

SAFETY CULTURE CONSULTING REPORT

Prepared for: The INGAA Foundation, Inc.



Developing safety culture through industry-wide employee safety surveys

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**Strengthening safety culture,
the critical path towards zero
incidents.**

MEET THE TEAM

INGAA Safety Culture Whitepaper Steering Committee

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Timothy Mason, Enable Midstream Partners

Kim Jackson, Enbridge Gas Transmission & Midstream (Chair)

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The Interstate Natural Gas Association of America (INGAA):

INGAA is comprised of 27 members, representing the vast majority of the U.S. interstate natural gas transmission pipeline companies. INGAA's members operate nearly 200,000 miles of pipelines and serve as an indispensable link between natural gas producers and consumers.

The INGAA Foundation:

Formed in 1990 by INGAA, The INGAA Foundation works to advance the use of natural gas for the benefit of the environment and the consuming public. The Foundation's primary focus is to sponsor research aimed at promoting natural gas use and safe, efficient pipeline construction and operation. Membership in The INGAA Foundation is open to natural gas pipelines and companies that provide goods and services to pipelines worldwide. The INGAA Foundation currently has over 220 members.

WHERE WE ARE TODAY



INGAA's journey toward an optimal safety culture began with the development of a set of "guiding principles" and a collective commitment to ZERO pipeline incidents.

Initially, the goal was to understand the safety culture and climate in its current state, and work to discover meaningful and effective ways to strengthen the safety culture across the natural gas transmission and storage industry.

Developing the initial survey was one of our greatest hurdles (and achievements) to date. In order to accomplish the task at hand effectively, we assembled a multi-faceted team comprised of operators, academics and consultants.

Our team worked with intention to acknowledge we had room for improvement and that our industry could do more to reduce risk and improve safe operations by enhancing our

internal cultures and sub-cultures when it came to risk tolerance and safety performance. To ensure a comprehensive, integrated and systematic approach in our evaluation process, our framework spanned across the transmission and storage operation sectors. This report provides valuable perspectives into the process we used to evaluate and measure existing safety culture.

As we continue down our path towards zero incidents, we recognize that our safety culture journey is always evolving, and that we must remain vigilant in our efforts to drive excellence in safety, quality and environmental stewardship.

May our work continue and our journey take us to new and safer heights.

~Kim Jackson

INGAA Health & Safety Task Force
Team Chair (2008-2018)

WHERE WE'RE GOING

Each iteration of the survey takes safety culture evaluation to the next level. The 2019 survey will bring greater data analytical capabilities with an ability to link to company operational data. This in turn will afford operators the ability to see the correlation between incidents and safety culture.

As operators invest in a more sophisticated safety culture analysis, they can begin to use the data to identify areas in their organization where risk is higher and design interventions before problems occur. This is the next step toward achieving zero pipeline incidents.

OUR SAFETY CULTURE JOURNEY



Ensuring safety of the public and workers during construction and operation is the highest priority of the pipeline industry. Pipeline safety regulations and practices have evolved rapidly and continue to shape how pipeline operators understand and engage employees, contractors and the public in the shared mission of safety. Complying with (and often exceeding) laws and regulations that provide detailed procedures for the safe operation and maintenance of assets, along with extensively training personnel, focuses an organization on safety. Applying American Petroleum Institute (API) Recommended Practice (RP) 1173, Pipeline Safety Management Systems (SMS), further reduces risk through leadership's active participation in safety, increasing the flow of safety communication throughout the organization, implementing checks to verify that safety practices are consistent and systematic throughout the organization and integrating all safety elements under the SMS umbrella.¹ Industry's goal is zero incidents. Analysis shows that the pipeline industry has made progress, but has further to go to achieve the goal of zero incidents industry-wide.

Terms like personal safety, asset safety and SMS are common within the pipeline industry. A lesser known concept is "safety culture." The concept first became relevant after the Chernobyl nuclear facility incident was attributed to weaknesses in internal safety norms, beliefs, roles and practices for handling hazards and managing risks.²

There are many ways to approach safety culture. The INGAA approach was to create a framework to assess the strengths and weaknesses of a pipeline organization's safety culture. The framework measures the components that determine the relative strengths and weaknesses in a safety culture and is administered through member company surveys.

INGAA members made a commitment in the INGAA Guiding Principles for Pipeline Safety to establish a strong safety culture to enhance safety performance.³

The value of the survey was made clear to me when the day the first set of results were distributed, I received calls from several managers and directors saying "help." Their results were much less favorable than anticipated and they wanted to know how to improve. They committed to taking specific steps to demonstrate their commitment to safety and expectations for excellent safety performance. The 2016 survey results showed significant improvement and reinforced the value of the survey.

--Tom Hutchins, Kinder Morgan, Inc.

Starting the Journey

In June 2011, INGAA released a white paper entitled "Foundation for an Effective Safety Culture," which described the key elements of organizational culture and business processes that lead to safety performance improvements.⁴ Safety is defined in the broadest possible terms, encompassing safety of employees, customers and the public, as well as the reliability of the pipeline system. The white paper outlined the characteristics of an organization with a mature safety culture as one that gathers the right business information within a supporting management system to identify and manage both internal and external risks. Employees, in turn, are empowered to report safety issues openly and management is committed to resolve them.

In 2012, INGAA members embarked on an effort to develop a way to measure safety culture. The INGAA Environmental, Health and Safety (EH&S) Committee spearheaded the effort, hosting numerous workshops, conference calls and meetings. The committee consulted with leading academics on safety culture and reached out to other industries, such as healthcare, nuclear and aviation, to gain their perspectives on safety culture.

Over the course of the year, the committee developed a survey model and survey guidelines to identify challenges to employee safety and potential precursors to lagging indicators, such as accidents, injuries and reportable events.

2013 Safety Culture Survey

During 2013, INGAA partnered with a survey vendor to conduct the baseline safety culture survey. Corporate Executive Board (CEB) was selected to develop a custom safety culture survey, including an index of six survey items that describe the top management, supervisor and work group behaviors that, in aggregate, indicate a prioritization of safety in the workplace. The survey measured three main categories of the work experience regarding safety: top management, direct supervisor and workgroup experiences.

High-level outcomes of the survey indicated:

- Top management's emphasis on safety is the strongest determinant of overall safety culture. In particular, employees indicated higher levels of overall perceptions of safety when top management provided necessary equipment, considered safety when setting production goals (safety priority), and promoted safety audits.
- Workgroup safety was strongest when fellow employees helped each other be safe and when employees felt comfortable raising safety issues.
- Employees reported higher levels of safety emphasis when direct supervisors adhered to safety rules and procedures regardless of external pressures.

2013-2017 Safety Culture Workshops

After the initial 2013 safety culture survey, the INGAA EH&S Committee held numerous workshops to promote safety culture improvements. In addition, INGAA and The INGAA Foundation included safety culture as a topic at meetings, workshops and integrated it in other guideline documents. The following safety culture topics were covered during this timeframe:

- 2012 Safety Culture Workshop: What is the Safety Culture of our Industry?
- 2013 Safety Culture Workshop: Effectively Communicating INGAA's Safety Culture Message
- 2013 Safety Culture Workshop: Employee Voice and Employee Citizenship
- 2014 Safety Culture Survey Workshop: Safety Culture and Importance of Senior Management Engagement (3 sessions)
- 2015 Safety Culture Workshop: Impact on Safety Management Systems Implementation
- 2016 Safety Culture Workshop: Sharing of Learnings and Best Practices
- 2017 Safety Culture Workshop: How Competing Priorities Impact Safety
- 2017 Safety Culture Workshop: Promoting Better Pipeline Safety Communication

2016 Safety Culture Survey

In 2016, INGAA members participated in a second safety culture survey. Compared with the initial survey, which focused more on personal safety, the 2016 survey included additional asset safety questions to reflect API RP 1173's focus on safety culture.

