



*Advancing public policy to
improve the health and safety
of workers and the community.*

California Industrial Hygiene Council

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(CIHC)*

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CIHC Profile

- Founded in 1990 to advocate for the IH and OEHS profession
- Volunteer organization supported by the five California local sections of AIHA
- Provide sound scientific and technological input to the regulatory and legislative processes and establish a legislative presence in the state Capitol



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Petition 612 Summary

- Amend Title 8 CCR §5155(e), Workplace Monitoring, specifically §5155(e)(3) to the following:
- “For the adequate protection of employees, the person supervising, directing or evaluating the monitoring and control methods shall be versed in this standard and shall be competent in industrial hygiene practice. A Certified Industrial Hygienist as codified in California’s Business and Professions Code sections 20700-20705 is competent in industrial hygiene practice.”

Petition 612 Summary

Does 	Does Not 
Sets a recognized credential (CIH) as an objective benchmark for employers to evaluate competency in industrial hygiene	Create a requirement for CIH certification for oversight
	Require employers to hire an independent CIH
	Prevent other competent professionals from conducting exposure monitoring
	Require that CIHs collect samples



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CIH as a Benchmark

- Board certification based on eligibility and examination → sufficient training, education, and experience
- Eligibility
 - Bachelor's degree in a relevant STEM science or equivalent (60 STEM semester hours)
 - Specific IH coursework (180 hours)
 - At least 90 hours in IH fundamentals + 2 hours ethics
 - 4+ years of professional practice
 - Two professional references, at least one from a CIH
 - Agree to code of ethics



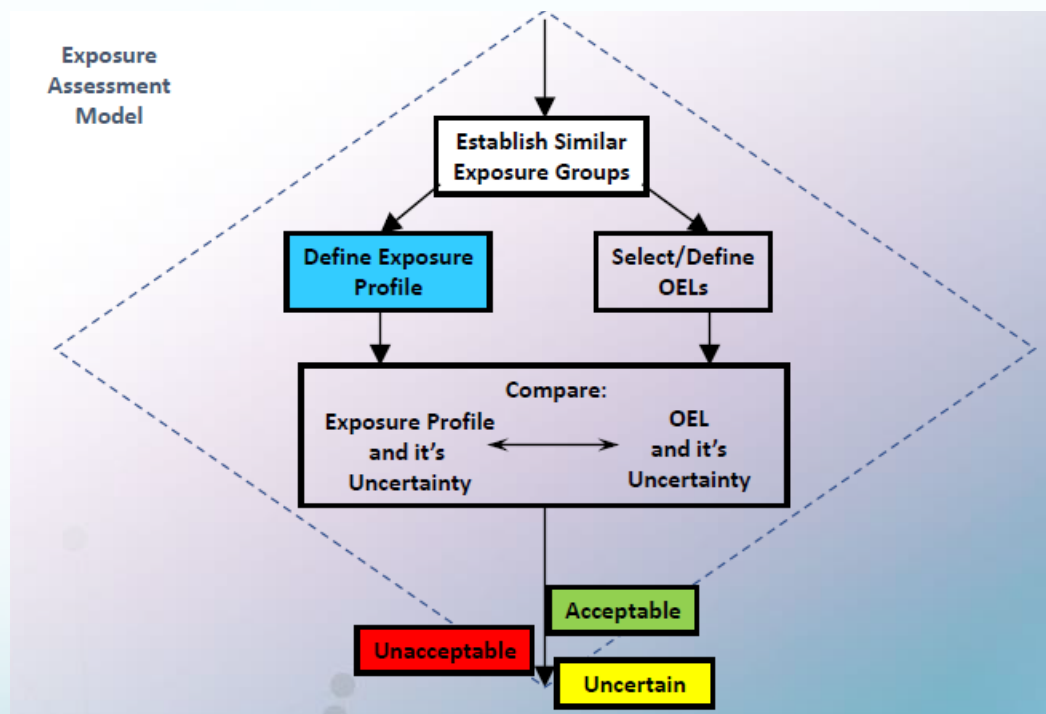
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CIH Exam Rubrics

- **Air Sampling & Instrumentation**
- **Analytical Chemistry**
- Basic Science
- Biohazards
- **Biostatistics & Epidemiology**
- Community Exposure
- **Engineering Controls/Ventilation**
- Ergonomics
- **Health Risk Analysis & Hazard Communication**
- **IH Program Management**
- Noise
- **Non-Engineering Controls**
- Ionizing & Non-ionizing Radiation
- Thermal Stressors
- Toxicology
- **Work Environments & Industrial Processes**

