NCCCO FOUNDATION

Workforce Research

FINAL REPORT

Prepared for | NCCCO Foundation

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NCCCO Foundation Workforce Research

Final Report

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Workforce Research Highlights

To fulfill their goals of *research, education,* and *workforce development,* the **NCCCO Foundation** partnered with the Human Resources Research Organization (HumRRO) to conduct an exploratory workforce research project.

The workforce research results outlined in this infographic represent the data gathered from **1,205 CCO-certified survey participants** and we assume that the findings reflect the field more broadly.

The Workforce Research Highlights section offers a snapshot of the project results. We encourage readers to delve into the report and appendices to better understand the extensive information gathered throughout this workforce research project.

TWO-PART RESEARCH EFFORT

PART 1:
Focus Group Sessions

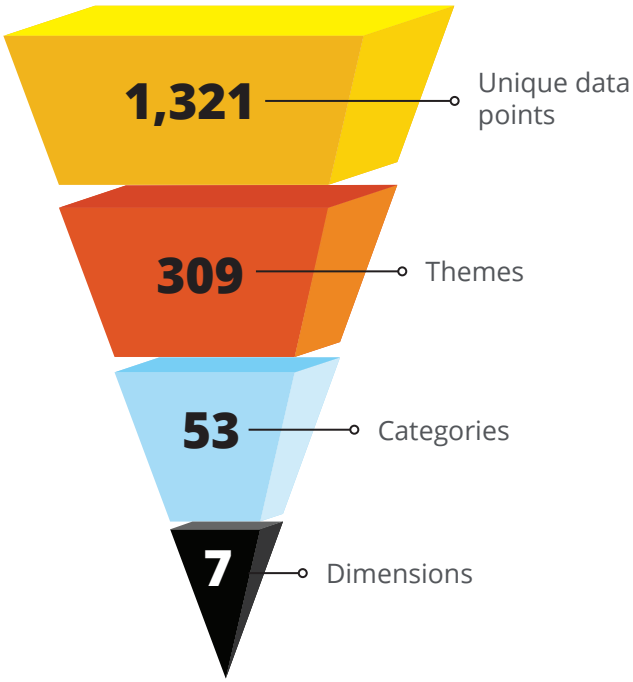
9 focus group sessions with **38** participants

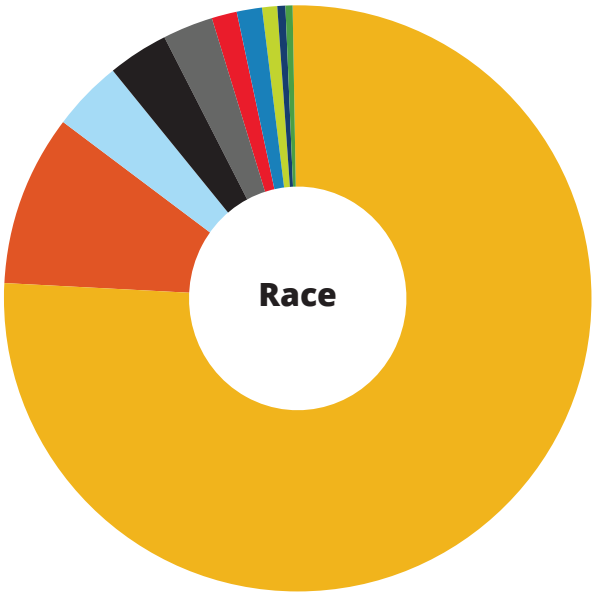
PART 2:
Widely Distributed Survey

65-question survey

1,205 participants

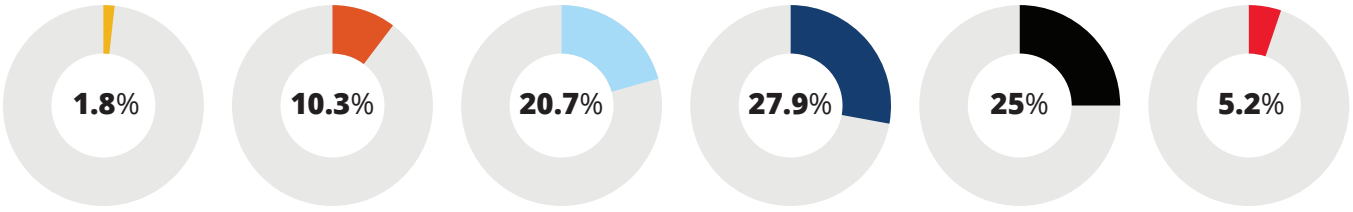
The focus group sessions generated 1,321 comments, or "unique data points," which were grouped into 309 themes, covering 53 categories, resulting in seven overarching dimensions to analyze further.





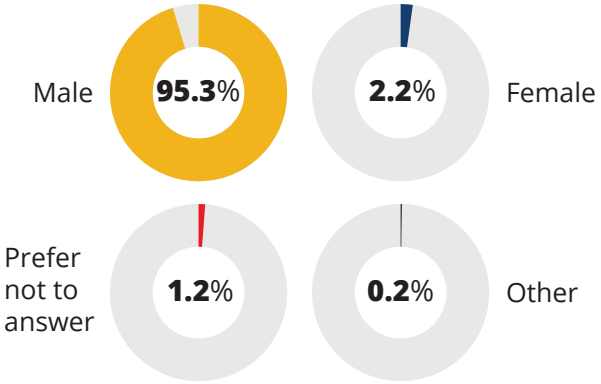
- **79%** White or Caucasian
- **9.6%** Hispanic or Latino
- **4.1%** Prefer not to answer
- **3.6%** Multi-Racial
- **2.8%** Black or African American
- **1.5%** American Indian or Alaska Native
- **1.3%** Other
- **0.9%** Asian
- **0.4%** Native Hawaiian or Other Pacific Islander
- **0.4%** Unknown

Age

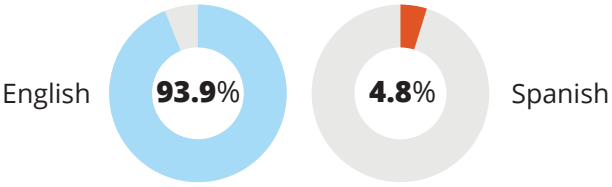


18–25 | 26–35 | 36–45 | 46–55 | 56–65 | 66–77

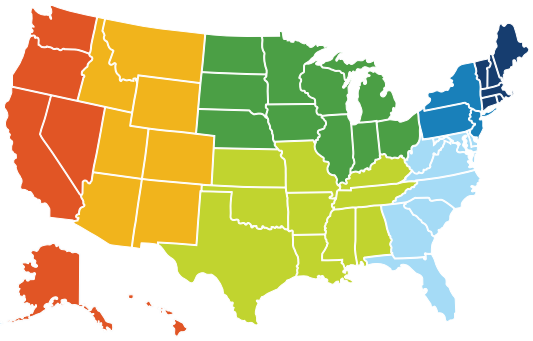
Gender Identity



Native Language



Regional Location



- South Central **27.7%**
- North Central **19.7%**
- South Atlantic **15.9%**
- Pacific **14.7%**
- Mid-Atlantic **9.8%**
- Mountain **7.5%**
- Northeast **3.5%**
- Outside of the U.S. **0.3%**

PAST EXPERIENCE AND EDUCATION

Highest Level of Education Completed

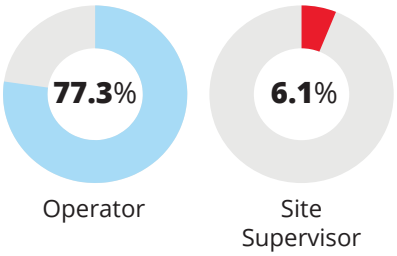
- **39.8%** High school diploma/GED
- **22.3%** Some college, no degree
- **17.7%** Vocational training or trade school

Introduction to the Load-Handling Field

- **57.3%** Working in a related field
  (e.g. non-load-handling construction work, mechanic, agriculture work)
- **23.3%** Referral from a personal connection working in the field
  (e.g. family member, friend)

CURRENT ROLE, TRAINING, AND SKILLS NEEDED

Primary Role

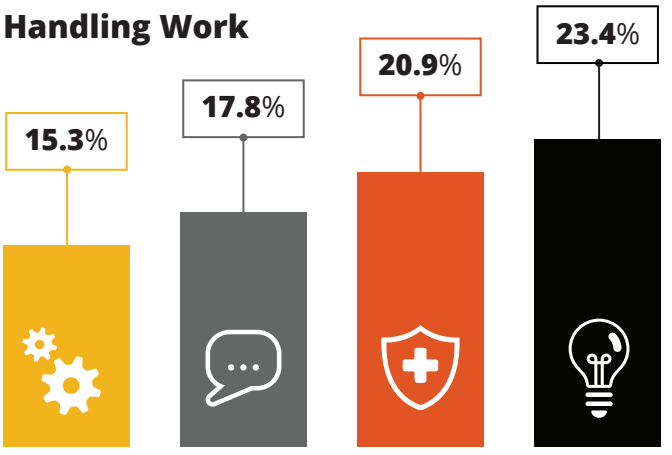


Load-handling Training and Quality of Training

	PERCENT	MEAN*
On-the-job training *(e.g. received training after being hired)*	43.4%	4.04
Employer-sponsored training *(e.g. training paid for by employer)*	20%	4.37
Union apprenticeship program	16%	4.55
Self-funded training *(e.g. paid for training out of pocket)*	7.4%	4.00

*(Means are based on a 5-point Likert scale: **1 = very low** quality and **5 = very high** quality)*

Most Important Skills Needed for Load-Handling Work



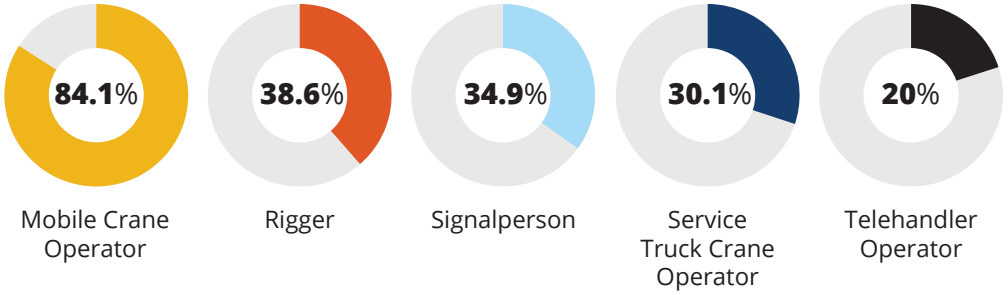
Length of Time Working in the Load-Handling Field

- Less than 1 year: **3%**
- 1–5 years: **11.8%**
- 6–10 years: **14%**
- 11–15 years: **11.5%**
- 16–20 years: **13%**
- 21–25 years: **15.8%**
- 26–30 years: **10.6%**
- 31–35 years: **7.6%**
- Over 35 years: **12.6%**

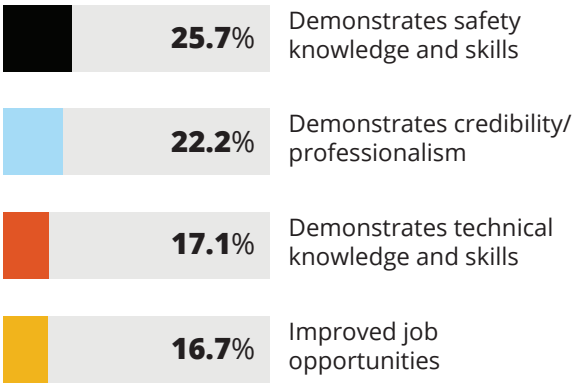
CERTIFICATION

Load-Handling Certifications Currently Held

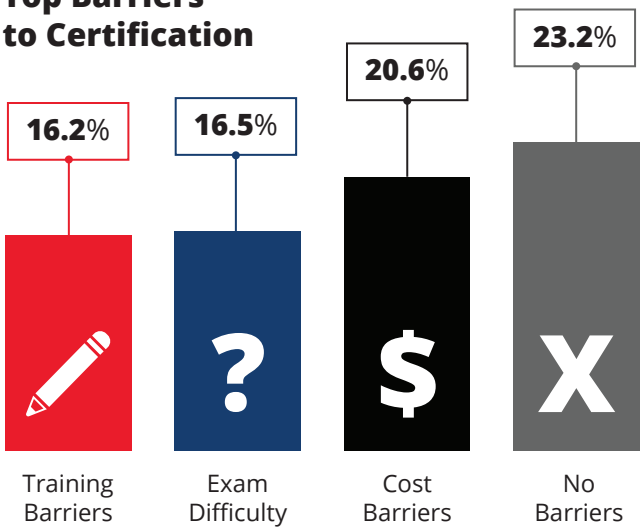
Note: This data will not add up to 100%, and individuals can hold more than one certification at a time.



