	Affected Public	Emergency Officials	Excavators	Public Officials
Message Type	Completed During Current Program Year	Completed During Current Program Year	Completed During Current Program Year	Completed During Current Program Year
Facility purpose (see 5.2.5)				
Damage prevention importance (see 5.3.2)				
Damage prevention steps (see 5.3.3)				
Damage reporting (see 5.3.4)				
Encroachments, threats, or suspected damage to a pipeline (see 5.3.5)				
Emergency response plans (see 5.4.3)				
Emergency drills and exercises (see 5.4.4)				
Leak recognition and response (see 5.4.5)				
Pipeline markers (see 5.5.2)				
NPMS (see 5.5.3)				

1) Was pre-testing conducted on any baseline materials for the current program year? If so, provide summary of pre-testing methodology, type of stakeholder materials tested, and location of supporting documentation.

Yes	No

2) If a language assessment was conducted prior to affected public outreach during this program year, provide a summary of the language assessment results (e.g. areas/zip codes exceeding identified threshold within written program, languages identified, data sources used, location of results, etc.).

#### C. ASSESS THE NEED FOR PROGRAM SUPPLEMENTS

1) Was an effectiveness evaluation conducted during the past year to determine if the public awareness program warrants change or supplement?



2) If any changes were made to the public awareness program, provide details regarding any identified circumstances that warrant a program change or supplement and a description of the planned activity or strategy to be implemented during the next program year.

Relevant Factor Category	Description of Identified Circumstances	Planned Program Supplement or Change (Describe outreach or strategy to be implemented)

#### D. LIST ASSESSMENT

The purpose of this section is to assess whether this year's implemented public awareness program effectively reached the targeted audiences based on the program goals as defined in the operator's written program and its objectives.

#### List Validation

To assess whether the public awareness baseline messages are reaching their intended stakeholders, was a list validation review conducted in an effort to obtain an accurate mailing addresses of the program's stakeholders (see 8.3.2.2.2)? Was the identification method that was used effective in identifying stakeholders? If a validation process was completed, identify the stakeholder audience and the process used.

Stakeholder Audience	List Validation Applicable	List Validation Conducted	Date Conducted	Describe Process Used
Affected public				
Emergency officials				
Excavators				
Public officials				

If a list validation/list completeness review was conducted, describe to results or findings of the assessment.

#### E. PROGRAM EFFECTIVENESS EVALUATION

Were program effectiveness efforts conducted to measure stakeholder message comprehension and knowledge, and behavioral intent during the current assessment's program year? If so, provide a high-level summary of the efforts completed.

1) Did the results of the previous year's program implementation assessment identify the need for program changes? If applicable, provide a summary of the program improvements and/or changes implemented during this program year.

Description of Program Component/Activity/Process Change	Program Change	Program Supplement	Basis for Implementation

2) Were any new program improvements or new supplemental program components implemented during the current assessment's program year? If so, provide a summary of any improvements or changes that were implemented during this program year.

Description of Program Component/Activity/Process Change	Program Change	Program Supplement	Basis for Implementation

# Annex C

(informative)

# **Data Collection**

## C.1 Data Collection

Information collected through the survey process, as well as the reliability of survey outcomes, can be impacted by many factors. These factors include, but are not limited to:

- the size of the survey population;
- the length of the survey (e.g. number of questions);
- the manner in which survey was conducted;
- whether an incentive was offered.

An operator should review these factors, or others, when evaluating the survey results. Operators may choose to set data collection expectations in their programs.

## C.2 Calculating the Level of Confidence and Margin of Error

Once stakeholder surveys are complete, operators should use information from the survey process to determine their confidence level and margin of error, which determines the reliability of a survey outcome. The level of confidence, including the margin of error, should constitute the statistically valid range of which the general population would be found to provide the same answers if everyone in that group was surveyed, and not just the limited and controlled group participating in the survey.

The relationship between the level of confidence and margin of error is inverse. The lower the level of confidence and the higher margin of error, the less likely survey outcomes can be repeated if the same survey were to be conducted again with a similar population within the same desired stakeholder group. The higher the level of confidence and the lower margin of error results in a more accurate and reliable survey; hence, the reliability to repeat the survey results if it were to be conducted again.

