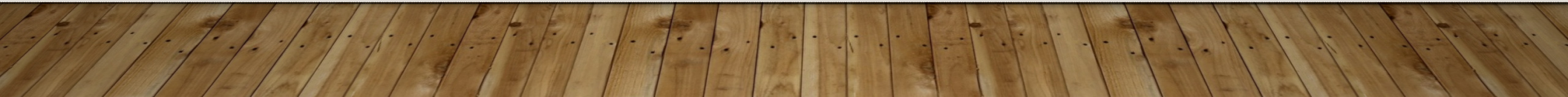


# UNDERSTANDING RAGAGEP

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WHAT IS AND IS NOT RAGAGEP



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**Say What You Do, and Do What You Say**

**BACKGROUND AND INTERPRETATIONS**

# DEFINITION OF A RAGAGEP

## FED/OSHA JUNE 8, 2015 MEMO BY JIM LAY

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- **RAGAGEP** Background
- Recognized and Generally Accepted Good *Engineering Practices* (RAGAGEP)
  - No definition for RAGAGEP in PSM Standard or OSHA administrative guidance.
  - Preamble to PSM Standard states that."[RAGAGEP] would include appropriate internal standards of a facility, as well as codes and standards published by NFPA, ASTM, ANSI,

# DEFINITION OF A RAGAGEP (FED/OSHA 2015 MEMO)

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- **RAGAGEP Background**
- Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)
- The term is referenced four times in the PSM Standard:
  - Paragraph (d)(3)(ii) requires employers to document that process equipment complies with RAGAGEP;
  - Paragraph (d)(3)(iii) addresses situations where the design codes, standards, or practices used in the design and construction of existing equipment are no longer in general use. In such cases, the employer must determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.
  - Paragraph (j)(4)(ii) requires that testing and inspecting procedures of process equipment to comply with RAGAGEP.
  - Paragraph (j)(4)(iii): Inspection and test frequency follows manufacturer's recommendations and good engineering practice, and more frequently if indicated by operating experience.

## DEFINITION OF A RAGAGEP (FED/OSHA)

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- May 11, 2016 - OSHA publishes a revised memo defining Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for the first time.
- 4 categories of acceptable RAGAGEP:
  - (1) Published and widely adopted codes (e.g., NFPA 70 National Electric codes);
  - (2) Published consensus documents (e.g., ASME B31.3 Process Piping Code);
  - (3) Published non-consensus documents (e.g., the Chlorine Institute's (CI) "pamphlets" that depart from ANSI's due process requirements for rulemaking and specifically focus on chlorine and sodium hypochlorite (bleach) safety); and
  - (4) "Appropriate" internal standards set by the employer (**Not in 5189.1**)

# DEFINITION OF A RAGAGEP (FED/OSHA)

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- **Shall vs. Should in Published Codes/Standards**

- **Shall**

- OSHA considers “shall” requirements to be “a mandatory minimum requirement.”
- OSHA will presume a violation if an employer deviates from either a “shall” or “shall not” requirement in the applicable RAGAGEP.

- **Should**

- “Should” requirements are the “acceptable and preferred approach.”
- OSHA presumes that employer compliance with the recommended approach is acceptable.
- If an employer does not follow a “should” requirement, the compliance officer will do an evaluation to decide if the alternative practice is as protective as the “should” provision in the code or standard.
  - Compliance officer will examine documents (e.g., PHAs and MOCs) to determine if the employer’s approach is as protective as the published RAGAGEP and is a good engineering practice.



## DEFINITION OF A RAGAGEP (FED/OSHA)

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- **Internal Standards**
- ~~Employers' internal standards must either meet or exceed the protective requirements of published RAGAGEP where such RAGAGEP exist. (2015)~~
- **If an employer develops and follows internal procedures, the CSHO should assess whether the internal procedures represent RAGAGEP. Like all employers complying with the PSM standard, an employer using internal procedures as RAGAGEP has an obligation under 1910.119(d)(3)(ii) to document that its equipment complies with recognized and generally accepted good engineering practices. (Revised 2016)**

# DEFINITION OF A RAGAGEP (FED/OSHA)

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- Internal Standards
  - Reasons an employer might choose to follow internal standards can include:
    - Translating the requirements of published RAGAGEP into detailed corporate or facility implementation programs and/or procedures.
    - Setting design, maintenance, inspection, and testing requirements for unique equipment for which no other RAGAGEP exists.
    - Supplementing or augmenting RAGAGEP selected by the employer that only partially or inadequately address the employer's equipment.
    - Controlling hazards more effectively than the available codes and consensus and/or non-consensus documents when deemed necessary by the employer's PSM program.
    - Addressing hazards when the codes and consensus and/or non-consensus documents used for existing equipment are outdated and no longer describe good engineering practice.



