One-Call Quality Assurance

Purpose	The purpose of this document is to share learnings of operators relating to One-Call Quality Assurance.
Reference	49CFR 195.442(c)(6) "Damage prevention program" API RP1166 State Damage Prevention Laws and Regulations
Appendices	• Appendix A: Forms and Reports • Appendix B: Other Documents
Related Toolbox Topics	• Operator One-Call Ticket Management Systems • One-Call Notifications Response and Communications • One-Call Notification Screening • Line Locating and Temporary Marking • Excavation Monitoring and Observation

One-Call Quality Assurance:

As a process-centered approach, One-Call Quality Assurance is designed to identify and eliminate systematic errors through frequent review and reporting. Unfortunately, systemic problems are sometimes discovered following an undesired event. Lagging indicators as these can be costly when considering the risks of excavating near underground pipelines. This toolbox topic provides an Operator with a platform for establishing his/her own One-Call Quality Assurance program. It provides a more proactive approach for assessing and optimizing damage prevention efforts related to One-Call processes, their systems, and the people that manage them.

Mapping:

A responsibility of every Operator that participates in a One-Call system is to manage the horizontal accuracy of their pipeline locations. Based upon real-world coordinates, a Geographical Information Systems (GIS) provides the tools to maintain pipeline centerlines and limit positional error. Spatial error is often unintentional and inherent to the methods of collection, processing, and transformation. Propagating this error is the addition of base map overlays that contain an imperfect network of streets, addresses, and other geographic references used by One-Call Centers to determine proposed excavation locations. To account for such error, often referred to as a "one-call buffer", Operators may submit to their One-Call Center a centerline buffer as a uniform offset distance or as an asymmetrical polygon. The size of the buffer is left to the Operator to determine, however most One-Call Centers have buffer requirements. The ideal buffer size is one that accounts for the total error while not overwhelming an operator with tickets that persist well outside areas of operation. When a One-Call Center analyst determines and plots a dig site location a spatial analysis is performed and all Operators of intersecting one-call buffers are sent the notification. Ultimately, Operator's with inadequate buffer coverage are likely to not be intersected resulting in a missed notifications.

CONSIDERATIONS:
- Is there a process for managing all centerline changes that includes the proper change notification to all one-call stakeholders?   - Are frequent buffer review meetings scheduled with all one-call stakeholders to account for changes in centerline geometry?   - Does a process exist for updating one-call coverage for newly acquired, divested, or abandoned lines?   - Is there a process to review, update, and validate current one-call coverage at the State One-Call Centers?   - Do One-Call stakeholders know the buffer submission requirements at each state One-Call Center? What data format is required? What coordinate system is required? Is a datum transformation necessary?   - Does the Operator have a competent person in place to oversee buffer management and submissions, one that understands GIS data management and the nuance of coordinates systems and their transformation methods?

Reporting:

Operator Ticket Management Systems are designed to transmit and record incoming ticket details including a time-stamped history of outgoing company responses. Most of these systems grant the Operator the ability to mine and report ticket histories as a single ticket or in the aggregate. Collected over time, these data may prove useful for assessing a one-call program that includes, but not limited to, an internal evaluation of protocols for screening, communication & response and a measure for monitoring other one-call activities.

Screening, Communication and Response

Standard on all incoming one-call notifications are attributes such as date, time, location, excavator name and work descriptions. Such information is the starting point for an Operator to perform the necessary due diligence and determine the appropriate screening action and response back to the excavator. All positive responses will contain date and time responded and response type, e.g., "clear" or "marked". Other pertinent details should be included in the response such as type and color of markings, conversation log, or any other details as outlined by the Operators' communication and response protocols. Designing reports around screening, communication & response details may provide useful feedback for One-Call Quality Assurance.