Findings from the 2016 survey indicated improvement since 2013 on all factors and categories, except in one area. Safety Priority (a worker's perspective that its top management, direct supervisor or workgroup emphasized safety) decreased significantly compared with the 2013 survey, causing concern among participating operators and INGAA as a whole. As a result,

We at ONEOK were extremely pleased with the results of the two rounds of safety culture surveys we have completed. More importantly, the comparison of the two surveys endorsed the success of our continued efforts to drive improvements in our safety culture.

--Wes Dunbar, ONEOK

INGAA created a workshop focused on safety priority to discuss steps operators can take to ensure increased work load and internal pressures do not lead to employees taking risks and shortcuts.

Discussions during the workshop resulted in:

- A renewed commitment to engage employees in building a culture that cares about doing work safely and correctly, recognizing and correcting out-of-compliance behavior and communicating about safety as a priority by top management and supervisors.
- An effort to find "pockets" in the organization where safety priority was discernably lower than other parts of the organization and working directly to engage with those work groups.
- An effort to understand how changing processes may unintentionally increase risky behavior.

2019 Safety Culture Survey

The next INGAA safety culture survey is scheduled for 2019, with the goal of broadening participation to a larger number of INGAA member companies. In addition, The INGAA Foundation is investigating the possibility of adapting the survey to measure the worker experience of pipeline construction contractors, subcontractors and other service providers in the future.

PROJECT GOALS & METHODOLOGY



During the first quarter of 2018, The INGAA Foundation commissioned a report by Process Performance Improvement Consulting (P-PIC) and the Center for Applied Psychological Research (CAPR) through the University of Houston to provide a detailed account of how INGAA member companies developed and executed the INGAA safety culture survey.

Documenting the safety culture journey ensures sustained focus on safety and provides a basis for future efforts.

The main goal of this document is to provide interested parties an overview of the rationale for the safety culture project, as well as an overview of results. We further expect this document to provide regulators and member company employees with an overview of the survey development process, decision making activities and the scientific and business rationales for executing the survey. We anticipate this document will guide other pipeline trade organizations and industries (e.g., offshore operators and service companies) that are considering the development of an industry-wide survey to advance the safety culture of their respective industries and contribute to the health and well-being of their workforce and member organizations.

- INGAA members that participated in the survey can use this report to document the evolution of the safety culture survey, and this report can serve as a historical reference as decision-makers evaluate participation in future surveys. Additionally, as subsequent safety culture surveys are conducted, the findings and lessons learned can be discussed within the INGAA safety culture steering committee to help refine the survey process and incorporate continuous improvement efforts.
- INGAA Foundation members that have not previously participated in a safety culture survey can use this document to determine how they might use a similar approach and model to measure contractor safety culture. Although the platform and model may be different from the INGAA safety culture model outlined in this report, elements of the model may be altered and adapted to reflect differences between operators and contractors.
- Other pipeline operators and trade associations not currently measuring safety culture may use this document as a way to develop an internal approach to safety culture. API RP 1173 directs operators to begin measuring safety culture as part of SMS, but does not define how. To date, many in the industry have been slow to adopt a standardized approach. INGAA's work in this area can serve as a foundation for others as they develop similar efforts.

The following audiences can benefit from these findings:

- Regulators can use this report to understand how the industry is approaching safety culture, including the constructs that INGAA has identified as critical in evaluating safety culture. Beyond the pure results, regulators can use this document to further their understanding of how SMS builds upon and strengthens safety culture.

P-PIC and CAPR expect that the ongoing development and refinement of the safety culture survey, as well as the steady commitment to use the results to make necessary changes internally, will improve the overall safety of the pipeline industry, ensuring that operators are identifying and correcting areas of systemic concern.



SAFETY CULTURE OVERVIEW

Safety culture is a complex construct that requires individuals at all levels within an organization to commit to overall safety performance, thereby ensuring everyone is doing the right thing, even when no one is looking.⁴

Safety culture can be divided into two dimensions:

- 1) organizational characteristics, policies and procedures; and
- 2) local/individual work conditions and practices.

Organizational characteristics, policies and procedures

- Management commitment – Does management place high priority on safety?
- Human resource management practices – Do human resource practices (e.g., selection, training and compensation) enhance safety?
- Safety management systems (SMS) – Are hazard management systems (e.g., incident investigation, safety policies and safety procedures) of high quality and effective?

Local/individual work conditions and practices

- Supervisor support – Do supervisors prioritize safety, respond to safety concerns and encourage subordinates to comply with safety procedures?
- Internal group processes – Are employees communicating with and supporting each other in relation to safety issues?
- Boundary management – Is there quality communication between workers and other stakeholders on safety issues?
- Risk – Are job tasks dangerous or unsafe?
- Work pressure – Does the workload hinder an employee's ability to perform his/her job tasks safely?

Mirroring these dimensions, INGAA's initial summary document on safety culture provides six key elements and indicators that outline the

characteristics of a strong, positive and effective safety culture:

Consistent, strategic leadership demonstrating an uncompromised commitment to safety.

Leaders at all levels play a strong role in creating a strong and positive safety culture. For employees to view safety as a value of the organization, they must witness their leaders consistently and purposefully demonstrating that safety is of value to them and the organization. Furthermore, leaders must clearly communicate safety expectations to their employees, build trust in the workforce, recognize and reward excellent safety performance and hold individuals accountable for reporting unsafe or risky conditions.

Process and results guide operational performance.

A strong safety culture ensures that all business practices are clearly defined and created based on empirical analysis. These practices should be consistently executed across all levels of the organization and continuously improved to make progress toward a stronger safety culture. Safety performance monitoring programs must align with the safety practices and policies set forth by the organization, and should include corrective-action processes to address deficiencies. These programs, processes and practices comprise a pipeline operator's SMS.

A mutually trusting organization in which a culture of openness and trust engages the workforce and safety is understood as a shared responsibility.

Employees trust their management to support them when faced with safety issues. They are confident they have the ability to identify and manage safety and risks, and must feel comfortable reporting safety issues without fear of retaliation.

Continuous organizational learning from adverse and positive events and a positive error management culture.

To create a positive overall safety culture across the industry, organizations must share lessons learned from both adverse and positive events, ranging from mere observations and near misses to incidents and accidents. Organizations should learn from both internal and external incidents by remaining actively engaged in industry associations and research programs.

Furthermore, companies should investigate all incidents with a focus on finding the cause of the incidents to learn from mistakes, rather than on pointing fingers and assigning blame to individuals.

The organization manages risk systematically using a framework provided by leadership.

Organizations need management systems that control risk through planning based on the likelihood and consequences of possible incidents and include a long-range risk management plan. Performance monitoring systems should include measures of leading and lagging performance indicators and evaluations from different sources (e.g., supervisor and self-assessment).

Management systems and safety performance should continuously be monitored and reviewed, as part of a plan-do-check-act cycle, to ensure continuous improvement.

Workforce investment is an ongoing management focus.

Procedures for enhancing employee effectiveness should be included in strategic plans. Creating a strong safety culture includes empowering employees' commitment to safety. Thus, employees should receive continuous training and personnel development. Moreover, organizations and their employees must recognize that even when they have an excellent safety record, there is always room to foster and improve safety culture (e.g., long-term training programs, monitoring long-term personnel

development and succession plans).

