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CCPS' Vision 20/20 – Delivering Great Process Safety Performance

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Abstract

Vision 20/20, developed by the Center for Chemical Process Safety (CCPS), looks into the not-too-distant future to describe how great process safety is delivered when it is collectively and fervently supported by industry, regulators, academia, and the community worldwide.

Driven by five industry tenets and enhanced by four global societal themes, Vision 20/20 highlights the principles that will help industry target and drive performance improvement, and serves as a call to action for all of society to be passionate about protecting people and property.

This paper will briefly review the concepts of Vision 20/20 and highlight the available resources that will help companies achieve this goal. Emphasis will be placed on the Industry Tenet Assessment Tool, as well as the Implementation Guide, which will help companies put their Vision 20/20 efforts into action. Other tools in support of Vision 20/20 which will be discussed include communication tools and a listing of helpful resources available to companies with identified opportunities for improvement.

1 Overview

Hastened by the occurrence of the Bhopal Incident in 1984, industry leaders recognized the need for a collective approach regarding delivery of process safety. In response to this appeal, the American Institute of Chemical Engineers' (AIChE) formed the Center for Chemical Process Safety (CCPS), which has led “a collaborative effort to eliminate catastrophic process incidents by advancing state of the art technology and management practices, serving as the premier resource for information on process safety, supporting process safety in engineering, and promoting process safety as a key industry value.” (1)

For 30 years, CCPS had has helped industry develop guidelines, practices and tools to keep workplaces and communities safer, even as technology and businesses have become more

complex and global. Recognizing this evolution, CCPS began an effort in 2011 to approach the challenge of delivering great process safety performance differently, resulting in an initiative called Vision 20/20.

In this paper, the concepts and resources associated with CCPS’s Vision 20/20 will be shared with the attendees of 2015 Mary Kay O’Conner Process Safety Center (MKOPSC) International Symposium. Additionally, a call to action will be outlined which requests efforts from within individual companies, from others in the industry, and from those beyond the industry.

2 Introduction to Vision 20/20

Vision 20/20’s novel approach to the goal of fewer incidents focuses on the characteristics of a company that delivers great process safety performance. Furthermore, it identifies features dependent on the collective energy and fervent support of industry, regulators, academia, and the community worldwide.

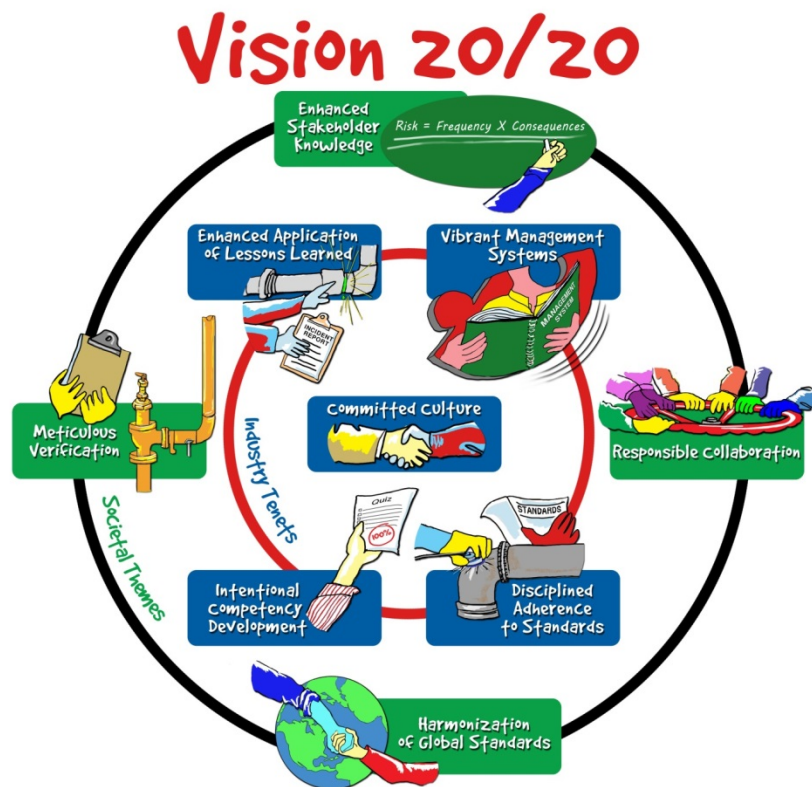


Figure 1. CCPS Vision 20/20 Five Industry Tenets and Four Societal Themes

2.1 Industry Tenets

Five industry tenets have been identified which highlight the attributes of these “great” companies. These tenets are intended to be focused on by the individual company. They include:

