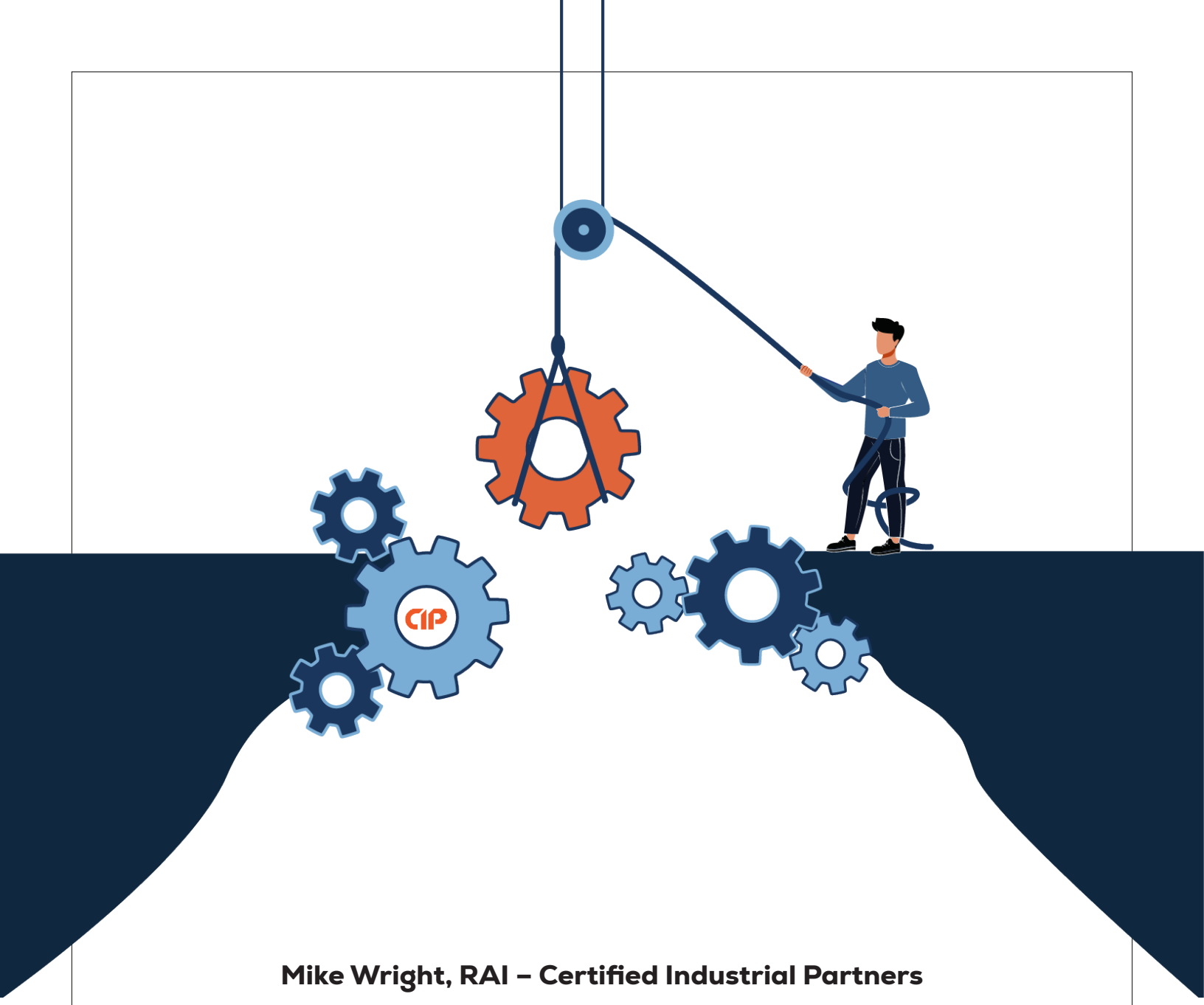