These elements are essential to creating a successful safety culture in which employees identify with safety and interact with one another to reinforce safety as a value. This creates a positive working environment where employees and management can trust and support one another in safety efforts.

Why is it important to measure safety culture?

Studying safety culture can benefit organizations and the industry as a whole by providing a means to understand employee perceptions on safety and the benefits of having a strong safety culture. Measuring the safety culture of an organization reveals employees' perceptions of organizational safety policies and procedures, the strength of an organization's commitment to safety, and how leaders within the organization respond to safety violations.⁵

Furthermore, measuring safety culture allows organizations to learn from front line employees about the risks and safety issues within the organization that management may not realize exist.

As findings from individual organizations are shared across the pipeline industry, the industry can understand the inherent beliefs, attitudes and values of employees at all levels and sectors. This information can serve as a valuable tool for organizations to improve their safety practices, procedures and overall culture.

SAFETY CULTURE SURVEY DEVELOPMENT

In 2011, INGAA contracted CAPR to aid in the identification and selection of safety survey items. The CAPR team, which consisted of four graduate students and an Associate Professor of Psychology, conducted comprehensive literature searches on safety culture, its antecedents and outcomes across industries. Survey items were also obtained directly from leading safety researchers, including Dr. Dov Zohar. Dr. Zohar developed the original safety climate measurement scale that has become the standard in the field of safety culture assessments. In addition, Dr. Zohar's work won the Best Safety Intervention awards by CDC/NIOSH.⁶ Utilizing survey question items from best in class academics in safety culture allowed INGAA to design a sophisticated survey approach.

The research team identified a host of articles on workplace safety. The majority of the articles were developed for use in other industries, such as aviation, healthcare and the nuclear industry. Still, the general concepts/constructs relating to safety culture were relevant to components of the pipeline industry.

When certain survey questions were not published, the research team contacted the article authors to request access to the survey question. All survey questions were classified with like concepts placed in similar categories.

The CAPR team conducted a one-day workshop with the initial INGAA steering committee, comprised of an INGAA representative and representatives of each participating company. The team identified the most critical concepts and the most relevant scales to measure the survey questions. Once scales were identified, the team

shortened the scales to appropriate length and modified the survey content to align with pipeline-industry terminology.

Through the process, the steering committee, with CAPR recommendations, made the following key decisions:

- Opted to use a 1-5 point Likert scale rating (1) indicates "Strongly Disagree"; (2) indicates "Disagree"; (3) indicates "Neither Agree or Disagree"; (4) indicates "Agree" and; (5) indicates "Strongly Agree."
- Developed constructs focused on top management, direct supervisor and workgroup.
- Designed factors under each construct; top management: asset safety, coaching, caring and public safety. Direct supervisor: compliance, asset safety, coaching and caring. Workgroup: voice, safety behavior, safety citizenship, safety priority and risks & hazards.
- Solicited and selected a survey vendor for survey execution and platform.
- Allowed participants to complete electronic or paper-based surveys.
- Aggregated results using a hierarchy structure.
- Created an Overall Safety Index score and a "norm" score for comparison and benchmarking purposes, as described in the next section.
- Created a minimum number of employees for reporting purposes to maintain employee anonymity.
- Collected demographic information as an additional way to analyze the data.
- Required Human Resource Information System (HRIS) data prior to the survey so that individual participants could be identified with hierarchy structures in place.

SURVEY RESULTS

The results of the survey allowed participating operators and INGAA to:

- receive feedback on how employees experience safety culture within their organization;
- identify the relative importance of top management, workgroup and supervisory drivers of overall safety culture; and
- share the impact of initiatives to improve safety culture and performance.

Findings from the 2013 and 2016 survey were provided to operators through a secure online portal. Operators could run various reports to analyze specific workgroup, supervisor and top management levels and overall company results. In addition, most operators included demographics on each participant, which in turn allowed operators to analyze results by length of service, gender, age, etc.

Individual survey results also rolled into category (top management, workgroup and direct supervisor) and sub-category levels (coaching, caring, compliance, asset safety, safety priority, etc.). An Overall Safety Index was developed, which included a special set of six survey questions describing top management, workgroup and supervisory behaviors plus concerns for asset safety and public safety that in aggregate indicate employees' perceptions of the importance of safety in their organizations.

For the 2016 survey, the Overall Safety Index remained unchanged from 2013. However, new sub-categories emerged in 2016 which included: (1) asset safety and (2) SMS. These were added due to growing interest in these areas to reflect early adoption of API RP 1173, published in 2015. Based on input from 2013 survey participants, several items were reworded or replaced to increase clarity and avoid confusion within the question set. As a result, all the main categories and more than half of the sub-categories contained at least one new item, which affected how the 2013 and 2016 results were compared.

The last major change in 2016 was the minimum number of employees included in reporting results was lowered from 10 in 2013 to eight in 2016, which allowed operators to view results of smaller group sizes compared to 2013. Member companies that participated in both surveys were able to compare the same small group as long as the minimum reporting population was 10 or more. The rationale for maintaining a minimum reporting population was to maintain employee anonymity. When numbers in reporting groups are lower, the identity of the respondent may be at jeopardy. Maintaining the anonymity of each survey participant allows employees to express their views openly and honestly without fear of reprisal from those who are viewing the results (supervisor, manager, leadership). Without maintaining a structure that provides anonymity, typical employee surveys have low response rates or may provide inaccurate data.

Members were able to compare their individual company scores to the Transmission and Storage norm (T&S norm). The T&S norm was calculated by pulling data for those participants in the Transmission, Storage and Shared Services departments, excluding distribution, administration and other parts of operations outside these general areas.

In addition, the survey vendor recalculated the 2013 and 2016 results to show a historical comparison of the data. This was termed the "Adjusted Historical Norm" and excluded participating companies that did not participate in both surveys or may have changed their survey approach. Some opted to sample only a select group within their organization as opposed to including all field operation employees in their T&S operations; these companies were excluded in the Adjusted Historical Norm result calculations. The Adjusted Historical Norm excludes changed questions and focuses only on the questions that were identical in both surveys.

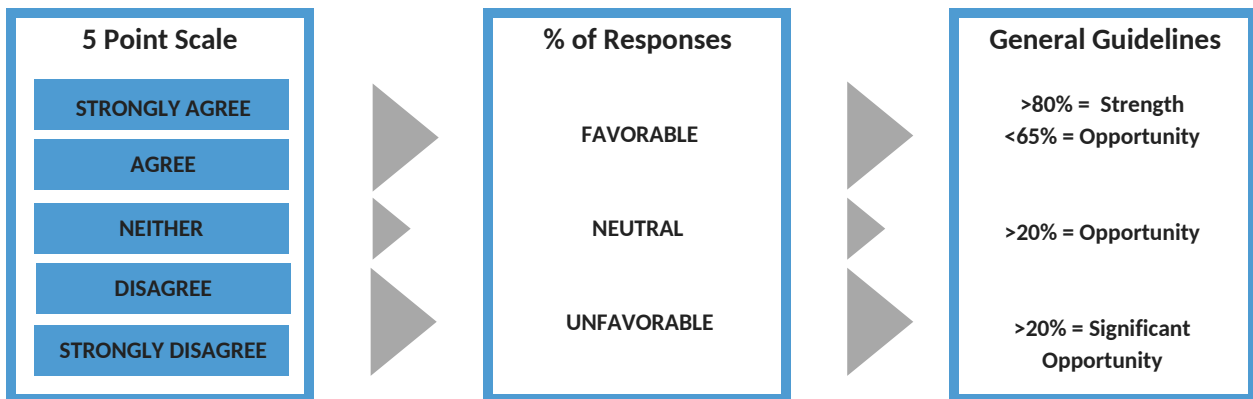


Figure 1: 5-Point Scale

Results were scored using a 5-point scale, which was converted into a Favorable, Neutral and Unfavorable groupings (see Figure 1).