The level of confidence and margin of error for a survey can be determined by using Equation (C.1):

$$E = \frac{z(\sigma)}{\sqrt{n}} \tag{C.1}$$

where

- *z* is the desired level of confidence critical value factor;
- *n* is the population size (number of stakeholders within a coverage area);
- $\sigma$  is the standard deviation.

An operator should use the following information to determine the margin of error for the listed potential levels of confidence.

To determine your margin of error, reference Table C.1 for the critical value (z) using your selected level of confidence.

10

Level of Confidence (%)	Critical Value ( <i>z</i> )	Factor
85	.15	1.44
90	.10	1.645
95	.05	1.96
98	.02	2.33
99	.01	2.575

#### Table C.1—Confidence Levels

An operator may choose to use different levels of confidence that are not outlined here.

#### C.3 Example of Calculating Margin of Error

#### C.3.1 General

- Step 1—Determine the values for each variable in the formula.
- Step 2—Select the level of confidence sought.

For example, 95 %.

Determine the corresponding critical value factor from Table C.1 for 95 %.

For this example, a 95 % level of confidence will use a 1.96 factor for z in the formula.

Step 3—Establish what method is needed to determine the standard deviation value ( $\sigma$ ).

There are two methods for calculating the standard deviation: one for a numeric sample and the other for a non-numeric sample, also referenced as a proportion.

#### C.3.2 Numeric Sample

A standard deviation for a numeric sample can be determined by using Equation (C.2):

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n} \left(x_i - \overline{x}\right)^2}{n-1}}$$
(C.2)

where

 $x_i$  is the value of the *i*<sup>th</sup> point in the data set;

- x is the mean value of the data set;
- *n* is the number of data points in the data set (total number of responses collected).

The mean value is calculated by adding all the data points and dividing by the number of data points.

#### C.3.3 Proportion

A standard deviation for a non-numeric, proportion sample can be determined by using Equation (C.3):

$$E = z\left(\sqrt{p}\right)\frac{(1-p)}{\sqrt{n}} \tag{C.3}$$

where

- *z* is the desired level of confidence critical value factor;
- *p* is the sample proportion, expressed as a decimal;
- *n* is the population size (number of stakeholders within a coverage area).

Step 4—Determine the population size. For the purposes of public awareness, the population size is the number of stakeholders within a coverage area.

Step 5—Use the numbers identified in Steps 1–4 to calculate the margin of error for the level of confidence sought. This can be done manually or by using a publicly available source (from the web) or using internal or external resources.

## C.4 Example of Margin of Error Calculation

#### C.4.1 Numeric Sample

In this example, the following values are used.

Level of confidence sought is 90 %.

Population of emergency responders is 540.

Standard deviation is 50.

*z* = 1.65

*n* = 540

 $\sigma = 50$ 

The margin of error is  $\pm$  3.54 %.

#### C.4.2 Population Sample

Level of confidence sought is 95 %.

Population of emergency responders is 6780.

Standard deviation proportion is 356.

*z* = 1.96

N = 6780

The margin of error is  $\pm$  8.47 %.

## C.5 How to Evaluate Survey Outcomes

Table C.2 illustrates the margin of error in relation to the population size of various quantities when a certain number of surveys are collected. The top row of the table represents the size of the survey population. The far-left column represents the margin of error generated.

To estimate the margin of error, select the population size (in the example) that closest resembles the size of the survey population that reflects the number of the stakeholder audience it has surveyed. Follow the column down until it identifies the number of surveys collected/received in response to the survey conducted. Then follow the row in which that number appears all the way to the left. The number appearing in the far-left column identifies the appreciate margin of error for that survey.

If your total audience size exceeds the population listed in the far-right column, the number of completed surveys outlined below will still provide an accurate approximation for a larger population.