Top Benefits of Load-Handling Certifications



Top Barriers to Certification



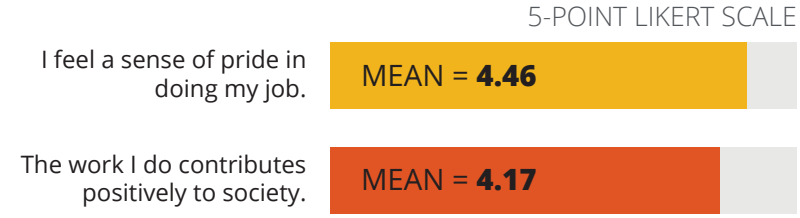
WORK OPINIONS

Note: Responses for Work Opinion items were made on a **5-point Likert scale**.

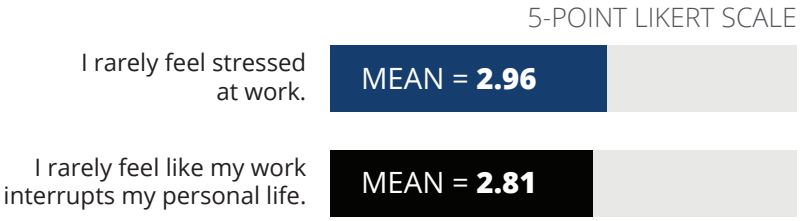
1 = Strongly Disagree
2 = Disagree
3 = Neither Agree nor Disagree
4 = Agree
5 = Strongly Agree

Higher values always indicate **more agreement** with the positively worded statements.

Most Agreed With Statements



Most Disagreed With Statements



Executive Summary

Project Overview

To fulfill their goals of *research*, *education*, and *workforce development*, the NCCCO Foundation partnered with the Human Resources Research Organization (HumRRO) to conduct an exploratory workforce research project. The NCCCO Foundation wanted to focus on understanding several topics of interest, including the demographic makeup of load-handling employees, the state of the current recruitment pipeline, and how load-handling employees view their jobs and certification. HumRRO conducted a two-stage research effort beginning with nine focus group sessions where a total of 1,321 unique comments were collected and systematically coded into themes/categories. The research effort concluded with a widely distributed survey in which 1,205 load-handling employees participated. We assume that the data collected during this research effort likely represents the field more broadly.

Although this executive summary offers a snapshot of the project results and suggestions for future efforts, we encourage readers to delve into the report and appendices to better understand the extensive information gathered throughout this workforce research project.

As a final note, the data interpretations and recommendations articulated throughout this report are the result of extensive research and data analysis conducted by the HumRRO research team. It should be noted that the interpretations and recommendations represent the professional opinion of the HumRRO research team and may not necessarily correspond with the perspectives of the NCCCO Foundation. For more information on the HumRRO research team backgrounds, please see Appendix D.

Results Overview

Load-handling Employee Backgrounds

With respect to demographic characteristics, most survey respondents were White/Caucasian (79.0%) males (95.3%), who tended to be in mid- to late career (i.e., between the ages of 46–55 [27.9%] and 56–65 [25.0%]). Additionally, most survey respondents were native English speakers (93.9%) who live in the U.S. (99.0%) and whose highest level of education was high school/GED (39.8%). Overall, the demographic makeup of load-handling employees is quite homogenous. These findings point to underrepresented demographic groups which could be targeted for recruitment efforts, thereby expanding the talent pipeline.

Current and Future Pipeline Considerations

With respect to current employment, most survey respondents currently work as an Operator (77.2%) in the construction industry (67.1%) and received on-the-job training (43.4%). Most respondents were introduced to the load-handling field because they worked in a related industry (e.g., construction; 57.3%) or were referred by a personal connection (e.g., friend or family member; 23.3%). This data indicates that the pipeline in the load-handling field heavily relies on two primary recruitment methods. Industry leaders and organizations should consider

revamping their recruitment methods to reach and engage with a diverse array of potential applicants.

Work Opinions

Overall job satisfaction (5-point Likert scale where higher values indicate more positive perceptions) averaged between neutral and moderate satisfaction (*M* = 3.63). However, levels of satisfaction varied across subscale areas in that respondents tended to feel a high sense of pride in their work (*M* = 4.46) and believe that their work positively contributes to society (*M* = 4.17), but also tended to think that their work interrupts their personal life (*M* = 2.96) and that they often experience stress on the job (*M* = 2.81).

Additionally, it was found that certain underrepresented demographic groups (i.e., females, Black/African Americans) tended to observe more instances of cultural insensitivity and discrimination in the workplace (*M* = 2.91 and *M* = 3.11, respectively), which can have far reaching impacts on employee well-being and organizational outcomes (e.g., turnover, recruitment).

With respect to the focus group sessions, participants tended to express more likes (*n* = 277) than dislikes (*n* = 140) about the field. One interesting trend was that interpersonal connection/interactions were both the most liked aspect (*n* = 57) *and* least liked aspect (*n* = 41) of the job. Overall, the data indicates that while there are positive aspects of job satisfaction, there are also issues that warrant attention from organizations. Improving employee satisfaction can have long-term positive implications for both employees and organizations alike.

Views on Load-handling Certifications

The most commonly held certification was Mobile Crane Operator (84.1%), followed by Rigger (38.6%), and Signalperson (34.9%), where the data showed that it was common to hold more than one certification at a time. By and large, respondents agree that their load-handling certifications are valuable (*M* = 4.12) but found less value in holding multiple certifications at a given time (*M* = 3.85). Only, 6.1% of survey respondents saw no benefits of load-handling certifications, whereas 93.9% selected a primary benefit of load-handling certification. Regarding the hurdles that people face when becoming certified, the top reported barriers were cost (20.6%), exam difficulty (16.5%), and access to/quality of training (16.2%).

The results highlight the overall positive perceptions about certification as well as a variety of different hurdles that employees face when becoming certified. Certification bodies and industry leaders should work to understand the needs of certificants and those seeking to be certified and make improvements where possible, while also communicating the value and importance of their certifications.

Performance Elements

Both the survey and focus group results emphasize the importance of technical skills and safety skills, which is unsurprising given how critical those skills are for work in the load-handling field. The research also highlighted several domains of “soft skills” that are crucial for successful performance in the load-handling field, including interpersonal skills (e.g., teamwork,

communication), problem-solving, leadership skills, attention to detail, adaptability, and more. Organizations should focus on systematically understanding the skills needed for load-handling work so that they can recruit, hire, and train talent accordingly.

Recommendations for the Future

Load-handling work is a critical part of infrastructure development and society more broadly. The stakes are high, and mistakes can have serious consequences. It is critical for industry leaders and organizations to do what they can to build the pipeline of skilled and quality workers who can become part of the load-handling workforce and ensure that employee well-being and performance are addressed in order to keep existing and new employees in load-handling positions.

In light of the findings outlined throughout this summary and report, the HumRRO research team developed five primary recommendations that we hope can guide workforce development efforts for the load-handling industry. The recommendations are as follows:

- Diversify the recruitment pipeline to expand the potential recruitment pool.
- Decrease identified barriers for entering the field and becoming certified.
- Reanalyze the skills needed for jobs in the load-handling field to improve recruitment, hiring, and training efforts.
- Address and improve overall job satisfaction.
- Research and address the perspectives and needs of underrepresented groups.

A significant amount of detailed information regarding the research findings, key takeaways, and future and recommendations are provided throughout the report and are summarized in the *Key Takeaways and Recommendations* section. To gain a full understanding of the research findings, it is critical to read on for more details.

INTRODUCTION

Introduction

Project Goals

This report outlines the findings of an extensive workforce research project commissioned by the NCCCO Foundation in partnership with the Human Resources Research Organization (HumRRO).

The NCCCO Foundation was created with three primary goals, including research, workforce development, and education.

- *Research*: Facilitate research and data collection regarding safety, innovation, and workforce development in the load-handling industry.
- *Workforce development*: Improve public awareness of careers in the load-handling industry and help share the skills and qualifications needed.
- *Education*: Disseminate and promote information that improves safety, skills development, and career advancement in the load-handling industry.

With these organizational goals in mind, the Foundation worked with the Human Resources Research Organization (HumRRO) to conduct an exploratory workforce research project. The Foundation wanted to investigate several areas for this project, outlined below.

- *Load-handling employee demographic makeup*: Gather data on background characteristics of load-handling employees, such as location, age, education, race, and gender.
- *Current employee pipeline*: Research load-handling employees' past employment to understand the talent pipeline and to inform future recruitment endeavors.
- *Opinions about jobs and certification*: Investigate how load-handling employees view the work that they do as well as the current certification system.

After identifying the primary areas of interest for the workforce research project, the HumRRO team set forth to plan and execute the extensive data collection as well as data synthesis efforts.

Project Overview

In June 2023, the NCCCO Foundation and HumRRO team had an initial project kickoff meeting where the overarching project goals and tasks were discussed and refined. After this kickoff, the HumRRO team set forth in conducting background research to gain an understanding of how the load-handling field operates. This background research served as the basis for the development of the focus group protocols and survey instruments. Please see Appendix A for details on the background research.

After completing the background research, the HumRRO team initiated the data collection phase of the project. Load-handling employees from all over the United States were recruited to participate in virtual focus group sessions where they were asked questions to investigate the areas of interest. The focus group data was systematically analyzed and organized into an extensive inductive coding system, which emerged from the data based on major themes.

At the conclusion of the focus groups, The HumRRO team had a firm understanding of the field and was in an informed position to develop the survey data collection instrument. The team of researchers worked with the NCCCO Foundation and software engineers to develop and implement the 65-item survey (see Appendix B). The survey remained open for 3 weeks, and 1,205 participants completed it. After survey data collection was finalized, the HumRRO team analyzed the survey data.

The results from the focus groups and survey are presented in the *Research Results* section of this report alongside the HumRRO research team's interpretations and suggestions for future research/organizational efforts. The data interpretations and recommendations articulated throughout this report are the result of extensive research and data analysis conducted by the HumRRO research team. It should be noted that the interpretations and recommendations represent the professional opinion of the HumRRO research team and may not necessarily correspond with the perspectives of the NCCCO Foundation. For more information on the HumRRO research team backgrounds, please see Appendix D.