In some cases where items were negatively worded, such as the three safety priority questions, responses were reversed (favorable responses were Disagree and Strongly Disagree and vice versa).

The T&S Norm is the average Favorable percentage of all T&S respondents.

Participating Member Organizations

- 13 of the 17 participating INGAA member companies from 2013 repeated the survey in 2016. Two new INGAA member companies joined the survey in 2016, for a total of 15 participating companies.
- Of the 13 repeating INGAA member companies, several changed their survey approach. As a result, only 11 of the 13 have comparable T&S respondent samples for 2013 and 2016.
- All but two of the 2016 participating member companies supplied demographic information for their participating employees.
- Of the 11 comparable companies, 8,266 participants made up the 2016 Adjusted Historical Norm calculation, up from 7,863 in 2013.
- Overall, the 2016 participating return rate was strong (79% response rate).

Summary of the Results

Figure 2 shows the sub-category levels by favorability. The highest sub-category scores were related to workgroup risks and hazards and safety citizenship. Conversely, the lowest sub-category areas were the Overall Safety Index, workgroup safety priority and familiarity with pipeline safety management systems (PSMS).

Findings from the survey suggest:

- Questions related to top management have the lowest favorable ratings and the greatest range across companies compared to supervisor and workgroup categories.
- Overall Safety Index and familiarity with PSMS have the greatest range of favorability ratings across the 15 companies.
- As favorable ratings decrease, neutral ratings increase, while unfavorable ratings are relatively stable.
- Supervisor survey items are the second highest rating, with moderate change across companies. Workgroup categories have the highest favorable ratings, except in safety priority.

Category	2016 T&S Favorable	2016 T&S Neutral	2016 T&S Unfavorable	Adjusted T&S 2013 Favorable
Overall Safety Index	77%	17%	6%	72%
Management-Coaching	85%	12%	2%	80%
Management-Asset Safety	81%	16%	3%	78%
Management-Compliance	81%	14%	4%	76%
Management Caring	80%	16%	4%	74%
Supervisor-Compliance	87%	11%	2%	86%
Supervisor-Asset Safety	90%	9%	1%	86%
Supervisor-Caring	84%	13%	3%	81%
Supervisor-Coaching	82%	15%	3%	77%
Workgroup-Risks & Hazards	94%	6%	1%	-
Workgroup-Safety Citizenship	91%	9%	1%	89%
Workgroup-Voice	90%	8%	2%	85%
Workgroup-Safety Behavior	87%	12%	2%	82%
Workgroup-Asset Safety	86%	12%	2%	-
Workgroup-Safety Priority	73%	10%	17%	77%
Familiarity with PSMS	67%	27%	6%	-

Figure 2: 2016 and 2013 Subcategory Results

Safety Priority

Safety priority was the only sub-category with a statistically significant decrease in 2016 compared with 2013. Competing priorities emerged as a theme, as did worker impressions on caring and communications. Substantial academic research suggests that the two may be correlated.

The following questions, related to safety priority and management caring/communications, rated least favorably:

Top Management

- Top management considers safety when setting production speed and schedules.
- Top management quickly corrects safety hazards (even if it's costly).

Workgroup

- In my workgroup, it is sometimes necessary to depart from safety requirements for the sake of production.
- In my workgroup, it is sometimes necessary to take safety risks to get a job done efficiently.
- In my workgroup, it is sometimes necessary to take safety shortcuts to get a job done on time.

Management Caring/Communication

- Top management shows by what it does that it really cares about our well-being.
- Top management provides detailed asset safety reports to workers.
- Top management listens carefully to workers' idea about improving safety.

A driver analysis of safety priority found that length of service of an employee was an important factor. Employees who were newer to the company (0-5 years of service) were more likely to score safety priority lower than older, tenured employees. Although there are several potential explanations for this finding, it's possible that newer employees are seeing conflicting priorities in the workplace, whereas tenured employees may be more accustomed to seeing other goals prioritized over safety.



Figure 3: Safety Priority Results

Figure 3 shows the changes in 2016 and 2013 in safety priority. In particular, the unfavorable ratings increased by six points, with both favorable and neutral declining significantly.

The INGAA Foundation held a workshop on safety priority in 2017 to understand the results and learn how companies are making changes based on the survey results.

The following topics were discussed at the workshop:

1. What is safety priority and how do employees understand competing messages?
2. What can companies do to make safety priority a clearer message?
3. Are there parts within the organization or pockets in the organization where this is more evident?

4. Do we think that newer employees are better able to identify these discrepancies? Or do employees with longer lengths of service have a better understanding of an organization's values?

5. How can we conduct additional discussions with field employees to observe and interpret cause-effects of safety priority?

6. What can INGAA do to help foster dialogue, reflection and insight into safety priority?



ECONOMIC BENEFITS

The success of the INGAA safety culture survey is not only the inherent ability to benchmark against peer organizations and leverage other companies' practices to improve safety. There is an additional economic value of choosing to participate in a consortium survey versus an individual organization conducting a custom survey with the same features.

To execute an individual company survey, an operator would need to develop a custom safety culture index to assess safety culture within its organization. The survey would need specific objectives and deliverables including at least the following phases:

- I. Survey planning and design
- II. Survey administration and execution
- III. Analysis and reporting
- IV. Action planning and performance tracking

Not only would organizations need to dedicate administrative, human resource staff and consulting resources, those resources would need to be in place for at least a year. Companies would need to select a vendor to execute the survey. Typical vendors selected for this work conduct regular workforce surveys and have a technology platform for executing the survey and collecting participant responses. The selected vendor would also analyze the data and develop a series of management reports specific to each level in the organization (supervisor, management, director, overall). In addition, the vendor would conduct a key driver analysis to help identify disconnects in the data.

Based on the amount of effort to ensure data quality, integrity and rigorous quality control processes to protect data, as well as the analysis and reporting requirements, the cost for an individual organization to conduct a survey of this magnitude ranges between \$75,000 and \$100,000.

INGAA's approach of administering a safety culture survey with member companies provides enormous value to participants due to the inherent economies of scale.

To date, participating organizations paid INGAA \$15,000 to participate in the 2013 and 2016 INGAA safety culture survey. Compared to the cost these companies would incur to conduct the survey by themselves, this is a \$60,000 to \$85,000 savings. It should be noted that the cost of the consortium survey is a pass-through cost that covers only the survey vendor costs and does not include INGAA administration, consulting, academic advising or change orders to the vendor for additional work outside the RFP. Due to these additional costs, future INGAA safety culture surveys may warrant price increases, particularly as the amount of data available for analysis from multiple survey years continues to grow.

As the INGAA Foundation determines a path for measuring safety culture for construction contractors and other service providers, alternative ways to structure the survey may make it more cost effective for these smaller organizations. Partnering with organizations such as CAPR or other academic institutions undoubtedly decreases the cost, while maintaining the survey goals and outcomes. The main cost driver in any workforce survey is the platform. Utilizing academic platforms, as opposed to private vendors, and utilizing graduate students to conduct and aggregate results, as opposed to private consultants versed in safety culture research, creates a lower cost and high integrity process. The INGAA Foundation would need to make key decisions on the number of management reports needed per participant and whether the survey would be offered online only or by paper. Paper-based surveys cost more due to the additional intermediate step of transcribing the survey fields into the database.

