

# OSHA ANPR ON LEAD

## Potential Impacts & Preparation

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On behalf of the:

National Steel Painting Contractors  
Association (NSPCA)



# Alison B. Kaelin, CQA

- ▶ 2021–2023 AMPP Global Center Director
- ▶ 2018–2021 SSPC Board of Governors
- ▶ 2018 JPCL Reader's Choice Award
- ▶ 2018 JPCL Prestige Award – Educator
- ▶ 2016 Coatings Education Award
- ▶ 2014 co-recipient of the inaugural SSPC Women in Coating Award
- ▶ 2013 JPCL Editors' award
- ▶ 2012 "JPCL: Top Thinkers: The Clive Hare Honors" as a visionary who has advanced the protective coatings industry in the past decade."
- ▶ 2011 ASQ Who's Who Northeast Division
- ▶ 2005 Recipient of Society of Protective Coatings (SSPC) Technical Achievement Award
- ▶ 30+ years of experience
- ▶ SSPC / AMPP C3 and C5 Principal Instructor
- ▶ AMPP / NACE Senior Inspector
- ▶ ASQ Certified Quality Auditor
- ▶ Environmental Engineer / Industrial Hygienist
- ▶ Specific experience in:
  - Containment review and design
  - Environmental /Regulatory issues
  - Lead and other metals
  - Coatings inspection
  - Auditing
- ▶ Chairman (Dust Collection & Environmental Monitoring).  
Developed:
  - SSPC TU7, "Conducting Ambient Air, Soil, and Water Monitoring During Surface Preparation and Paint Disturbance Activities" (SSPC 00–03)
  - SSPC Guide 16, Guide to Specifying and Selecting Dust Collectors
- ▶ Member: Guide 6, Guide 7 and Platform Committees
- ▶ Former Chair QP2/QP3 Certification
- ▶ Journal of Protective Coatings and Linings and Coatings Pro  
Contributing Author & Editor
- ▶ American Society of Quality (ASQ)

# OUTLINE



ANPR BKGD



NEW HEALTH EFFECTS



COMMENT ANALYSIS / EXPECTATIONS



HOW TO PREPARE

# ANPR Background / Overview

OSHA issued an Advanced Notice of Proposed Rulemaking (ANPR) on July 2, 2022 to update the OSHA Lead in Construction and General Industry Standards.



Introduced new medical information:

New Route of Entry

New Health Effects

Impact at lower Blood lead levels



Provided information on new Michigan rule and CA and WA proposed BLLs, PELs and controls.

Medical data from ATSR and ABLES

# New Information from ANPR

Dermal (skin) identified as a new route of exposure in addition to inhalation (breathing) and ingestion (eating/drinking)

In adults, 99 % of lead is in bone & soft tissues, 1 % in blood

Lead can be released from bone to blood and other soft tissues over time

- even after removal from occupational exposure;
- during age-related bone loss, especially menopause and osteoporosis; and during pregnancy and lactation

It is difficult to predict individuals' BLLs from their recent external exposures due to released lead from the bones into the bloodstream over time. (This implies BLL testing is not reliable in predicting current exposures in chronically exposed workers)

ZPP is no longer considered to be an effective test

# New and Expanded Health Effects

TABLE 2—OVERVIEW OF HEALTH EFFECTS ASSOCIATED WITH ELEVATED BLL IN ADULTS

BLL (µg/dL)	Health effects
5–10 .....	Acute decrease in renal function. Elevated blood pressure. Altered heme synthesis. Impaired neurocognitive and neuropsychological assessment. Developmental effects (e.g., decreased cognitive and reduced birthweights)—fetuses exposed to lead in utero through pregnant worker lead exposure.
10–20 .....	Spontaneous abortion (miscarriage). Hypertension. Decreased renal function. Decreased platelet count. Decreased blood hemoglobin.
20–40 .....	Headache. Fatigue. Anemia. Sleep disturbance. Anorexia. Bowel changes. Arthralgia. Myalgia. Decreased libido. Personality changes
40–60 .....	Sperm effects (decreased number and function). Subclinical peripheral neuropathy. Altered red blood cell function. Renal damage. Cognitive dysfunction.
60–80 .....	Hemolytic anemia. Renal failure. Stroke.
Above 80 .....	Central Nervous System (CNS) effects. Nephropathy. Gout. Hearing loss. Encephalopathy.