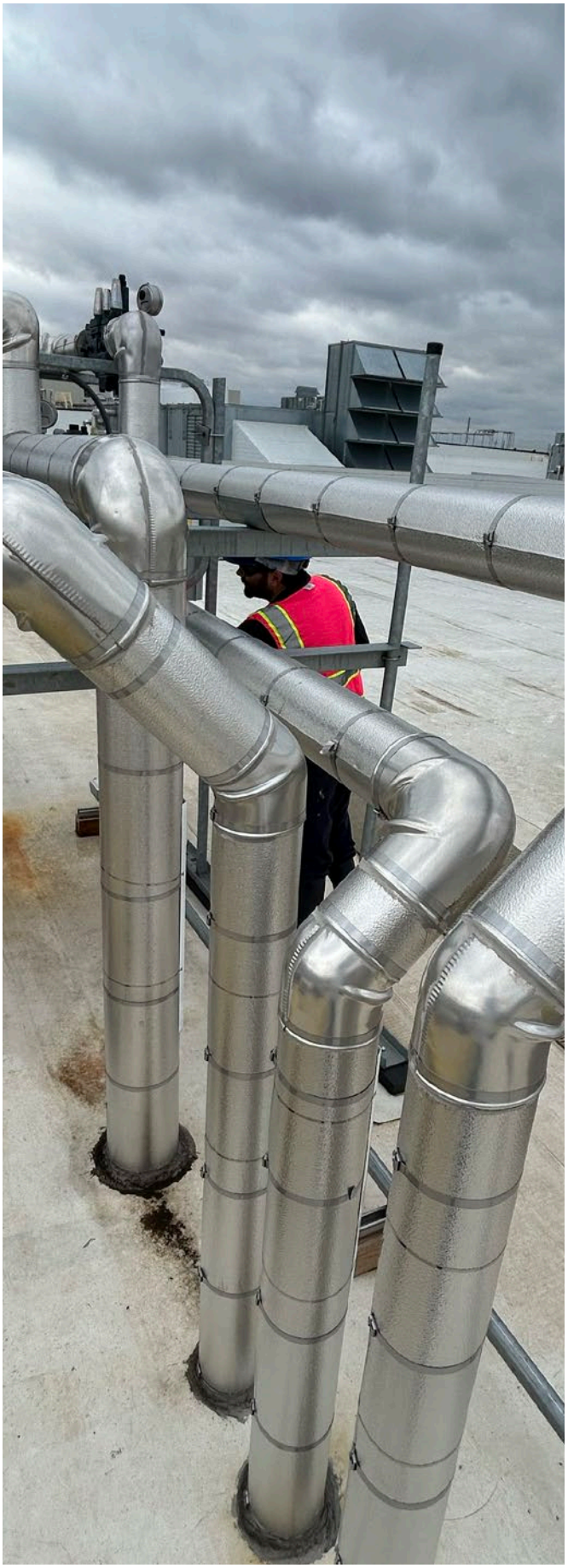