Work Load Balancing

Perhaps easiest to report is one-call activity levels. As a simple ticket count, known activity levels provide an Operator with a baseline for identifying or predicting changes in field workloads. Operators covering large geographic areas may find it useful to identify and report upon work zones of responsibility. Activity level reports broken into zones have potential to highlight workload imbalances that may be corrected by redefining responsibility boundaries or a justification for adding headcount to cover areas with higher ticket volumes. A ratio of tickets per locator or tickets per zone may be established to bring attention to sudden spikes in one-call activity. At a more macro level, trends in monthly or seasonal variability may provide enough evidence for shifting the workforce or planning other activities, such as training, during periods of lull.

Timeliness and Effort

Another variable to consider when reporting one-call activity is effort or the time it take to close a ticket. While some tickets are straightforward, taking minutes to complete, others are more complicated and may take additional time for marking and observation. Normalizing activity levels can be accomplished by one of two ways. The first is to assume effort by reporting response type categories. Tickets that were identified as not in conflict with the planned excavation can be assumed a lower effort than those that required marking or a field visit (no-conflict vs. conflict). Optionally, some ticket management systems have the ability for the Operator to enter effort in units of time. Used correctly this method is a more precise measurement of effort.

Auditing

Most Operator Ticket Management Systems have the ability to configure daily audit criteria as practical way to confirm notification systems and processes are functioning properly. Operators may choose to configure automatic electronic audits such as a daily count of received notifications in comparison of notifications sent by the One-Call Center. Most systems allow audit notification sent via email to the appropriate one-call stakeholder for review or immediate attention.

CONSIDERATIONS:
- Count of Tickets per Month, per Quarter, per Year.   - Tickets Per Mile of Pipe   - Ratio of tickets per locator   - Outstanding Tickets/Past Due Tickets   - Monitor variability in ticket volumes (monthly, seasonal)   - Number of Positive Responses   - Average and Median Time for Positive Responses   - Percentage Marked   - Percentage Update Tickets (Ticket Extensions)   - Ticket Type (regular, emergency, update, etc.)   - Average and Median Time to Respond to Emergencies

CONSIDERATIONS:
- Tickets with pictures attached   - Drove to Field (Y/N)   - Method of Clearing (Map, Contact, Site Visit)   - Method of Marking (paint, pin flags, cane poles)   - Distributed Safe Digging Literature (Y/N)   - Required Crossing Agreement (Y/N)   - Daily Audit of Tickets Received by Operator vs. Tickets Sent from One-Call Center

Training/Personnel Responsibility:

If required, training should be available to ensure that designated personnel can manage all one-call mapping files and all supporting software. Operators may also designate personnel to assess and manage the configuration of reports and metrics identified for One-Call Quality Assurance reviews.

CONSIDERATIONS:
- Are designated personnel adequately trained in the tools and software that supports the management, submission, and review of one-call mapping files?   - Does the one-call buffer review process require any specialized training that includes editing or confirming coverage using any proprietary One-Call Center mapping software?   - Are designated personnel adequately trained in the tools and software that supports the configuration of reports and metrics identified for One-Call Quality Assurance reviews?

Records Information:

All records regarding Quality Assurance should be maintained by the Operator as required by Operators' document retention policy.

CONSIDERATIONS:
- Is there a company retention policy? What is company retention policy?   - How will company use these records?   - Will data be used for internal and external rending analysis activities? How?

1 Appendix A: Forms and Reports

This appendix contains industry examples of forms and reports related to the topic.

1.1 Example Report

Ticket Volume

Area: _____

District: _____

State: _____

Month: _____This Year's Volume: _____

Previous Year's Volume: _____

% Change: _____

Total Tickets per Area: _____

Total Tickets per District: _____

Miles per Area (District): _____ Tickets per Mile (District): _____

TOTAL Tickets: _____

TOTAL Miles per Area: _____ Tickets per Mile: _____

%of TOTAL Budget: _____

1.2 Example Team One-Call Report

Team One Call Report

Team Name
Jan-11
01/01/2012 - 01/31/2012

Summary					
Metric	Current Month	Previous	YTD	Target	Description
Total Tickets					Raw Ticket Counts
Outstanding Tickets					Tickets w/o any response (internal or postive)
Positive Response Ticket Count					Tickets with respsonse to excavator
% 48 hr Positive Response Timeliness					Postive Responses recorded before 48 hrs
Avg. Positive Response Time					Avg. response time
Avg. Internal Response Time					First acknowledged
Avg. Response Time (Emergency Locates)					Avg. response time for emergncy locate requests
Conflict vs. No-Conflict					Marked & conflict work complete vs. no-conflict
% Update Tickets					Tickets identified as an extention to an existing ticket