Adapted from AOEC, 2007. For additional resources please also see: *NTP Monograph on Health Effects of Low-Level Lead*, available at [https://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead\\_newissn\\_508.pdf](https://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf).


# Health Effects by BLL

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# Response to ANPR

- ▶ The comment period closed on October 28, 2022
  - ▶ Approximately 50 individuals and organizations submitted comments
  - ▶ A majority of the respondents (>90%) were in support of lower BLLs, PELs, and additional controls
  - ▶ Construction related organizations were:
    - Concerned with impact on OSHA 300 and EMR issues at lower medical removal BLLs
    - Wanted phase in period for lower BLLs and PELs
    - Wanted Special considerations for industrial painting industry
- 



# Expected Regulation Changes

## Medical Surveillance

- BLL limits of 10–20  $\mu\text{g}/\text{dL}$
- New triggers for initial BLL testing
- Increased frequency of testing (monthly or bi-monthly) and if certain levels are exceeded
- Removal of ZPP testing

Medical Removal – At 20–30  $\mu\text{g}/\text{dL}$ , one high BLL above the threshold and/or repeated elevated values

Return to Work – 2 BLLs, taken 2 weeks apart, below 15  $\mu\text{g}/\text{dL}$

Permissible Exposure Limit (PEL) – 10 – 20  $\mu\text{g}/\text{m}^3$  as 8-hour TWA

- Action Level at  $\frac{1}{2}$  the PEL, 5–10  $\mu\text{g}/\text{m}^3$  8-hour TWA

# Possible Regulation Changes

Impermeable or full body PPE

Increased frequency of worker exposure monitoring

Medical examinations

# OSHA's Next Steps

- ▶ AMPP and other organizations are providing information to OSHA regarding our industry, BLLs and controls and potential impact of revised regulations
- ▶ AMPP is supporting:
  - Medical removal at 30 ug/dL, return at 15 ug/dL
  - No change to PEL
  - Improved engineering controls, improved hygiene and consistent implementation of existing controls
  - Phased in compliance for industrial painting industry
- ▶ OSHA will review comments and respond with a Notice of Proposed Rulemaking or a Proposed Rule
  - It will be more detailed
  - Expected in 2023-early 2024
  - **We get to comment again**
- ▶ OSHA is expected to issue a final rule by Fall-Winter 2024

# CALOSHA PROPOSED LEAD RULE March 2023

- ▶ BLLS  $\geq 20 \mu\text{g/dL}$  require medical exam and more frequent testing
- ▶ Medical Removal Protection (MRP) at or above  $30 \mu\text{g/dl}$ 
  - 1 year after the effective date, MRP if last 2 BLLs are at or above  $20 \mu\text{g/dl}$  or the average of all BLLs in the last 6 months is at or above  $20 \mu\text{g/dl}$
- ▶ Response plan when an employee's BLL is at or above  $10 \mu\text{g/dl}$
- ▶ Returning from MRP at  $15 \mu\text{g/dl}$
- ▶ PEL will be  $10 \mu\text{g/m}^3$ / Action Level  $2 \mu\text{g/m}^3$
- ▶ Hygiene requirements at exposure to lead vs.  $\geq$  PEL
- ▶ Medical examinations, regulated areas, eating areas and a lead training program as interim protection based on performing trigger tasks, and additional protections when employees conduct level 3 trigger tasks (**This is abrasive blast cleaning**)
- ▶ Increasing the frequency of BLL testing to be provided for employees when their BLL is at or above  $10 \mu\text{g/dl}$ , or their airborne exposure is above  $500 \mu\text{g/m}^3$  (**This is abrasive blast cleaning**)
- ▶ Updated training requirements