METHOD

Method

Focus Group Research

Purpose

The first step of this research effort was to conduct a series of virtual focus groups. Focus group research serves several purposes. Namely, focus group research allows for exploration of phenomena in a way that survey data cannot. That is, focus group facilitators can ask follow-up questions and uncover additional context and insight into the comments that participants say. Ultimately, using focus groups to collect information results in rich data that provides a deep understanding of the area of interest.

With the benefits of focus group research in mind, the HumRRO team conducted a series of nine virtual focus groups to gain a deeper understanding of the load-handling field. Conducting this research before implementing the widescale survey was particularly useful in informing the survey content.

Participants

In total, HumRRO hosted nine focus groups sessions with 38 participants (see Table 1). The NCCCO Foundation recruited focus group participants through an email and LinkedIn campaign, where volunteers completed a sign-up form which asked for contact information and basic demographic information (e.g., years of experience, race, gender). Participants were incentivized with an Amazon gift card drawing, where five randomly selected participants received a $100 Amazon gift card.

HumRRO split focus group participants into three groups based on experience (i.e., less than 5 years of experience, 5–10 years of experience, and greater than 10 years of experience). Given the lack of representation in the load-handling field, HumRRO and the NCCCO Foundation attempted to facilitate a focus group with just female participants. However, only one person was able to contribute during this female focus group session. HumRRO attempted to reschedule the female focus group and also provided female subject matter experts with an opportunity to submit their responses to the focus group questions via email/Word document. However, no female subject matter experts participated in the rescheduled focus group nor submitted responses. Therefore, to protect the single female focus group participant's anonymity, the data was merged with their corresponding years of experience group. Additionally, before merging the data, the findings from the female focus group session were analyzed and the researchers concluded that in this instance there were no significantly unique themes that warranted keeping the data separate from the experience-based groupings.

The HumRRO research team recommends that the NCCCO Foundation and other industry leaders make future efforts to facilitate focus groups with female participants as well as members of other important demographic groups (e.g., underrepresented racial groups) to supplement and expand upon the findings gathered in this research effort.

Table 1: Focus Group Structure

Years of Experience	Total Sessions	Total Participants
Less than 5 years	2	12
5 to 10 years	3	9
More than 10 years	4	17

Note: Focus group sample sizes vary for the years of experience breakdowns. When interpreting focus group tables and comparing the results across the experience breakdowns, please keep in mind the differences in sample size (*n*).

Format

HumRRO first developed a focus group protocol, including the introductory content and focus group questions, which was approved for use by the NCCCO Foundation before beginning the focus group research. Participants were asked the same standardized set of questions across all nine focus groups. Example questions for each dimension are listed below in Table 2.

Table 2: Focus Group Questions

Data Dimension	Example Focus Group Question	Number of Data Points
Likes about the Field	"What aspects of your job do you like?"	277
Dislikes about the Field	"What aspects of your job do you dislike?"	140
Views on Certification	"Do you believe that certification is valuable? Why or why not?"	270
Getting into the Field	"What do you think is the best path for entering the load-handling field?"	242
Previous Employment	"What job did you hold directly before you started working in the load-handling field?"	119
Performance Elements	"What differentiates good versus excellent performance for people working in the load-handling field?"	196
Changes in the Field	"What are some changes (both minor and major) that you have seen in the load-handling field in the last 5 years?"	77

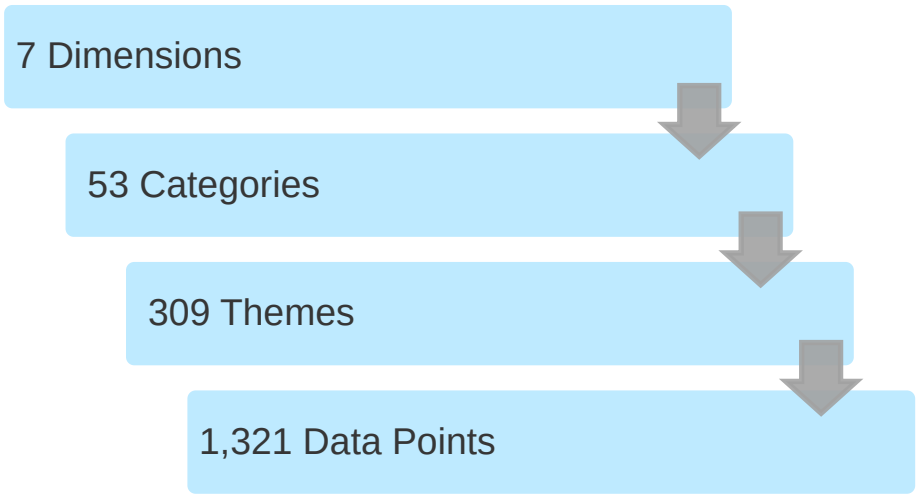
Data Coding

Focus group transcription documents were saved in a secure location after each focus group. The documents were cleaned of any transcription errors. Moreover, any identifiable information was redacted. The documents were then transferred into the qualitative coding software, MaxQDA, for qualitative analysis.

Before coding the data, each team member went through training and engaged in several hours of consensus meetings with the team of coders. After training, the coding team had a shared understanding of where data points should be categorized. If individual coders had questions about specific data points, they brought those ambiguous data points to the team to collectively make a decision on where the information should be categorized. Throughout the process of analyzing the focus group data, an extensive inductive coding scheme emerged. In other words, categories were derived from the data itself rather than using predefined categories. After the initial data coding was complete, team members analyzed the code structure, reorganized codes, and verified that the data points within a particular code belonged there.

The data from the focus groups was broken down using the following hierarchical structure (from largest to smallest): dimensions, categories, themes, and data points. There was a total of 1,321 data points (i.e., unique comments), which were categorized into 309 themes across the 53 categories, situated within seven overarching dimensions.

Figure 1: Data Structure



Survey Research

Purpose

The second stage of this research effort was to administer a widescale survey. Survey research has several benefits, including standardization, cost- and time-effectiveness, anonymity, and the ease of analysis. By collecting survey data, the HumRRO research team was able to validate

and expand upon information from the focus groups as well as collect other very critical data (e.g., employee demographics). With the benefits of survey research in mind, the HumRRO team developed a 65-question, 20-minute survey for members of the load-handling field to voluntarily complete (see Appendix B for survey details).

Participants

The NCCCO Foundation sent out a call for survey participation through one of their email listservs. The survey participation email was delivered to a total of 103,643 individuals who are currently CCO certified. Participants who completed the survey were entered into a raffle to win one of 20 $25 Amazon gift cards. In total, 1,205 participants completed the survey. To see a detailed breakdown of participant demographics, work experience, etc., please see the *Load-handling Employee Backgrounds* section.

While the total number of survey participants was relatively large for typical, voluntary behavioral science research, the overall survey response rate was fairly low (i.e., approximately 1%). Low survey response rates are associated with several issues, including non-response bias, where the characteristics of individuals who respond can differ greatly from individuals who do not respond. Similarly, subgroup analyses become less reliable with small sample sizes, as we see in our data breakdowns (e.g., role, length of time in the field, race, and gender). It becomes difficult to compare groups with small samples sizes and draw meaningful conclusions. Finally, with a low response rate, the representativeness of the sample compared to the population at hand (i.e., employees in the load-handling field) is more questionable. With these downsides in mind, we urge industry leaders and organizations to build on this research effort, with an emphasis on improved sampling methods and therefore an improvement in generalizability of results.

Format

The survey was administered on HumRRO's secure online platform where participants accessed it via an anonymous link. The survey was open for three weeks and took approximately 15–20 minutes to complete. All responses were anonymous, and participants had a chance to enter in a raffle to receive one of 20 $25 Amazon gift cards. The survey was broken down into the following categories, which were listed on the survey for participants to see:

- General Career and Training Questions
- Current Employment and Certification Questions
- Education and Demographic Background Questions
- Location and Language Questions
- Media Questions
- Work Attitudes
- Performance Elements
- Certification Attitudes

Please see Appendix B for a copy of the survey.

Data Analysis

A total of 1,205 participants completed the survey. This sample size figure is listed numerously throughout the *Research Results* section. To begin the data analysis process, HumRRO first created a data analysis plan, which was reviewed and approved by the NCCCO Foundation. After the analysis plan was approved, HumRRO conducted a data cleaning effort to help ensure high-quality data (e.g., screening for implausible values). After the data set was prepared, the team began the analysis process. All analyses were conducted using the SPSS data analysis software. There were several rounds of quality control checks during and after the data analyses process to ensure that the SPSS code was appropriate and accurate. The results consist of various descriptive statistics (i.e., counts, percentages, and means) for each survey item and also include data breakdowns (e.g., breaking down the results by role, length in field, race, gender) for relevant survey items.

A total of 1,205 participants completed the workforce research survey.

RESEARCH RESULTS

Research Results

Load-Handling Employee Backgrounds

Section Summary

This section primarily focuses on descriptive information for survey respondents' background. The information described includes data on the survey respondents' demographic makeup (e.g., location, gender, race), current employment (e.g., role, industry), previous employment experience, education, income, and more. While the focus for other sections in the report goes beyond basic data reporting and also includes data interpretations and suggestions for the future, this section primarily focuses on descriptive information. We provide specific recommendations based on the results reported in this section later on in the report, specifically in the *Current and Future Pipeline Considerations* section.

The survey results show that a large majority of respondents were white males who tended to be mid- to late- career Operators. Additionally, a majority of survey respondents were native English speakers from the U.S. whose highest level of education was high school. We assume that these figures represent the load-handling field more broadly. When interpreting the results throughout this report, please keep in mind the lack of representation from particular demographic groups. To understand the perspective of certain groups, throughout the report we have broken down the survey results by role, length of time in the field, race, and gender, but at times the breakdown sample sizes are small, which impacts our ability to draw meaningful conclusions. With that in mind, throughout this report we include future research ideas and suggestions for industry leaders to address the lack of demographic representation in the field.

A large majority of respondents were white males who tended to be mid- to late- career Operators. Most respondents were native English speakers from the U.S. with high school level education.

Survey Respondent Demographics

This subsection overviews the demographic information collected from the 1,205 survey respondents, including information on gender, race, age, location, and native language. Many of these results provide insights into pipeline and recruitment recommendations, which will be discussed in the subsequent *Current and Future Pipeline Considerations* results section below.

Gender, Race, and Age

An large majority of survey respondents were *male* (95.3%). A majority of survey respondents were *White or Caucasian* (79.0%), distantly followed by *Latino or Hispanic* (9.6%). The highest number of survey respondents were between *46–55 years old* (27.9%), with the next highest age group being *56–65 years old* (25.0%). For more details, please see Table 3.

Location

Nearly all survey respondents indicated they live in the *United States* (99.0%). The most common states where respondents lived were *Texas* (12.4%) and *California* (7.3%), which follows logic given that those are the two largest states in both population and size. Additional location details can be found in Table 4.

Language

A majority survey respondents indicated that *English* (93.9%) was their native language. Additionally, most respondents indicated their study materials were written in *English* (98.5%) and their certification tests were taken in *English* (98.6%). See Table 5 for details.

Current Employment

The *Current Employment* subsection contains information about employees' current job role, current industry, years of experience in the load-handling field, load-handling training, current income, and current work travel rates. These results, in part, provide insights into pipeline and recruitment recommendations, which will be discussed in the *Current and Future Pipeline Considerations* results section.

Current Role and Industry

A majority of survey respondents indicated that they currently work as an *Operator* (77.2%). Additionally, *construction* (67.1%) was by far the most common industry that survey respondents worked in (see Table 6).