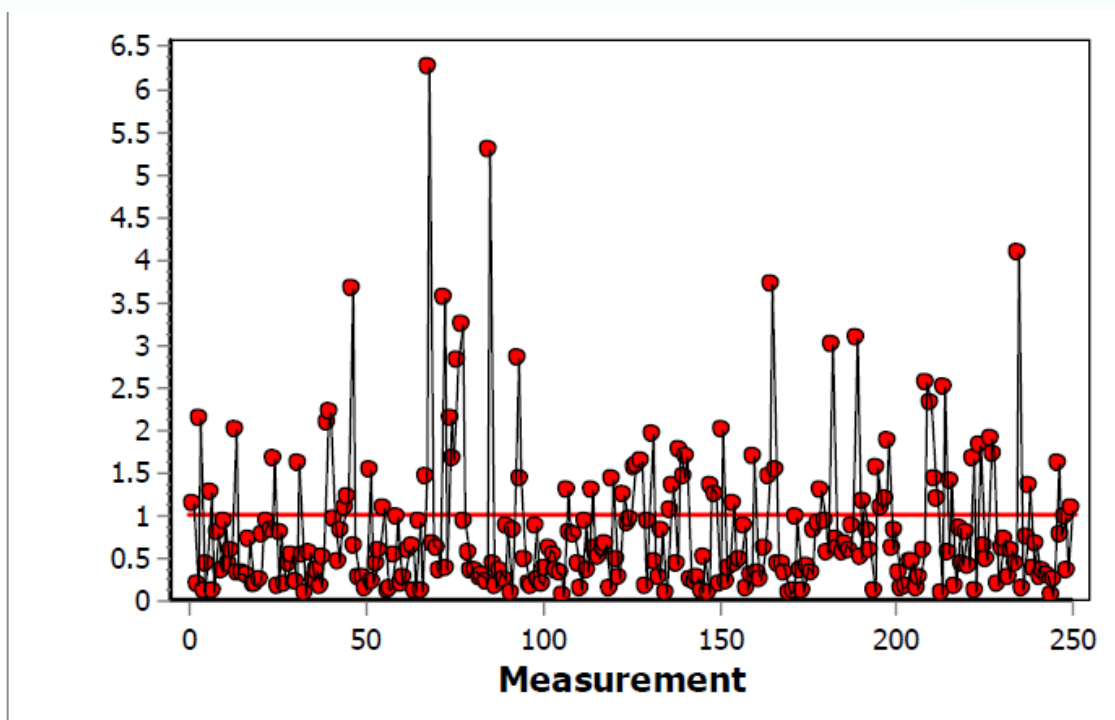
Monitoring & Control

- Exposure assessment is not just sample collection!
- Exposure monitoring is critical to exposure judgment
 - Whether sampling is necessary
 - Which employee(s) should be sampled
 - How should workers be grouped (SEGs)
 - Which tasks should be sampled and how
 - How many samples are necessary
 - Which sampling and analytical methods to use
 - Whether the data collected is sufficient to support an exposure judgement, and...
 - Whether the exposure is acceptable
 - Determine what controls are needed