# CALOSHA PROPOSED LEAD RULE

- Regulated areas added
- Prohibition of food, etc. all areas that lead exposure is possible
- Use of special cleansing compounds
- Washing of exposed arms
- Burden of proof on employer of evaluations of worker exposures, engineering controls, respiratory protection, and cleaning
- Removal of second blood test
- Initial medical exam if exposed above  $2 \mu\text{g}/\text{m}^3$
- Signs at the Action Level

# PROPOSED LEAD RULE – Abrasive Blasting

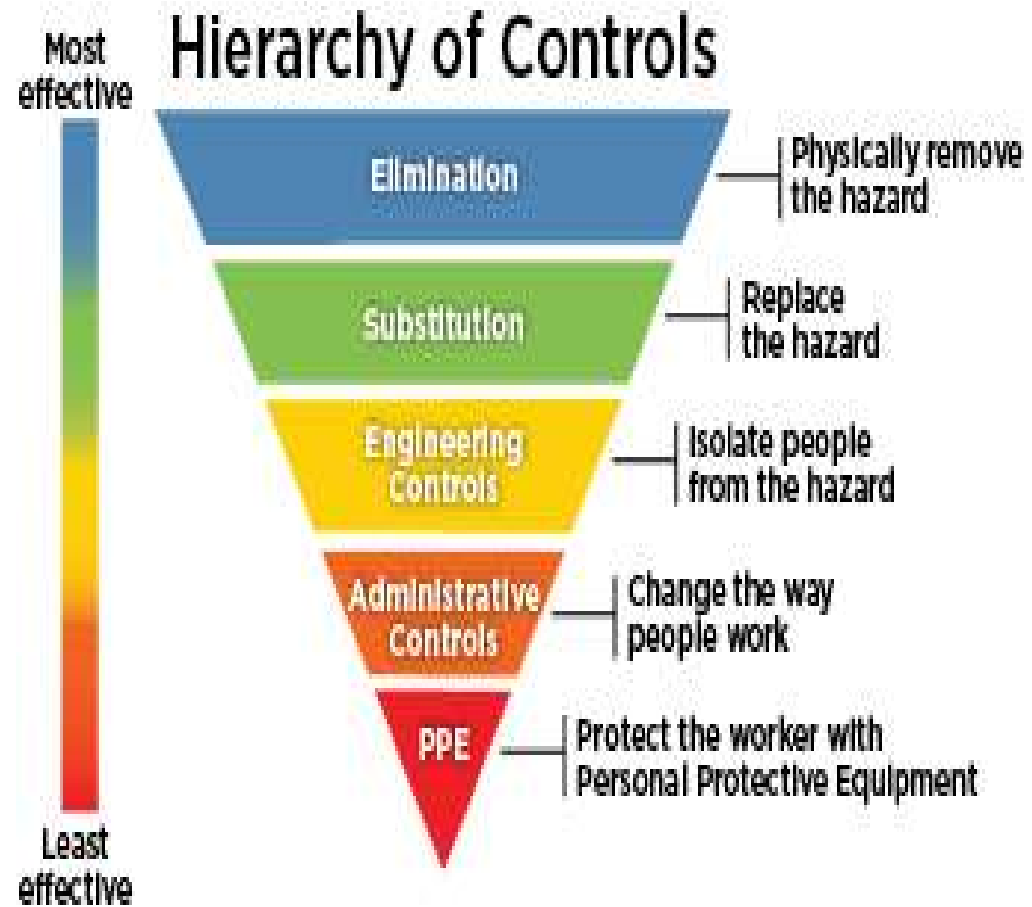
- Exception to subsection (c)(1) would allow, **until 5 years from the effective date**, employers to expose employees **conducting abrasive blasting** to an airborne concentration of lead no greater than **25 µg/m<sup>3</sup> as an 8-hour TWA**.
  - Directly due to Legacy SSPC comments in 2010.
- ▶ Add showers and eating areas as interim protection during Group 3 trigger tasks (abrasive blasting)
- ▶ As an interim administrative control for employees conducting dry abrasive blasting, the amount of time an employee could conduct **dry abrasive blasting would be limited to 5 hours per day**
- ▶ **except that after 5 years** from the effective date of the standard, the amount of time would be limited to **2 hours per day**.
- ▶ As an interim protection, this administrative control would apply only until exposure assessment has been conducted, after which exposure controls would be based on the exposure assessment.
- ▶ Mont