Positive Responses							
Positive Response	Regular	Emergency	Update	Design	Total	Responses ≤ 48 hrs	% Timeliness
Marked							
No-Conflict							
Total							

All Responses					
Type	Regular	Emergency	Update	Design	Total
All Responses					
Marked					
Conflict Work Complete					
No-Conflict					
Investigating					
Update Retrans					

All Responses					
Type	Regular	Emergency	Update	Design	Total
All Responses					
Marked					
Conflict Work Complete					
No-Conflict					
Investigating					
Update Retrans					

Responsibilty Area							
Folder	Total Tickets	Open	Positive Responses	% Timlienss	Avg Emergncy Response Times	Conflict No Conflict	% Updates
Area 1							
Area 2							
Area 3							
Totals							

Other	
Drove to Site	
Distributed Literature	
Pictures Attached	

1.3   Example Monthly One-Call Report

One-Call Month Year Summary Chart

Region	Entity	State	CDC	CDC Description	Total Tickets	Daily Avg
Emergency	%	Not Processed	Marked	%	No Conflict	%
In-Progress Current	%	In-Progress Total	<10 feet	10-25 ft	25-50 ft	50-500 ft
>500 ft	Field Visit	Excavator Contacted	Excavation Observed	Line Crossing	Line Exposed	Excavation Monitored
CO Procedures Not Followed	Warning Signs Used	Parallel Construction	Waiver			

Definitions for Monthly One-Call Report

- Items to check

Tickets Received

- **Total Tickets** = Total Number of one-calls received by the CDC for the specified time period.

    o   Review this number to see that it is in line with previous month's ticket volumes. Compare to other Call Distribution Centers (CDCs) in the Region/Entity for work load and activity.

- Daily Average – This is the total tickets divided by the days in the month. It includes weekends and holidays.

- **Emergency Tickets** are tickets that meet the definition of Emergency by the state or tickets that are classified as "short notice" by the one-call center.

- "Emergency" means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Unexpected occurrence" includes, but is not limited to, fires, floods, earthquakes or other soil or geologic movements, riots, accidents, damage to a subsurface installation requiring immediate repair, or sabotage. (CA definition)

- Short Notice (SN) means the excavator indicated the excavation is scheduled to begin before the state required notification time.

- COMPANY considers Short Notices "emergency" so the ROW Defenders will know that they do not have the full 48 hours to mark the ticket.

- **%** = Percent of Emergency and Short Notice tickets received within the specified period (compared to total tickets received)

  o Compare the percentage to other CDCs in the Region/Entity as well as the company average. A high percentage of emergencies could be an indication of poor project planning by excavators. A high percentage will also indicate additional work load for that CDC.

- *Not Processed =* total number of Tickets in One-Call Ticket Management System for the specified period that the record indicates have not been processed as "Locate" or "No Conflict" (new or viewed tickets only).

  o This number should be monitored closely on the daily reports. A high number (more and 1.5 times daily ticket volumes) would indicate that tickets are not being processed timely and are starting to stack up in the inbox.

Tickets Processed

- *Marked =* total number of tickets that, the record in One-Call Ticket Management System indicates, have been physically marked. This should include, but is not limited to all locations where the locations of the excavation area (inside the white marks) are within 50 foot of the pipeline, unless the procedure or a ROW Specialist/Supervisor exempts the marking. This also includes a minimal amount of tickets, such as "Meet" or "Design" tickets that were checked as marked to prevent a positive response. Even though the line may not have been marked.

