

RETA Chapter Meeting Schedule

ARIZONA

PHOENIX

4th Thursday; 6 pm

SOUTHWEST

2nd Wednesday; 6 pm

ARKANSAS

NORTHWEST ARKANSAS

2nd Thursday; 6 pm

CALIFORNIA

BAY AREA

3rd Wednesday; bi-monthly;
6:30 pm

CALIFORNIA CHAPTER #2

3rd Wednesday; 6 pm

No meeting in December

CENTRAL VALLEY

3rd Thursday; 6:30 pm

INLAND EMPIRE

3rd Tuesday; 6 pm

KERN

Last Wednesday; 7 pm

MONTEREY BAY

3rd Wednesday; 6 pm

SAN JOAQUIN

2nd Tuesday; 6 pm

SANTA MARIA

Last Thursday; 6 pm

No meeting December

DELAWARE

DELMARVA

3rd Tuesday; 6:30 pm

FLORIDA

CENTRAL FLORIDA

3rd Thursday; 6:30 pm

NORTH FLORIDA

2nd Thursday; 6:30 pm

No meeting in July or October

SOUTH FLORIDA

2nd Thursday

GEORGIA

ATLANTA

2nd Thursday; 6:30 pm

No meeting in June or July

IDAHO

TREASURE VALLEY

3rd Tuesday

PSM/RMP Compliance



MECHANICAL INTEGRITY - WHERE DO WE START? 40 CFR 68.73 & OSHA 1910.119 (j)

By Lee Pyle and Jeanna Emmons, SCS Tracer Environmental

When sitting down to prepare your written Mechanical Integrity program for compliance with EPA's Risk Management Program, OSHA's Process Safety Management Program, or under the General Duty Clause, let us consult Webster's Dictionary to better detail what is meant by **mechanical** and **integrity**.

- Mechanical: (a)(1) of or relating to machinery or tools (2) produced or operated by a machine or tool <mechanical power> <a mechanical refrigerator> <a mechanical saw> (b) of or relating to manual.
- Integrity: (1) firm adherence to a code of especially moral or artistic values (**incorruptibility**) (2) an unimpaired condition (**soundness**) (3) the quality or state of being complete or undivided (**completeness**)

Taking these definitions into account, we need to prepare a document that ensures the soundness of our mechanical refrigeration system.

The regulations require that we have maintenance procedures for: Pressure vessels and storage tanks;

- Piping systems;
- Relief and vent systems;
- Emergency shutdown systems;

- Controls; and
- Pumps.

In the event new equipment is installed or old equipment is replaced, the maintenance procedures are required to be updated/revised accordingly.

In addition, the written program must demonstrate that all **affected** employees have been trained on these maintenance procedures. **Affected**, means those that are using the procedures to conduct their job tasks. When writing the written mechanical integrity program, ensure that there are training policies in place that document that each employee responsible for an inspection or test has been trained in the steps necessary to complete those inspections and/or tests. (1910.119(g)(5)). This training is required to include, an overview of the process and its hazards as well as procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

The regulation also requires that an employer ensure that maintenance, testing, and inspections are performed regularly and are **documented**. This documentation must include the equipment name/serial number, the name of the person completing the task, the date of the inspection/test, description of the

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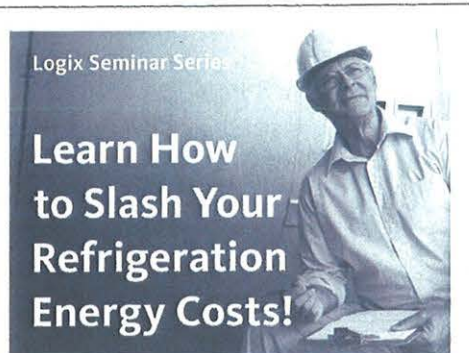
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inspection/test performed, and the results of the inspection/test (1910.119(j)(4)(iv)).

Basis for schedules, tests, inspections (1910.119(j)(4)(iii)) are to include the following:

- Manufacturer's Recommendations
- Facility History
- Industry Standards

In the event any of the above are not followed, ensure to note the reason within the Process Safety Management, Mechanical Integrity program.



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Manufacturer Recommendations, is simple, ensure the preventative maintenance schedules include recommendations from the manufacturer. Pay particular attention to safety functions, i.e. compressor cutouts, ammonia sensors, etc.

Facility History, based on operating history, the preventative maintenance schedule can be altered to better meet the needs of the system.

Industry Standards, such as the International Institute of Ammonia Refrigeration (IIAR) Bulletin 110, Guidelines for Start-up, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems, includes frequencies for various visual inspections and tests. These items could be used when no manufacturer's recommendations exist such as in the case of vessels and piping.

Examining the IIAR Bulletin 110 in more depth, is Chapter 6, Inspection and Maintenance, Section 6.4.4, Independent Full Inspection which states:

"At least every five years, the annual inspection of the vessels and heat exchangers shall be carried out by a competent person independent of immediate commercial and production pressures for that installation, who shall carry out whatever examinations and tests he may consider necessary in order to determine that the equipment is safe for further use or in order to specify such repairs that may be necessary."

What is a competent person?