# PROPOSED LEAD RULE – Abrasive Blasting Considerations

- monthly BLL testing as an interim protection for employees who perform level 3 trigger tasks, and for employees whose airborne exposure is above  $500 \mu\text{g}/\text{m}^3$  as an 8-hour TWA.
  - A blood lead test required within 3 days after discontinuing either level 3 trigger task work or work associated with airborne exposure above  $500 \mu\text{g}/\text{m}^3$
- 

# What Can We Do To Prepare?

- ▶ Management Engagement
- ▶ Post & Current Data Analysis
- ▶ RCA / SMART Goals
- ▶ Evaluate & Update
  - Engineering Controls
  - Administrative
    - Employee Training and Engagement
    - Work Practices
  - PPE / Respiratory Protection
- ▶ Audit and Adjust
- ▶ Comment on next draft



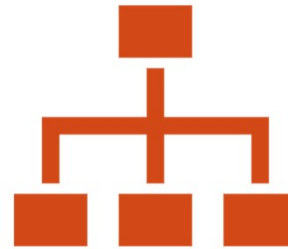
Source: [NIOSH](#)



# Management Engagement



**WHOLE OF  
COMPANY  
APPROACH**



**Management must lead on this effort by:**

Initiating data analysis and establishing a BLLs and PEL reduction strategy based on hierarchy of controls

Root Cause Analysis (RCA)


Plan, Do, Check and Adjust (PDCA)

Developing Specific – Measurable – Attainable – Relevant – Time Bound (SMART) Goals for Key Areas and Staff

Providing resources for Safety Directors, Competent Persons and craft workers to meet goals

Audit / Verify Goals are being met and adjust as needed

# Data Analysis

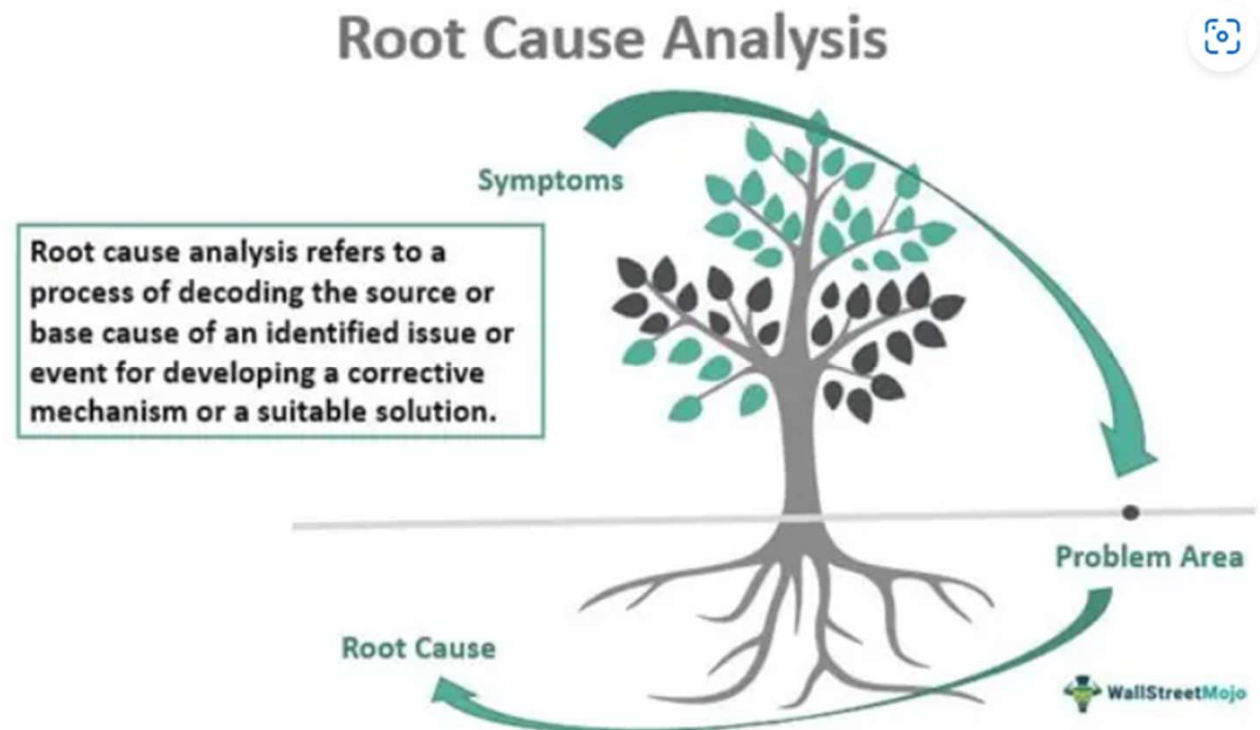
- ▶ Review your historic, 2022 and 2023 and project records
  - ▶ Identify your high, low, mean and average BLLs throughout the season or by project
  - ▶ Review airborne worker exposure results by task, project, or worker
  - ▶ Review
    - Engineering controls / ventilation design, construction and measurements
    - Administrative / Work Practices
    - PPE / respiratory protection
    - Competent Person Records
- 