- Committed Culture,
- Vibrant Management Systems,

- Disciplined Adherence to Standards,
- Intentional Competency Development, and
- Enhanced Application and Sharing of Lessons Learned.

As expected, a Committed Culture serves as the core of these five tenets. Creating and sustaining a culture which understands and fervently supports the vision through changing times, opportunities, and environments will be key to success in realizing Vision 20/20.

2.2 Societal Themes

Society continually raises expectations for process safety performance, and as such, it has been recognized that various stakeholders will be integral to sustaining and improving the performance of industry. Four societal themes have also been developed, recognizing their importance. They are:

- Enhanced Stakeholder Knowledge,
- Responsible Collaboration,
- Harmonization of Global Standards, and
- Meticulous Verification.

The themes describe the attributes that require collective support for successful fulfilment of Vision 20/20.

2.3 Highlights of the Industry Tenets and Societal Themes

In a **Committed Culture**, executives involve themselves personally, managers and supervisors drive excellent execution every day, and all employees maintain a sense of vigilance and vulnerability.

What does it mean in 20/20? All employees and contractors commit to “do it right” and have a plan for when it goes wrong.

- Executives personally and visibly lead process safety.
- Operators and mechanics diligently follow procedures and speak up when they suspect a problem or see an opportunity for improvement.
- Supervisors and managers verify work is done properly, intervene to correct situations, and openly communicate negative news to management.

What is the value? Doing “the right thing, the right way” shift after shift, day in and day out, prevents incidents.

Vibrant Management Systems are engrained throughout the organization. Vibrant systems readily adapt to the organization’s varying operations and risks.

What does it mean in 20/20? For vibrant management systems to be effective, all employees must clearly understand their role in managing process safety.

The management system:

- Is documented, accessible, and easily used,
- Defines how operations are conducted at the workplace,

- Promotes safety in design, operations, and maintenance, and
- Is agile and continuously improved.

What is the value? Everyone consistently works together towards the same goal of great process safety performance.

Disciplined Adherence to Standards means using recognized design, operations, and maintenance standards. These standards are followed every time, all the time, and are continually improved.

What does it mean in 20/20? Companies identify, document, and diligently follow standards for new designs.

Companies also identify, document, and diligently follow a set of standards applicable to existing equipment. These standards for existing equipment set the minimum expectations for design, operations, and maintenance. Companies identify and manage process safety risks arising from gaps against these standards.

As industry standards evolve, companies codify significant new learnings in their identified standards for existing equipment.

What is the value? Use of standards reduces major accident potential, promotes efficiency, and minimizes opportunities for error in design, operations, and maintenance.

Intentional Competency Development ensures that all employees who impact process safety are fully capable of meeting the technical and behavioral requirements for their jobs.

What does it mean in 20/20? The bottom line: no matter how good the culture or management system is, or how well the company adheres to standards, it takes competent employees to implement those systems and standards.

This requires intentional competency development, which includes understanding competency expectations, providing educational resources, and allowing time for people to build competency.

Intentional competency development applies to all levels in the organization. Competency includes engineers implementing technical designs, operators knowing their process and safe operating limits, and leaders visibly leading process safety.

What is the value? Highly competent people drive great process safety performance and enhance reliability in design and operation.

Enhanced Application & Sharing of Lessons Learned communicates critical knowledge in a focused manner that satisfies the thirst for learning.

What does it mean in 20/20? To reduce incidents, everyone needs to continually learn. We learn from accidents, near misses, industry benchmarking, and success stories.

First, identify the learnings and recognize the value in sharing it with others.

Second, use a system to efficiently share learnings, without overwhelming the organization.

Third, embed the learning in standards or practices, and check if existing equipment or processes require modification.

