



Conducting Effective Ammonia Refrigeration Audits and Inspections

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Training Assumptions

- Class is set to an advanced journey level for CalARP inspectors who have read, understand, apply the laws and regulations and understand the anhydrous ammonia refrigeration process regulated by CalARP.
- Part 2 of this class, Applications of P&ID Drawings within Select Prevention Program Elements.



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Agenda

- Review Handouts Provided
- Some Key Definitions
- Applicability and Program level
- CalARP Only Process Safety Rules
- RMP Submission requirements
- Some Elements of RMP



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Review Handouts Provided

- Handout 1 – EPA Accident Prevention and Response Manual
- Handout 2 – EPA Compliance Assistance Tools
- Handout 3 – OSHA Interpretive Letter PSM compliance
- Handout 4 – Brass Policy – SWP Concept
- Handout 5 – ANSI/IIAR Standards list



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CalARP Laws/Regulations Intent



- Accidental Release Prevention
- If a release does occur, minimize community and environmental impacts



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Inspection defined

Inspection as referenced in *CCR 2775.3*

- Site visit to evaluate compliance with laws and regulations and provisions of site RMP;
- Enforcement activity
- CUPA must inspect every 3 years



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Audit defined

Audit as referenced in CCR §2775.2

- CUPA evaluates adequacy of the site RMP itself in compliance with laws and regulations and provisions of site RMP.
- CUPA may evaluate full RMP or certain parts of the RMP
- Regulation contains list of criteria CUPA may use to select a stationary source for audit, like accident history and proximity of public and environmental receptors



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Audit defined, continued

- Not an enforcement activity
- CUPA must perform an audit “periodically” and timeline is not defined
- Following audit, CUPA may issue a preliminary determination that RMP must be revised. See CCR §2775.2 for audit process



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CalARP RMP submission

Owner Operator certification

- For all other covered processes, the owner or operator shall submit in the RMP a single certification that, to the best of the signer's knowledge, information, and belief formed after reasonable inquiry, the information submitted is **true, accurate, and complete**.

*bold item added for emphasis



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Ow/Op Certification – What does it mean?

- Have read and understood CalARP laws/regulations
- Have read and understood and deemed RMP complete and compliant with laws and regulations
- Understands how to implement the RMP onsite