# Data Analysis

METRIC / DATA	CURRENT STATE	TARGET FUTURE STATE
BLLs (RANGE)		
BLLs (AVERAGE)		
BLLs (MEAN)		
BLLs (by Task / or project / engineering control / ???)		
AVERAGE PELs		
PELs (by Task / or project / ???)		
<b>ENGINEERING CONTROLS</b>		
Type of Containment		
Type of Engineering controls (ventilation design)		
Ventilation actual		
Number of blasters / workers		
Duct layout		
<b>ADMINISTRATIVE CONTROLS</b>		
Type of training / frequency		
Hygiene / Housekeeping		
WORK PRACTICES		
JOB ROTATION		
Competent Person Inspections		
<b>PPE</b>		
Type by task		
Penetrability		
Cleanliness		
<b>RESPIRATORY PROTECTION</b>		
Type by task		
Cleanliness		

# Does the Data Trend in any way?

- ▶ Are there particular tasks, projects or workers with BLLs at or above 10-20  $\mu\text{g}/\text{dL}$ ?
- ▶ Are BLLs are higher or lower at the beginning or end of a project?
- ▶ Were worker exposures results above 10-20  $\mu\text{g}/\text{m}^3$ ?
- ▶ What engineering controls, administrative & work practices, training, PPE / respiratory protection, oversight were in place?
- ▶ **INITIATE ROOT CAUSE ANALYSIS**



# Root Cause Analysis

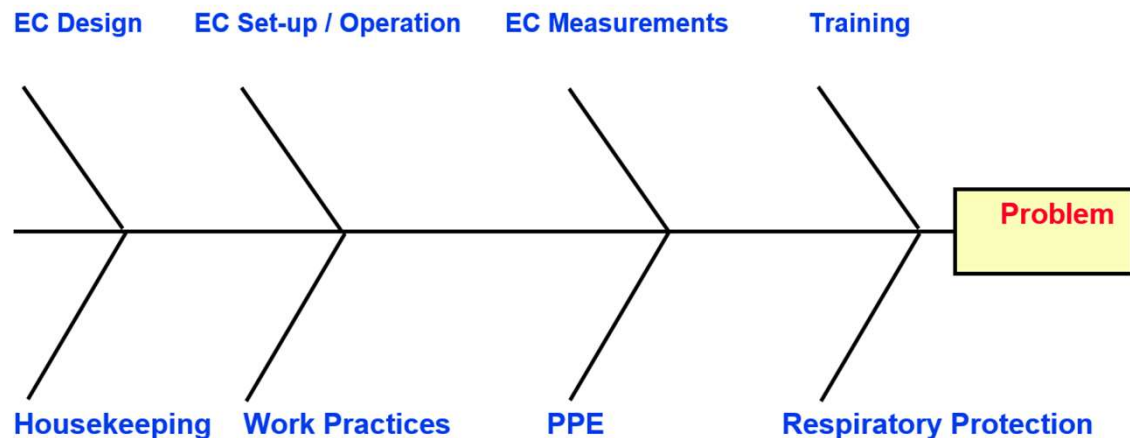
1. What is the Key Problem Area (KPA)?

