

Questions To Ask About Process Safety Program Performance: Part 2

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In Part 1, three key questions were proposed that should be considered in assessing process safety program performance (1). The first question — What is the current level of process safety performance? — requires that performance be assessed in terms of meeting process system requirements and goals, including prevention of serious incidents and day-to-day effectiveness in managing process hazards. Current performance, which may be good or poor, is used to help set priorities for maintaining or improving performance.

The second question — Will performance in the future be better, about the same, or worse? — anticipates the future direction of performance. Without continued attention and resources, process safety programs will likely degrade over time due to complacency, competing priorities, and/or poor measurement and follow-up on performance issues — at least until a significant incident or other event occurs that triggers a program reassessment. This leads to the third question: What can be done to achieve or maintain excellent performance?

The answer to this question of course depends on what process hazards are present, current performance levels, and process safety program goals. Some approaches to consider include (2):

- Ensure all process hazards have been identified and review current risk management practices to determine if process risks are being properly evaluated. If process hazards are not properly identified and evaluated, appropriate process safety programs cannot be developed to manage these hazards.

- Manage process safety programs based on the process hazards that are present, in addition to compliance with related regulatory requirements (3, 4). Regulatory requirements should be considered minimum essential practices, and additional requirements should be implemented based on risk management evaluations, as needed.

- Set process safety improvement goals annually and provide appropriate leading and lagging metrics to measure progress and provide early warning of performance issues. Ensure timely follow-up on specific issues identified from these feedback systems.

- Review process safety training and organizational change strategies to raise process safety awareness, understanding, and capabilities at all levels of the organization as part of a strong safety culture.

- Provide strategies to maintain a sense of vulnerability in personnel at all levels. Lack of a sense of vulnerability can cause complacency, especially when performance has been strong for a long time, leading to a mistaken belief that good performance is routine and expected, rather than

requiring continued focus and diligence.

- Implement an effective mechanical integrity program to maintain aging equipment and help prevent loss-of-containment incidents. The program should include appropriate focus on maintenance procedures and training, equipment inspection and testing, and quality assurance (5).

- Develop a process safety learning plan that ensures awareness of external process safety regulations and guidance and develops organizational learning approaches to maintain critical technical, operational, and safety information (4). A learning plan can help strengthen process safety programs and performance over time by promoting a sense of vulnerability and sensitivity to operations, based on external information and organizational memory of past problems and successes.

- Identify opportunities to improve operational discipline (OD) (4). Process safety systems only work as intended if personnel are actually following them, and even highly trained and dedicated people occasionally make mistakes. Human error should be anticipated and appropriate safeguards should be provided to make sure errors do not lead to serious injuries and incidents. The goal is knowledgeable, experienced personnel who follow procedures and account for the existing work environment, rather than have an unquestioning focus on strict adherence to procedures when circumstances change. This requires developing appropriate procedures and effective training that include recognition and troubleshooting of possible problems.

A continued focus on these questions is essential:

- What is the current level of process safety performance?
- Will performance in the future be better, about the same, or worse?
- What can be done to achieve and/or maintain excellent performance?

The answers can help an organization develop and sustain effective process safety programs and achieve desired process safety performance.

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1. Klein, J., "Questions to Ask About Process Safety Program Performance: Part 1," *Chemical Engineering Progress*, **118** (3), p. 18 (Mar. 2022).

2. Klein, J. A., "Factors That Impact Safety Performance and How They Can Be Used to Achieve and Sustain Excellent Performance," *Professional Safety*, pp. 48–52 (June 2021).

3. CCPS, "Guidelines for Risk Based Process Safety," AIChE and John Wiley & Sons, New York, NY (2007).

4. Klein, J. A., and B. K. Vaughan, "Process Safety: Key Concepts and Practical Approaches," CRC Press, Boca Raton, FL (2017).

5. CCPS, "Guidelines for Asset Integrity Management," AIChE and John Wiley & Sons, New York, NY (2016).