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CaIARP RMP Elements

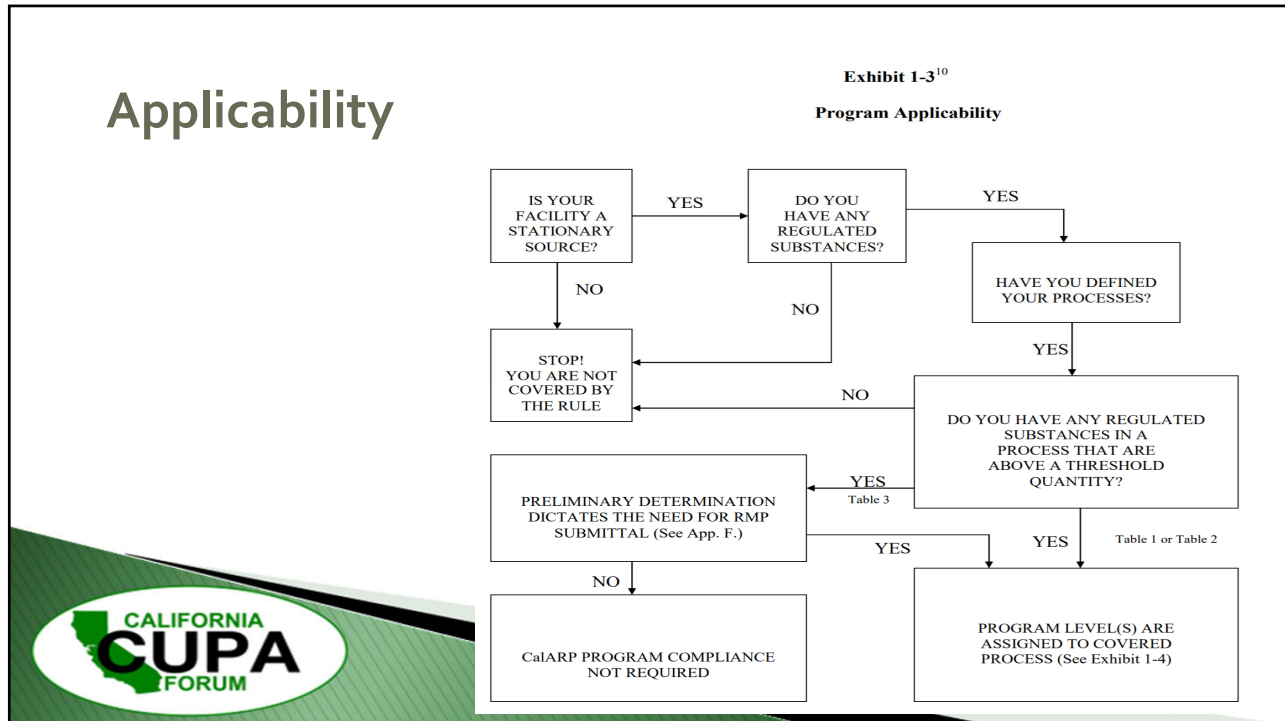
PROGRAM REQUIREMENT	CALARP	EPA	CALOSHA	OSHA
Program Levels 1, 2, and 3	Yes	Yes	No	No
Management System	2735.6	68.15		
Hazard Assessment/Offsite Consequence Analysis	2750.1-9	68.20 -42		
Process Safety Information	2760.1	68.65	5189(d)	1910.119(d)
Process Hazard Analysis	2760.2	68.67	5189(e)	1910.119(e)
Operating Procedures	2760.3	68.69	5189(f)	1910.119(f)
Training	2760.4	68.71	5189(g)	1910.119(g)
Mechanical Integrity	2760.5	68.73	5189(j)	1910.119(j)
Management of Change	2760.6	68.75	5189(l)	1910.119(l)
Pre-Startup Safety Review	2760.7	68.77	5189(i)	1910.119(i)
Compliance Audit	2760.8	68.79	<i>IIPP</i>	1910.119(o)
Incident Investigation	2760.9	68.81	5189(m)	1910.119(m)
Employee Participation	2760.10	68.83	5189(p)	1910.119(c)
Hot Work Permits	2760.11	68.85	5189(k)	1910.119(k)
Contractors	2760.12	68.87	5189(h)	1910.119(h)
Emergency Planning & Response	2765.1 – 2	68.95	5189(n)	1910.119(n)
Trade Secrets				1910.119(p)

