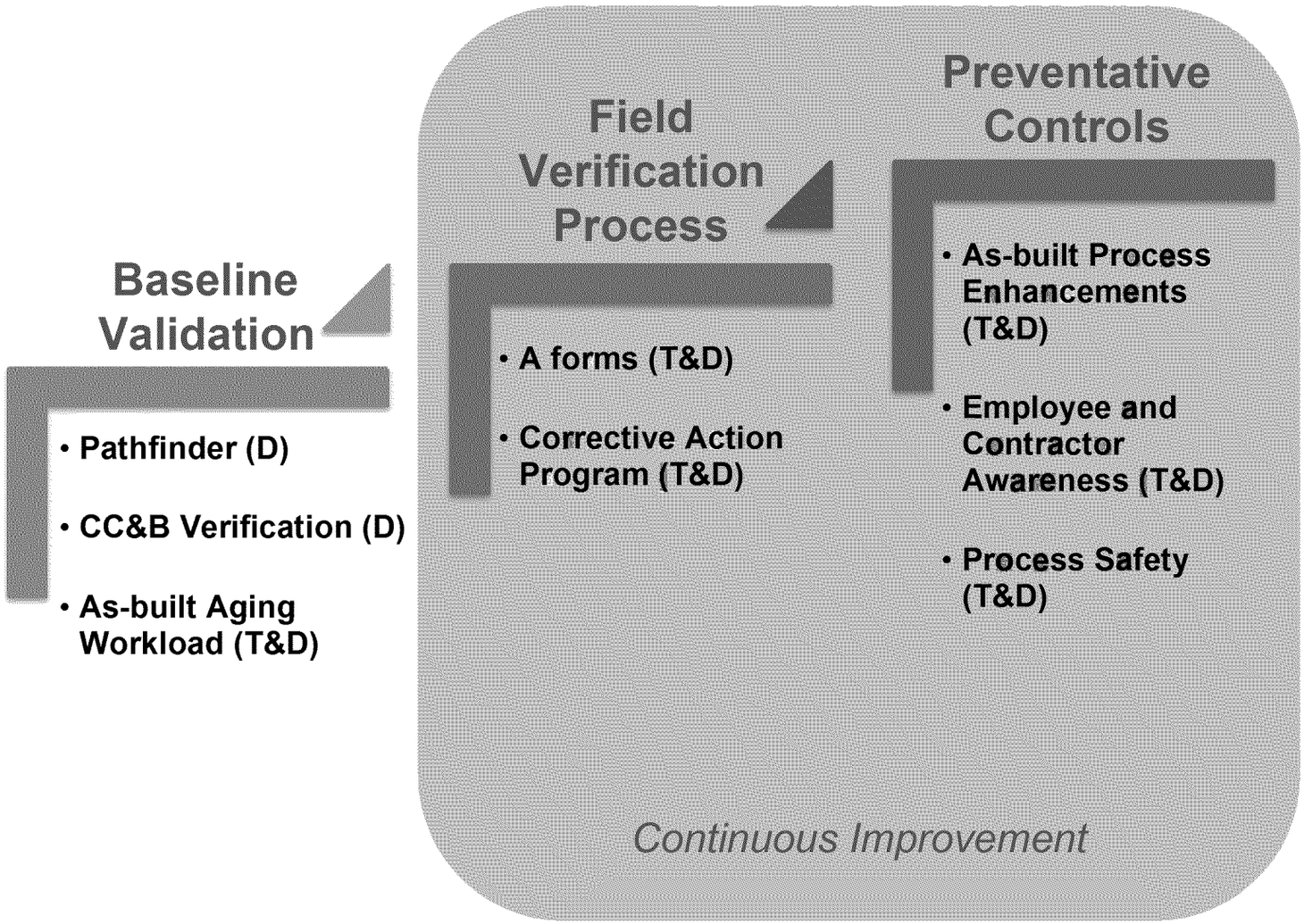
Gas Operations Distribution Records Update

July 11, 2014

Steps in Enhancing Distribution Records Quality



Legend:
T: Transmission
D: Distribution

Summary of Progress

Initiative		Status	Progress
Baseline Validation	Pathfinder (D)		• Data representing 17,000 of 42,000 miles of mains and 1.5 million of 3.3 million services has been converted into GIS, using a risk-based schedule • As a result of the conversion, data quality enhancements are being performed including resolving discrepancies between job orders, installation year, coating type, size, material and other relevant attributes • On-track to complete system-wide data conversion by end of 2015
	CC&B Verification (D)		• Compared distribution asset maps with customer billing data that includes meter locations • Identified 2,883 distribution services and associated mains not included on the distribution asset maps, which were subsequently leak surveyed and mapped
	As-Built Aging Workload (T&D)		• Searched all open work orders associatedwith asset installation or modification in the work management systems (SAP and PSRS) and identified 61,947 open work orders for both transmission and distribution • Researched each work order to identify where construction was completed but not yet mapped resulting in 18,113 distribution work orders; some were pending updates in the mapping system by more than 5 years • 12,929 open distribution work orders have been completed; On-track to update mapping system for all remaining distribution outstanding work orders by Oct, 2014