RECOMMENDATIONS

For future iterations of the safety culture survey, we recommend the INGAA Safety Culture Steering Committee devote attention to five critical areas.

- First, research on safety culture has progressed and, in particular, linkage analyses related to safety culture operational and safety outcomes has progressed significantly.
- Second, interventions developed and designed as a consequence of the INGAA safety culture surveys across organizations should be rigorously studied and evaluated and considered for broad dissemination.
- Third, analytically, we recommend a focus on person-to-person analyses of change with an emphasis on how prospective survey vendors and consultants can help with execution.
- Fourth, we recommend determining participation models that would allow inclusion of construction companies and other service providers in the process – allowing for optimization of safety culture among an expanded number of workers.
- Last, we recommend close collaboration with a public relations firm or entity to enhance the impact of INGAA's unique and groundbreaking approach to measure and improve safety culture.

Other recommendations:

1. During each safety culture survey cycle, the Safety Culture Steering Committee comes together to agree on upcoming changes to the survey. The process has worked well in the past. However, as more operators participate, and more data is collected and analyzed, developing a strategic planning committee with responsibility to provide counsel and long-range direction may help with continuity.

2. In the past, only limited linkage analyses between safety culture and operational, as well as safety outcomes were conducted as part of the INGAA safety culture process. For the next phase, we recommend a discussion among participating INGAA companies to determine what types of safety outcomes (e.g., near misses, injuries, process violations, utilization of stop work authority) relate to safety culture. These analyses will allow participating companies to analyze the safety culture components that most closely relate to relevant outcomes. Developing linkage analyses approaches would require INGAA members to standardize outcome data collection and reporting through standard databases systems.

3. In past iterations of the survey, participating organizations have participated to varying degrees in industry-wide interventions organized through the Safety Culture Steering Committee (e.g., workshops organized by INGAA, results discussion). In addition, most participating organizations have implemented organization-specific and unit-specific intervention mechanisms to leverage safety culture survey results fully. However, our understanding of which interventions and processes have led to the strongest improvements in safety culture could be developed further. We thus recommend, based on the safety culture survey data changes over time, determining which organizations have attained particularly strong improvements in specific areas. We further recommend examining how the design, content and rollout of interventions in these organizations differed from organizations that saw less success from post climate assessment interventions.

4. The comparison conducted by CEB focused on between-person and group-to-group analyses. Complete unit data was compared over time, irrespective of employee recruitment into the units or significant employee turnover. However, research findings support that individuals' perceptions of safety culture are partially shaped by their demographics and prior experiences. As such, comparisons of units over time are occasionally of limited use. In fact, these comparisons can lead to misleading results. We thus recommend supplementing the comparisons with within-person analyses (i.e., statistical evaluations on whether views and safety culture perceptions of the same individual have shifted due to events or interventions). We specifically recommend including these as a required component of the survey vendor's scope for the next iteration of the survey.

5. Generally, contract employees, including construction company employees, are most likely to be affected by incidents or work pressure. Thus, we encourage participating member companies to discuss models for supporting participation by construction companies and other service providers to ensure safety culture survey results include the most vulnerable workers in the industry and hence provide an accurate reflection of challenges and experiences in the industry.

6. INGAA's safety culture assessment approach is unique. Only a couple of survey consortium organizations exist, and none of them in the energy transmission area. Other industries could greatly benefit from learning about INGAA's efforts. We recommend that INGAA consider developing methods and communications strategies to leverage member companies' investment in the safety survey culture process.



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Appendix A: Survey Scale Background

What are advantages of developing nonproprietary survey tools versus relying on vendor-provided instruments?

In developing an industry-wide survey, two broad options for developing survey tools are available to organizations and/or survey consortium organizations. First, organizations can select consulting firms that specialize in safety culture surveys. These consulting firms generally have developed their own scales that measure components of safety culture (e.g. safety knowledge, safety attitudes, safety participation, safety priority, perceptions of risk/hazardous working conditions etc.). Second, organizations or consortium groups can decide to utilize scales that are nonproprietary and published in the extant safety research literature to develop survey tools. There are several benefits of using published scales as opposed to using scales that are the proprietary products of consultancy firms.

Reliability & Validity

Scales that are published in academic literature go through a multi-stage, multi-source vetting process to ensure that they are to large degree reliable and valid. To ensure that a scale is reliable and valid, everyone, from the researcher/s who first develops the scale, to the reviewers who make the decision to publish the articles, to other researchers in the field who use that scale, performs their checks and balances. Furthermore, the process is transparent, that is anyone trying to choose which scales to use can refer to previous research articles that have developed and/or used the scale to determine the degree to which it is reliable and valid. However, outsiders are not usually privy to the scale development process that occurs within consulting firms, and thus find it harder to assess whether a scale is valid, reliable or even appropriate for the intended purpose. Published scales are also easy to procure and often come with examples of how to use and score them. In some cases, prior research conducted using the scales provides evidence regarding the predictive validity of the scales, including but not limited to information on the extent to which the scale and its items are related to organizationally relevant outcomes, such as accidents, injuries, process safety incidents and fatalities.

Ownership of and Access to Scales and Data

Perhaps the biggest drawback of using proprietary scales is that the ownership of the both the scales, and the data collected through them typically remains with the consulting firm. The implication is that the client organization may become obligated to continue renewing the contract with the consulting firm or risk losing all previously collected data and the opportunity to repeat the survey in the future (or compare results across data collection waves/time points). Using nonproprietary scales derived from the extant research literature does not come with these strings attached, they are available to anyone who has access to the article or journal they are published in, and organizations have the option to retain ownership of the data generated through the safety culture survey project.

How can organizations or survey consortium groups identify validated scales that are psychometrically sound?

Many validated scales originate in academic research. When scales have been used as part of a study published in a peer-reviewed journal – or, better yet, multiple published research studies – they are often more credible. These scales are a great starting point for constructing an organizational survey because the items are often publicly available. Also, in many cases, using existing scales is significantly easier for companies than developing and testing their own measures.

Many scales are accessible online by searching for published research articles on Google Scholar. Companies can also purchase access to research journal databases like PsycINFO. Although locating sound, validated scales often requires a bit of time and effort up front, companies generally benefit from using evidence-based scales that are more accurate, more actionable, and more legally defensible. In addition, as companies repeatedly conduct organizational surveys, they can also begin to develop their own validity evidence.

In reviewing available survey items, how can organizations and survey consortium groups determine which items are of high quality?

Not all survey items are created equal. Companies should look for scales, or sets of survey items, that are validated – that is, some evidence exists to support the use of the scale in a given context.⁷ Evidence of validity can help answer questions like “does the survey content match the job content?” and “are we measuring variables that demonstrate meaningful relationships with other important work variables?”⁸ Alternatively, a lack of validity can mean that an organization spends a great deal of time and effort

developing or using survey scales that are not actually measuring what they are intended to measure. Ultimately, validity is not a binary concept – a scale is not simply valid or invalid – but rather, evidence of validity gradually accumulates as researchers and practitioners use and test it.

Can single items/questions be used to measure entire concept domains or are multi-item scales needed to accurately measure a construct?