Most survey respondents currently work as an Operator (77.2%) in the construction industry (67.1%).

Years of Experience

With respect to the number of years in their current role, survey respondents most often indicated that they have been working in their current role for either *1–5 years* (19.1%) or *6–10 years* (16.8%), which is unsurprising given the typical nature of promotions and career progression for a single job role. In other words, employees tend to change roles several times in the span of their career, and it makes sense that the average number of years in a single role would be relatively low.

With respect to years of experience in the load-handling field specifically, the results were somewhat uniform across the year ranges (see Table 6). However, survey respondents tended to be somewhat older—58.1% were 46+ years old. Looking at these two data points together, this information indicates that employees in the load-handling field often worked in other jobs or industries before entering the load-handling field and that load-handling work is not typically their first job. A point which is underscored by the fact that only 1.8% of survey respondents were between the ages of 18-25, an age at which many people are getting their first jobs.

Training

With respect to load-handling related training, the highest number of survey respondents reported receiving *on-the-job training* (43.4%), followed by *employer-sponsored training* (20.0%) and *union apprenticeship programs* (16.0%). However, survey respondents viewed *union apprenticeship programs* (*M* = 4.55) and *employer-sponsored training* (*M* = 4.37) as the highest quality forms of training. See Table 7 for more detail. These results provide insights into pipeline and recruitment recommendations, which will be discussed in the *Current and Future Pipeline Considerations* section of this report.

Most respondents received on-the-job training (43.4%), followed by employer-sponsored training (20.0%) and union apprenticeship programs (16.0%). However, employees viewed union apprenticeship programs and employer-sponsored training as the highest quality forms of training.

Income

Survey respondents were asked to report their income. Across roles, salaries fell on a somewhat normal distribution, where most respondents indicated they make between *$80,000 and $99,000* (*n* = 271). The salary for *Lift Directors* tended to be higher compared to the other roles. It should be noted that most respondents were Operators (931 out of 1204) and that a sizable number of respondents preferred not to answer this question (*n* = 91). Please see Table 8 for more details.

Travel

The majority of respondents indicated that they *do not travel for work* (51.5%). The next highest percentage of respondents indicated they spend *1-4 days* (16.3%) a month traveling for work. The third highest percentage of respondents reported *over 25 days* (12.4%) of travel a month. Additional details are provided in Table 9.

With nearly half of survey respondents doing some traveling each month for work, it is important to note that survey respondents had relatively low agreement with the statement, "I enjoy traveling for work," (*M* = 3.09). Please see the *Work Opinions* section for more details.

Education and Past Employment

The *Education and Past Employment* subsection discusses the industries that survey respondents (*n* = 1205) have formerly worked in, and more specifically the industries they worked in directly before entering the load-handling field. This subsection also covers the educational attainment of survey respondents. These results, in part, provide insights into pipeline and recruitment recommendations, which will be discussed in the *Current and Future Pipeline Considerations* results section.

Past Employment

Survey respondents were asked about all the industries that they have worked in before they started working in a load-handling job. By a large margin, most survey respondents indicated that they worked in *construction* (72.9%). This was followed by *agriculture and farming* (24.2%) and *transportation and logistics* (21.2%). Similarly, when asked about the industry they worked in directly before entering the load-handling field, again most indicated *construction* (45.5%), with *transportation and logistics* coming in a distant second place (10.5%). Please see Table 10 for details.

When asked about the industry they worked in directly before entering the load-handling field, most indicated construction (45.5%), with transportation and logistics coming in a distant second place (10.5%).

Similarly, the results of the focus group research indicated that most participants were already working in *Jobs Related to the Load-Handling Industry* (*n* = 33) and *Transportation and Logistics* (*n* = 18). Please see Tables 61 and 62 in Appendix C for details. These results provide insights into pipeline and recruitment recommendations, which will be discussed in the *Current and Future Pipeline Considerations* section.

Educational Background

Most survey respondents indicated they had a *high school diploma/GED* (39.8%). Many respondents also indicated they had *some college, no degree* (22.3%), or attended *vocational training/trade school* (17.7%). Of those who attended a trade school, the most popular areas of study were *equipment operating* (21.6%) and *commercial truck driving* (20.7%). Those who attended college pursued a variety of majors. See Table 11 for additional details. These results provide insights into pipeline and recruitment recommendations, which will be discussed in the *Current and Future Pipeline Considerations* section below.

Survey Tables: Load-Handling Employee Backgrounds

Note: Heat maps have been included for each table to assist with interpretation. For tables representing multiple survey questions, heat map color schemes are based on each question and not across questions. Dark red represents the lowest number of the question results, and dark blue represents the highest number of the question results (see graphic below). Please read the notes section at the bottom of each table for detailed information about interpretation.

Table 3: Basic Demographics

	n	%
What is your age?		
18-25	22	1.8
26 – 35	124	10.3
36 – 45	249	20.7
46 – 55	336	27.9
56 – 65	301	25.0
66 – 77	63	5.2
Missing	110	9.1
Total	1205	100
What is your race?		
American Indian or Alaska Native	17	1.5
Asian	10	0.9
Black or African American	32	2.8
Hispanic or Latino	111	9.6
Native Hawaiian or Other Pacific Islander	5	0.4
White or Caucasian	916	79.0
Other	15	1.3
Unknown	5	0.4
Prefer not to answer	48	4.1
Multi-Racial	43	3.6
Missing	3	0.2
Total	1205	100
What is your gender identity?		
Male	1148	95.3
Female	27	2.2
Other	2	0.2
Prefer not to answer	14	1.2
Missing	14	1.2
Total	1205	100

Note: Heat map color schemes are based on each question and not across questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question.

Table 4: Location

	n	%
Which country do you currently live in?		
United States	1193	99.0
Canada	1	0.1
Costa Rica	1	0.1
Mexico	1	0.1
Pacific Islands	1	0.1
Philippines	2	0.2
Missing	6	0.5
Total	1205	100
For those living in the U.S., which state do you currently live in?		
Alabama	23	1.9
Alaska	5	0.4
Arizona	16	1.3
Arkansas	11	0.9
California	88	7.3
Colorado	24	2.0
Connecticut	2	0.2
Delaware	3	0.2
Florida	54	4.5
Georgia	16	1.3
Hawaii	9	0.7
Idaho	13	1.1
Illinois	26	2.2
Indiana	38	3.2
Iowa	15	1.2
Kansas	6	0.5
Kentucky	19	1.6
Louisiana	41	3.4
Maine	3	0.2
Maryland	20	1.7
Massachusetts	14	1.2
Michigan	29	2.4
Minnesota	29	2.4
Mississippi	15	1.2
Missouri	23	1.9

Table 4: Location

	n	%
Montana	6	0.5
Nebraska	7	0.6
Nevada	5	0.4
New Hampshire	1	0.1
New Jersey	28	2.3
New Mexico	5	0.4
New York	23	1.9
North Carolina	26	2.2
North Dakota	14	1.2
Ohio	33	2.7
Oklahoma	18	1.5
Oregon	21	1.7
Pennsylvania	66	5.5
Rhode Island	2	0.2
South Carolina	23	1.9
South Dakota	5	0.4
Tennessee	28	2.3
Texas	149	12.4
Utah	29	2.4
Vermont	1	0.1
Virginia	32	2.7
Washington	46	3.8
West Virginia	17	1.4
Wisconsin	33	2.7
Wyoming	5	0.4
District of Colombia (D.C.)	1	0.1
Guam	1	0.1
Missing	38	3.2
Total	1205	100
What region do you primarily work in?		
Northeast (CT, MA, ME, NH, RI, VT)	42	3.5
Mid-Atlantic (NJ, NY, PA)	118	9.8
South Atlantic (DC, DE, FL, GA, MD, NC, SC, VA, WV, PR)	191	15.9
North Central (IA, IL, IN, MI, MN, OH, ND, NE, SD, WI)	237	19.7
South Central (AL, AR, LA, KS, KY, MO, MS, OK, TN, TX)	334	27.7

Table 4: Location

	n	%
Mountain (AZ, CO, ID, MT, NM, UT, WY)	90	7.5
Pacific (AK, CA, HI, NV, OR, WA)	177	14.7
Outside of the U.S.	4	0.3
Missing	12	1.0
Total	1205	100

Note: Heat map color schemes are based on each question and not across questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question.

Table 5: Language

	n	%
What is your native language?		
English	1131	93.9
Spanish	58	4.8
Tagalog (Filipino)	3	0.2
Vietnamese	1	0.1
French (including Haitian Creole)	1	0.1
German	2	0.2
Portuguese	2	0.2
Italian	1	0.1
Other	5	0.4
Missing	1	0.1
Total	1205	100
For those who hold a load-handling certification, which language were your study materials in?		
English	1187	98.5
Spanish	5	0.4
French (including Haitian Creole)	1	0.1
German	1	0.1
Italian	1	0.1
Other	2	0.2
Missing	8	0.7
Total	1205	100
Which language did you take your load-handling certification tests in?		
English	1188	98.6
Spanish	5	0.4
French (including Haitian Creole)	1	0.1
German	1	0.1
Italian	1	0.1
Other	2	0.2
Missing	7	0.6
Total	1205	100

Note: Heat map color schemes are based on each question and not across questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question.

Table 6: Current Role and Industry

	n	%
What best describes your primary role?		
Operator	931	77.3
Rigger	34	2.8
Signalperson	8	0.7
Site Supervisor	74	6.1
Trainer	37	3.1
Crane Inspector	14	1.2
Lift Director	24	2.0
Retired from load-handling	31	2.6
Other	51	4.2
Missing	1	0.1
Total	1205	100
Which of the following categories best represents your employer's primary industry?		
Agriculture/Forestry	8	0.7
Construction	808	67.1
Manufacturing	51	4.2
Mining/Quarrying	22	1.8
Refining	55	4.6
Transportation & Warehousing (not Maritime)	20	1.7
Transportation & Warehousing (Maritime)	18	1.5
Utilities	100	8.3
Wholesale Trade (includes Metal Recycling)	3	0.2
Other	120	10.0
Missing	-	-
Total	1205	100
How long have you been working in your current role?		
Less than 1 year	59	4.9
1-5 years	230	19.1
6-10 years	202	16.8
11-15 years	133	11.0
16-20 years	147	12.2
21-25 years	151	12.5
26-30 years	87	7.2
31-35 years	59	4.9
Over 35 years	104	8.6
Retired from load-handling	33	2.7
Missing	-	-
Total	1205	100

Table 6: Current Role and Industry

	n	%
How long have you been working (or did work, if retired) in the load-handling field?		
Less than 1 year	36	3.0
1-5 years	142	11.8
6-10 years	169	14.0
11-15 years	138	11.5
16-20 years	157	13.0
21-25 years	190	15.8
26-30 years	128	10.6
31-35 years	91	7.6
Over 35 years	152	12.6
Missing	2	0.2
Total	1205	100

Note: Heat map color schemes are based on each question and not across questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question.

Table 7: Training Type and Quality

	n	%	Quality of Training (Mean)
Which best describes how you received training to work in the load-handling field?			
Employer-sponsored training (e.g., training paid for by employer)	241	20.0	4.37
On-the-job training (e.g., received training after being hired)	523	43.4	4.04
Self-funded training (e.g., paid for training out of pocket)	89	7.4	4.00
Union apprenticeship program	193	16.0	4.55
Non-union apprenticeship program	11	0.9	4.09
Vocational/tech school	17	1.4	4.06
College	2	0.2	4.00
Self-taught (e.g., independent study)	84	7.0	3.62
No formal training	20	1.7	3.21
Other	22	1.8	4.05
Missing	3	0.2	-[a]
Total	1205	100	4.15

Note: Heat map color schemes are based within each column and not across columns. Dark red represents the lowest number in a column, and dark blue represents the highest number in a column. [a]*Quality of Training* was not calculated for individuals who did not indicate the type of training that they received. Means are based on a 5-point Likert scale: 1 = very low quality and 5 = very high quality.

