Survey Benchmarks Safety Culture Surveys

Responses come from a range of chemical companies

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INTRODUCTION

The first use of the phrase "safety culture" has been attributed to the International Atomic Energy Agency when analyzing the nuclear reactor accident at Chernobyl (Lee, 1998). Safety culture also has been identified as a contributing factor in various incidents, including the National Aeronautics and Space Administration's (NASA's) Challenger (1986) and Columbia (2003) catastrophes, King's Cross fire (1987), the Piper Alpha explosion (1988) and the Clapham Junction rail crash (1988).

As a result, organizations have sought to measure their safety culture in various ways. The primary way that organizations have done this is through a survey of company representatives or a sample of employees. According to the 2018 National Safety Survey, 24% of companies use safety perception surveys, their results and subsequent follow-ups as leading indicators that they track (Valentic, 2019). However, details about these surveys and the decisions made when administering them in practice (not for research purposes) are not well-documented or shared across industries.

As such, we sought descriptive information about the practice of conducting safety culture surveys by the oil and gas and chemical processing industries. Specifically, we were interested in what these surveys look like (the nature of the questions asked), who they are administered to (various levels of employees), how frequently they are conducted, and whether any concerns have been expressed about the practice of administering these surveys.

By pursuing this information, we wanted to to benchmark the practice of conducting safety culture surveys (rather than benchmarking the actual survey data). Benchmarking is the process of comparing one's business processes and performance metrics to industry bests or best practices from other companies. We were interested in all aspects of this process including who, what, where, when, why and how. Ultimately, this information would facilitate the ability to benchmark

safety culture survey data scores across organizations.

Some specific research questions we wanted to answer were:

- Which organizations conduct safety culture surveys, how frequently do they do so and when was the last survey conducted?
- What types of questions are asked in the surveys (process safety, personal safety)?
- Who completes the surveys (managers, internal/external contractors) and what were the response rates?
- In what languages are the surveys administered in?
- How are the survey results used and who were they disseminated to?

METHOD

More than 4,000 individuals on Texas A&M University's Mary Kay O'Connor Process Safety Center listserv were invited to participate in a safety culture survey benchmarking survey in late 2015. One hundred seventy-two individuals responded and of them, 126 identified the type of company they work for based on the following categories: 76 worked in operating companies; 23 worked in consulting firms; 12 worked in engineering, procurement and construction (EPC)

firms; and 15 worked in "other" (government agencies and educational institutions).

For this study, we were particularly interested in operating company survey practices and so our unit of analysis was at the company level. We wanted only one response from each company, so we started with the 76 responses from operating company representatives and reviewed the company names provided for these responses. Of these 76 responses, 52 respondents provided the name of the company they worked for. Of these, 41 unique company representative responses could be identified.

When selecting a response for a company in which more than one response was provided, we chose the most complete response. If that was debatable, we chose the first response. The remainder of the analyses were limited to the 41 responses from unique operating company representatives. The majority of the operating companies were in the oil and gas industry (e.g., Amoco, BP, Chevron, ConocoPhillips, ExxonMobil, Qatar Petroleum and TOTAL) or the chemical processing industry (e.g., Dow and Petrochemical Corp of Singapore).

RESULTS

Safety Culture Survey Administration. The first question we asked about safety culture surveys was "Has your company ever conducted a safety culture survey?" Thirty respondents (73%) indicated that, yes, their company had administered a safety culture survey and the remaining (11) respondents checked no.

The next question we asked was how frequently they conducted safety culture surveys. Seventeen respondents provided an answer to this question (24 left it blank). One respondent indicated biannually, four respondents indicated annually, one checked every other year, three respondents checked every three years, three additional respondents checked four to five years, and one respondent checked more than every five years. Four respondents checked "ad hoc/as needed."

Most Recent Safety Culture Survey. We asked when the last safety culture survey was administered. Nineteen respondents provided a year (22 left it blank). Seven indicated they had administered a survey in the past year (2015), four indicated the year prior (2014), and three noted the year before that (2013). The remaining five responses were for years ranging from 2000 to 2012.