Completed | In Progress | On-Going | Early Stage Initiative

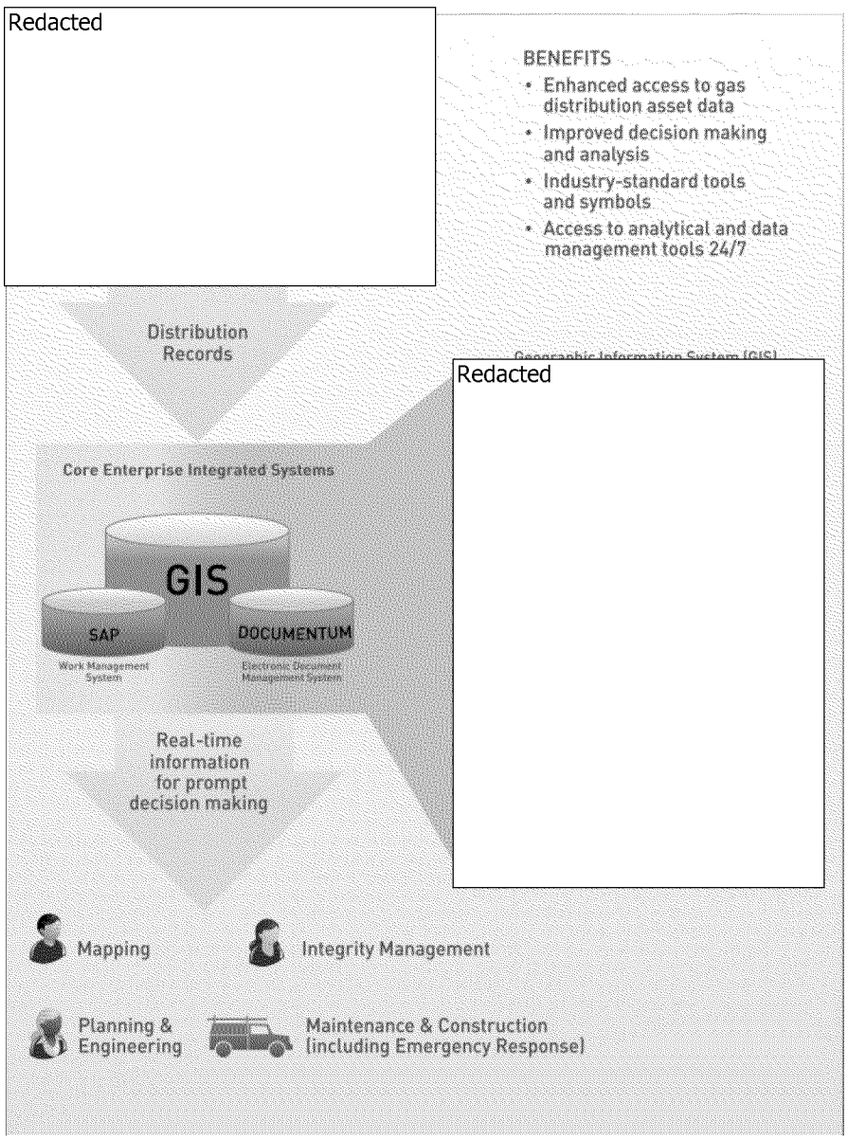
Summary of Progress

	Initiative	Status	Progress
Field Verification Process	A Forms (T&D)		• Use of field inspection data for transmission and distribution assets captured during leak repair to update asset specifications in GIS
	Corrective Action Program (T&D)		• Discrepancies between records and actual asset informationinput into CAP for tracking and resolution
Preventative Controls	As-Built Process Enhancements (T&D)		• Track and measure cycle time of every transmission and distribution work order from construction complete to update of mapping system • Reduced average duration from 75 days in 2011 (3rd quartile) to current performance of 29 days (1st quartile)
	Employee and Contractor Awareness (T&D)		• Reinforce importance of having accurate and updated information prior to starting any job and the ability to stop a job in case of uncertainty or identified discrepancy in records • Emphasize use of CAP to submit all discrepancies betweenrecords and actual asset information
	Process Safety (T&D)		• Developed and implemented a gas carrier pipe field verification checklist for distribution mains and services • Initiated an effort, Records Validation Project, to enhance process controls for validating asset information during design and prior to construction analogous to a “pre-flight” safety checklist

Completed | In Progress | On-Going | Early Stage Initiative

Pathfinder (D)
(Baseline Validation)