Table 8: Income by Role

	Total	Operator	Rigger	Signalperson	Site Supervisor	Trainer	Crane Inspector	Lift Director	Retired from load-handling	Other
Sample size	1204[a]	931	34	8	74	37	14	24	31	51
	n	%								
$0 – $19,000	8	0.5	0.0	0.0	0.0	2.7	0.0	0.0	0.0	3.9
$20,000 – $39,000	14	1.2	5.9	0.0	0.0	0.0	0.0	0.0	3.2	0.0
$40,000 – $59,000	85	7.1	17.6	0.0	0.0	5.4	21.4	0.0	6.5	9.8
$60,000 – $79,000	212	18.8	26.5	0.0	9.5	13.5	21.4	12.5	9.7	13.7
$80,000 – $99,000	271	22.9	23.5	50.0	20.3	18.9	14.3	8.3	32.3	19.6
$100,000 – $119,000	218	18.6	17.6	0.0	17.6	16.2	14.3	20.8	16.1	15.7
$120,000 – $139,000	140	11.2	2.9	25.0	13.5	21.6	21.4	20.8	6.5	9.8
$140,000 – $159,000	76	5.7	0.0	0.0	12.2	8.1	7.1	20.8	3.2	7.8
$160,000 – $179,000	28	2.3	0.0	0.0	5.4	5.4	0.0	0.0	0.0	2.0
$180,000 – $199,000	28	2.4	0.0	0.0	4.1	2.7	0.0	4.2	0.0	2.0
$200,000 +	33	2.6	0.0	12.5	8.1	0.0	0.0	8.3	0.0	0.0
Prefer not to answer	91	6.9	5.9	12.5	9.5	5.4	0.0	4.2	19.4	15.7
Missing	1	-	-	-	-	-	-	-	3.2	-
Total	1205	100	100	100	100	100	100	100	100	100

Note: Heat map color schemes are based within each column and not across columns. Dark red represents the lowest number in a column, and dark blue represents the highest number in a column. [a]Not all participants answered the role question, indicating a lower total in the top row.

Table 9: Travel

	n	%
On average, in a typical month, how many days do you spend traveling for work, where you stay overnight, away from your usual residence?		
0	621	51.5
1-4	197	16.3
5-9	73	6.1
10-14	46	3.8
15-19	51	4.2
20-24	65	5.4
25+	150	12.4
Missing	2	0.2
Total	1205	100

Note: Dark red represents the lowest number in the column, and dark blue represents the highest number in the column.

Table 10: Past Employment

	n	%	*n*	%
	Before getting a job in the load-handling field, what types of industries have you worked in previously?		Before getting a job in load handling, which industry did you work in directly before entering the field?	
Agriculture and Farming	292	24.2	45	3.7
Automotive	217	18.0	42	3.5
Construction	879	72.9	548	45.5
Customer Service	92	7.6	7	0.6
Education	18	1.5	3	0.2
Energy and Utilities	186	15.4	73	6.1
Environmental Services	38	3.2	7	0.6
Fashion and Retail	8	0.7	0	0.0
Finance and Banking	10	0.8	3	0.2
Food Service and Restaurants	119	9.9	23	1.9
Government and Public Administration	41	3.4	10	0.8
Healthcare	25	2.1	7	0.6
Hospitality and Tourism	19	1.6	6	0.5
Human Resources	5	0.4	0	0.0
Information Technology (IT)	9	0.7	3	0.2
Manufacturing	230	19.1	71	5.9
Maritime	76	6.3	33	2.7
Media and Journalism	2	0.2	1	0.1
Military and Defense	146	12.1	52	4.3
Retail	69	5.7	10	0.8
Sales	69	5.7	10	0.8
Sports and Recreation	25	2.1	5	0.4
Telecommunications	31	2.6	10	0.8
Transportation and Logistics	255	21.2	126	10.5
Other	101	8.4	69	5.7
No other experience outside of the load-handling field	39	3.2	33	2.7
Missing	-[a]	-	8	0.7
Total	3001[b]	-[c]	1205	100

Note: Heat map color schemes are based within each column and not across columns. Dark red represents the lowest number in a column, and dark blue represents the highest number in a column. [a]Since participants could select multiple responses, there is no clear way to differentiate how many people did not answer the question. [b] Participants could select more than one response for the question depicted in columns two and three. Therefore, the total number of responses is higher than the total number of survey respondents (*n* = 1205). [c]The sum of percentages for column three will not add up to 100%, given that respondents were allowed to select more than one response.

Table 11: Educational Background

	n	%
What is the highest level of education that you completed?		
Some high school	62	5.1
High school diploma/GED	480	39.8
Vocational training or trade school	213	17.7
Some college, no degree	269	22.3
Associate's degree	97	8.0
Bachelor's degree	74	6.1
Master's degree	7	0.6
Doctoral degree	1	0.1
Missing	2	0.2
Total	1205	100
If you completed vocational training or trade school, which programs did you complete?		
Commercial Truck Driving	249	20.7
Welder	160	13.3
Carpenter	50	4.1
Automotive Technician	99	8.2
Equipment Operator	260	21.6
Electrician	33	2.7
Plumber	12	1.0
HVAC Technician	22	1.8
Computer Programming	11	0.9
Graphic Design	5	0.4
Culinary Arts	6	0.5
Medical Assistant	7	0.6
Pharmacy Technician	2	0.2
I did not complete vocational training or trade school	383	31.8
Other	171	14.2
Missing	-[a]	-
Total	1470[b]	-[c]
If you completed a college degree, what was your area of study?		
I did not complete a college degree	733	60.8
Accounting	5	0.4
Architecture	5	0.4
Biology	4	0.3
Business Administration and Management	42	3.5
Building/Construction Science	9	0.7
Computer Science	9	0.7

Table 11: Educational Background

	n	%
Construction Management	9	0.7
Criminal Justice	11	0.9
Economics	1	0.1
Elementary Education	1	0.1
Engineering – Architectural	4	0.3
Engineering – Civil	5	0.4
Engineering – Construction	6	0.5
Engineering – Electrical	4	0.3
Engineering – Mechanical	13	1.1
Finance	2	0.2
History	5	0.4
Marketing	2	0.2
Nursing	2	0.2
Political Science	3	0.2
Pre-Medical Studies	3	0.2
Psychology	8	0.7
Sociology	2	0.2
Major is not listed	78	6.5
Missing	-[a]	-
Total	966[b]	-[c]

Note: Heat map color schemes are based on each question and not across questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question. [a]Since participants had the option to select multiple responses, there is no clear way to differentiate how many people did not answer the question. [b]Participants had the option of selecting more than one response for the questions depicted in the second and third sections of the table. Therefore, the total number of responses is higher than the total number of survey respondents (*n* = 1205). [c]The sum of percentages for column three in the second and third sections of the table will not add up to 100%, given that respondents were allowed to select more than one response.

Current and Future Pipeline Considerations

Section Summary

With respect to current pipeline trends for the load-handling industry, focus group, and survey data reveal that most people enter the field by either already having a job in the industry (e.g., construction) or through a personal connection (e.g., family member, friend). This data indicates that the load-handling field pipeline heavily relies on two primary recruitment methods. A point which is underscored by the focus group data which shows that the primary hurdles for entering the field are lack of exposure through school and general lack of exposure to the field.

The load-handling field pipeline heavily relies on two primary recruitment methods. That is, recruiting individuals from adjacent industries (e.g., construction) or through informal referrals from personal connections (e.g., family member, friend).

When thinking about recruitment methods and enhancing the robustness of the overall employment pipeline, industry leaders and organizations should consider implementing several tactics. First, Facebook and YouTube were the most used and most recommended social media platforms by employees in the load-handling field and, therefore, represent an ideal place to start regarding social media outreach.

Second, current load-handling employees recommended that industry leaders and organizations focus their outreach messages on pay, benefits, the opportunity to work with load-handling equipment, and the contributions that load-handling work has on society, as those are the job aspects that survey respondents found most appealing/enjoyable about the field.

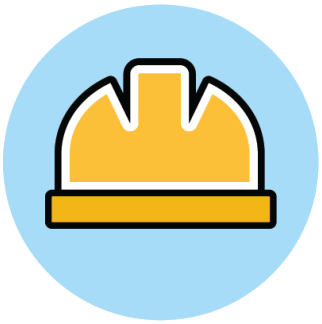
Third, organizations should implement internship and outreach programs in educational settings (e.g., tech schools and high schools) so that young people can be exposed to the load-handling field and better understand the benefits of working in it.

Fourth, programs that ensure smooth transitions into the workforce and hurdle-free training for new employees in the field will be important for keeping turnover low and success rates high. These types of programs can include formal mentorship programs and structured employer-sponsored training.

Finally, industry leaders and load-handling organizations should focus their attention on the underrepresented groups in load-handling. These groups include early career professionals (e.g., 18–25-year-olds), women, minorities, non-English speakers, and more. By understanding the needs of these groups and the barriers they face, industry leaders can adapt their systems

and attract employees from these underrepresented groups, thereby improving the strength of the long-term talent pipeline.

The findings outlined throughout this report section underline an important need for recruitment method diversification and offer an array of alternative methods that can be used to diversify the industry's recruitment pipeline. The load-handling field pipeline benefits if industry leaders and organizations revamp the methods they use to reach and engage with potential applicants.



The load-handling field pipeline benefits if industry leaders and organizations revamp the methods they use to reach and engage with potential applicants.

Introduction to the Field

Introduction to the Field fell into three broad categories. That is, how individuals learned about the field, what appealed to them about the field, and the hurdles they faced when entering the field. Please see the corresponding subsections for more details.

Learning about the Field

When asked how they were introduced to their jobs in the load-handling field, over half of survey respondents indicated that they were introduced to load-handling because they *worked in a related field* (e.g., construction; 57.3%) and nearly a quarter of respondents were referred to the field by a *personal connection* (e.g., friend or family member; 23.3%). In contrast, very few respondents indicated they were introduced to the field through alternative routes. Please see Table 12 for more details.

Over half of respondents were introduced to load-handling because they worked in a related field (e.g., construction; 57.3%) and nearly a quarter of respondents were referred to the field by a personal connection (e.g., friend or family member; 23.3%).

These results align with the focus group data where the most cited ways that participants learned about the load-handling field were *currently working in the field* (*n* = 16), through a *family member* (*n* = 11), or *friend* (*n* = 8), and having *interest or experience in a similar field* (i.e., mechanics; *n* = 10). Please see Table 59 in Appendix C for details.

These results provide insight into the current pipeline trends for the load-handling field and help highlight the established, successful methods for recruitment. The results also illuminate potential avenues for alternative recruitment methods that can be used in the future. Please see the *Recruitment and Pipeline Recommendations* subsection below for more information and discussion.

Appeal of the Field

Survey respondents indicated that the most appealing aspects of the field were the *opportunity to work with load-handling equipment* (33.0%), *pay* (21.8%), and *career advancement opportunities* (11.3%). Please see Table 13 for more details. These results indicate topics that industry leaders and organizations can emphasize in recruitment and marketing campaigns.