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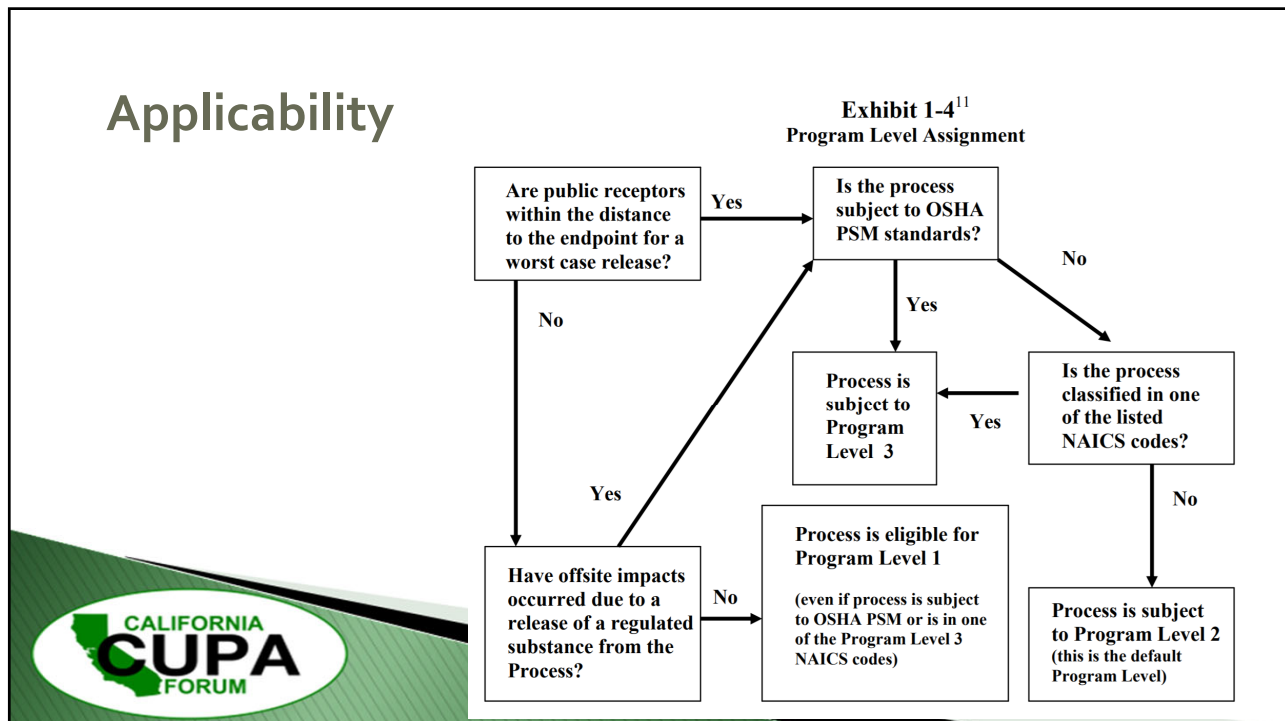
	Program 1	Program 2	Program 3
Executive Summary	Executive Summary	Executive Summary	Executive Summary
Worst-case release analysis	Worst-case release analysis	Worst-case release analysis	Worst-case release analysis
		Alternative release analysis	Alternative release analysis
5-year accident history	5-year accident history	5-year accident history	5-year accident history
		Document management system	Document management system
Prevention Program			
Certify no additional prevention steps needed	Safety Information	Process Safety Information	
	Hazard Review	Process Hazard Analysis	
	Operating Procedures	Operating Procedures	
	Training	Training	
	Maintenance	Mechanical Integrity	
	Incident Investigation	Incident Investigation	
	Compliance Audit	Compliance Audit	
		Management of Change	
		Pre-Startup Review	
		Contractors	
		Employee Participation	
		Hot Work Permits	
Emergency Response Program			
Coordinate with local emergency responders	Develop a plan and program (if applicable) and coordinate with local emergency responders	Develop a plan and program (if applicable) and coordinate with local emergency responders	
Submit One Risk Management Plan for All Covered Processes			



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CalARP RMP 5-Year Update Program 3

- PHA Report
- Offsite Consequence Analysis Report
- Owner/Operator Certification
- CalARP Registration form
- US EPA RMP*eSubmit Report



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Slido Poll 1 – True or False

As a CUPA inspector - does a CalARP 5-Year RMP Update submission is an EPA RMP*eSubmit Report, PHA Report, and OCA modeling report?

True

False

EPA FACILITY ID: 10000026454 @ Test Facility 1 Correction: 02/19/2009 16:25:31

Section 6. Five-Year Accident History

Accident 1

Status:			
APPROD			
6.1 Date of accident	02/19/2009		
6.2 Time accident began	7:00 AM		
6.3 TRAC Code of primary incident	22131 (Other Safety and Inspection Systems)		
6.4 Release duration	0 Hours 15 Mins		
6.5 Chemicals involved			
Chemical Name	CAS Number	Quantity released (lbs)	Percent weight of chemical if in mixture
Dibenz	7782-50-3	200	100
6.6 Release Event			
6.6.a. Gas release	Y		
6.7 Release Source	Y		
6.7.a. Storage vessel	Y		
6.7.b. Piped	Y		
6.8 Weather conditions at time of event			
6.8.a. Wind speed and direction	3 mph/hr 30		
6.8.b. Temperature (F)	24		
6.8.c. Atmospheric stability class	C		
6.9. Deviate from:			
	Employee or contractor	Public responders	Public
6.9.a. Facility			0



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CalARP RMP submission

RMP includes CCR §2745.3 – §2745.9 components

- Executive Summary
 - RMP Offsite Consequence Analysis
 - Five-Year Accident History
 - Prevention Program 2, 3, or 4* element
 - Emergency Response
 - EPA RMP submit report (10,000 lb or more)
 - RMP Certification by ow/op
- In addition:*
- Qualified Person Certification CCR §2745.2(a)
 - CalARP Registration form



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Slido Poll 2 – One Correct Answer

When reviewing an RMP or CERS submittal either at your CUPA office or within the facility during an audit/inspection, where will you find anhydrous ammonia quantity data?