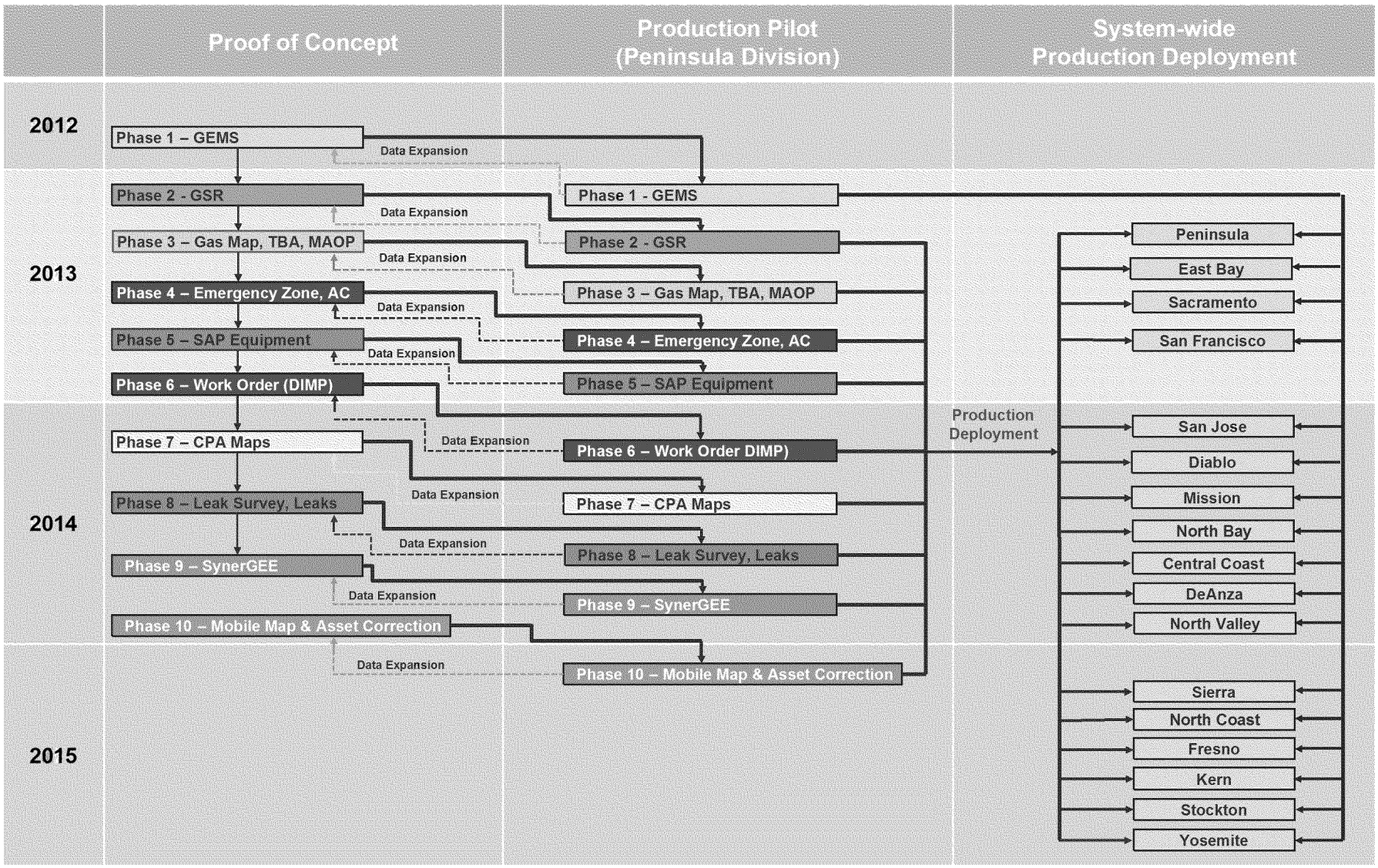
Gas Distribution GIS



Establishing a single database for gas distribution asset data and substantially improving the accessibility of information resulting in improved:

- Safety,
- Compliance, and
- Work Management Processes

Pathfinder Scope and Schedule (risk-based)