	25	250	750	1500	2500	5000	7500	10,000	25,000	100,000	250,000
40	5	6	6	6	6	6	6	6	6	6	6
39	5	6	6	6	6	6	6	6	6	6	6
38	5	7	7	7	7	7	7	7	7	7	7
37	6	7	7	7	7	7	7	7	7	7	7
36	6	7	7	7	7	7	7	7	7	7	7
35	6	8	8	8	8	8	8	8	8	8	8
34	6	8	8	8	8	8	8	8	8	8	8
33	7	9	9	9	9	9	9	9	9	9	9
32	7	9	9	9	9	9	9	9	9	9	9
31	7	10	10	10	10	10	10	10	10	10	10
30	8	10	11	11	11	11	11	11	11	11	11
29	8	11	11	11	11	11	11	11	11	11	11
28	8	12	12	12	12	12	12	12	12	12	12
27	9	13	13	13	13	13	13	13	13	13	13
26	9	13	14	14	14	14	14	14	14	14	14
25	10	15	15	15	15	15	15	15	17	15	15
24	10	16	16	17	17	17	17	17	17	17	17
23	11	17	18	18	18	18	18	18	18	18	18
22	11	18	19	20	20	20	20	20	20	20	20
21	12	20	21	21	22	22	22	22	22	22	22
20	13	22	23	24	24	24	24	24	24	24	24
19	13	24	26	26	26	26	27	27	27	27	27
18	14	27	29	29	29	29	30	30	30	30	30
17	15	29	32	33	33	33	33	33	33	33	33
16	15	33	36	37	37	37	37	37	37	38	38
15	16	37	40	42	42	42	42	43	43	43	43
14	17	41	46	47	48	49	49	49	49	49	49
13	18	46	53	55	56	56	56	57	57	57	57
12	18	53	61	64	65	66	66	66	67	67	67
11	19	60	72	75	77	78	79	79	79	79	79
10	20	70	85	90	93	94	95	95	96	96	96
9	21	81	103	110	113	116	117	117	118	118	119
8	22	94	125	136	142	146	147	148	149	150	150
7	22	110	156	173	182	189	191	192	194	196	196
6	23	129	197	227	241	253	258	260	264	266	266
5	24	152	254	306	333	357	365	370	378	<u>38</u> 3	384
4	24	177	334	429	484	536	556	566	586	597	599
3	24	203	441	624	748	880	934	964	1023	1056	1063
2	25	227	572	923	1225	1623	1819	1936	2191	2345	2378
1	25	244	696	1297	1984	3289	4212	4899	6939	<u>8763</u>	9249

Table C.2—Example Audience Size Table

### C.6 Examples of Survey Outcomes

Achieving a lower margin of error and/or higher level of confidence can be very difficult depending on several factors:

- the size of the population from which the sample is drawn;
- the stakeholder group being evaluated;
- the type of the questions;
- the length of the survey (e.g. number of questions).

Table C.3 provides examples of survey outcomes, and specifically surveys conducted to collect data from the various stakeholder groups. The table illustrates how the margin of error can vary significantly depending on different factors and approaches.

Operators can use this information to guide what they may expect when conducting a survey of a stakeholder group given similar circumstances and facts.

Follow the steps below to calculate the margin of error:	Total Stakeholder Size/Population ( <i>N</i> )	Outbound Sample Size	Number of Responses (n)	Response/ Cooperation Rate (%)	Survey Sampling Approach	Margin of Error (.95 confidence level) (%)
Operator A	895	895	7	0.8	Census	$\pm36.92$
Operator B	1034	1034	42	4.1	Census	± 14.82
Operator C	1919	1919	227	11.8	Census	± 6.11
Operator D	3833	1710	57	3.3	Random sample	± 12.88
Operator E	18,263	18,263	146	0.8	Census	$\pm$ 8.08
Operator F	38,462	38,462	462	1.2	Census	$\pm 4.53$
Operator G	99,998	38,393	211	0.5	Random sample	$\pm 6.74$
Operator H	126,404	11,950	239	2.0	Random sample	$\pm 6.33$

Table C.3—Example Survey Responses

The survey examples referenced in this annex are provided for reference only and do not reflect all parameters of an operator's public awareness program. Operator-established confidence level and margin of error may differ from those included as examples.

### C.7 Survey Improvement

As operators evaluate the outcomes of surveys and the overall effectiveness of their programs, they may make changes to the data collection process to enable the collection of more information. For operators employing the use of a census, higher margins of error may result from smaller populations or lower response rates.