- A. Process Safety Information – Max. Intended Inventory
- B. CalOES CalARP Registration Certification
- C. CERS submittal
- D. Offsite Consequence Analysis – Worst Case Scenario data
- E. All of the above



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Slido Poll 3 – True or False

Is a 3-Year Compliance Audit the same in scope as the CUPA Inspection due every 3 years?

True

False




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3-Year Compliance Audit

- Owner/Operator certify program in compliance every 3 years to ensure procedures and practices are adequate and are being followed per their RMP;
 - **Prevention Program 2** elements
 - **Prevention Program 3** elements



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CalARP Elements

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3-Year Compliance Audit

- Conducted by at least one person knowledgeable in process
- Develop report and recommendations (Program 2), develop a report with the scope, methods used, results and findings of the audit (Program 3):
 - Document response and actual date of correction of deficiencies
 - Enter into agreement with CUPA or resolve recommendations within 1.5 years of performing the audit
- Retain 2 most current audits



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3-Year Compliance Audit

“To assure a complete and statistically valid audit, OSHA recommends, but does not require, that the audit team have at least one member familiar with the auditing methodology which will be used to audit the process. When OSHA evaluates the employer’s audit, the factors that will be considered in the overall performance of the employer’s compliance with this requirement [1910.1119(o)(2)] are the methodology used and the experience and background of the audit team member(s).”

OSHA PSM Interpretive Letter:

[PSM compliance for ammonia refrigeration systems. | Occupational Safety and Health Administration \(osha.gov\)](#)

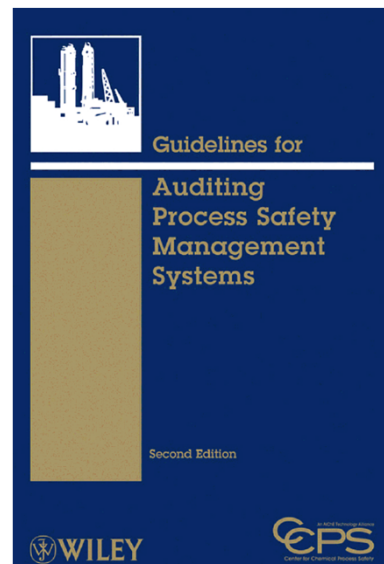


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3-Year Compliance Audit

*Guidelines for Auditing Process
Safety Management Systems,
AIChE-CCPS*



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Slido Poll 4 – True or False

Is Safety Information under Program 2 the same data as Process Safety Information under Program 3?

True

False




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Safety Information

- (1) Material Safety Data Sheets that meet the requirements of Section 5189 of Title 8 of CCR;
- (2) Maximum intended inventory of equipment in which the regulated substances are stored or processed;
- (3) Safe upper and lower temperatures, pressures, flows, and compositions;



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Safety Information

- (4) Equipment specifications; and,
- (5) Codes and standards used to design, build, and operate the process.



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Process Safety Information

Chemical Hazards	Process Technology	Process Equipment
<ul style="list-style-type: none"> ✓ Toxicity ✓ Permissible exposure limits (PEL) ✓ Physical data ✓ Reactivity ✓ Corrosivity ✓ Thermal & chemical stability ✓ Hazardous effects of inadvertent mixing of materials 	<ul style="list-style-type: none"> ✓ Block flow diagram or simplified process flow diagram ✓ Process chemistry ✓ Maximum intended inventory ✓ Safe upper and lower limits for items such as temperature, pressure, flows or composition ✓ Evaluation of the consequences of deviation 	<ul style="list-style-type: none"> ✓ Materials of construction ✓ Piping and instrument diagrams (P&IDs) ✓ Electrical classification ✓ Relief system design & design basis ✓ Ventilation system design ✓ Design codes & standards employed ✓ Safety systems ✓ Material and energy balances for processes built after June 21, 1999



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PSI – Materials of Construction

Equipment in the process as required in Mechanical Integrity:

- (1) Pressure vessels and storage tanks;
- (2) Piping systems (including ancillary components such as valves);
- (3) Relief and vent systems and devices;
- (4) Emergency shutdown systems;
- (5) Controls (including monitoring devices and sensors, alarms, and interlocks); and,
- (6) Pumps, compressors and their drivers.