What is the value? Rapidly sharing lessons drives improvement in company standards and practices and is key to delivering process safety performance.

Enhanced Stakeholder Knowledge promotes understanding of risk among all stakeholders, including the public, government, and industry leaders.

What does it mean in 20/20? Enhanced Stakeholder Knowledge starts in high school where students learn the basic concepts of risk.

Engaging in science, technology, engineering, and mathematics (STEM) education in business and engineering schools allows university students to absorb technical concepts and understand process safety risk.

This Enhanced Stakeholder Knowledge allows the public to effectively challenge industry to prevent process safety incidents. The same holds true for industry challenging the public to understand process safety risks.

What is the value? Understanding risks allows industry and stakeholders to have meaningful two-way conversations addressing public concerns on managing process safety risks.

Responsible Collaboration is a cooperative relationship among regulatory and investigative authorities, labor organizations, communities, research institutions, universities, and industries.

What does it mean in 20/20? Responsible Collaboration means working together on a common goal of excellent process safety performance.

This means seeking to understand each other's point of view and respecting each other's perspective.

This includes removing barriers to sharing and learning from incidents, promoting consistent understanding of risks, and maintaining effective process safety.

What is the value? Everyone working towards the same process safety goal is more efficient and effective.

Harmonization of Global Standards for the safe design, operation, and maintenance of equipment streamlines practices, eliminates redundancy, and cooperatively addresses emerging issues.

What does it mean in 20/20? It is important to communicate requirements consistently... down the street, across the country, and around the world.

Currently, a variety of standards may apply to a single operation, including local, industry, national, and international, which have the potential to conflict with each other. Harmonized standards provide consistent guidance for design, operations, and maintenance, to support effective understanding of process safety risk.

What is the value? Harmonization of Standards leads to efficiency in conforming to applicable standards in local, national, and global commerce.

Meticulous Verification by knowledgeable independent parties helps companies evaluate their process safety programs from an independent perspective.

What does it mean in 20/20? Companies use various assessment techniques to assure their process safety management systems are working as intended.

It will become standard practice for companies to supplement internal audits with competent third-party verification of their engineered systems and process safety management systems.

Third-party technical experts verify specific technical details.

Public and non-governmental organizations evaluate implementation of company process safety programs.

What is the value? Third-party assessments may identify additional opportunities for improvement in company process safety management and can enhance stakeholder relationships.

3 Vision 20/20 Implementation Resources and Tools

The success of Vision 20/20 lies in its ownership by industry and various stakeholders. To aid in propagating the concepts, a number of resources have been created to support the implementation of Vision 20/20. Some of the content is intended to help companies better understand the intent of the vision. Other tools help companies identify opportunities for improvement and bring Vision 20/20 tenets and themes to life.

3.1 Communications

Individuals and companies need to understand and support the concepts of Vision 20/20. Several products have been developed to aid in this communication.

- *Brochure* – This introductory product focuses on communicating the concepts and the business case for Vision 20/20.
- *One-page ‘posters’* – These are simple one-page ‘posters’ on each industry tenet and societal theme and are similar in style to the CCPS Process Safety Beacon. They start to engage people by answering “What is the value?” and prompting them to question “What can I do?” Their content is referenced within *Section 2.3: Highlights of the Industry*

Tenets and Societal Themes. These one-pagers will be distributed worldwide to over a million readers through CCPS’s distribution networks.

- “A day in the life of...” vignettes – To help ‘paint the picture’ of what this company with great process safety performance in Vision 20/20 would look like, a subcommittee created a number of vignettes that describe “A day in the life of...” a CEO, a Unit Manager, a Unit Engineer, and an Academic. These recognize the difference in behavior between 2014 and the envisioned state in 2020. These “A day in the life of” vignettes are included in the Vision 20/20 brochure.
- *Booklet of ‘posters’* – The simple one-page posters on each industry tenet and societal theme have been compiled into a booklet. This booklet is also available in Spanish.

The above resources are available at: <http://www.aiche.org/ccps/resources/vision-2020> and are in the process of being translated into the Spanish, Portuguese and Mandarin languages.