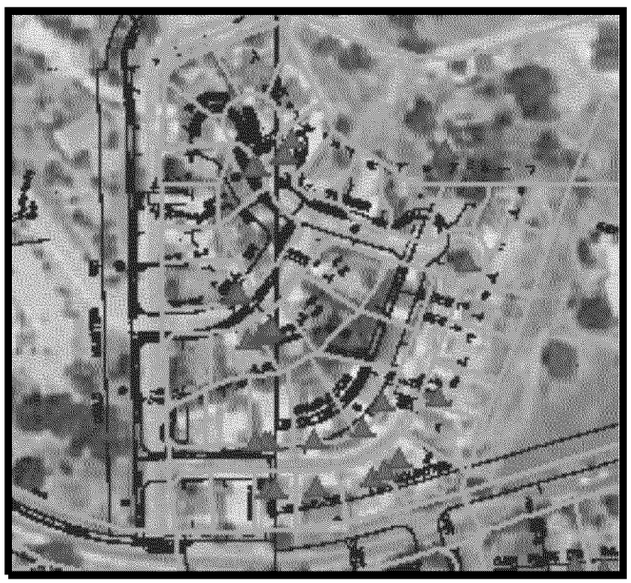


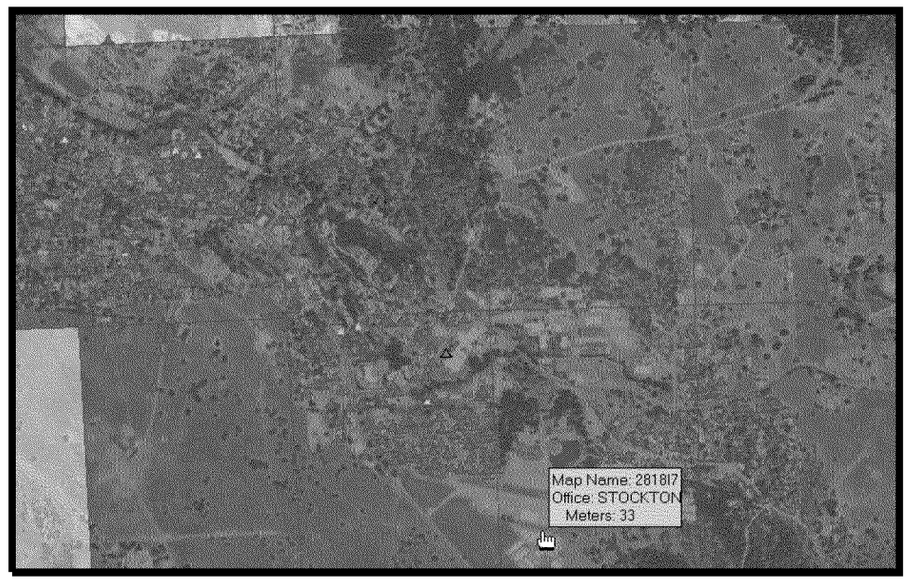
Gas Distribution GIS Demonstration

CC&B Verification (D)
(Baseline Validation)

CC&B Verification Process

- Verified meter locations in billing database with distribution asset maps and Google Earth
- Identified and analyzed exceptions to validate and determine assets not included on the distribution maps
- Ensured traceable, verifiable, and complete records for the remediation of each exception





CC&B Verification Results

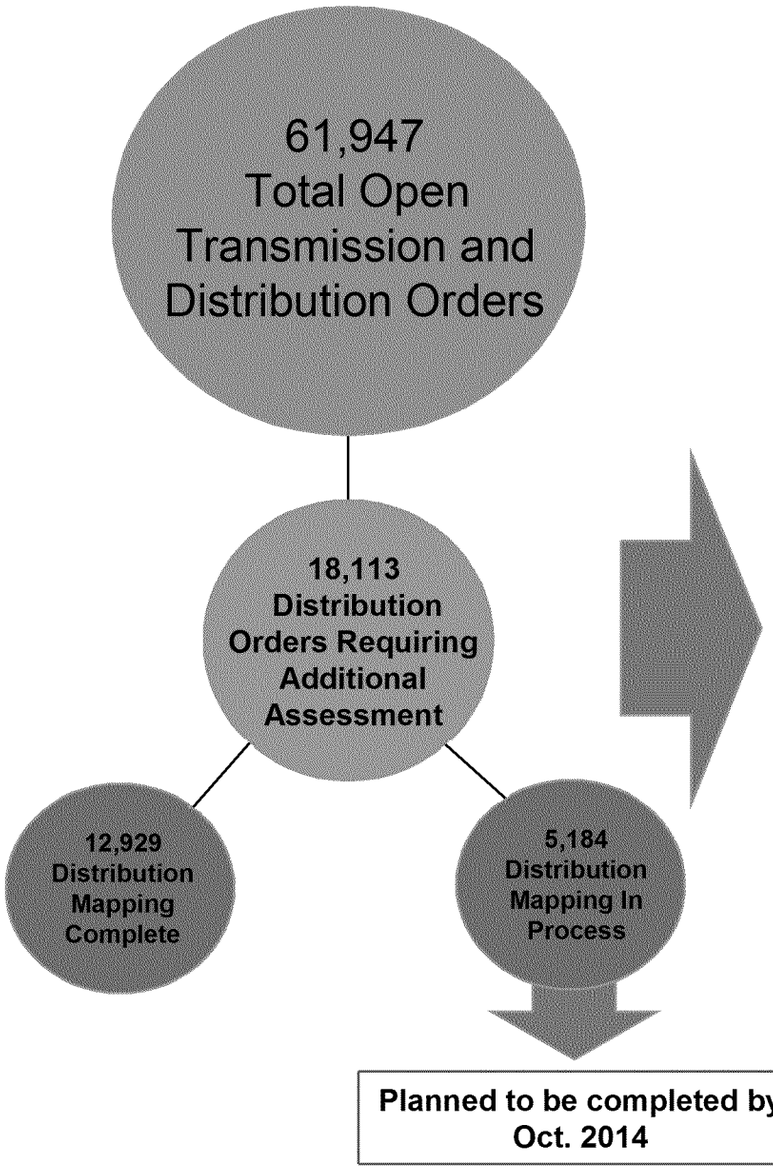
Prepared at the Request of
Pacific Gas and Electric Company