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PSI – Materials of Construction

- Anhydrous Ammonia Refrigeration systems designed for ammonia service using aluminum, stainless steel, and carbon steel.
- copper, brass, zinc, and other alloys in the presence of moisture, pose significant **corrosion concerns**.



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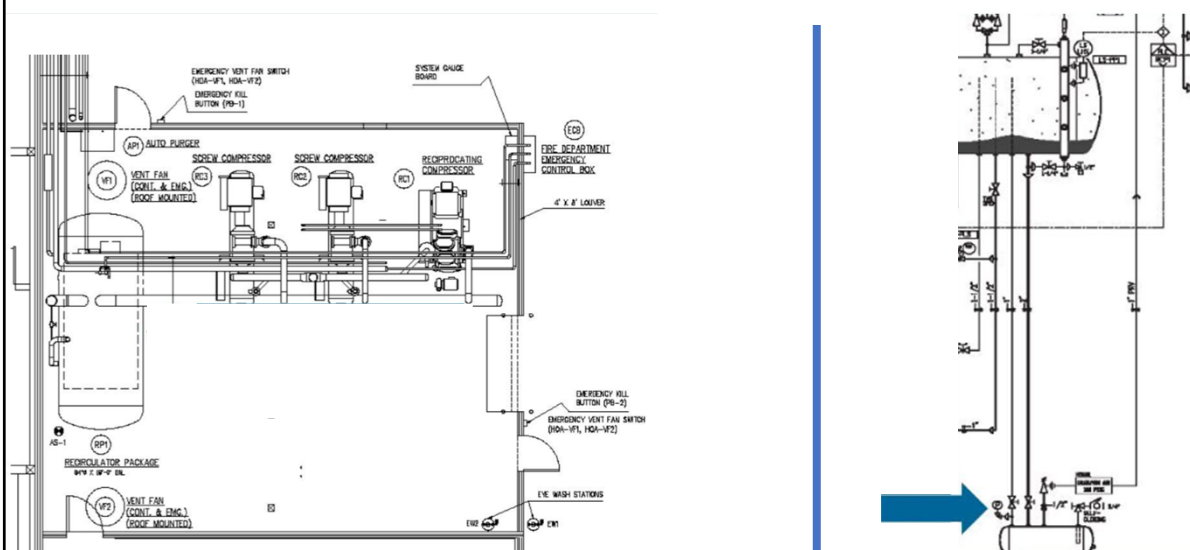
PSI – Materials of Construction



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PSI – Materials of Construction



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PSI – Materials of Construction

1 – *2* Facility

Safe Work Practices

Concept SWP-25
 Prepared by 2012 Salinas Valley
 Ammonia Safety Day
 Committee with permission to
 share granted by Kim Snowden,
 PE and Bruce Welden



CONCEPT SWP-25: BRASS POLICY, INSPECTION & CHECKLIST
SVASD COMMITTEE DISCLAIMER: THIS "SAFE WORK PRACTICE" GUIDELINE PREPARED BY SVASD COMMITTEE (MAY 2012) IS INTENDED TO SERVE AS A REFERENCE FOR FACILITY PERSONNEL IN THEIR DEVELOPMENT OF PROCEDURES RELATED TO AMMONIA REFRIGERATION SYSTEM; BUT NOT AS A SUBSTITUTE FOR SITE SPECIFIC PROCEDURES.

PART A: BRASS POLICY
POLICY STATEMENT:
 1 prohibits brass, copper, or bronze (referenced as "brass") components (valves, fittings, caps, any hoses with brass components) to ever be connected to any ammonia systems or ammonia containing components (*including nurse tanks*)
*[Possible]*1* Exceptions:*

- Ammonia pump brass seals as originally constructed by ammonia pump manufacturer within oil reservoir.
- Brass Components required for temporary Test Equipment - with Pre-use* inspection (i.e., no degradation) and Post-use* inspection to confirm brass component was removed.
- Component required for temporary pumpdowns – vacuum pumps with Pre-use* inspection (i.e., no degradation) and Post-use* inspection to confirm brass component was removed.

[*IDEA –Reference your Line Entry (Break) Procedure/Permit and then detail these inspections in the Line Entry (Break) Procedure.]