3.2 Implementation Tools

Recognizing an opportunity to promote efficient adoption of Vision 20/20 within industry, an *Implementation Guide* was created. This document highlighting a six-point process ranging from preparation to sustaining great process safety performance, and is highlighted in Figure 2.



Figure 2. Vision 20/20 Implementation Guide

A key reference within this implementation plan is the Vision 20/20 *Industry Tenet Assessment Tool*. This simple-to-use spreadsheet tool describes ‘what good looks like’ in terms of attributes

of a company with great process safety performance. Companies that embrace the tenets in Vision 20/20 may find value in a tool to assess their position relative to the vision.

The assessment tool differentiates mediocre performance from great performance for each of the industry tenets so that companies can recognize and prioritize their biggest opportunities for improvement. It consists of a series of indicators that industry experts have developed based on their experience. This assessment tool has proven to be a valuable aid to companies trying to use Vision 20/20 concepts by discussing the statements in small groups. The indicators are described as being present: Always, Most of the time, Some of the time, and Infrequently/Never (See Figure 3), and results are generated in a number of formats (See Figures 4 and 5). *Note: These figures have been generated using a fictitious assessment.*

In current development is a *Resource Listing*, highlighting previously published resources (e.g. documented references and training materials) that can be used to address identified gaps. While some gaps may require new tools and guidelines, many gaps can be addressed using existing resources. For this resource list, we will seek resources from around the world which apply to the five industry tenets.

Vibrant Management Systems				
All employees must clearly understand their role in managing process safety.	Always	Most of Time	Some of Time	Infrequent or Never
All employees can describe their site barriers (what they are, what they are for, how they work) that control major accident hazards and risks.	x			
All employees can describe their roles and responsibilities in maintaining barriers to prevent major accidents.	x			
The management system is documented, readily accessible by all employees, and easily used to access process safety content.	x			
Management system includes all 20 elements of CCPS's Guidelines for Risk Based Process Safety.	x			
Management system includes all process safety elements required by local regulations.		x		
Management system is not solely at the company level; rather, it cascades from a corporate system to regional requirements to site activities.		x		
Average score	3.67			
The management system defines how operations are conducted at the workplace and promotes safety in design, operations, and maintenance.	Always	Most of Time	Some of Time	Infrequent or Never
The management system defines the process safety-related activities that are conducted (e.g. hazard identification, MOCs, incident investigation, and action item tracking).	x			
The management system refers to specific tools used to perform process safety related activities (e.g. hazard identification, MOCs, incident investigation, and action item tracking).		x		
Managers have a structured management review process (see CCPS's Guidelines for Risk Based Process Safety) for process safety elements and generate actions to address identified issues.			x	
The management system ensures employees are assigned to roles based on their competency to perform the tasks expected of that role.				x
Average score	2.50			

Figure 3. Industry Tenet Assessment Tool Indicators and Interface

Summary Page

Industry Tenet	Total Avg Score	Evidence	Total Score
Committed Culture	1.67	Executives personally and visibly lead process safety.	1.00
		Operators and mechanics diligently follow procedures and speak up when they suspect a problem or see an opportunity for improvement.	2.50
		Supervisors and managers verify work is done properly, intervene to correct situations, and openly communicate negative news to management.	2.00
		All employees and contractors commit to "do it right" and have a plan for when it goes wrong.	2.60
Vibrant Management Systems	2.79	All employees must clearly understand their role in managing process safety.	3.67
		The management system defines how operations are conducted at the workplace and promotes safety in design, operations, and maintenance.	2.50
		The management system is agile and continually improved.	1.75
Disciplined Adherence to Standards	2.54	Companies identify, document, and diligently follow standards for new equipment.	4.00
		Companies also identify, document, and diligently follow a set of standards applicable to existing equipment.	2.50
		Companies identify and manage process safety risks arising from gaps against these standards.	1.60
		As industry standards evolve, companies codify significant new learnings in their identified standards for existing (and new?) equipment.	3.00
Intentional Competency Development	3.15	Intentional competency development includes understanding competency expectations, providing educational resources, and allowing time for people to build competency.	4.00
		Intentional competency development applies to all levels in the organization.	3.00
		Competency includes engineers implementing technical designs.	2.00
		Competency includes operators knowing their process and safe operating limits.	3.33
		Competency includes leaders visibly leading process safety.	3.33
Enhanced Application and Sharing of Lessons Learned	2.79	We learn from accidents, near misses, industry benchmarking, and success stories.	3.67
		First, identify the learnings and recognize the value in sharing it with others.	3.57
		Second, use a system to efficiently share learnings, without overwhelming the organization.	2.00
		Third, embed the learning in standards or practices, and check if existing equipment or processes require modification	1.60