PACIFIC GAS AND ELECTRIC COMPANY
CC&B/GEMS VALIDATION PROJECT
PROGRESS AND RESULTS REPORT BY PG&E MAPPING OFFICE
AS OF JANUARY 14, 2013

	Location	Total Plats	Number of Meters	FINAL DETERMINATION				
				Percentage of Review Complete	Estimated Number of Meter Exceptions	Percentage of Meter Exceptions	Number of Plats with Exceptions	Percentage of Plats with Exceptions
1.	Redacted	1,347	193,364	100.0%	22	0.01%	12	0.89%
2.		1,053	146,124	100.0%	34	0.02%	23	2.18%
3.		822	80,442	100.0%	23	0.03%	17	2.07%
4.		1,160	261,709	100.0%	40	0.02%	12	1.03%
5.		1,499	514,550	100.0%	417	0.08%	27	1.80%
6.		1,085	101,714	100.0%	117	0.12%	50	4.61%
7.		1,430	260,754	100.0%	407	0.16%	15	1.05%
8.		1,023	317,489	100.0%	27	0.01%	13	1.27%
9.		1,997	271,454	100.0%	86	0.03%	37	1.85%
10.		613	327,798	100.0%	69	0.02%	9	1.47%
11.		2,790	635,781	100.0%	151	0.02%	30	1.08%
12.		1,654	212,672	100.0%	329	0.15%	48	2.90%
13.		709	242,187	100.0%	96	0.04%	7	0.99%
14.		568	289,063	100.0%	219	0.08%	42	7.39%
15.		975	197,043	100.0%	648	0.33%	44	4.51%
16.		1,006	163,236	100.0%	93	0.06%	8	0.80%
17.		1,778	226,783	100.0%	96	0.04%	41	2.31%
18.		221	14,452	100.0%	9	0.06%	6	2.71%
	TOTALS / AVERAGES:	**21,730**	**4,456,615**	**100.00%**	**2,883**	**0.06%**	**441**	**2.03%**

As-Built Aging Workload (T&D)
(Baseline Validation)

Distribution Work Orders Aging Workload



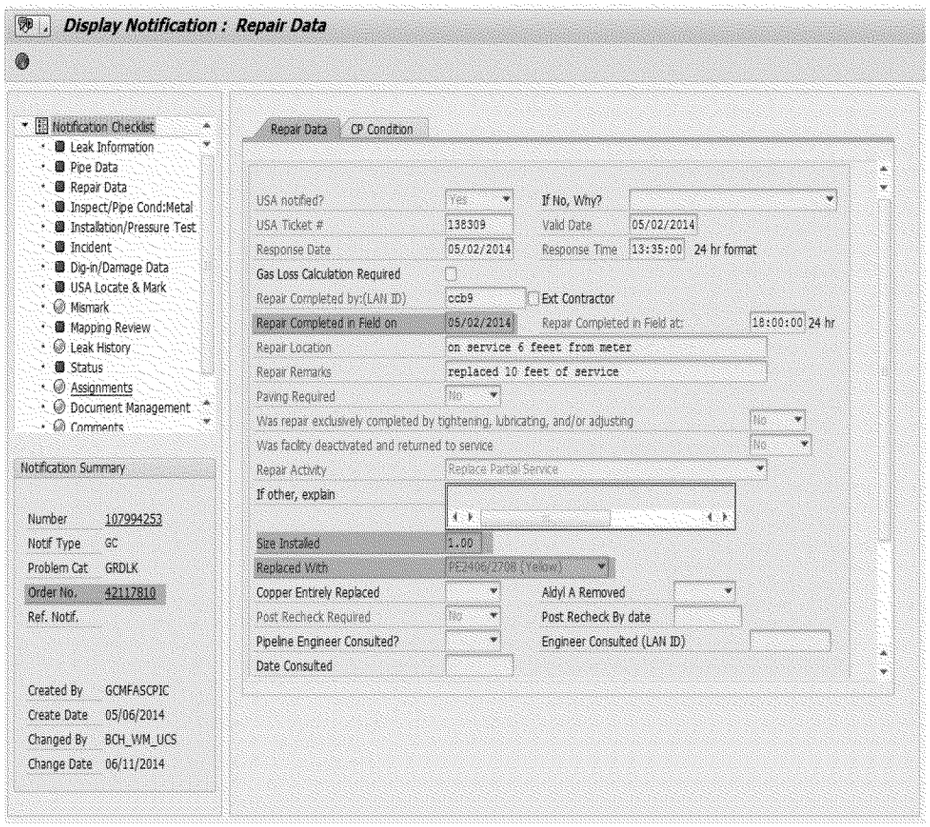
Distribution Orders requiring additional assessment after first review