In most cases, using multiple items (i.e. at least four or five per concept measured) has significant advantages over the use of single-item measures of a concept or construct. For instance, if a safety climate scale combines eight items addressing different aspects of safety climate (e.g., safety training, management support for safety), the measurement will probably provide more complete and reliable information than if the scale were to include only one or two items asking about safety climate in general. At the other extreme, however, a ceiling effect certainly exists – at a point, adding more and more items offers minimal new information.⁹

Ultimately, the number of items in a scale depends on the construct being measured. Some constructs are so straightforward and narrow in scope, that they can be measured by a single item or a few items.¹⁰ For example, it is not necessary to construct a multi-item scale to ask whether an employee intends to quit her job or whether a supervisor would recommend an interviewee for hire. However, for most psychological constructs, it is common to include multiple items so that the scale fully captures the concept being measured.¹¹

Checklist around item and scale development for measuring safety culture:

1. **Some scales and items are better than others.** Although writing survey items seems so easy that anyone could do it, scales are most useful when backed by validity evidence. Many scales exist in the public domain that have already been developed, tested, and refined by researchers. These scales are often great options for building organizational surveys.
2. **Add and remove with caution.** Before altering scales that have already been established (e.g., adding items, removing items, modifying language), organizations should exercise caution. In many cases, established scales have already withstood many revisions and iterations, so there are likely specific reasons that a scale looks the way it does. Organizations should make sure they have a logical reason to modify a scale.
3. **Consider the consequences.** Although using scales backed by validity evidence is always beneficial, it is especially important if the organization may use survey information to inform safety-critical decision making.

What kinds of response scales are appropriate for measuring safety culture and related constructs?

In measuring safety culture, there are significant advantages to the use of Likert type response scales, which were also selected for the INGAA safety culture surveys. In general, when using a survey scale to measure attitudes or opinions, a response scale is generally used to indicate one’s agreement or disagreement with a single prompt within a scale. While a response scale can take many forms, the most common of these is the Likert scale.¹² The Likert scale includes five characteristics: (a) a declarative statement as a prompt, (b) an ordered continuum of response categories, (c) an equal amount of positive and negative options, (d) descriptive labels for each category, and (e) numeric values assigned to each response category. Figure 1 is an example of the typical appearance of a survey item with a Likert scale format.

Figure 1. Sample Likert scale

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Safety is my number one priority when I work.	1	2	3	4	5

Likert scales are more useful than simply asking participants to provide a “Yes” or “No” response due to three unique characteristics: (a) attitude/opinion direction, (b) attitude/opinion intensity, (c) treatment of attitudes/opinions as a linear continuum.

Direction. Likert scale responses allow participants to indicate their agreement or disagreement with the scale item. This characteristic is analogous to the Yes/No response option.

Intensity. Likert scale responses allow participants to indicate the degree to which they either agree or disagree with the scale item.

Intensity is indicated with the presence (or lack thereof) of an adverb (e.g. strongly, slightly, neither) ^{13, 14, 15}

Linear continuum of attitudes. As opposed to the limited analytical nature of the bivariate Yes/No response option, Likert scales provide a more nuanced perspective of a participant’s attitude or opinion by combining direction and intensity to form a linear continuum of attitudes that can be measured in an ordinal manner.

Variations of Likert scales can be used to measure other types of responses, such as frequency of events. When used in this context, response categories typically range from “Never” to “Always,” providing an indication of how often a certain situation or behavior occurs. Figure 2 is an example of a survey item, with a Likert-type scale format, used to measure the frequency of which an event occurs.

Figure 2. Likert-based Frequency Response Scales

	Never	Rarely	Occasion-ally	Frequently	Always
How often do errors go unreported to management?	1	2	3	4	5

Should response scales for safety culture items contain a neutral midpoint, or should we “force” respondents to choose?

Neutral response categories allow survey participants to indicate that they do not perceive or feel any agreement or disagreement toward a scale item. Considering the nature of the Likert scale response format as a linear continuum of attitudes ranging from “Strongly Disagree” to “Strongly Agree,” there is a hypothetical point where agreement must convert from “Disagree” to “Agree,” or vice versa. Traditionally, survey participants who are unable to determine the direction of their agreement, or feel such minimal intensity in their agreement, are able to reflect this state by indicating a neutral response category, such as “Neither Agree or Disagree.”

Some Likert scale response formats utilize an even number of response options by omitting the neutral category and forcing participants to indicate their agreement or disagreement, even it is of minimal intensity. Research on the effectiveness of either including or excluding the neutral category have shown that there are no distortions to survey results through either method. ^{16, 17} Since including a neutral response category does not bias survey results, and it allows individuals to indicate a lack of attitude/opinion direction or intensity, it is recommended to include a neutral response category in potential survey scales.

Appendix B: 2016 Survey Items

The following items were used in the 2016 survey.

Direct or Immediate Supervisor

Item Text: For the next set of items please think about what your DIRECT or IMMEDIATE SUPERVISOR actually does about safety practices and respond by beginning each statement with the phrase

My direct supervisor...

Item Text	Sub-Category	2013 History
Makes sure we receive all the equipment needed to do the job safely.	Compliance	Yes
Frequently checks to see if we are all obeying the safety rules.	Compliance	Yes
Emphasizes safety procedures when we are working under pressure.	Compliance	Yes
Is strict about working safely when we are tired or stressed.	Compliance	Yes
Reminds workers who need reminders to work safely.	Compliance	Yes
Makes sure we follow all the safety rules (not just the most important ones).	Compliance	Yes
Insists that we obey safety rules when fixing equipment or machines.	Compliance	Yes
Is strict about safety at the end of the shift, when we want to go home.	Compliance	Yes
Discusses how to improve safety with us.	Caring	Yes
Uses explanations (not just compliance) to get us to act safely.	Caring	Yes
Spends time helping us learn to see problems before they arise.	Caring	Yes
Values safety as much or more than schedule and cost.	Caring	NO
Frequently tells us about hazards in our work.	Coaching	Yes
Says a “good word” to workers who pay special attention to safety.	Coaching	Yes
Frequently talks about safety issues throughout the work week.	Coaching	Yes
Is committed to <u>pipeline integrity</u> and <u>safety of the assets</u> .	Asset Safety	Yes
Holds us to high standards in following <u>asset safety</u> rules.	Asset Safety	Yes
Always expects us to follow prescribed maintenance procedures.	Asset Safety	NO

Top Management

For the next set of items please think about what TOP MANGAGEMENT actually does about safety practices and respond by beginning each statement with the phase:

Top management in this company...