Figure 4. Industry Tenet Assessment Summary Page

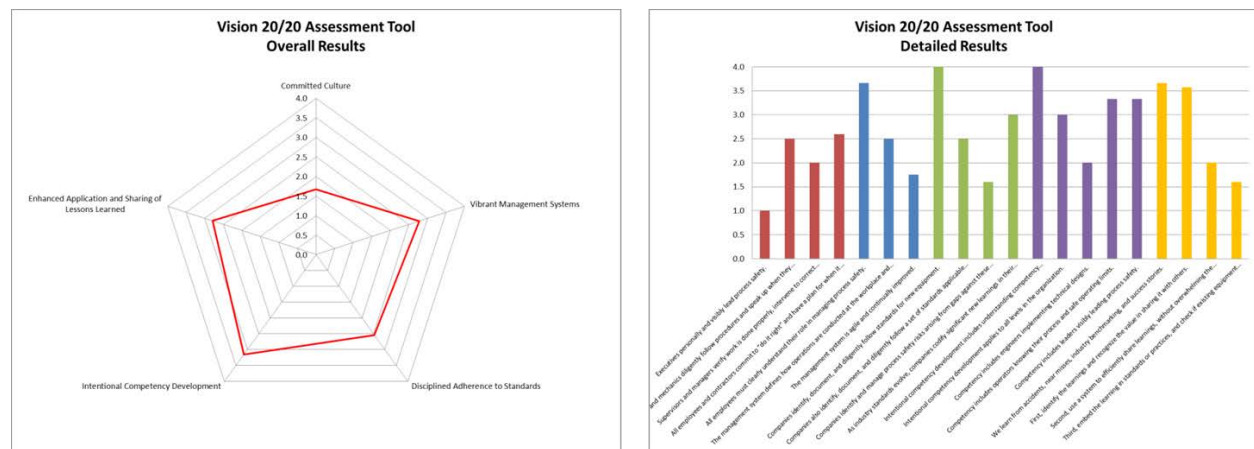


Figure 5. Industry Tenet Assessment Results

3.3 Global Benchmarking

Starting at the 11th Global Congress on Process Safety in April 2015, a series of benchmarking activities have been conducted by CCPS worldwide, using the Industry Tenet Assessment Tool. An update of the results will be shared during the MKOPSC International Symposium.

4 Call to Action

The tools that have been developed will help companies understand the concepts in Vision 20/20 and will aid companies who want to respond to the ideas. Developing the tools does not reduce risk for any company. Only you can further reduce risk by using the tools to improve your

company's performance. CCPS has taken the first step in creating Vision 20/20. We now challenge you join us. Help bring the Vision 20/20 to life.

Get personally involved – not week, next month, next year - but now! Personally take on board and communicate the five industry tenets and four societal themes. Evaluate your company performance relative to the tenets and themes and take action to improve where needed. Prompt others to change behaviors and to support a common vision for great process safety performance. We look forward to working together with you to achieve Vision 20/20.

5 References

- 1) Center for Chemical Process Safety. History. <http://www.aiche.org/ccps/about/history>
- 2) Center for Chemical Process Safety. Vision 20/20. <http://www.aiche.org/ccps/resources/vision-2020>
- 3) “Vision 20/20 - Delivering Great Process Safety Globally”, C. Grounds, J. McCavit, presented at the Offshore Technology Conference (OTC), 6 May 2015.
- 4) “Vision 20/20 Implementation Tools”, J. McCavit, C. Grounds, presented at the IChemE Hazards 25 Conference, 13 May 2015.

6 Acknowledgements

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Vision 20/20 Project Committee Members

Cheryl Grounds – BP, Committee Chair
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