Mike Wright, RAI – Certified Industrial Partners
Industrial Training Manager

FROM SHORTAGE TO SOLUTION

Navigating the Skills Crisis in Industrial Refrigeration



Executive Summary

The industrial refrigeration industry is grappling with a critical workforce issue – a persistent and deepening shortage of skilled technicians and operators. As the need for safe, reliable, and energy-efficient refrigeration systems continues to rise, the availability of well-trained professionals to support, operate, and maintain these systems has not kept pace. This paper examines the root causes of the growing workforce gap, outlines its impact on operational performance and safety, and provides practical solutions that organizations, from technicians on the ground to boardroom decision-makers, can implement to build a more sustainable and skilled workforce for the future.

This paper pulls together a mix of real-world experience, industry trends, and lessons learned over the years to highlight why it is essential we tackle some long-standing issues head-on. Factors include an aging workforce, outdated training approaches, the way trade careers are often undervalued, and the lack of a unified effort to grow and support technical talent across the board. The solutions offered include mentorship frameworks, accredited training, early career education, robust public-private partnerships, technological adoption, and a broad cultural shift in how trade careers are valued. The path forward requires a collective and sustained commitment from industry leaders, educators, and policymakers.

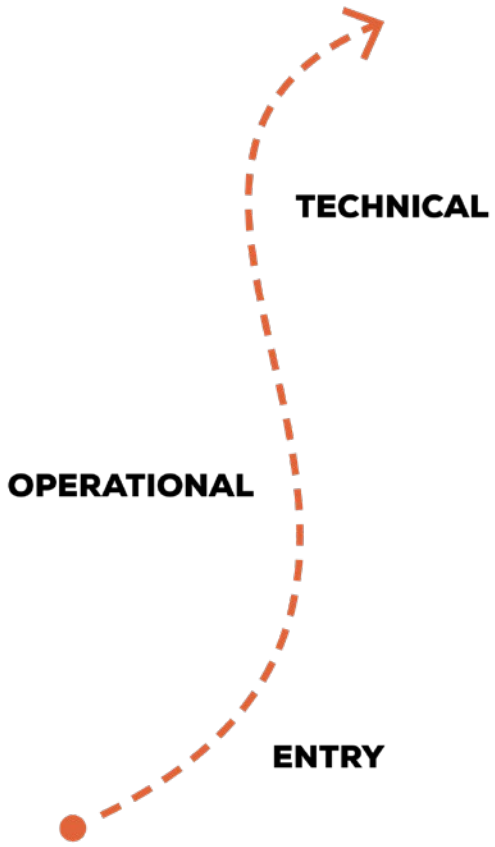
Introduction / Background

Industrial refrigeration plays a crucial role in maintaining the smooth operation of global food production, manufacturing, and cold storage. From frozen desserts to pharmaceuticals, these systems are the quiet workhorses behind everyday essentials. Many of them rely on ammonia and other natural refrigerants. These natural refrigerants are highly efficient options that come with strict safety and compliance requirements. That complexity makes it critical to have well-trained people operating the systems that use them.

Operators and technicians are the backbone of this work. They keep systems running day and night, often in demanding conditions, and their knowledge spans everything from mechanical repairs and electrical troubleshooting to automation and control systems. Despite their importance, the pipeline for bringing new talent into these roles is falling short. Aging workers are leaving the field, and younger generations often don't see this line of work as a viable career option. Additionally, many individuals have limited access to quality training. As more senior technicians retire, the loss of institutional knowledge compounds the challenge and widens the gap even more.

The IIAR Ammonia Refrigeration Training Guideline (2008) identifies three skill levels: Entry, Operational, and Technical. Each level defines a progressive path for building competence.

However, real-world implementation of these structured development paths is often inconsistent or absent. Many facilities lack the bandwidth or resources to support on-the-job mentorship, and fewer still leverage partnerships with technical institutions.

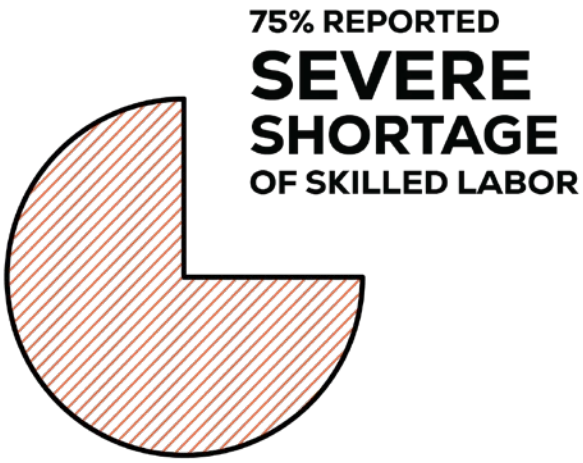


Problem Statement

Is there a skills gap in industrial refrigeration, and what does it mean for the future of the industry?