- *% -*

- Compare the percentage of marked tickets to other CDCs in the Region/Entity as well as the average for the company. A higher percentage than the average could indicate more or closer proximity encroachments for that CDC. The number of "Marked" encroachments should also correlate to the totals in the distance to pipeline columns. For example: if you mark your pipeline when an encroachment is within 50'. The total of <10' + 10-25' + 25-50' should be close to the number of encroachments that were marked. These numbers may not be exact since we do sometimes mark our lines even if the encroachment is over 50' away. If the percentage of "Marked" encroachments is higher than the average and higher than the totals of the less than 50' columns then we may be marking encroachments that will not affect our assets.

Note - Due to the fact that most state laws do not allow for an "In-Progress" ticket. Some tickets are initially declared as "Marked" so that they can be processed within the 48hr. requirement. That same ticket may eventually be cleared as a "No Conflict" and recorded in the ticket notes section. These types of tickets will cause other numbers within the report to be off also.

- **No Conflict =** total number tickets that, the record in One-Call Ticket Management System indicates, are not required to be marked (the work area is greater than 50' from our line)**.** The act of determining that a ticket is a "No Conflict" is sometimes referred to as "Cleared" Note: a Positive response should have been sent to the excavator indicating that there was no conflict. Summation of One-Call Ticket Management System "No Conflict Reports"

- **%**

  o No Conflict percentages should also be compared to the percentages of other CDCs in the Region/Entity as well as the average for the company. A high percentage of No Conflict tickets might indicate that we are getting tickets that we should not be. A review of the pipeline buffer we have registered with the One-Call Center might be in order. Or we might need to work with certain excavators to ensure that they are giving accurate work descriptions to the One-Call Centers.

Note – See the note in the "Marked" section above. Some tickets that initially cleared as "Marked" are ultimately cleared as "No Conflict" and that is recorded in the ticket notes section.

- **In Progress Current –** This response is used in states where COMPANY responds back to the one-call center. "In Progress" means that COMPANY has acknowledged receipt to the one-call center, but has not either cleared the ticket or located it. This column also indicates tickets that are in "Monitor Status". Monitored tickets are tickets that have been processed as "Marked" or "No Conflict" but are being held in monitor status because the job is not complete. This column indicates only the tickets from this reporting month. (These tickets are also counted in the "In-Progress Total" column.)

  o The number of "In Progress" tickets should be monitored to make sure that they are being cleared and do not begin to pile up in the CDCs in-box. Tickets should not be held in monitor status, past the ticket life for that state. If work continues past the ticket life then the excavator should issue a new one-call and the old ticket should be cleared from the CDC in-box. Tickets in the "In Progress" column can indicate the number of long duration projects (increased monitoring/workload) in an area.

- **In Progress Total –** As described in the section above; "In Progress" means that COMPANY has acknowledged receipt to the one-call center, but has not either cleared the ticket or located it. This column also indicates tickets that are in "Monitor Status". Monitored tickets are tickets that have been processed as "Marked" or "No Conflict" but are being held in monitor status because the job is not complete. This column indicates **all** tickets that are in progress. This will also indicate how many tickets are held over from the previous month(s).

  (The total in this column includes the "In-Progress Current" tickets.)

o The number of "In Progress Total" tickets should be monitored to make sure that they are being cleared and do not begin to pile up in the CDCs in-box. Tickets should not be held in monitor status, past the ticket life for that state. If work continues past the ticket life then the excavator should issue a new one-call and the old ticket should be cleared from the CDC in-box. Tickets in the "In Progress" column can indicate the number of long duration projects (increased monitoring/workload) in an area.

From this point to the end of the report will only include information for tickets that have been closed. It does not count information for any ticket that is still in "monitor" status.

NOTE: The information in these columns should be used to check for potential problems only. Discrepancies will require a review of individual tickets.

Pipeline Distances - This field is required. It should be completed for each ticket and care taken to make sure that the proper distance is recorded when closing the ticket.