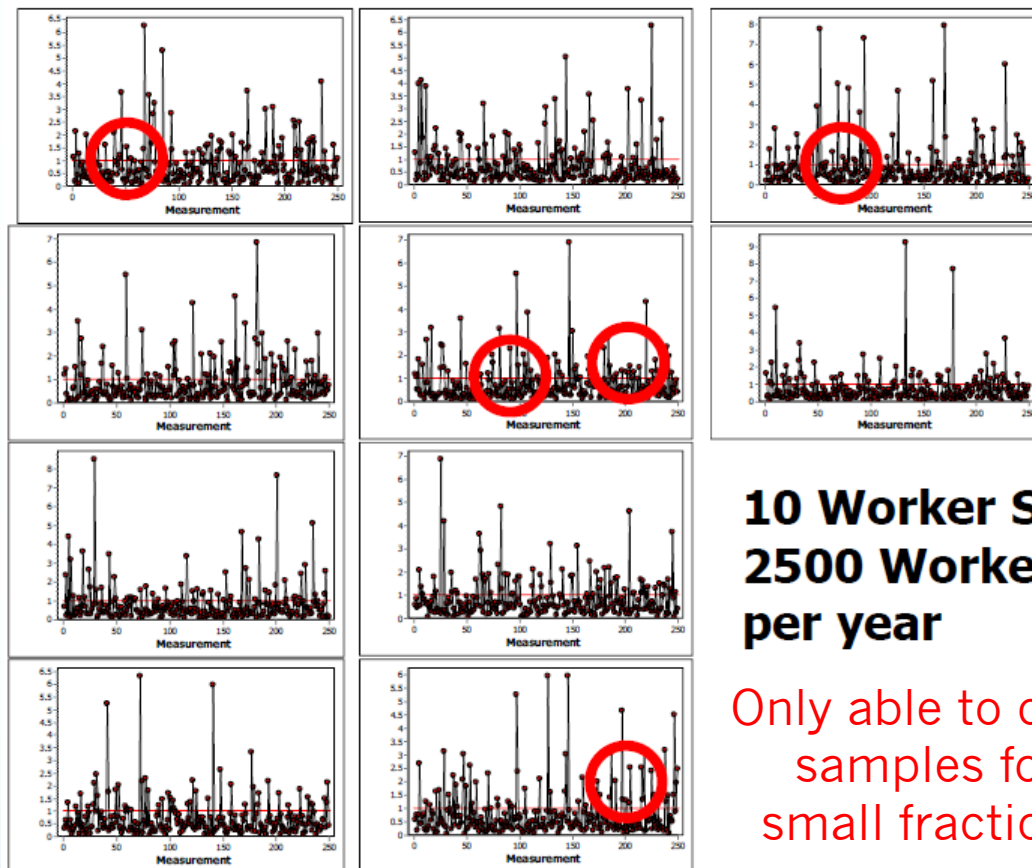
Exposures are Variable

Trying to understand this...



Annual population of exposures for one worker: 250 Worker-days per Year

And really trying to understand this...



**10 Worker SEG:
2500 Worker-days
per year**

Only able to collect
samples for a
small fraction of
exposures!

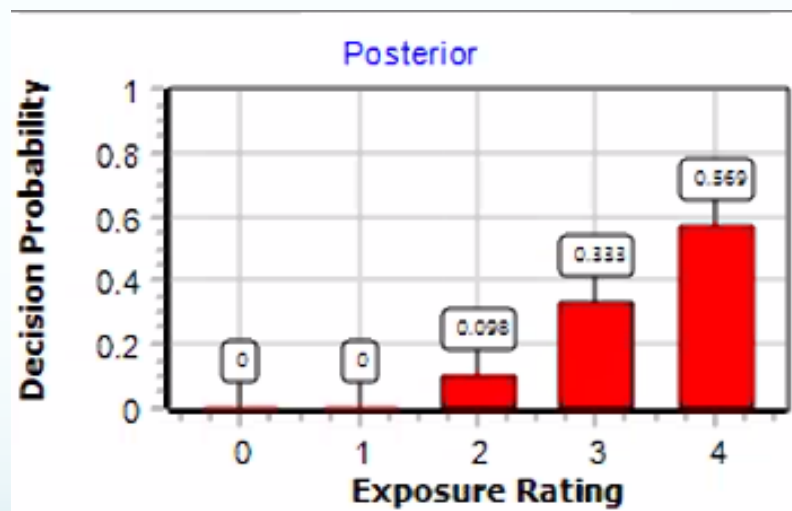
Professionals must apply judgement to determine whether that small fraction indicates that overall exposures are acceptable or not

Acceptable or Not?

Silica AL = 25 $\mu\text{g}/\text{m}^3$ PEL = 50 $\mu\text{g}/\text{m}^3$	
Sample 1	<5 $\mu\text{g}/\text{m}^3$
Sample 2	23 $\mu\text{g}/\text{m}^3$
Sample 3	21 $\mu\text{g}/\text{m}^3$



Most would say
“acceptable”, below
the Action Level



$$X_{0.95} = 58.2 \mu\text{g}/\text{m}^3$$

There is a nearly 60% probability that 95th percentile exposures are above the PEL! Nearly 95% probability that they are above the AL!

Who is Competent?

- So, who is competent in IH?
 - A recent graduate from an IH program?
 - Someone with 6 months of experience?
 - A person who takes an online class?
 - A professional with 20 years of experience?
- **Any person with sufficient training, education, and experience in IH!**
- CIHC presents the CIH certification, which establishes IH education, training, and experience requirements, as a globally recognized benchmark for IH competency
- *Studies show that education, training, and experience in exposure assessment significantly improves exposure judgment accuracy
- Improved exposure judgement better protects workers and facilitates employer compliance

Factor	Improves Accuracy?
Advanced education	✓
>10 years experience	✓
Training	✓
Data interpretation skills	✓
More exposure data	✓

Adapted from Logan et. al. (2011)