**BLLs ABOVE 10-20  $\mu\text{g}/\text{dL}$**

2. Why did it occur?

**CURRENT PRACTICES / WHICH ONES?**

- A. **USE FISHBONE (OR OTHER METHOD) TO IDENTIFY POTENTIAL CAUSES & SUB-CAUSES OF KPA**



3. How to resolve it?

**ESTABLISH PLAN (PDCA) / SMART GOALS TO GET BLLs  
BELOW 10-20  $\mu\text{g}/\text{dL}$**

# Engineering Controls

Engineering controls (e.g., air movement) is top hierarchy of control for reducing exposures to lead below expected PELs of 10–20  $\mu\text{g}/\text{m}^3$

This means we need:  
even more airflow to reduce PELs and BLLs  
Alternate (less dusty) methods

# RCA – Engineering Controls

Design to meet SSPC / AMPP Guide 6, target air flows of 60 and 100 fpm intended for visibility vs. hazard reduction to “as low as feasible”

Aging or poorly maintained equipment

Poor duct layout

Number of blasters inside

Containment size

# Administrative Controls / Work Practices

Training, procedure, work practices, hygiene, housekeeping, or shift designs that lessen the threat of a hazard to an individual

Compliance Programs

Competent Person Inspections



# RCA – Administrative Controls /Work Practices

Poor employee training or retention

Poor housekeeping, handwashing, hygiene including use of tobacco, vapes, food, drink, etc.

Poor employee behavior

Lack of competent person inspections and **CORRECTIVE ACTIONS**

Failure to enforce Compliance Programs

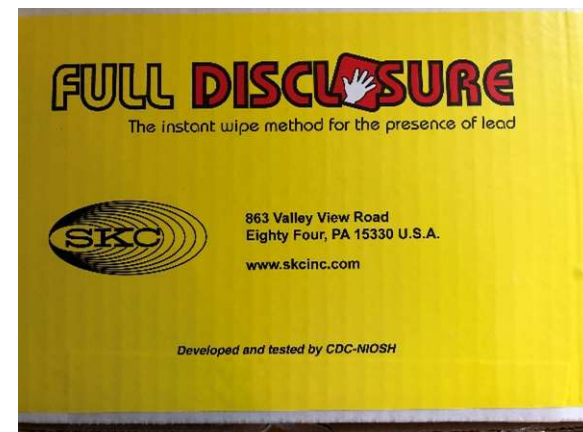
# Hygiene Practices – Corrective Action

- We rely on employees to follow proper hygiene practices to reduce BLLs
  - Washing before they eat, drink, use tobacco products, etc.
- Dr. Kevin Guth, CSP/CIH tested industrial painting contractors and has presented data suggesting lead on skin as a key factor in high BLLs
  - 46% biological uptake from hand to mouth contact
  - Worker touch mouth 23-40 times per hour
  - “Lead specific” cleaning products are more effective than regular soaps and wipes
  - Hand “lead” wipes are not as effective as handwashing with “lead” soap

# Hygiene Practices – Corrective Action

➤ Guths data suggests we can reduce BLLs by:

- Use barrier creams on the face and exposed skin
- Improved washing of hand, face, and arms by workers
- Use lead soap
  - NIOSH-patented Hygenall seems to work best
- Provide monthly BLL testing and competent person inspections to identify poor hygiene
- Test skin (by wipe sampling) after washing to verify hygiene is effective and to establish skin “PEL”