The answer is a definitive yes, there is a skills gap in industrial refrigeration. A skills gap, defined as a significant mismatch between job requirements and the capabilities of the available workforce, poses serious threats. Without adequate numbers of trained technicians and operators, companies face increased risks, regulatory noncompliance, and operational inefficiencies.

The responsibilities of refrigeration personnel have been reshaped by numerous regulatory and organizational standards, including those from OSHA, EPA, SERC, LEPC, DHS, IIAR, and RETA. Compliance requires rigorous documentation, system monitoring, and preventive maintenance. Failing to meet these standards can result in safety incidents, environmental violations, and shutdowns.



More and more data continues to point to the seriousness and growing impact of the skills gap:

• A 2014 study by Accenture and the Manufacturing Institute found that 75% of manufacturers reported a severe shortage of skilled labor.

• Tyson Foods disclosed in 2018 that 60% of their refrigeration technicians were over the age of 50.

• According to the Bureau of Labor Statistics (2023), HVAC-R job openings will exceed 42,000 annually through 2033.

• In a 2025 interview, Mike Rowe highlighted a parallel “will gap” – a lack of enthusiasm for trade careers fueled by outdated perceptions and cultural bias toward blue-collar professions.

In 2023, one company reported receiving

only one qualified applicant for every nine open positions.

Conversations with international clients reveal the problem is not confined to the United States. Countries like Jamaica report similar difficulties in talent acquisition and retention.

The consequences of the skills gap are both clear and costly. When training falls short safety risks increase, often putting both people and equipment in jeopardy. Regulatory compliance also suffers, as underqualified staff may struggle to keep up with inspection protocols, documentation, or proper maintenance procedures. In the long run, these gaps lead to increased operating costs. Equipment does not run as efficiently, maintenance becomes more reactive than preventive, and downtime increases. Most of the time, these issues are not caused by carelessness but because workers have not been provided with the necessary training or tools to perform the job correctly.

Proposed Solutions

1. Promote Early Career Awareness

Changing the narrative around skilled trades must begin at an early stage. Industry players should collaborate with school systems to introduce students to vocational careers by the time they are in junior high.

- Develop career days, internships, and cooperative programs.
- Promote real-world success stories of technicians and operators.
- Highlight earning potential, job security, and career progression.

Technical careers must be seen as every bit as valuable as traditional college paths. Outreach efforts should focus on demonstrating how careers in industrial refrigeration are not only stable and well-paying but also play a crucial role in keeping major sectors of the economy, such as food production, healthcare, and logistics, operational. By connecting the work to real-world impact, we can better engage students, parents, and educators in recognizing the value of these roles.

2. Expand Mentorship and Apprenticeship Programs

Apprenticeships provide a structured and proven model for skill development and transfer.

These programs should be:

- USDOL-registered and industry-aligned.
- Supported by senior technicians willing to mentor.
- Connected to industry-recognized certifications like RETA's CARO and CIRO.

Facilities can benefit by implementing tiered training structures and offering incentives for mentors. Internal apprenticeship programs can also serve as succession planning tools, preserving institutional knowledge.

Proposed Solutions

3. Develop Customized Training Paths

Every learner absorbs information differently. To be truly effective, training programs should be designed with different learning styles in mind. Not everyone learns the same way, and a one-size-fits-all approach often leaves some people behind.

Consider the following methods:

• Kinesthetic: Many in our industry learn best through hands-on experience. For them, hands-on simulations, lab exercises, and real-world practice are key to mastering skills.

• **Visual:** Diagrams, schematics, videos, and P&IDs help these learners understand systems and processes at a glance.

• **Auditory:** These learners respond well to lectures, discussions, and verbal walkthroughs. Recorded sessions or podcasts can reinforce key concepts.