If an operator elects to change its data collection process or methodology, it should review the impacts as any change may affect the ability to compare future outcomes with previous evaluation efforts and specific survey responses as well as the overall quality of the data available.

Changes to surveys may include, but are not limited to:

- approach (e.g. census or random sample);
- methodology (phone, online, direct mail, etc.);
- incentives provided;
- reminders (the number of times a stakeholder is provided an opportunity to participate in a survey).

# Annex D

(normative)

# **Effectiveness Evaluation Questions**

This annex provides guidance to an operator on how to structure and deploy standardized survey questions to stakeholders and then collect and analyze stakeholder responses. Tables D.1 through D.4 list for each stakeholder audience the public awareness topics that should be measured, the question stems that should be used, the response categories that should be designed, and how the question should be formatted. Additionally, the tables provide operators with an understanding on how each question relates back to program objectives in 4.3. This will assist operators in performing the "Check" phase of their public awareness program. The findings based on evaluation results can identify the areas for an operator to make improvements to the public awareness program.

The questions in the tables below were selected from historical survey questionnaires that were utilized by pipeline operators. In certain instances, the standardized survey question is structured to allow an operator to be more specific about an industry segment (i.e. distribution, gathering, or transmission) or the commodity transported (e.g. natural and other gas, or hazardous liquids). Customization is permitted as long as it does not change the intent of the question but allows an industry segment, coalition, or an operator to benchmark performance and build comparisons over time. Response categories are presented for both aided and unaided survey questions, and other categories can be added.

The standardized survey questions included in Annex D were based on leading measurement practices and developed to encourage standardization across the pipeline industry. Within the standardized questions, text which can be customized to an operator's program is indicated in brackets. Examples of how an operator could compose customized questions are provided in the table footnotes. The term "descriptor pipeline" is intended to allow an operator to cite a particular type of pipeline system, whether it be transmission, natural gas distribution, gathering, etc. If operators decide to use questions other than those in this annex, they should document those alternate questions and the reasons for deviating (see Section 8).

Categories to be used for coding responses are included in the "Response Categories" column. A question listed as "aided" provides exact responses from which the respondent will select an answer, whereas an "unaided" question offers the respondent the ability to provide an open-ended response. The list provided for unaided questions is intended to assist the operator to evaluate responses.

Question Number	Topic (Meas. Factor)	Question	Response Categories	Unaided/Aided	Section 4 Objectives		
D.1.1	Pipeline proximity awareness (Message comprehension)	To the best of your knowledge, are there currently [a descriptor pipeline] operating in your community [that transport descriptor product]?	Yes/No/Don't know	Aided	4.3.2 (Awareness)		
Examples o	of allowable question edits a	nd customized text that can be used:					
— To the b	est of your knowledge, are the	re currently natural gas pipelines in you	r community?				
— To the b	est of your knowledge, are the	re currently pipelines in your community	that transport liquid petro	leum gas?			
— To the b	— To the best of your knowledge, are there currently pipelines in your community that transport highly volatile liquids?						
— To the best of your knowledge, are there currently crude oil pipelines in your community?							
— To the b	— To the best of your knowledge, are there currently hazardous liquid pipelines in your community?						
— To the b	est of your knowledge, are the	re currently gas utility lines in your com	munity?				

Table D.1—Standardized Surve	v Questions: Affected Public

Question Number	Topic (Meas. Factor)	Question	Response Categories	Unaided/Aided	Section 4 Objectives	
D.1.2	Information recall (Recall)	Within the past 4 years, do you recall reading, seeing, or hearing information from [a descriptor pipeline operator] related to [descriptor] pipelines and pipeline safety?	Yes/No/Don't know	Aided	4.3.2 (Awareness)	
Examples of allowable question edits and customized text that can be used:						

- Within the past 4 years, do you recall reading, seeing, or hearing information from a natural gas utility related to gas pipelines and pipeline safety?

- Within the past 4 years, do you recall reading, seeing, or hearing information from pipeline operators related to pipelines and pipeline safety?

- Within the past 4 years, do you recall reading, seeing, or hearing information from Company Y related to propane pipelines and pipeline safety?