Item Text	Sub-Category	2013 History
Reacts quickly to solve problems when told about safety hazards.	Compliance	Yes
Provides all the equipment required to do the job safely.	Compliance	Yes
Is strict about working safely when work falls behind schedule.	Compliance	Yes
Considers safety when setting production speed and schedules.	Compliance	Yes
Ensures that processes/procedures are routinely assessed for accuracy, completeness and effectiveness	Compliance	NO
Encourages employees to stop work when an unsafe condition is indicated.	Compliance	NO

Tries to continuously improve safety performance in each department.	Caring	Yes
Quickly corrects safety hazards (even if it's costly).	Caring	Yes
Requires each manager to improve safety in his/her department.	Caring	Yes
Uses any available information to improve existing safety rules.	Caring	Yes
Listens carefully to workers' ideas about improving safety.	Caring	Yes
Shows by what it does that it really cares about our well-being.	Caring	Yes
Regularly communicates the company's safety objectives to me.	Caring	NO
Provides workers a lot of information on safety issues.	Coaching	Yes
Regularly holds events to promote safety-awareness (e.g., presentations, ceremonies, safety summits, safety conference calls, safety stand downs, etc.).	Coaching	Yes
Gives safety personnel the authority they need to do their job.	Coaching	Yes
Uses incident reports (e.g., on near-accidents, injuries) to create opportunities for learning and promote awareness.	Coaching	Yes
Places a high priority on safety training.	Coaching	Yes
Demonstrates commitment to <u>pipeline integrity</u> and <u>safety of the assets</u> .	Asset Safety	Yes
Provides detailed <u>asset safety</u> reports to workers.	Asset Safety	Yes
Gives <u>pipeline integrity</u> personnel the authority they need to do their job.	Asset Safety	Yes
Quickly responds to reports on <u>asset safety</u> and <u>pipeline integrity</u> hazards.	Asset Safety	Yes
Encourages identification of hazards to assets.	Asset Safety	NO
Takes appropriate action on asset evaluations.	Asset Safety	NO
Takes the actions necessary to maximize public safety at construction sites.	Public Safety	Yes
Includes public safety considerations during the planning phase of construction jobs.	Public Safety	Yes
Insists that the same safety standards be used by contractors as for regular company employees.	Public Safety	Yes
Develops partnerships with local emergency response organizations (e.g., fire department, police department) near active construction sites.	Public Safety	Yes
Provides up-to-date information about pipeline safety to local organizations (e.g., schools, commerce associations).	Public Safety	Yes
Responds to community/public inquiries or complaints in a timely manner.	Public Safety	Yes
Has adequate mechanisms in place to allow for public/community inquiries and feedback.	Public Safety	Yes

Work Group

For the next set of items please think about what actually happens in YOUR WORKGROUP with regard to safety practices and respond by beginning each statement with the phrase

In my workgroup...

Item Text	Sub-Category	2013 History
We seek to identify safety risks & hazards in our work environment (e.g., chemicals, fumes, forth)	Risks Hazards	NO
We seek to eliminate and/or control safety risks & hazards in our work environment (e.g., chemicals, fumes, noise, and so forth)	Risks and Hazards	NO
We freely discuss any errors/mistakes/near accidents so we can learn from each other.	Voice	Yes
When someone makes a safety-related error, he/she shares it with others so that they don't make the same mistake.	Voice	Yes

People feel comfortable to voice concerns to our supervisor around any safety issue.	Voice	Yes
We speak up and encourage others to get involved in safety issues.	Voice	Yes
My co-workers help each other out to be sure we work safely.	Safety Citizenship	Yes
We consistently report all incidents, accidents, and other safety issues.	Safety Citizenship	Yes
We help teach safety procedures to new crew members.	Safety Citizenship	Yes
We go out of our way to look out for the safety of other crew members.	Safety Citizenship	Yes
We try to change the way the job is done to make it safer.	Safety Citizenship	Yes
It is sometimes necessary to take safety risks to get a job done efficiently.	Safety Priority	Yes
It is sometimes necessary to depart from safety requirements for the sake of production.	Safety Priority	Yes
It is sometimes necessary to take safety shortcuts to get a job done on time.	Safety Priority	Yes
We correctly use appropriate procedures to do our jobs.	Safety Behavior	Yes
We correctly inspect and test all personal protective equipment prior to using them.	Safety Behavior	Yes
We correctly store all personal protective equipment.	Safety Behavior	Yes
When safety risks related to our assets are reported, they are properly addressed.	Asset Safety	NO
We learn from incidents and near misses involving our assets and take corrective action to prevent further exposure to similar risks.	Asset Safety	NO
We review "lessons learned" from incidents and near misses involving other companies' assets and take action to prevent exposure to similar risks.	Asset Safety	NO
All scheduled maintenance on our equipment is current.	Asset Safety	NO
Warning and alarm systems are working.	Asset Safety	NO

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For this last section, please switch your thinking to RATING the top management of your business, your direct supervisor and what actually happens in your work group with regard to safety policies and practices

Overall, how do you rate...

Item Text	Category	2013 History
<u>Top management</u> commitment (money) to worker safety on the job?	Safety Index	Yes
Your <u>direct supervisor's</u> commitment to worker safety as a key priority in his/her job?	Safety Index	Yes
The cooperation you see between workers in ensuring a safe work environment for all?	Safety Index	Yes
The willingness of your co-workers to speak up about safety violations they observe?	Safety Index	Yes
<u>Top management's</u> caring for the public's safety on projects we do?	Safety Index	Yes
The care and concern shown for <u>asset safety</u> by your company?	Safety Index	Yes

Pipeline Safety Management System Question

In 2016, INGAA opted to add a PSMS question to the survey. The question below is the one item in the PSMS category.

How familiar are you with your company pipeline safety management system(s) or other program(s) to continuously improve pipeline safety?

Appendix C: Vendor Requirements for Safety Culture Survey Administration

The purpose of this section is to memorialize the survey vendor selection process for further used and improvement as subsequent surveys are planned and executed. If the steering committee decides to move to a different survey vendor in the future, , data integrity and data integration into a new vendor system must be taken into account.

Prospective survey vendors were approached by INGAA based on two criteria: 1) Prior experience conducting safety culture surveys for INGAA member companies, 2) Prior experience conducting industry-wide or multi-organization culture or employee engagement surveys. First, the request for proposal (RFP) document was developed by the INGAA steering committee. INGAA then developed evaluation tools to map survey vendors’ capabilities against the requirements outlined in the RFP. The criteria utilized for vendor selection are summarized in the tables following this section. For each category of criteria, we provide specific components a company should require from a vendor for successful survey administration (left), as well as more detailed descriptions of these components (right).

I. General Information

Demonstrates a history of legal compliance and adherence to ethical principles, defines a clear vision for the project, and establishes experience, expertise, and trustworthiness as a vendor

Requirement	Description
Brief description of the organization	Provides a brief history (e.g., date of incorporation, previous names under which the organization has operated) and description (e.g., number of employees, corporate address) of the organization Specifies the local address of the project manager
Experience and expertise	Describes the organization’s past relevant experiences Details relevant areas of expertise that meet the needs of the safety culture project requirements. This includes an operational execution plan, core competencies and capabilities, the firm’s unique approach to accomplish project objectives, and key features of a successful safety culture survey
Performance standards and project outcomes	Defines the organization’s standards for exceptional performance and project outcomes in terms of the service provided by the firm
Principles and ethics	Lists the principles and ethics that guide the services provided by the firm
Active corporate accounts	Provides a list of the organization’s active Fortune 500 and/or Global 1000 corporate accounts (if any) Describes survey- and data analysis-related services provided to Fortune 500 and/or Global 1000 corporations
Professional organizations and certifications	Lists professional organizations to which the firm belongs Lists the firm’s third-party certification(s)
Legal compliance	Discloses all previous or outstanding lawsuits against the firm

II. Project Leadership and Staffing

Employs competent and trustworthy staff members, plans carefully for each phase of the project, and prepares for potential issues that may arise in survey implementation

Requirement	Description
Project oversight and leadership plan	Details how the firm will provide oversight and leadership in project management
Problem solving	Describes the firm’s plan for collaborating with INGAA to resolve any problems or issues that may arise during various phases of the project
Employee qualifications	Lists staff qualifications and experience (e.g., job position, education level, professional designations and technical training, job assignments and tasks, number of employers supervised)

III. Project Management

Sets objectives for how the survey will be implemented and accepted by organizational members, plans for challenges in administration, and takes steps to facilitate ease of use