Selected References*

- **Hawkins, N.C., and J.S. Evans:** Subjective estimation of toluene exposures: A calibration study of industrial hygienists. *Appl. Ind. Hyg.* 4:61–68 (1989)
- **Teschke, K., C. Hertzman, H. Dimich-Ward, A. Ostry, J. Blair, and R. Hershler:** A comparison of exposure estimates by worker raters and industrial hygienists. *Scand. J. Work Environ. Health* 15:424–429 (1989)
- **Kromhout, H., Y. Oostendorp, D. Heederik, and J.S.M. Boleij:** Agreement between qualitative exposure estimates and quantitative exposure measurements. *Am. J. Ind. Med.* 12:551–562 (1987)
- **Macaluso, M., E. Delzell, V. Rose, J. Perkins, and K. Oostenstad:** Interrater agreement in the assessment of solvent exposure at a car assembly plant. *Am. Ind. Hyg. Assoc. J.* 54:351–359 (1993) Logan et. al. (2011): Desktop Study of Occupational Exposure Judgments: Do Education and Experience Influence Accuracy? *JOEH*, 8:12, 746-758
- **Friesen, M.C., P.A. Demers, J.J. Spinelli, and N.D. Le:** Validation of semi-quantitative job exposure matrix at a Soderberg aluminum smelter. *Ann. Occup. Hyg.* 47(6):477–484 (2003)
- **Ramachandran, G., S. Banerjee, and J.H. Vincent:** Expert judgment and occupational hygiene: Application to aerosol speciation in the nickel primary production industry. *Ann. Occup. Hyg.* 47:461–475 (2003)
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- **Perry W. Logan, P.W., Ramachandran, G., Mulhausen, J.R., Banerjee, s., & Hewett, P.:** Desktop Study of Occupational Exposure Judgments: Do Education and Experience Influence Accuracy?, *Journal of Occupational and Environmental Hygiene*, 8:12, 746-758 (2011)

**CIHC Responses to OSHSB Proposed Decision Comment Themes Regarding
Petition 612**

OSHSB Comment/Theme	CIHC Response
The approach of the CIH as the only professional competent in IH places a burden on employers	The CIHC petition does not state and it is not CIHC's position that only CIHs are competent. CIHC's position is that the eligibility and exam requirements for achieving CIH certification provide a benchmark for assessing competency.
Many CSPs possess competency in IH through education, training, and experience and may be capable.	CIHC agrees. CSPs may be competent in IH with sufficient education, training, and experience. However, CSP eligibility and successful examination alone do not demonstrate competency. CIHC has not presented an argument comparing CIHs to CSPs with respect to competency in the petition. However, in response to the Board's proposed decision comments: The CSP eligibility and exam process is safety-focused and involves a much narrower IH scope compared to the CIH process. The CIH eligibility and exam process is focused on IH. CIHs must demonstrate education, training, and experience in IH to qualify for and pass the exam. Conversely, while CSPs may be competent in IH, they do have to <u>demonstrate</u> that competency to achieve CSP certification. CSPs may achieve a passing score on the CSP exam without passing the IH portion of the exam.
CSPs are similarly certified in the same skills as the CIH	CIHC has not presented an argument comparing CIHs to CSPs with respect to competency in the petition. However, in response to the Board's proposed decision comments: The CSP and CIH certifications are not interchangeable and do not assess competency in the same skills or establish eligibility using the same criteria. For example, CSP eligibility requires a bachelor's degree in any field,

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OSHSB Comment/Theme	CIHC Response
	where CIH eligibility requires a bachelor's degree in a STEM field. The eligibility and exam for the CSP certification cover a wide range of applied safety and risk management topics, where the CIH eligibility and exam are focused on industrial hygiene and related topics. While CSPs may be competent in IH, the CSP certification alone does not demonstrate IH competency. IH is a minority component (<10%) of CSP certification, where IH is the majority component (100%) of CIH certification. Per the Global Board of EHS Credentialling, the CSP Exam Blueprint is comprised of the following related to IH: • Occupational Health (10% of exam); IH is one component of six in this rubric Per the Global Board of EHS Credentialling, the CIH Exam Blueprint is comprised of the following related to IH: • Industrial Hygiene (100%) ○ Hazard Identification (50%) ○ Hazard Evaluation (35%) ○ Controls & Programs (15%)
CIHC's members are CIHs	CIHC's members consist of the members of the five local sections of AIHA, many of whom are not CIHs. • 317 CIHs in California (not all are CIHC members) • 400-500 CIHC members in California (not all are CIHs)

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OSHSB Comment/Theme	CIHC Response
No evidence to support that non-CIHs contribute to poor exposure judgements while CIHs avoid the outcome	CIHC has not presented an argument that CIHs achieve better outcomes. CIHC’s position is that the training, education, and experience in exposure assessment improves exposure judgements and seeks to establish the CIH certification as a benchmark for assessing competency.
Enforcement currently allows for assessment of qualifications on a case-specifics basis	Allowing for the assessment of IH competency on a case-specific basis without providing a benchmark for reference creates an environment that allows for bias and inconsistent application of the regulation. Current language requires the employer to determine competency in IH practice. Employers need prospective guidance for the selection of a person competent in IH practice not retrospective guidance following involvement of enforcement agents.