Hurdles for Entering the Field

While there are several aspects of the load-handling field that respondents indicated are appealing, the focus group participants cited several hurdles that prevent people from entering the field, such as a *lack of exposure through school* (e.g., minimal discussions about the industry within educational settings; *n* = 5), *general lack of exposure* (*n* = 4), and barriers to receiving training, such as *high costs* (*n* = 3) and *training difficulty* (*n* = 3). Please see Table 60 in Appendix C for details.

Industry leaders and organizations should investigate these hurdles and work to address them to the best of their ability. By alleviating barriers to entering the field, industry leaders are in a better position to improve recruitment and the talent pipeline long-term.

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Recruitment and Pipeline Recommendations

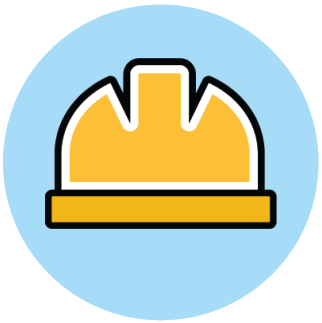
Recruitment and Pipeline Recommendations fell into four broad categories. That is, recruitment and pipeline recommendations for individuals, recommendations for higher level entities (e.g., industry leaders, employers), recommendations based on employee background section, and recommendations based on social media data. Please see the corresponding subsections for more details.

Individual Recommendations

When asked about the best path for entering the load-handling field, a majority of survey respondents indicated either *entry-level work in the load-handling field* (37.3%) or a *union-based apprenticeship program* (33.8%) (see Table 14). Similarly, focus group participants highly

recommended that individuals enter the field through *attending a training/crane school* (*n* = 17), *making industry connections* (*n* = 10), *finding entry level work* (*n* =7), and *apprenticeship programs* (*n* = 7). Please see Table 57 in Appendix C for details.

The recommendations that survey respondents and focus group participants suggested aligned with how people actually entered the field (see the *Introduction to the Field* subsection in the *Current and Future Pipeline Considerations* section above). It makes sense that people would recommend to others what they themselves experienced. However, while the focus group participants and survey respondents are experts in load-handling, they are not necessarily recruitment and pipeline experts. There is opportunity for industry leaders and organizations to rethink the way that training and entry into the field works. In the *Current Employment* subsection, we noted that employees viewed structured training (i.e., union apprenticeship programs, employer-sponsored training) as the highest quality forms of training and rated less structured training (e.g., on-the-job, self-funded, and self-taught training) lower on quality. Perhaps there are alternative, structured routes for recruitment and training that organizations can invest more resources into. For example, internship programs, mentorship programs, and programs geared toward underrepresented groups, including women and minorities. Please see the subsections below for further discussion on alternative recruitment methods.



There is opportunity for industry leaders and organizations to rethink the way that training and entry into the field works.

Organizational Recommendations

Aspects to Highlight

Survey respondents indicated that the top three aspects of the field that industry leaders and employers should highlight to attract more applicants are the *pay* (60.7%), *benefits* (42.1%), and the *opportunity to work with load-handling equipment* (39.4%). Please see Table 13 for more details. These recommendations for recruitment align with what respondents viewed as the most appealing aspects of the field (i.e., pay and working with load-handling equipment; Table 13). Moreover, in the *Work Opinions* section you will find that survey respondents by and large indicated that they feel a sense of pride in doing their job, that their work is enjoyable, and that what they do contributes positively to society. Please see the *Work Opinions* section for more details.

In sum, knowing what current members of the field value about their jobs provides useful, quantitatively backed information that can be integrated into future recruitment and pipeline endeavors. In conjunction with other findings discussed throughout this report, such as social media preferences and work opinions, industry leaders and organizations can implement

targeted recruitment campaigns that focus on relevant topics which will appeal to the target audience.

Knowing what current members of the field value about their jobs provides useful, quantitatively backed information that can be integrated into future recruitment and pipeline endeavors.

Outreach Methods

Regarding specific recruitment outreach methods, the top three suggestions were *educational outreach* (67.9%), *referral from personal connections working in the field* (36.9%), and *job fairs* (35.3%). Please see Table 15 for more details. Focus group participants most cited *outreach in school* (*n* = 10), *improve access to information* (*n* = 9), *youth outreach* (*n* = 6), and *real-life exposure* (*n* = 6) as recommendations for organizations to improve the pipeline for the field. Please see Table 58 in Appendix C for details.

Even though very few survey respondents learned about the load-handling field through *school or educational programs* (2.5%; Table 12), *educational outreach* (67.9%) was the most recommended method to recruit more applicants (Table 15). We highlight this particular discrepancy to point to a broader issue. That is, the pipeline for the load-handling industry heavily relies on recruiting people already working in construction and informal employee recruitment through personal connections (e.g., family member, friend). If load-handling organizations look to improve the recruitment pipeline and ensure its robustness, there needs to be a focus on formal outreach programs, such as the methods suggested throughout this section.

Even though very few survey respondents learned about the load-handling field through school or educational programs (2.5%), educational outreach (67.9%) was the most recommended method to recruit more applicants.

If load-handling organizations look to improve the recruitment pipeline and ensure its robustness, there needs to be a focus on formal outreach programs.

Recommendation Based on Employee Background Section

The findings from the *Load-handling Field Employee Background* section described earlier in the report have important implications for recruitment and the load-handling talent pipeline, which are discussed in the subsections below.

Gender, Race, and Age

A majority of survey respondents (*n* = 1205) were *male* (95.3%), *White/Caucasian* (79.0%), and *46+ years old* (58.1%) (see Table 3). We assume that our large survey sample represents the demographic trends in the load-handling field more broadly. The homogeneity of the survey sample will inevitably impact the report results, with those majority perspectives dominating over the perspectives of other groups.

The data showed a particularly interesting finding related to race. Given that our survey results showed that a large majority of employees in the load-handling field work in *construction* (67.1%; Table 6), the next two paragraphs focus on statistics from the construction industry.

In *Appendix A: Background Research*, we note that 30% of employees in the construction industry are Latino/Hispanic, compared to 16% within the general US workforce. However, Latino/Hispanic individuals only make up 9.6% of load-handling employees. As discussed previously, most employees learn about the load-handling field because they either worked in a related field (e.g., construction) or are referred to the field by a personal connection (e.g., friend or family member).

If Latino/Hispanic employees are represented two times as much in construction compared to the general US workforce (30% versus 16%, respectively), it is very surprising that Latinos/Hispanics in the load-handling field are represented far less compared to construction (9.6% versus 30%, respectively) and even represented less compared to the general US workforce (9.6% versus 16%, respectively). There seems to be a unique set of hurdles that Latino/Hispanic construction workers face when entering the load-handling field.

All of this is to say that belonging to an underrepresented group (e.g., early career, female, underrepresented racial groups) can impact one's lived experience and change one's perspectives on work and life more generally. These different experiences and perspectives matter and are unfortunately underrepresented in our survey and likely in the field more broadly. With this in mind, please pay particular attention to the data breakdowns by race, gender, role, and length of time in the field when navigating this report. Do note, however, that at times the

samples sizes for these data breakdowns are quite small, which impacts our ability to draw robust conclusions from the data.

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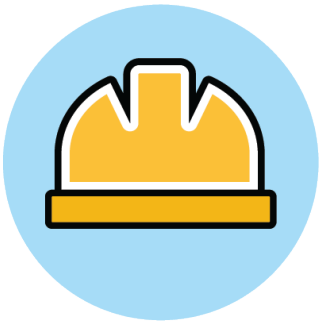
The load-handling field lacks demographic diversity, which indicates that industry leaders are successfully capitalizing on the opportunity to recruit from certain sectors of the talent pool (e.g., females, underrepresented racial groups, etc.). The lack of successful recruitment from these underrepresented groups is inevitably impacting the talent pipeline. It is critical for industry leaders and organizations to better understand the perspectives of underrepresented groups. By understanding their views, organizations are in a better position to create systems, policies, training programs, etc. that target the needs of these communities and greatly expand the talent pipeline.



The load handling field lacks demographic diversity and it is critical for industry leaders to understand the perspectives of underrepresented groups so that they are in a better position to create systems, policies, and training programs that target the needs of these communities and greatly expand the talent pipeline.

Language

A majority of survey respondents indicated that *English* (93.9%) is their native language. Additionally, most respondents indicated their certification study materials were written in *English* (98.5%) and their certification tests were taken in *English* (98.6%). See Table 5 for details.

As noted in the subsection above, the load-handling field is predominately White/Caucasian, yet construction (the most common load-handling industry; 67.1%) is 30% Latino/Hispanic. The focus group research revealed that one hurdle that Latino/Hispanic construction employees may face when entering the load-handling field is the emphasis on English language certification study materials and English language certification testing (see Table 53 in Appendix C for details).

Therefore, one possible avenue for expanding the recruitment and talent pipeline in the load-handling field is to create a more robust education and training system that includes different languages, particularly Spanish. However, we recognize that having several languages spoken on a job site presents important issues that need considered. Indeed, focus group participants cited *language barriers with teammates* (*n* = 4) as a dislike of their job and also mentioned that *language barriers can prevent good performance* on the job (*n* = 2; see Table 68 in Appendix C). Nevertheless, emerging translation technologies are becoming increasingly more accessible on smartphones. Technologies such as this may mitigate some of the issues associated with language diversity on job sites, while allowing people to train, study, test, and work using the language they are most familiar with.

One possible avenue for expanding the recruitment and talent pipeline is to create a more robust education and training system that includes different languages, particularly Spanish.

Past Employment

With respect to general experience before entering the load-handling field (see Table 10), a large majority of survey respondents indicated that they worked in *construction* (72.9%), followed by *agriculture and farming* (24.2%), and *transportation and logistics* (21.2%). Regarding the industry employees were working in directly before entering the field, most again indicated this was *construction* (45.5%) with *transportation and logistics* coming in a distant second place (10.5%).

Adding to the data mentioned above, the bulk of survey respondents (58.1%) were *46+ years old*, but experience in the load-handling field was somewhat uniform across the year ranges (see Table 6). Taken together, it appears that individuals do not typically obtain load-handling jobs early in their careers (e.g., 18-25 years old). Commercial Driver's Licenses (CDLs) and

insurance are typically required for employees entering the load-handling field. Given that CDLs are often associated with age requirements (e.g., 21+ years old) and also considering insurance limitations that hinder coverage for younger individuals, it makes sense that individuals 18-25 years old face unique barriers for entering the load-handling field. However, when a field depends on a pipeline of mid-career professionals, it can impact workforce sustainability and long-term competitiveness of the field.

One obvious conclusion is that continuing with the current construction to load-handling pipeline would have predictable and steady results. However, if industry leaders and organizations want to expand the load-handling pipeline and systematically reach a broader audience, and in particular an early-career audience, then it behooves them to minimize barriers where possible and diversify recruitment methods to include different outreach techniques, including educational outreach and social media campaigns.

Industry leaders and organizations should attempt to systematically reach a broader audience and utilize different recruitment techniques.

Training

With respect to load-handling related training, the highest number of survey respondents reported receiving *on-the-job training* (43.4%), followed by *employer-sponsored training* (20.0%) and *union apprenticeship programs* (16.0%). However, *union apprenticeship programs* (*M* = 4.55) and *employer-sponsored training* (*M* = 4.37) were viewed as the highest quality forms of training (see Table 7).

Union apprenticeship programs (M = 4.55) and employer-sponsored training (M = 4.37) were viewed as the highest quality forms of training.