The remainder of the survey questions concerned their most recent safety culture survey administration. Of the 16 respondents who answered the question regarding who conducted the survey, 10 respondents indicated the survey was done in-house and six others indicated the survey was conducted by an external vendor or party. Of the 14 who provided sufficient information, only three respondents reported the same instrument (DuPont's Safety Perception Survey).

When asked who completed the survey, respondents were prompted with the following categories, and the corresponding number checked each option: 14 top management, 19 middle management, 17 technical staff, 17 operations staff, six contractors and eight others. We also asked the overall approximate response rate. Of the 16 who provided responses to this question, the average response rate was 73.13% (SD = 20.28%).

Almost all of the respondents indicated that the survey was administered in English. Five respondents indicated that the survey was administered in another language beyond English, including Portuguese, Hindi, Gujarati, French, Dutch, Indonesian and the language of the respective country.

We asked why the survey was conducted and listed two possible examples within the question — part of a new initiative or in response to an incident. Eighteen respondents provided an answer to this question (23 left it blank). Responses were coded as follows: five new leadership, four new initiative, four assess/measure safety culture, two continuous improvement, two monitor climate regularly and one tied to training.

Respondents were asked whether individuals raised any concerns or obstacles outside of safety (e.g., legal or marketing) before the survey's administration and, if so, to briefly describe these concerns. Of the 18 respondents who answered this question (23 left it blank), 15 wrote "no," one wrote "yes," and two wrote they were not sure. The one person who wrote yes elaborated on a larger concern for the company involving politics and economics that appeared to extend well-beyond the survey.

Respondents also were asked, "In general, how did employees react?" Of the 17 respondents who answered this question, nine expressed a positive sentiment with comments such as "Very positive, very informal conversational survey. Measuring culture not compliance," and "Positively for

the most part. There are always a few cynics!"

Eight respondents expressed more mixed reactions, including "Well. Voiced some legitimate concerns. Also became a platform for employees to discuss other concerns outside safety" and "Employees directed involved in the survey had a positive reaction in general. The same is not true with people not directly involve[e]d in the survey, which react with ceticism [sic cynicism] concerning to the aim and result of such survey."

When asked who the results were disseminated to, 12 respondents indicated all employees and eight respondents indicated results were disseminated only to management.

In terms of postsurvey actions, of the 18 respondents who answered this question (23 left it blank), one said "none," one did not know, and 16 noted changes were made. A wide range of changes were listed. Some examples included:

"Each facility HSE committee follows up with any actions identified by the surveys with the timelines."

"Implementation of a greater number of leadership field audits and more field presence. Began communicating status of site discipline program regularly — so people are aware there are consequences for intentionally unsafe

behaviors.""Targets have been decided including actions plans; review of Company internal requirements and directives related to process safety; improvement of ways to collect data used to verify safety indicators; review safety indicators; reinforcement of train[i]ng and dissemination of safety process culture to employees; implementation of workshops aiming dissemination and analysis of process safety accidents in the Company; implementation of workshop comprising analysis of results of auditing executed by Petr[o]leum National Agency regarding process safety aspects."

Finally, respondents estimated that approximately 25% of the survey questions concerned process safety culture and approximately 51% of the survey questions concerned personal safety culture.

DISCUSSION

This descriptive study of 41 operating companies provides some initial information about the use of safety culture surveys, which can inform and facilitate the benchmarking of safety culture survey scores across organizations. Based on the data collected in this survey, it does not appear that one single survey instrument has been used extensively by multiple operating companies. However, a large number of safety culture and safety climate scales are freely available in the research literature.

Further, the publicly available BP Process Safety Culture Survey is a freely available benchmarking tool for the chemical industry (Baker Panel Report, 2007). Should it be perceived and used this way and results shared across organizations, organizations would be able to compare their personal and process safety cultures within their organization across the hierarchy (e.g., Beus et al., 2012; Xu et al., 2018) and across employment arrangements (e.g., contractors vs. employees; Fuller & Vassie, 2001) as well as to other organizations. As a result, they would be able to identify areas in which they may need to intervene or probe further, ultimately enhancing their safety culture.

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