A competent person is a person who is **capable** of identifying existing and predictable hazards in the surroundings or

RETA Chapter Meeting Schedule

ILLINOIS

CHICAGO

2nd Wednesday; 5:30 pm

INDIANA

FT. WAYNE

2nd Thursday; 5:30 pm

KANSAS

GOLDEN PLAINS

To be determined

MINNESOTA

NORTHERN PLAINS

3rd Thursday; 6 pm

N/S CAROLINA

CAROLINAS (NC)

2nd Thursday; time varies

No meeting in June, July or August

GREATER RALEIGH (NC)

2nd Wednesday; time varies

No meeting in June, July or August

NEBRASKA

OMAHA

Not Scheduled

NEVADA

SOUTHERN NEVADA

2nd Monday; 5 pm

NEW YORK

WESTERN NEW YORK

3rd Tuesday; 6 pm

OHIO

COLUMBUS

to be determined

OREGON

WILL H. KNOX

2nd Tuesday

OKLAHOMA

TULSA

2nd Tuesday; 6:30 pm

PENNSYLVANIA

NORTHEASTERN (NEPA)

4th Thursday; 6 pm

SOUTHEASTERN (SEPA)

2nd Tuesday; 6:30 pm

No meeting in June, July or August

PHILADELPHIA

3rd Thursday; 6 pm

No meeting in June, July or August

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RETA Chapter Meeting Schedule

TEXAS

HIGH PLAINS

3rd Tuesday; 7 pm

DALLAS/FT. WORTH

3rd Thursday; 7 pm

HOUSTON

4th Thursday; 6:30 pm

No meeting in July, November or December

WACO

to be determined

VIRGINIA

OLD DOMINION

2nd Thursday; 6:30 pm

WASHINGTON

TRI CITIES

2nd Thursday; 6 pm

PUGET SOUND

2nd Wednesday; 6 pm

WISCONSIN

MADISON

2nd Tuesday; 6 pm

No meeting in June, July or August

MILWAUKEE

2nd Thursday; 5 pm

No meeting in June, July or August

WESTERN WISCONSIN

2nd Wednesday; 5:30 pm

No meeting in June, July or August.

MECHANICAL INTEGRITY - WHERE DO WE START? 40 CFR 68.73 & OSHA 1910.119 (j)

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working conditions that are unsanitary, hazardous, or dangerous to employees.

Some tasks that may be included in an independent five-year independent mechanical integrity inspection include, but are not limited to:

- Visual inspection of all applicable equipment and associated piping
- Interview with maintenance personnel
- Review of maintenance records
- Review of ammonia incident reports
- Review of manufacturer's O&M manuals
- Water test
- Non-Condensable Test
- Observe test of safety shut-off functions (e.g. compressor cut-outs, high/low levels on vessels, detection system, etc.)
- Non-Destructive Testing

Some areas of concern to look for when conducting the five-year independent mechanical integrity inspection (or anytime for that matter) include, but are not limited to:

- Rusted or Corrosion of Piping
- Compromised Vapor Barrier
- Location of relief valve discharge
- Date Tag on Relief Valves
- Trends on Daily Log Sheets
- Functionality of Key Switches
- Labeling
- Cleanliness
- Storage of New and Used Oil
- Proper ASME Identification and Corresponding Manufacturer's Data Reports

Corrosion is defined as *"the deterioration of a material, usually a metal, by reaction with its environment."*

The National Association of Corrosion Engineers (NACE) has identified some reasons and preventative measures for corrosion:

- **An anodic-cathodic reaction**
- When positive ions travel through an electrolyte (i.e. water, ice, etc.) Controlling water is essential!!
- **When the material is sacrificed**
- General (Uniform) Corrosion
- Pitting Corrosion

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Industry News

Stellar Launches Food for Thought Blog

Stellar recently launched Food for Thought, a blog serving the food processing and distribution industry. The Blog will cover a range of topics such as food safety, energy efficiency, processing trends, design-build best practices, advances in refrigeration, new technologies, materials and techniques. Each month the blog will feature four posts (one each week) focusing on a specific area of the company's expertise.

Stellar is an architecture, engineering, construction and mechanical services firm. For more information, visit www.stellar.net.

MECHANICAL INTEGRITY - WHERE DO WE START? 40 CFR 68.73 & OSHA 1910.119 (j)

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- **Gradual erosion of wall material**
- Similar effect to sandpaper on wood
- May be small pits present
- Danger is from wall thinning sufficient to allow cracking

Corrosion Under Insulation (CUI) is general corrosion that occurs undetected under piping insulation which can occur due to:

- Water infiltrates the insulation system through a break in the jacket/vapor barrier.
- Insulation then becomes an enabler which aids in corrosion by holding the water tight to the pipe.

Pipe must also be without or have a failure in the surface protection (i.e. pipe paint).

Issues associated with wet suction piping:

- Vapor sits in bottom of pipe.
- Bottom is always frozen.
- Top can freeze-thaw.
- CUI at mid-pipe or higher.
- Look for bottom frost/water.


Some thoughts on rust or corrosion preventative measures:

- Use of Coatings that are Impervious to Moisture.
- Properly Replace Insulation, when repairs require removing existing insulation.
- Keep Un-Insulated Metal Surfaces Painted.
- Use Only Tested And Proven Insulation/Vapor Barrier Materials and Methods.
- Include Checking for Rust and/or Corrosion on System Logs.

Other things to look for when conducting your mechanical integrity inspections whether at the five-year interval or sooner:

- Liquid Hammering (Liquid Slugging)
- Vibration of Pipe
- Equipment Moving and/or Shaking
- Pipe Swaying
- Loud Noises
- Pipe Movement
- Ice Build-Up On Evaporators
- Moisture Accumulation On Vessels Or Piping
- Un-Protected Piping/Equipment From Fork Lift Or Other Vehicles

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