Given the overall satisfaction with structured training programs, such as union apprenticeship programs and employer-sponsored training, load-handling organizations should work to ensure that recruits interested in load-handling work have access to structured training programs and that the path for training is unambiguous and free of major hurdles.

Load-handling organizations should work to ensure that recruits have access to structured training programs and that the path for training is unambiguous and free of major hurdles.

Media Usage and Preferences

The HumRRO research team asked survey respondents a series of questions about their media usage and particularly about their social media usage, which can provide insights into media-based recruitment and information sharing strategies. A breakdown of these responses across different age groups is provided in Table 16.

Staying Up-To-Date on Load-handling News

With respect to general media usage (see Table 16), survey respondents indicated that the two most common ways they stay up to date on load-handling-related news are through *coworkers/colleagues* (63.6%) and *social media* (59.1%). When comparing the youngest age group with the highest age group, the percentage of respondents keeping up with news in the field via *social media* decreased greatly by age (18-25 = 59.1%; 66+ = 22.2%) and keeping up via *coworkers/colleagues* only decreased somewhat by age (18-25 = 63.6%; 66+ = 49.2%). These results are not particularly surprising given typical social media usage trends across age groups.

General Social Media Usage

With respect to social media platforms (see Table 16), most survey respondents indicated that they use *Facebook* (*n* = 694) and *YouTube* (*n* = 514) at least once a week. When comparing the youngest age group with the oldest age group, the percentage of respondents using *Facebook* remained somewhat steady by age (18-25 = 63.6%; 66+ = 47.6%), whereas the percentage of respondents using *YouTube* decreased greatly by age (18-25 = 81.8%; 66+ = 33.3%). Similar trends of social media usage decreasing by age can be found for Snapchat, Instagram, and TikTok.

Most Preferred Social Media Platform

When asked which single social media platform they prefer the most (see Table 16), *Facebook* (*n* = 449), *I do not use social media* (*n* = 246), and *YouTube* (*n* = 233) were the top three responses. When comparing the youngest age group with the oldest age group, the percentage of respondents who reported *Facebook* as their most preferred social media platform increased somewhat by age (18-25 = 18.2%; 66+ = 44.4%). Conversely, those who selected *YouTube* as their preferred social media platform remained somewhat steady by age (18-25 = 22.7%; 66+ = 14.3%). Age differences were quite pronounced for Snapchat, Instagram, and TikTok, with the youngest age group using these platforms much more often than the oldest age group. In line with the previous findings, those who selected *I do not use social media* increased greatly by age (18-25 = 4.5%; 66+ = 36.5%).

Social Media Recruitment Suggestions

When asked which social media platform that the load-handling industry should use to recruit and attract more applicants (see Table 16), the top three responses were *Facebook* (*n* = 445), *YouTube* (*n* = 252), and *TikTok* (*n* = 113). When comparing the youngest age group with the oldest age group, the percentage of respondents who reported *Facebook* as the suggested platform remained somewhat steady by age (18-25 = 27.3%; 66+ = 41.3%). Similarly, those who selected *YouTube* as the suggested platform remained somewhat steady by age (18-25 = 9.1%; 66+ = 19.0%). Conversely, those who selected *TikTok* as the suggested platform decreased greatly by age (18-25 = 40.9%; 66+ = 1.6%).

Conclusions on Media Results

Succinctly put, while there were no survey respondents who indicated that they learned about the field via *social media* (0.0%; Table 12). *social media* (24.5%; Table 15) outreach was recommended by nearly a quarter of survey respondents. Taken as a whole, the data suggests that using social media as a recruitment and pipeline tool as well as an information sharing tool is an underutilized method but is a promising avenue for employers and industry leaders to explore.

Using social media as a recruitment and information sharing tool is an underutilized method but is a promising avenue for employers and industry leaders to explore.

General social media usage wanes in older age groups, but overall *Facebook* and *YouTube* were the most commonly used social media platforms across age groups. *Facebook* and *YouTube* were also the two most suggested platforms that survey respondents think organizations in the load-handling field should use to connect with more applicants. This data is useful for industry leaders and employers who are looking to broaden their reach and ensure that their advertising campaigns and messages are reaching their desired audience.

Overall, Facebook and YouTube were the most commonly used social media platforms across age groups.

Survey Tables: Current and Future Pipeline Considerations

Note: Heat maps have been included for each table to assist with interpretation. For tables representing multiple survey questions, heat map color schemes are based on each question and not across questions. Dark red represents the lowest number of the question results, and dark blue represents the highest number of the question results (see graphic below). Please read the notes section at the bottom of each table for detailed information about interpretation.

Table 12: Introduction to the Field

	n	%
Which best describes how you were introduced to jobs in the load-handling field?		
Working in a related field (e.g., non-load-handling construction work, mechanic, agriculture work)	690	57.3
Referral from a personal connection working in the field (e.g., family member, friend)	281	23.3
Online job board or website (e.g., Indeed)	19	1.6
Social media (e.g., Facebook, Twitter)	0	0.0
Recruitment agency	3	0.2
School or educational program	30	2.5
Job fair	6	0.5
Conference	2	0.2
Other	166	13.8
Missing	8	0.7
Total	1205	100

Note: Dark red represents the lowest number in the column and dark blue represents the highest number in the column.

Table 13: Appeal of the Field

	n	%	*n*	%
	When you first started working in the load-handling field, which of the following aspects appealed most to you?		Which aspects should the load-handling field highlight or emphasize to attract more applicants?	
Pay	263	21.8	732	60.7
Benefits	58	4.8	507	42.1
Travel opportunities	15	1.2	193	16.0
Career advancement opportunities	136	11.3	412	34.2
Apprenticeship program	39	3.2	336	27.9
Job site culture[a]	46[a]	3.8[a]	129	10.7
Safety aspects[a]	46[a]	3.8[a]	236	19.6
Supervisor relationships	1	0.1	44	3.7
Coworker relationships	11	0.9	100	8.3
Technology	4	0.3	124	10.3
Growth opportunities	102	8.5	402	33.4
Outdoor work	47	3.9	188	15.6
Equipment (e.g., cranes)	398	33.0	475	39.4
Other	77	6.4	47	3.9
Missing	8	0.7	-[b]	-
Total	1205	100	3925[c]	-[d]

Note: Heat map color schemes are based within each column and not across columns. Dark red represents the lowest number in a column, and dark blue represents the highest number in a column. [a] *Job site culture* and *Safety aspects* were combined in columns two and three due to an error with the survey collection instrument. [b] Since participants had the option to select multiple responses, there is no clear way to differentiate how many people did not answer the question. [c] Participants had the option of selecting more than one response for the question depicted in columns four and five, therefore the total number of responses is higher than the total number of survey respondents (*n* = 1205). [d] The sum of percentages for column five will not add up to 100% given that respondents were allowed to select more than one response.

Table 14: Suggestions for Entering the Field

	n	%
Which do you believe is the best path for entering the load-handling field?		
Apprenticeship program (union)	407	33.8
Apprenticeship program (non-union)	79	6.6
Vocational/tech school	24	2.0
Work in the load-handling field (entry-level work)	449	37.3
Network with individuals in the load-handling field	16	1.3
Attend a crane/training program (paid for by the individual)	35	2.9
Attend a crane/training program (paid for by employer)	116	9.6
Attend industry conferences	0	0.0
Obtain a load-handling related certification (paid for by the individual)	18	1.5
Obtain a load-handling related certification (paid for by employer)	39	3.2
Other	19	1.6
Missing	3	0.2
Total	1205	100

Note: Dark red represents the lowest number in the column and dark blue represents the highest number in the column.

Table 15: Suggestions for Pipeline Outreach

	n	%
Which outreach methods would you recommend the load-handling field use to attract more applicants?		
Educational outreach (e.g., high schools, vocational schools, community colleges)	818	67.9
Industry associations	218	18.1
Industry conferences	109	9.0
Job fairs	425	35.3
Online job board or website (e.g., Indeed, LinkedIn)	197	16.3
Recruitment agencies	123	10.2
Referral from a personal connection working in the field (e.g., family member, friend)	445	36.9
Social media	295	24.5
Other	78	6.5
Missing	-[a]	-
Total	2708[b]	-[c]

Note: Dark red represents the lowest number in the column and dark blue represents the highest number in the column. [a] Since participants had the option to select multiple responses, there is no clear way to differentiate how many people did not answer the question. [b] Participants had the option of selecting more than one response for the question depicted in row 2, therefore the total number of responses is higher than the total number of survey respondents (*n* = 1205). [c] The sum of percentages for column three will not add up to 100% given that respondents were allowed to select more than one response.

Table 16: Media by Age

	Total	18-25	26-35	36-45	46-55	56-65	66-77
Sample size	1205	22	124	249	336	301	63
	n	%					
How do you stay up to date on news and information about the load-handling field?							
Social media	448	59.1	47.6	44.2	37.8	29.6	22.2
Online forums and discussion boards	180	13.6	9.7	14.5	17.6	16.6	7.9
LinkedIn groups	109	4.5	8.1	12.4	10.4	7.6	3.2
Newsletters	229	18.2	10.5	19.3	18.5	23.6	20.6
Equipment manufacturers' websites	224	13.6	21.8	14.5	16.1	23.9	23.8
Industry associations	206	22.7	17.7	18.1	15.5	18.9	7.9
Trade magazines and journals	229	9.1	14.5	16.5	16.1	27.6	25.4
Webinars and seminars	49	4.5	2.5	4.4	3.9	5.0	4.8
Coworkers/colleagues	602	63.6	53.2	53.0	46.4	49.5	49.2
Other	228	4.5	16.9	21.3	22.3	16.3	15.9
Missing	-[a]	-	-	-	-	-	-
Total	2504[b]	-[c]	-	-	-	-	-
Thinking about your general social media use, please indicate which social media platforms you use at least one time per week.							
Facebook	694	63.6	65.3	60.6	58.6	53.5	47.6
YouTube	514	81.8	51.6	45.4	41.4	39.5	33.3
Instagram	295	72.7	46.8	33.7	21.7	14.0	4.8
Reddit	49	13.6	11.3	6.8	2.4	1.0	0.0
TikTok	222	68.2	28.2	28.1	16.4	10.0	6.3
X (Twitter)	97	31.8	9.7	8.4	9.8	6.6	0.0
LinkedIn	145	18.2	9.7	14.1	14.0	11.3	4.8
Snapchat	144	77.3	33.1	14.9	7.4	5.0	0.0
Pinterest	36	4.5	0.8	3.2	2.1	3.7	3.2
Discord	27	13.6	5.6	3.6	2.1	0.0	0.0
I do not use social media	256	4.5	10.5	18.1	20.2	26.2	36.5
Missing	-[a]	-	-	-	-	-	-
Total	2479[b]	-[c]	-	-	-	-	-