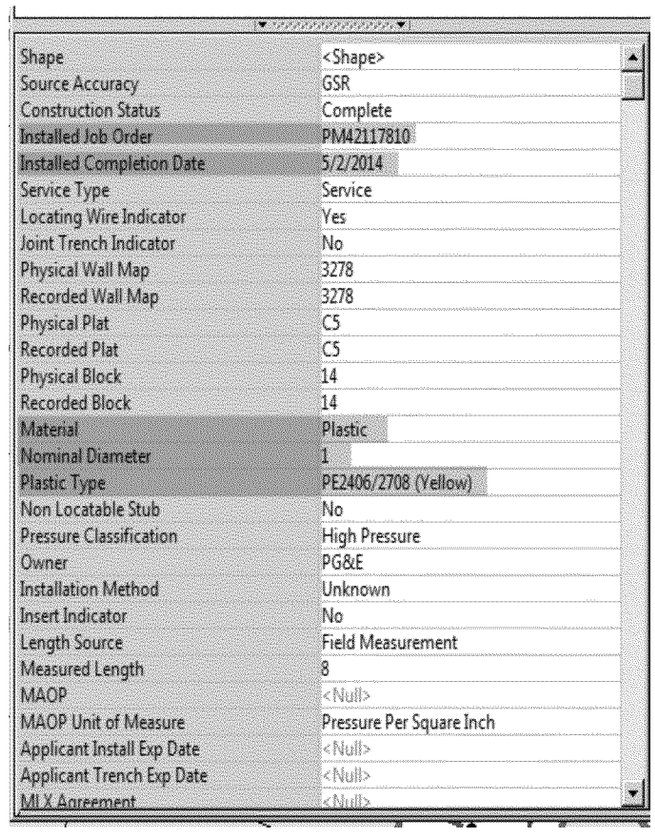
Distribution Asset Family	Total
Distribution Services	6,385
Distribution Copper Services - no order	3,607
Distribution Mains	3,464
Measurement & Control - no order	2,089
Distribution Services - no order	2,072
Measurement & Control	467
CNG/LNG	29
Total	**18,113**

A Forms (T&D)
(Field Verification Process)

Leveraging Mobile A-Form Data

Leak A-Form ← *compared* → GIS Attribute Data





Corrective Action Program (T&D)
(Field Verification Process)

CAP Items – Records Discrepancies

Miss-mapped (or mapping discrepancy) related items

SAP No.	Initiation Date	Title	Risk
7000373	10/29/2013	SR-047 Mapping-Svc not posted/Citrus Hts	Medium 3-B
7001198	1/8/2014	Gas Plat Sheet 3414-C2 Error	Low 4-C
7001351	1/16/2014	Inaccurate gas plat map info. - Orinda	Low 4-D
7001876	2/18/2014	DCUST1530 Not Drawn in GIS - 3" TP Serv	Medium 3-B
7001940	2/19/2014	School Srvc not on Gas Plat - Danville	Medium 3-B
7001929	2/21/2014	unmapped transmission mains in ST & YO	Medium 3-B
7001937	2/21/2014	Trans assets not mapped by both T & D	Medium 4-A

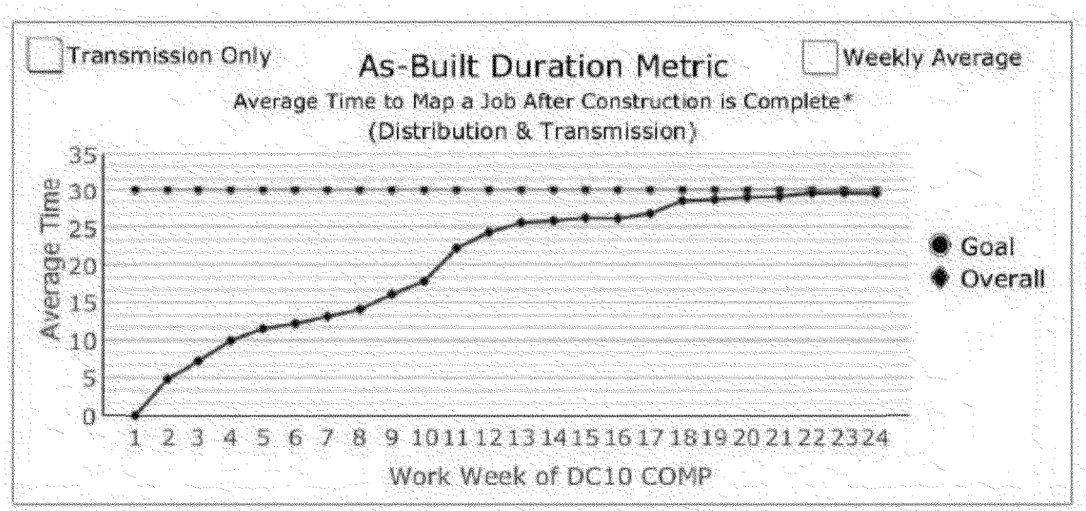
Miss-mapped (or mapping discrepancy) related items specific to inserted mains or services