# DEFINITION OF RAGAGEP :TITLE 8 §5189 PSM

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- Title 8 5189 Process Safety Management
- OSHA 2016 - OSHA publishes revised memo defining Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)
- As used in the PSM standard, RAGAGEP apply to process equipment design and maintenance; inspection and test practices; and inspection and test frequencies.

# RAGAGEP APPLIES

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- As used in the PSM standard , RAGAGEP apply to process equipment design and maintenance; inspection and test practices; and inspection and test frequencies
- What it does NOT apply to is (Discuss):
  - ANSI/IIAR Standard 7-2013 Developing Operating Procedures for Closed-Circuit Ammonia Mechanical Refrigerating Systems
  - ASHRAE Standard I 5-2016, Safety Standard for Refrigeration Systems, does not require that SCBA's be placed outside of the refrigeration machinery room.
  - ANSI/IIAR 5 Startup and Commissioning of Ammonia Refrigeration Systems

# DEFINITION OF RAGAGEP:

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- Title 8 5189.1 for Refineries - Definition of Recognized and Generally Accepted Good Engineering Practices:
  - Engineering operation or maintenance activities established in codes, standards, technical reports or recommended practices, and published by recognized and generally accepted organizations the American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), American Society of Mechanical Engineers (ASME), American Society of Testing and Materials (ASTM), National Fire Protection Association (NFPA), and Instrument Society of America (ISA). RAGAGEP does not include standards, guidelines or practices developed for internal use by the employer.

# RAGAGEP USED IN: 5189.1 (D)(7)(8)(9)

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- (7) The employer shall document that process equipment complies with RAGAGEP, where RAGAGEP has been established for that process equipment, or with more protective internal practices that ensure safe operation.
- (8) If the employer installs new process equipment for which no RAGAGEP exists, the employer shall document that this equipment is designed, constructed, installed, maintained, inspected, tested and operating in a safe manner.
- (9) If existing process equipment was designed and constructed in accordance with codes, standards or practices that are no longer in general use, the employer shall document that the process equipment is designed, installed, maintained, inspected, tested and operating in a safe manner for its intended purpose .

# RAGAGEP USED IN 5189.1- (J)(2)(A)(B) AND (3)(A)

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- (2) Inspection and testing.
  - (A) Inspections and tests shall be performed on process equipment using procedures that meet or exceed RAGAGEP.
  - (B) The frequency of inspections and tests shall be consistent with: (1) the applicable manufacturer's recommendations, (2) RAGAGEP or (3) internal practices that are more protective than (1) or (2). Inspections and tests shall be conducted more frequently if necessary, based on the operating experience with the process equipment.
- (3) Equipment deficiencies.
  - (A) The employer shall correct deficiencies to ensure safe operation of process equipment. Repair methodologies shall be consistent With RAGAGEP or more protective internal practices.

## **RAGAGEP USED IN 5189.1- (4) QUALITY ASSURANCE.**

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- (B) If the employer installs new process equipment or has existing process equipment for which no RAGAGEP exists, the employer shall document and ensure that this equipment is designed, constructed, installed, maintained, inspected, tested and operating in a safe manner.



# RAGAGEP APPLIES

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- As used in the PSM standard, RAGAGEP apply to process equipment design and maintenance; inspection and test practices; and inspection and test frequencies. Examples:
  - API 510 Pressure Vessel Codes
  - API 537 Flare System
  - API 570 Pipe Inspection Code
- What it does NOT apply to is:
  - API/RP 755 Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries
  - API Environmental Health & Safety Mission and Guiding Principles
  - Most CCPS Books

## CAL/OSHA USE OF THE WORD “SHOULD” IN RAGAGEP

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- Use of the term "should" or similar language in RAGAGEP denotes a recommendation that reflects an acceptable and preferred practice. If a "should" provision in the employer's selected RAGAGEP is applicable to the covered process or particular situation, the CSHO will presume that the employer's compliance with the recommended practice is acceptable.
- If an employer selects RAGAGEP that contains "should" provisions, but does not follow them, the CSHO will evaluate whether the employer's approach reflects recognized and generally accepted good engineering practices and whether the employer documented that its equipment complies with RAGAGEP. An employer does not need to document deviations from a "should" statement provided it documents that its equipment complies with RAGAGEP.

## BRAIN TEASER 5189.1

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MOC (n)(3) Prior to implementing a major change, the employer shall review or conduct a DMR pursuant to subsection (k) and perform an HCA pursuant to subsection (l). The findings of the DMR and recommendations of the HCA shall be included in the MOC documentation.

Major Change. Any of the following:

- Introduction of a new process, new process equipment, or new highly hazardous material;
- Any operational change outside of established safe operating limits; or,
- Any alteration that introduces a new process safety hazard or worsens an existing process safety hazard.

Process Equipment. Equipment, including pressure vessels, rotating equipment, piping, instrumentation, process control, or appurtenance, related to a process.