Requirement	Description
Project phases	Details a specific approach for each phase of the project
Collaboration methodology	Describes the firm’s proposed methodology for collaborating with INGAA to ensure all steps are complete for project rollout
Project progress assessment	Lists the metrics that will be used to assess project progress
Project management tools	Provides the project management tools that will be used specifically for safety culture assessment
Communications plan	Discusses a communications plan designed to ensure effective survey development and execution
Data management plan	Describes a data management plan that includes the survey data file format and an employee database structure
Survey tools	Outlines the proposed online survey administration tools to be used

IV. Data Analysis and Reporting

Creates a strategy for analyzing and reporting data that meets the client’s needs, ensures that survey scales are relevant to job requirements, survey data can be linked to important work outcomes, scores map validly onto the identified traits or constructs, and scales can be used across different member organizations

Requirement	Description
Data analysis strategy	Executes a data analysis strategy that is based on RFP specifications Links survey data to important work outcomes, ensures that survey scales map validly onto the identified traits or constructs
Reporting strategy	Reports survey findings to INGAA and each participating member organization

Standardized reports	Uses standardized methods for generating reports
Non-standard reports	Describes methods for generating non-standard reports

V. Customer Service Orientation

Demonstrates an ability to collaborate with other parties and respond effectively to unexpected issues

Requirement	Description
Customer responsiveness	Provides an example of a successful response to an unexpected customer request that was not in the Original Statement of Work

VI. Past Performance

Demonstrates a proven track record of completing projects successfully and meeting the client’s needs

Requirement	Description
Provides references	Lists at least five references within the last five years that can vouch for the vendor’s credibility and quality of work
Provides detailed examples of services provided to referenced clients	Provides client information (e.g., corporate names, addresses and telephone numbers, points of contact, contract award dates, duration of contract periods) Discusses problems encountered during projects and how they were resolved, provides information about customer satisfaction, explains whether projects were completed within budget Demonstrates ability to handle privacy and security appropriately

VII. Project Cost Breakdown

Itemizes anticipated costs, communicates transparently about project costs, offers high-quality work for a reasonable price, calculates benefits of the project, clarifies how the data can be leveraged or owned by INGAA and integrated into existing INGAA systems

Cost	Description
Survey administration	Online survey administration Administration of additional paper surveys (i.e., cost per 100 paper surveys)
Data entry and analysis	Data entry for additional paper surveys (i.e., cost per 100 paper surveys) Time and statistical programs needed to analyze data
Provision of searchable database	Provides a searchable database that INGAA can use to access and use data
Travel requirements	Lists travel required for meetings, presentations, data collection, and other project-relevant work
Reporting	Reporting and presentation of results for INGAA

	Reporting and presentation of results designed to address company-specific needs and goals Cost of generating additional reports as requested by member organizations (i.e., cost per additional report)
Heatmap development	Creates heatmaps to help present data and facilitate visualization of data

Appendix D: Safety Culture Timeline and Milestones

A number of key dates and milestones are important as INGAA begins the planning and execution of future safety culture surveys. Although the timing and planning may change survey-to-survey, based on the amount of change to the survey process or survey items, the phased-approach below serves as a high-level timeline for members to consider.

Over the past two rounds of surveys, it has become evident that beginning the planning process at least a year in advance to the survey launch is important for a successful survey.

PHASE 1: Kick-off

- **May before survey year: Steering team kick-off and Workshop:**
During the kick-off meeting, there are a number of typical activities that occur, including review of previous survey results. The meeting is usually held in-person; however members may have the ability to call-in.
 - **SWOT Analysis:** Identifies the strengths, weakness, opportunities and threats of the survey process, including changes in membership, previous survey issues, industry changes, etc.
 - **Lessons Learned and Previous Survey Feedback:** For example, in 2015, there was discussion of how to handle “shared services,” how to differentiate between employee and asset safety and ways that companies used the survey results.
 - **Question Analysis Review:** The survey vendor prepares an analysis of the questions that were used in the previous survey to determine how well each question performed. The list is then reviewed at the kick-off meeting.
 - **Determine timelines, RFP revisions, vendor selection criteria:** The members determine a high-level timeline for the survey’s execution, including deadlines, survey administration and general schedule.
- **June: Draft Commitment Letter to Members:** The commitment letter is sent to all interested INGAA members to ask for their participation in the INGAA Safety Culture Survey. The commitment letter outlines the basic format of the survey process, result format and includes a confidentiality and non-disclosure agreement.

Phase 2: RFP and Commitments

- **July Issue RFP:** In 2013 and 2015, INGAA issues RFPs to select vendors who conduct workforce surveys and are knowledgeable in safety culture.
- **September: Evaluate Proposals and Conduct Vendor Interviews:**
- **September: INGAA Member Commitments:** Ask that companies make a decision to participate. Cost is divided based on the number of participants—so commitments help companies plan for the upcoming expense.
- **October: INGAA Board of Directors Approval:** Once the vendor has been selected, the committee members present to the INGAA Board of Directors to receive approval for moving forward with the project.
- **November: Select and Inform Vendor & Members:** Once decisions are made, members are notified of the path forward. The vendor is also communicated with and contracts are executed.

Phase 3: Develop Survey with Vendor

- **January of survey year: Survey Vendor Kick-off meeting:** This meeting is to align with all participating INGAA member companies and the vendor to discuss the project goals, milestones and schedule. In addition, participants can discuss internal organization changes or unique hierarchy structure requirements.
- **February: Participant File to Vendor:** Participating companies work with their Human Resource Department to provide HRIS files to the vendor. The HRIS files contain the hierarchy structure that denote the internal relationships of reporting and workgroups structures. The vendor will typically work with organizations after the files are sent to the vendor if a large change occurs in reporting, for example in the case of a reorganization.

- February: Survey Content Final: The vendor works with the steering team to finalize the survey question items, including any additional sub-categories or changes to survey question items.
- March: Web Survey Draft and feedback: The vendor works with the steering team to review survey category and sub-category definitions, survey directions and introductory email to participants.
- April: Hierarchy Review and History Mapping: With multiple years of data, mapping back to previous datasets is important. As questions and sub-categories change, the role of review to ensure that results can be accessed as intended is a necessary step in the survey process. The steering committee reviews the history mapping, while participating members review their individual hierarchy on the vendors' survey platform.

Phase 4: Survey Launch

- May: 1st Web Survey Reminder: Survey participants receive an initial email from the vendor asking them to participate in the survey. For those who have not completed the survey, they receive a follow-up email from the survey company with a link to survey.
- June: 2nd Web Survey Reminder: A second final reminder is sent to participants who have not completed the survey asking for their participation.
- Mid-June: Survey Close: Although the survey close is pre-determined by the vendor and steering committee, the steering committee may elect to extend the survey based on feedback from the vendor on the number of completed surveys and response rate.

Phase 5: Results

- July-August: Results Roll-out: Individual company results are provided to member participants through an online portal. A number of workshops and/or webinars are developed to explain how to use the portal and access results. There are a number of tools within the vendor's platform to "slice" the data. Due to the complexity comparing multiple years of data, having a good knowledge of the system is an important step in the analysis of results.
- July: Executive Survey Results: The vendor creates company-specific result PowerPoint presentations. These presentations provide participating members with an overview of their organization in aggregate by category and sub-category.
- August: Action Planning Workshop: The workshop is the first of several that focuses on the latest results of INGAA T&S data compared to the historical data. Typically the survey vendor leads the workshop with dedicated time for individual companies to work one-on-one with the vendor to ask questions about their specific data.

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