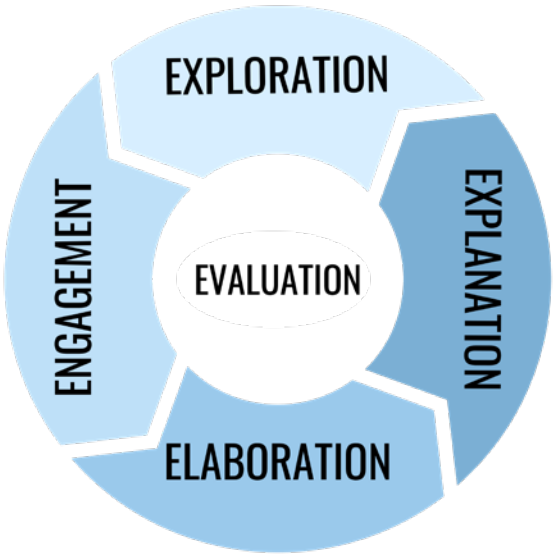
• **Social:** Group-based learning approaches, such as peer discussions, collaborative problem-solving, or team-based exercises, are most effective for these learners.

• **Solitary:** Others prefer to go at their own pace, learning through manuals, self-guided study, and quiet reflection.

Understanding and adapting to these learning preferences can make a significant difference in how quickly and effectively someone gains the skills they need on the job.

Moreover, training should include:

•Mechanical systems and automation basics.
•Troubleshooting with root cause analysis.
•Documentation practices and regulatory expectations.
•Thermodynamics and refrigerant behavior.
•Soft skills like communication and leadership.



Proposed Solutions

4. Leverage Technology

Technology can mitigate labor shortages by enhancing system automation and diagnostics.

•Adopt AI-enabled monitoring and predictive maintenance platforms to enhance operational efficiency and effectiveness.
•Use virtual reality (VR) for immersive training.
•Implement cloud-based systems for remote control and data logging.

While some legacy technicians may resist technological changes, younger workers may be drawn to companies using cutting edge technology. Training must ensure comfort with user interfaces, programmable logic controllers (PLCs), and energy optimization tools.

5. Access Public Training Funds

Many employers overlook government-funded workforce programs. In Arkansas, for example, the Office of Skills Development funds up to 75% of eligible training.
• Research workforce grants and education tax credits in your region.
• Partner with local colleges to co-develop curriculum.
• Utilize grants to offset the costs of new hire orientation or upskilling existing employees.

6. Explore New Talent Pools

While it's been common practice for companies to recruit talent solely from within the refrigeration field, it's time to broaden that approach.

To build a stronger and more resilient workforce, **organizations should consider:**
• Recruiting veterans with technical backgrounds.
• Offering transitional training for HVAC technicians.
• Collaborating with re-entry and immigration programs.
• Reassigning in-house staff from adjacent departments.

Create "Grow Your Own" pathways by upskilling internal candidates, which also builds loyalty and reduces turnover.

7. Measure and Communicate Value

Executives often see training as a cost rather than an investment. Changing this mindset requires **clear metrics:**
•Compare incident rates before and after training interventions.
•Quantify energy savings from optimized system use.
•Track retention improvements from formal development programs.
Demonstrate that properly trained staff are safer, more productive, and more engaged.

Conclusion

The skills gap in industrial refrigeration is not a looming threat – it is a present crisis.

It is also a call to action. This moment presents the industry with an opportunity to rebuild its workforce pipeline, modernize its approach to talent development, and secure its future. By working together across sectors – industry leaders, educators, trade organizations, and policymakers – solutions can be implemented that reshape the labor landscape. From classrooms to control rooms, we must ensure that the next generation of refrigeration professionals is not only capable but also empowered.

To move from shortage to solution, we must:

- Reinvest in early outreach and education.
- Develop inclusive, accessible training programs.
- Leverage public funding and technological tools.
- Elevate the status of skilled trades.

If we answer this call, we will not only close the skills gap, we will build a safer, more sustainable, and more prosperous industry.

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