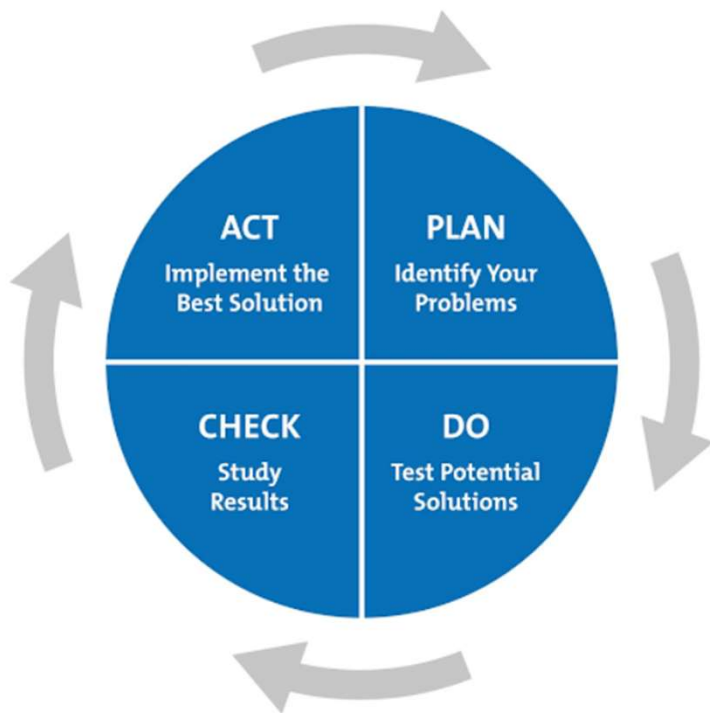
# RCA – PPE & Respiratory Protection

- ▶ Evaluate the typical types of PPE and respiratory protection used for various tasks or craft workers
  - Are workers being exposed through hands, faces, and other exposures to the skin?
  - Do we need to re-educate our employees about full body protection, such as sealing boots and gloves to coveralls with duct tape?
  - Are we using penetrable PPE like cotton-coveralls (that might allow lead to come into contact with the skin)?
  - Are workers wearing ½ masks that do not protect the face?
- ▶ Are we properly using, storing and cleaning respirators?
- ▶ Are they potential exposure pathways
  - Many companies are not storing or cleaning negative pressure respirators and supplier air respirators per 29 CFR 1910.134, Respiratory Protection Standard or Manufacturers Instructions

# Root Cause Analysis – PDCA – SMART Goals for BLL Reduction Strategy

- ▶ **ESTABLISH PLAN (PDCA) / SMART GOALS TO GET BLLs BELOW 10-20  $\mu\text{g}/\text{dL}$**

Figure 1: The Plan-Do-Check-Act Cycle



**SPECIFIC**

Who and what?

**MEASURABLE**

By how much?

**ACHIEVABLE**

How?

**RELEVANT**

Why?

**TIME-BOUND**

When?

# SMART Goals

## SMART worksheet

### Goal 1: REDUCE BLLs

	<i>Answers at time of development</i>	<i>3 Month Update</i>
<b>Specific</b> <ul style="list-style-type: none"> <li>What is the desired result? (<u>who</u>, what, when, why, how)</li> </ul>	Reduce worker BLLs	
<b>Measurable</b> <ul style="list-style-type: none"> <li>How can you quantify (numerically or descriptively) completion?</li> <li>How can you measure progress?</li> </ul>	By 25% over 2022 or to below 20 ug/dL Test workers BLL monthly	
<b>Achievable</b> <ul style="list-style-type: none"> <li>What skills are needed?</li> <li>What resources are necessary?</li> <li>How does the environment impact goal achievement?</li> <li>Does the goal require the right amount of effort?</li> </ul>	Engineering Controls (Goal 2) Admin / Work Practices (Goal 3) PPE (Goal 4) Respiratory Protection (Goal 5) Employee Engagement (Goal 6)	
<b>Realistic/relevant</b> <ul style="list-style-type: none"> <li>Is the goal realistic for the situation?</li> <li>Is the goal in alignment with the overall mission or strategy?</li> </ul>	Yes, must achieve reduction to 20 ug/dL by end of 2024	
<b>Time-bound</b> <ul style="list-style-type: none"> <li>What is the deadline?</li> <li>Is the deadline realistic?</li> </ul>	by end of 2023	