- **<10 ft** = Total number of tickets where the locate area is less than 10 foot from the pipeline. This location requires continuous Observation, depending on O&M procedure or unless exempted by procedure or variance given by supervisor. Taken from One-Call Ticket Management System "Marked Ticket Report "

- **10 to 25 ft** = Total number of tickets where the locate area is between 10 ft and 25 ft (inclusive) This location requires Observation, depending on O&M procedure or unless exempted by procedure or variance given by ROW Specialist/Supervisor. Taken from One-Call Ticket Management System "Marked Ticket Report "

- **25 – 50 ft** = Total number of tickets where the locate area is greater than 25 ft, but 50 ft or less from the Pipeline Asset (This location requires monitoring, depending on O&M procedure or unless exempted by procedure or variance given by ROW Specialist/Supervisor. Pipelines must be marked unless exempted by procedure or by ROW Specialist/Supervisor. This area requires monitoring or, at the discretion of the ROW Defender, observed Taken from One-Call Ticket Management System "Marked Ticket Report "

  o Depending on which O&M Procedure you follow the encroachment distance to pipeline columns should correlate to the totals in the "Excavation Observed" and "Excavation Monitored" columns. Example: if you had 20 encroachments less than 10 ft. from the pipeline you would expect to see at least 20 in the "Excavation Observed" column for that CDC. If not it would indicate that we did not observe the encroachments per our O&M procedure.

- **50-500 ft** = Total number of tickets where the locate area is greater than 50 ft from the pipeline but less than 500 ft. This area does not require marking; however, the ROW Defender may

choose to mark the PL based on knowledge of Excavator, Scope of Work, or Equipment being used.

- o   Tickets that fall within this buffer are usually within the buffer that we have filed with the state one-call center. The total number of tickets in this column plus the total in the >500' column should closely compare to the total in the "No Conflict" column.

- **>500 ft** = Total number of tickets greater than 500 ft from the pipeline.

- o   This number is <u>usually</u> outside the buffer that we have filed with the state one-call center. The totals should be watched to make sure we are not getting too many tickets that are outside that buffer. A high number might indicate that a coverage review is needed. Or, that excavators are not giving accurate job descriptions on their tickets.

Report Information –

- **Field Visit =** This is the number of site visits for tickets cleared as "No Conflict". Taken from the One-Call Ticket Management System "No Conflict Report "

- o   Add this number to the number of "Marked" tickets to get: total site visits. - A field visit can be required to ether mark the PL or determine that no locating was required.

- **Excavator Contacted** = Total number of one-call tickets that were followed-up by a personal contact by a ROW Defender, either by phone or site visit Taken from One-Call Ticket Management System "Marked Ticket Report ".

- **Excavation Observed =** This description will fit the definition in the (L)O&M204 and indicate the number of excavations where we were continuously present.

- **Line Crossing** = Total number of excavations that actually crossed a COMPANY pipeline. This does not include excavations that paralleled COMPANY. Taken from One-Call Ticket Management System "Marked Ticket Report "

- o   If a line is crossed there should be a corresponding "Foreign Line Crossing Report" on file.

- **Line Exposed** = Total number of excavations that required the COMPANY PL to be exposed. Taken from One-Call Ticket Management System "Marked Ticket Report "

- o   If a line is exposed there should be a corresponding "Buried Pipeline Inspection Report" on file.

- **Excavation Monitored** = This description will fit the definition in the (L)O&M204 and indicate the number of excavations where we monitored the excavation or progress. Taken from the One-Call Ticket Management System "Marked Ticket Report "

- **Temporary Markings Used =** Indicates the number of locates where temporary markings were used.

- **Warning Signs Used =** Indicates the number of encroachments where the additional "25 ft" warning signs were used.

- ***Parallel Construction =*** Indicates the number of encroachments where there was parallel construction to the COMPANY pipeline.

Our four highest risk encroachments are:

- Line Crossings

- Line Exposed

- Encroachments within 10'

- Parallel Construction

The numbers in these columns should be monitored, as an indication of potential risk and work load requirements for each CDC.

2   Appendix B: Other Documents

This appendix contains industry examples of forms and reports related to the topic.

2.1   Example One-Call Mapping Review

Overview - One-Call Coverage Review