# SAFETY SHOWERS IN ENGINE ROOMS WHAT'S EVERYONE GETTING ALL WET ABOUT?

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## **T8 §5162. EMERGENCY EYEWASH AND SHOWER EQUIPMENT.**

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(a) Plumbed or self-contained eyewash or eye/facewash equipment which meets the requirements of sections 5, 7, or 9 of ANSI Z358.1-1981, Emergency Eyewash and Shower Equipment. incorporated ...reference, shall be provided at all work areas ..., during routine operations or foreseeable emergencies, the eyes of an employee may come into contact with a substance which can cause corrosion, severe irritation or permanent tissue damage or which is toxic by absorption. Water hoses, sink faucets, or showers are not acceptable eyewash facilities. Personal eyewash units or drench hoses which meet the requirements of section 6 or 8 of ANSI Z358.1-1981



## T8 §5 I 62. EMERGENCY EYEWASH AND SHOWER EQUIPMENT.

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(c) Location. Emergency eyewash facilities and deluge showers shall be in accessible locations *that require no more than 10 seconds for the injured person to reach*. If both an eyewash and shower are needed, they shall be located so that both can be used at the same time by one person. *The area of the eyewash and shower equipment shall be maintained free of items which obstruct their use.*



# ANSI Z358.1-1981

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- ANSI Z358.1 - 1981 Section 5.4.4 states in part
  - *"Eyewash Units shall be in accessible locations that require no more than 10 seconds to reach and should be within a travel distance no greater than 30.5 meters (100 feet) from the hazard. The unit should be located as close to the hazard as possible ...for a strong acid or caustic, the eyewash should be immediately adjacent to or within 3 meters (10 feet) of the hazard ."*

# THINGS TO THINK ABOUT ...

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- What is an obstruction?
- What is accessible location ?
- How far can you walk in 10 seconds?
- Is anhydrous ammonia a "strong acid."?
- Catastrophic Release?

# THINGS TO THINK ABOUT ...

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- What is an obstruction?
  - Z358.1-2009 Appendix B.5 states "A door is considered an obstruction:"
- What is accessible location?
  - No more than 10 seconds. The average person travels 55 feet in 10 seconds(!)
- How far can you walk in 10 seconds? See above.
- Is anhydrous ammonia a "strong acid."?
  - No it is a strong base 11.6pH. Ammonia is a strong alkali (caustic) and readily damages all body tissues.

# THINGS TO THINK ABOUT ...

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- **Catastrophic Release?**

- 2010 Tulare ammonia safety day; out of 800 representing ammonia refrigeration facilities, two have seen a catastrophic release of anhydrous ammonia. Everybody in the last 3 years have seen a "minor" release.

## IIAR 2 §6.3 .1.4

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- **Eye-wash & Shower Station**
  - Located outside exit door and another **recommended** *inside machinery room*

*Is there a conflict?*

## **LET'S DISCUSS ...**

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- Enforcement (by Cal/OSHA)
- IIAR 2 §6.3.1.4 vs. T8 §5162



# TWO SCBAS ARE REQUIRED AT EACH FACILITY OUTSIDE THE ENGINE ROOM

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- ASHRAE 15 1994
- I 1.6 Self-Contained Breathing Apparatus (SCBA) ... At least one approved self-contained breathing apparatus, suitable for the refrigerant used, shall be located outside of, but close to, the machinery room. A second, backup, self-contained breathing apparatus shall also be provided .

# TWO SCBAS ARE REQUIRED AT EACH FACILITY OUTSIDE THE ENGINE ROOM

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- ADDENDUM D to ASHRAE Standard IS-20 16, Safety Standard for Refrigeration Systems, does not require that SCBA's be placed outside of the refrigeration machinery room.
- A BIG NOTE, It is important to note that the change to Standard IS for SCBAs required outside of machinery rooms does not imply that personal protective equipment is no longer needed. Specific requirements for respiratory protection are generally established by other agencies.

# LETS DISCUSS ...

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- Recognized and Generally Accepted Good *Engineering Practices*
  - Definition: AS used in the PSM standard, **RAGAGEP** apply to process equipment design and maintenance; inspection and test practices: and inspection and test frequencies .
- Definition of Good Engineering Practice
  - The application of engineering, operating or maintenance activities derived from engineering knowledge and industry experience based upon the evaluation and analyses of appropriate internal and external standards, applicable codes, technical reports, guidance, or recommended practices or documents of a similar nature.

# LETS DISCUSS ...

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- Self-Contained Breathing Apparatus (SCBA) ...At least one approved self-contained breathing apparatus ..... shall be located outside of, but close to, the machinery room. A second, backup, self-contained breathing apparatus shall also be provided .
- Definition of use of SCBA: A self-contained breathing apparatus (SCBA) is a device worn by rescue workers, firefighters, and others to provide breathable air in an immediately dangerous to life or health atmosphere (IDLH).
- IS the use of an SCBA as defined in ASHRE 15 11.6 a RAGAGEP?
- If not, is there a violation ?

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# QUESTIONS