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PSI – Materials of Construction

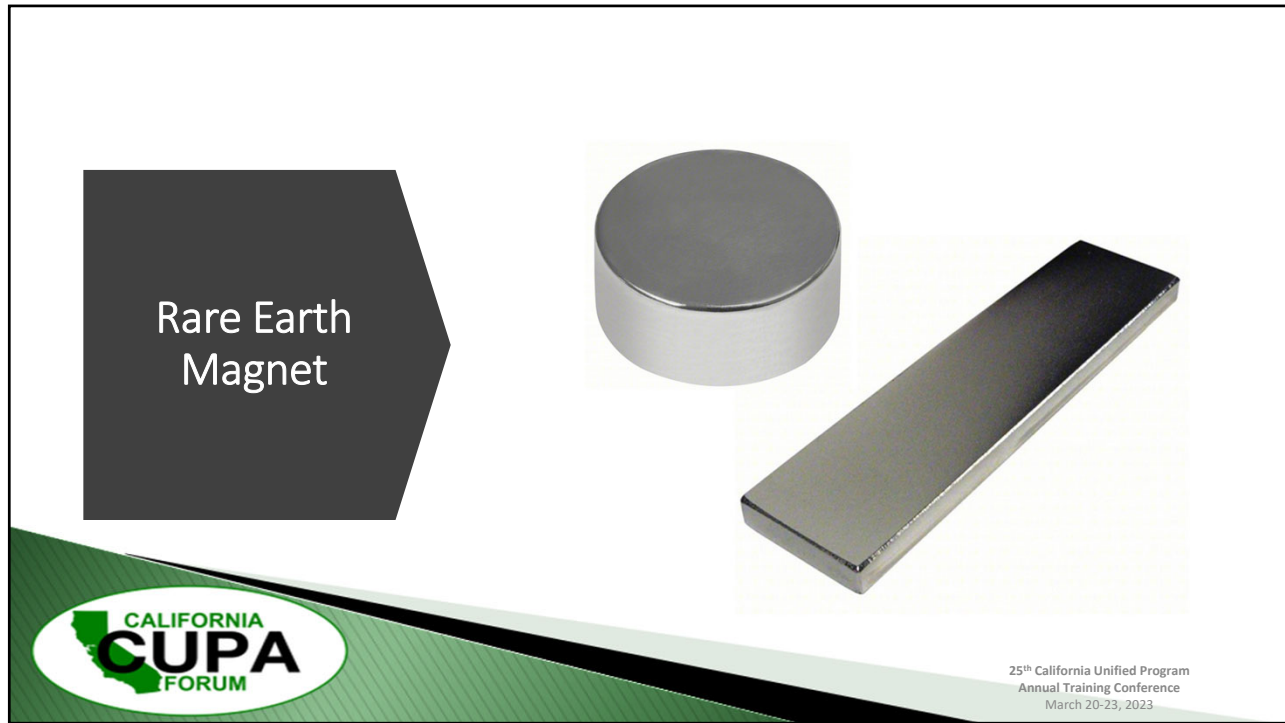
Review Steps for trained Refrigeration Personnel:

1. Review Part A Brass Policy and *1* Emergency Action Plan
2. Photo copy P&ID for areas to be reviewed.
3. With proper PPE (per _____), visually look for brass component and mark any with *red* tape
4. Indications/Signs to watch for:
 - a. Color: Blue, Green, White on component surface or residue
 - b. Shape: Flare Fittings, Quick-Connections, Hose Barbs, "JIC", Tubing/Tubing Fittings, Pressure Switches or Gauges without "Ammonia" duty noted on label/face.
 - c. Size: Usually small components
 - d. Places: Small gauge valves (3/8", 1/4") – especially one that open to atmosphere, PRV vent lines, ADT components (valves and sights),
 - e. Special – Electrical Panels: No ammonia component (even stainless steel tubing or pressure gauges/switches) should be located inside Electrical Panels. Any ammonia leaks will damage the brass, copper, bronze wiring/components within the Panel.
5. Check suspicious components with magnet. If magnet does not stick, the component could be brass or stainless steel. (This helps distinguish anodized steel valves which may look like brass but are OK.)
6. On copy of P&ID, mark-off piping, piece –by –piece, as reviewed. Note any component that is not on the P&ID. Circle any suspicious components.
7. If possible, photograph suspicious component.



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