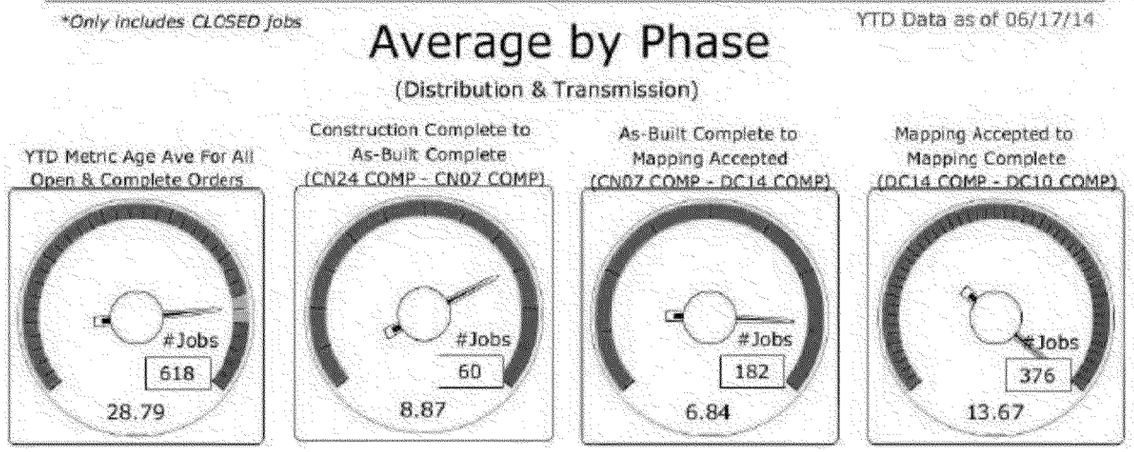
SAP No.	Initiation Date	Title	Description	Risk
7000189	10/28/2013	Gas Leak Repair and a CPUC Site Visit	On July 30, 2013, a General Construction (GC) crew working at Redacted welded a Redacted onto the Redact Redacted preparing to transfer the gas service to the new plastic gas main the following day. The Redacted had an Redacted that melted due to the heat of the weld. The GC crew did not notice the service was leaking before ending the day. On July 30, 2013 at 1717 hours, PG&E was notified of a gas odor at Redacted by the Mountain View Fire Department. A Gas Crew was dispatched, the gas was shut in at 2100 hours, repairs were made and service was restored to 7 customers on July 31, 2013 at 0030 hours.	Medium 3-B

As-Built Process Enhancements (T&D)
(Preventative Controls)

As-Built Process Performance

- In 2013, every transmission and distribution job was tracked and monitored to update the mapping system after construction complete within 90-days, identified as the as-built duration metric
- In 2014, the as-built duration metric will continue to improve our processes by monitoring the <u>average</u> number of days it takes to update the mapping system after construction complete
  - Goal: Average duration of 32 days to map a job after construction complete
  - At the end of 2013, the average duration to map a job was 34 days[1]
  - The average duration to map a job is 29 days as of 6/17/14

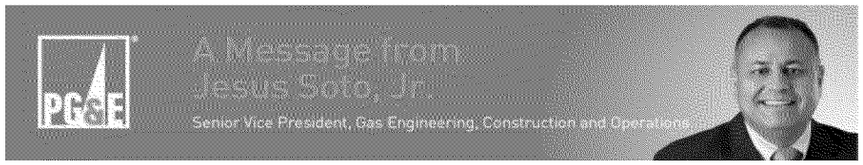




[1]Average duration to map a job in 2011 was 75 days

Employee and Contractor Awareness (Preventative Controls)

Stop the work if records don't match; Report any records issues to CAP



Team:

Accurate and reliable records are the foundation of the everyday work we do at PG&E and are essential to making informed decisions that keep the public and employees safe. We all play a role in keeping our records current and ensuring that we use accurate records for every job that we perform.

Thank you for the great progress you've made on records

You've made great strides in updating, verifying and centralizing our records. In fact, more than four million of our records for all 6,750 miles of transmission pipeline system have been collected, verified and entered into a centralized repository—making them easier for our employees to access. Together, we are continuing to make similar progress for our distribution system. The work you have completed provides a strong foundation but given that our infrastructure is many decades old, we have continued opportunities to use our "find it and fix it" approach to improve the accuracy of our records.

Take the time to execute the work in the right way

In addition to validating procedures and standards for the job, it is just as important to confirm that you are using accurate records. The gas explosion in a vacant Carmel home on March 3 serves as a very real reminder of how critical it is to have accurate records in our hands when we're performing work on our gas system. Since this incident, we have implemented the new Gas Carrier Pipe Checklist to help remind us of the steps involved in verifying our distribution assets before we start work. But the checklist is only a starting point. Each and every one of us has a responsibility to make sure that we have the most accurate records in our hands whenever we are performing work on our gas facilities.

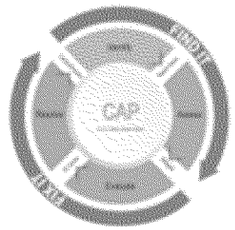
Everyone has the authority to stop a job if records don't match

Before starting a job that involves our gas facilities, whether it's in the field or at your desk, ask yourself these questions:

1. Do I know everything I need to know about the facilities I'm about to work with?
2. Do I feel confident that I have the information I need to perform the job safely?

If your answer is "No" or "I don't know" then the work should not be started until you can answer "Yes" to those questions. If you feel any uncertainty about the records you are working from, stop the job and seek out the most up-to-date version, or ask your co-worker or supervisor for assistance.