# SMART Goals

## SMART worksheet

### Goal 3: REDUCE BLLs through improved Administrative / Work Practices – Focus on Hygiene

	<i>Answers at time of development</i>	<i>3 Month Update</i>
<b>Specific</b> <ul style="list-style-type: none"> <li>What is the desired result? (<u>who</u>, what, when, why, how)</li> </ul>	Improve administrative / work practice controls through training, engagement, & enforcement	
<b>Measurable</b> <ul style="list-style-type: none"> <li>How can you quantify (numerically or descriptively) completion?</li> <li>How can you measure progress?</li> </ul>	<ul style="list-style-type: none"> <li>Lower PELs &amp; BLLs are lower than 2022</li> <li>Fewer competent person observations</li> </ul>	
<b>Achievable</b> <ul style="list-style-type: none"> <li>What skills are needed?</li> <li>What resources are necessary?</li> <li>How does the environment impact goal achievement?</li> <li>Does the goal require the right amount of effort?</li> </ul>	<ul style="list-style-type: none"> <li>Train workers in health effects, expected changes, and new strategies</li> <li>Use <u>hygenall</u> soap / enforce hygiene</li> <li>Hold all workers accountable to hygiene and housekeeping goals</li> </ul>	
<b>Realistic/relevant</b> <ul style="list-style-type: none"> <li>Is the goal realistic for the situation?</li> <li>Is the goal in alignment with the overall mission or strategy?</li> </ul>		
<b>Time-bound</b> <ul style="list-style-type: none"> <li>What is the deadline?</li> <li>Is the deadline realistic?</li> </ul>		

# Employee Engagement and Training

- ▶ Safety Managers / Directors / Management
  - Involve in Data Review, RCA and SMART Goals
    - May want to bring in Competent Persons, Production, CIH, PE, etc.
  - Train Competent Person in SMART Goals and lead reduction strategy
  - Audit, initiate and track issues, corrective actions, and opportunities for improvement
  - Provide competent persons with the time, resources, support and authority to actively enforce work practices
  - Provide resources needed to meet SMART Goals



# Employee Engagement and Training


## ▶ Competent Person

- Perform meaningful daily inspections, enforce work practices to change behavior **now** before the regulations change
- Actively evaluate ventilation system performance
- Accurately and honestly document problems, do root cause analysis and track what corrective actions are effective in reducing PELs and BLLs
- Hold employees accountable, including disciplinary action, to reduce BLLs


## ▶ Craft Worker

- Update your craft worker training **now** to include the new health effects identified in the ANPR and that skin may be an exposure pathway
- Focus on hygiene practices and worker behaviors needed to keep BLLs as low as possible
- Explain to employees how their negative behaviors, like poor hygiene, result in high BLLs and ultimately medical removal putting themselves and the company at risk

# Implement and Check Goals

- ▶ Perform more frequent BLL and worker exposure monitoring to identify typical ranges
  - ▶ Track and check BLLs and PELs & SMART Goals
  - ▶ Perform “test” projects using
    - New ventilation equipment, smaller containments, higher air flow rates
    - New respiratory protection options for various tasks
    - New PPE, hand hygiene or decontamination procedures
  - ▶ Audit projects and SMART goal progress
  - ▶ Evaluate elevated results and implement changes if they are higher than SMART goals
- 

# Conclusions / Recommendations

- ▶ The regulations are going to change
  - ▶ We get one more chance to comment – Use your voice individually or through AMPP, PDCA, or other organizations
  - ▶ Every employer will need to find their own way to reduce BLLs and PELs
  - ▶ By identifying problems and focusing on solutions today, we may be able to come into compliance with expected regulatory changes, before they go in effect
  - ▶ Reduction of BLLs to below 20 µg/dL should be a part of every industrial painter's safety goal for 2023-2024 and beyond
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# Thank You

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