Remember that a two month-old copy of a map in your truck or on your desk might not be the most accurate because we're updating our maps at a much faster rate. In fact, the recent assessment performed by Lloyd's Register, which supported our PAS 55-1 and ISO 55001 certifications, noted that "records is a challenging area for any utility company and that PG&E has made good progress, however inconsistencies continue to be identified between the master copies of drawings and those retained by individuals on the site."



Continuing to improve the accuracy and reliability of our records is at the core of becoming the safest, most reliable gas company in the nation. As you perform your work, if you come across situations where you believe there may be differences between our records and field verified information, it's critical that you submit these items through the Corrective Action Program (CAP), either online by clicking here or by calling the helpline (855) 85-GO-CAP (855-854-6227).

Our vision is to become the safest, most reliable gas company in the United States. Every day our actions must be guided by putting safety and people at the heart of everything that we do.

Be safe,

Jesus

Process Safety (T&D)
(Preventative Controls)

Gas Carrier Pipe Verification Checklist

5 Minute Meeting

March 24, 2014

Gas Carrier Pipe Verification

AUDIENCE:

- All personnel performing welding and/or tapping on distribution facilities

Why It Matters To You

Safety:

As a result of a recent incident, the following measures must be taken to verify that steel pipe has not been inserted prior to welding and tapping. These measures are effective immediately.

Key Discussion Points

This 5MM outlines measures which must be taken to identify whether or not a steel pipe has been inserted with a plastic pipe.

Complete the attached "Gas Carrier Pipe Checklist" to document these steps.

Perform both record review and jobsite review prior to any physical work.

Record Review (Plat Sheets, Gas Service Records, As-builts)	Perform the following: ☐ Review most current records to ensure that they match each other and jobsite conditions. a. Is the job package current and complete? b. Do the facility construction details on the documents match each other? **If any of the answers to the above are NO, then STOP and contact your supervisor for guidance.**
Jobsite Review	☐ "Read the Street." Check for signs of recent construction activity on gas facilities. a. Do the existing adjacent risers match the documentation? b. Does the facility construction type seen in the field match what is shown on the records? **If any of the answers to the above are NO, then STOP and contact your supervisor for guidance.**
Physical Verification	☐ If plastic is present, then STOP and contact supervisor. ☐ If fittings are in the excavation, then utilize them for pressure check. If you detect no pressure or if there are no visible fittings, then STOP and contact your supervisor.

3/24/2014

Pacific Gas and Electric Company® | **Gas Carrier Pipe Checklist** | Page 1 of 1

This is an interim form to ensure the necessary steps are taken to help identify when a steel line has been inserted. It will be incorporated into the JSSA.

NOTES:

- Use non-erasable blue or black ink.
- Complete this form before welding or tapping on steel distribution lines.
- Attach this checklist to the supervisor's JSSA that is submitted for each job.
- Perform both the Record/Jobsite Review and the Physical Verification to determine if the steel pipe is inserted.
- If the answer to ANY of the below questions is "NO", **stop work** and contact your supervisor.

GENERAL INFORMATION			
Division/Area:		Date:	
Physical Work Location:		Person in Charge:	

RECORD/JOBSITE REVIEW		
Task	**Question**	**Outcome**
Review the job package	Is the job package current and complete?	YES or NO
Compare the documents in the package to each other	Do the facility construction details on the documents match each other?	YES or NO
Look for signs of insertion at risers (e.g. pre-fabricated, service-head adapters)	Do the existing adjacent risers match what is shown on the documentation?	YES or NO
Compare the documents to the jobsite	Does the facility construction type match what is shown on the records?	YES or NO
PHYSICAL VERIFICATION		
Look for signs of plastic insert in excavation	Have you determined that there are no signs of plastic inserts?	YES or NO
Utilize existing fitting in excavation	If you gauged pressure using an existing fitting at the work site, did you detect pressure in the steel line?	YES or NO

Records Validation Project - Overview

Objective

Further enhance process controls for validation of asset information during design and prior to construction

Deliverable

Asset information validation checklist, analogous to a pre-flight checklist

Approach

Project Initiation

- Identify level of records validation
- Determine critical records and specifications for the project

Engineering/Design

- Evaluate the quality of records
- Determine the asset specifications requiring field review and conduct reviews as appropriate

Construction

- Conduct field validation of critical asset specifications
- Take appropriate action where discrepancies are found

→ Inform mapping or integrity management of data discrepancies

→ STOP WORK if critical discrepancies are noted

Records Validation Project - Approach

- Exponent has been engaged to establish checklists and procedures
  - Continuation of work associated with corrective actions from Carmel incident (e.g., gas carrier pipe checklist)
  - A procedure, including a process map and checklist, applicable to each design organization that defines design input verification requirements
  - A procedure, including a checklist, to be used by field personnel to verify system status and configuration prior to commencing any work, with safety implications
  - Completion and roll out expected September 2014

- Work to be stress tested by additional academic professors