Table 16: Media by Age

	Total	18-25	26-35	36-45	46-55	56-65	66-77
Thinking about your general social media preferences, which social media platform do you spend the most time using? In other words, what is your single most preferred social media platform?							
Facebook	449	18.2	32.3	33.3	36.6	42.9	44.4
YouTube	233	22.7	21.0	18.9	19.9	19.3	14.3
Instagram	101	9.1	19.4	10.4	8.9	3.3	3.2
Reddit	6	0.0	0.8	0.4	1.2	0.0	0.0
TikTok	80	22.7	8.9	12.4	6.3	2.3	0.0
X (Twitter)	30	4.5	2.4	2.0	3.3	2.7	0.0
LinkedIn	27	0.0	0.8	2.4	1.8	3.7	1.6
Snapchat	17	13.6	4.8	1.2	1.2	0.3	0.0
Pinterest	7	4.5	0.0	0.4	0.6	0.7	0.0
Discord	4	0.0	1.6	0.4	0.3	0.0	0.0
I do not use social media	246	4.5	8.1	17.3	19.9	24.9	36.5
Missing	5	-	-	0.8	-	-	-
Total	1205	100	100	100	100	100	100
Which social media platform should the load-handling field utilize to connect with and attract more applicants to the field?							
Facebook	445	27.3	35.5	32.5	36.9	41.5	41.3
YouTube	252	9.1	23.4	17.3	21.7	22.3	19.0
Instagram	97	9.1	16.9	7.6	8.3	4.3	4.8
Reddit	4	0.0	0.0	0.8	0.6	0.0	0.0
TikTok	113	40.9	14.5	18.1	6.5	4.7	1.6
X (Twitter)	26	0.0	1.6	2.0	2.7	2.0	0.0
LinkedIn	82	0.0	4.0	5.6	6.5	9.6	9.5
Snapchat	14	13.6	0.8	1.2	2.1	0.0	0.0
Pinterest	2	0.0	0.0	0.0	0.3	0.3	0.0
Discord	28	0.0	1.6	1.6	3.3	1.7	3.2
Missing	142	-	1.6	13.3	11.0	13.6	20.6
Total	1205	100	100	100	100	100	100

Note: Heat map color schemes are based within each column of each question and not across columns or questions. Dark red represents the lowest number in a question, and dark blue represents the highest number in a question. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. [a] Since participants had the option to select multiple responses, there is no clear way to differentiate how many people did not answer the question due to the total being higher than the total number of respondents. [b]Participants had the option of selecting more than one response for the questions depicted in the first and second sections of the table, therefore the total number of responses is higher than the total number of survey respondents (n = 1205). [c]The sum of percentages for columns three through eight in the first and second sections of the table do not add up to 100% given that respondents were allowed to select more than one response.

Work Opinions

Section Summary

Survey respondents' overall satisfaction with work averaged between neutral and moderate satisfaction, although, levels of satisfaction did vary across different areas. For example, most respondents indicated that they feel a sense of pride in doing their job, that their work is enjoyable, and that what they do contributes positively to society. Conversely, respondents also indicated they experience stress/burnout on the job and that they do not have adequate work-life balance.

Survey respondents' overall satisfaction with work averaged between neutral and moderate satisfaction.

When the job satisfaction results were broken down by role, length of time in the field, race, and gender, the overall trend of slightly above neutral satisfaction remained quite consistent. However, some nuances were observed. For example, employees who have been in the field for less than a year tended to feel less pride in their work and did not necessarily see their work contributing to society. Additionally, Black/African American and female survey respondents were more likely to say they have observed instances of cultural insensitivity or discrimination at work.

Moreover, focus group research revealed an interesting finding. That is, interpersonal connection/interactions were both the most *and* least liked aspects of the field. What participants liked about interpersonal interactions included teamwork and general interpersonal connection with colleagues. What participants disliked about interpersonal interactions were issues with teammates and issues with management.

With respect to the positive findings highlighted throughout this section, organizations and industry leaders can leverage these points to incorporate in marketing campaigns, recruitment endeavors, and employee recognition programs.

With respect to the negative findings highlighted throughout this section, it is critical to recognize the long-term consequences of employee dissatisfaction or disengagement and where those negative perceptions stem from (e.g., stress, lack of work-life balance, cultural insensitivity, discrimination, negative interpersonal interactions). Low satisfaction with work can have negative implications for both the organization and employees, including low productivity, high turnover, decreased organizational commitment, worse employee health, and more. With this in mind, we encourage industry leaders to measure and track employee opinions and overall

satisfaction so that they can capitalize on positive aspects and begin to address issues to promote a happier, safer, and more productive workforce.

It is critical to recognize the long-term consequences of employee dissatisfaction or disengagement and where those negative perceptions stem from (e.g., stress, lack of work-life balance, cultural insensitivity, discrimination, negative interpersonal interactions).

We encourage industry leaders to measure and track employee opinions and overall satisfaction so that they can capitalize on positive aspects and begin to address issues to promote a happier, safer, and more productive workforce.

Work Views

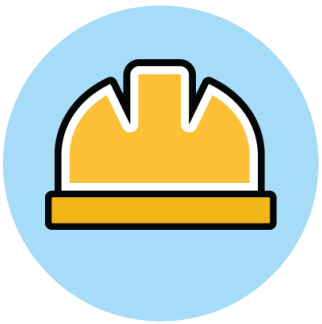
The *Work Views* subsection contains information about employees' work-related attitudes (e.g., likes and dislikes) along with breakdowns by key demographic variables (i.e., role, length of time in the field, race, and gender). Both focus group and survey results are described in detail below.

> *Note that all responses to the attitude items were made on a 5-point Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree) and that higher values always indicate more positive perceptions.*

Attitudes Overview

Most survey respondents indicated strong agreement with the following item, "I feel a sense of pride in doing my job." (*M* = 4.46). The following two items had the next highest levels of agreement, "The work I do contributes positively to society" (*M* = 4.17), and "My job is enjoyable" (*M* = 4.13) (see Table 17).

In contrast, the following items had the lowest levels of agreement: "I rarely feel stressed at work" (*M* = 2.96), "I rarely feel like my work interrupts my personal life" (*M* = 2.81), and "My supervisor shows a lot of interest in the feelings and thoughts of subordinates" (*M* = 3.27) (see Table 17).



Survey respondents tended to feel a high sense of pride in their work (*M* = 4.46) and believe that their work positively contributes to society (*M* = 4.17), but also tended to think that their work interrupts their personal life (*M* = 2.96) and that they often experience stress on the job (*M* = 2.81).

In general, the items with the most positive responses concerned the type of work respondents do and its impact. Items concerning working with coworkers also tended to be high, which suggests that teamwork is a positive experience for many employees. The items with the most negative responses tended to pertain to stress and a lack of work-life balance.

Respondents' overall satisfaction (*M* = 3.63) averaged between the neutral and moderate agreement points of the scale, which suggests that general satisfaction is not noticeably high. While the breakdown in Table 17 provides some insights into areas where respondents are/are not satisfied, additional insights about these findings are provided below, where results are further broken down across role, length of time in the load-handling field, race, and gender.

Respondents' overall satisfaction (*M* = 3.63) averaged between the neutral and moderate agreement points of the scale

Attitudes Detailed Breakdown

Role

Across roles, the results were consistent with the findings described in the subsection above in that respondents generally feel a sense of pride in their work, find their job enjoyable, and believe their work contributes positively to society. Respondents across all roles also indicated they experience stress at work and have a lack of work-life balance.

Interestingly, *Site Supervisors* and *Lift Directors* tended to report more stress and less work-life balance compared to other roles. This trend suggests that advanced-level positions are

associated with more work stress compared to lower-level positions or those positions that directly operate equipment. Given the negative impacts of stress on work productivity, employee turnover, etc., organizations should re-evaluate the work systems that may be causing advanced-level positions (e.g., supervisors and directors) to experience undue levels of stress and lack of work-life balance. On the other hand, assessing people's ability to handle stress may be especially valuable when hiring/promoting for higher level positions. Finally, training programs designed to mitigate stress might also be especially beneficial for supervisors and directors in the load-handling field. See Table 18 for details about these findings.

Length of Time in the Field

The *Work View* results broken down by length in the field also align with the overall work opinion findings. Specifically, respondents indicated they feel pride in their work, find their job enjoyable, and believe their work contributes positively to society (see Table 19). One interesting finding is that these views are slightly less positive for employees who have been in the field for less than one year. This suggests that feelings of pride and that load-handling work contributes to society take time to develop and may not immediately be present when starting a new job within the field. Respondents again indicated they feel stressed at work and lack work-life balance. This trend was consistent across varying lengths of time in the field.

Race

The *Work Views* results were also broken down by *race* and are displayed in Table 20. When interpreting these findings, please note that certain samples sizes are quite small, which impacts our ability to draw robust conclusions from the data. In general, respondents again indicated they feel a sense of pride in their work, their job is enjoyable, and the work they do contributes positively to society. Across all race categories, respondents again tended to indicate they were stressed and do not have work-life balance.

There were some items with notable differences in responses. For example, responses to the following item, "I rarely observe instances of cultural insensitivity or discrimination in my workplace" were notably lower for the *Black or African American* category (M = 2.91) compared to the others (note the *Mean* for all respondents is 3.64). The following items also generally followed this trend: "I feel respected when I am at work" and "My workplace values and promotes cultural diversity" (see Table 20 for details). Collectively, these results suggest that certain underrepresented racial groups have different, and unfortunately more negative, experiences/perceptions of diversity, respect, and inclusion on the job. Efforts to promote diversity and inclusivity within the load-handling field would be beneficial for employee well-being as well as overall organizational performance, including turnover rates, employee job satisfaction, and more.

Underrepresented racial groups have different, and unfortunately more negative, experiences/perceptions of diversity, respect, and inclusion on the job. Efforts to promote diversity and inclusivity may benefit employee well-being as well as overall organizational performance, including turnover rates, employee job satisfaction, and more.

Gender

Finally, the *Work Views* findings were also broken down by gender (Table 21). Similar to the race subsection above, some caution should be exercised when interpreting these findings given that there were only 27 female respondents (compared to 1,148 male respondents).

In general, results were very similar for both males and females. The items with the largest differences were "Recent advances in technology help me do my job better" (male *M* = 3.66; female *M* = 3.07) and "I rarely observe instances of cultural insensitivity or discrimination in my workplace" (male *M* = 3.66; female *M* = 3.11). Again, these results suggest that underrepresented gender groups have different, and unfortunately more negative, experiences/perceptions of diversity, respect, and inclusion on the job. Industry leaders should work to address and improve these disparities, which has the potential to help improve various organizational outcomes including recruitment efforts with females.

Travel

Recall in the *Current Employment* subsection that nearly half of survey respondents do some traveling for work each month, with 12.4% of survey respondents reporting over 25 days of travel each month (Table 9). With this in mind, survey respondents had relatively low agreement with the statement, "I enjoy traveling for work," (*M* = 3.09; Table 17). Indeed, this work opinion about travel was the third lowest rated statement among all of the work view scale statements. On the other hand, focus group participants noted that *exposure to different places and beautiful scenery* (*n* = 23) was a top cited environmental like about their work (Table 38, Appendix C) and too much travel was only cited three times during focus groups (Table 45, Appendix C).

Some individuals have lifestyles and preferences that are more conducive to work travel. Employers in the load-handling field should work to create recruitment and hiring systems that measure and account for these preferences so that the right people get put in jobs that are a good match for them. Ensuring a good person-role fit can result in greater work satisfaction and less employee turnover, which benefits both organizational outcomes as well as employee well-being.

Conclusions on Work Opinions Breakdowns

It is interesting to note that across all four breakdowns examined, overall job satisfaction was never particularly high (*M* = 3.63; Table 17). While certain aspects of the job were rated positively (e.g., the meaningfulness of work, working with colleagues), many other aspects were rated negatively (e.g., stress, lack of work-life balance, supervisor taking an interest in employees), and these trends tended to be consistent regardless of how findings were broken down. This finding of overall underwhelming job satisfaction is particularly important when you consider that the second most common way that employees were introduced to the load-handling field was through a referral from a personal connection (23.3%; see the *Introduction to the Field* subsection in the *Current and Future Pipeline Considerations* section). If one of the primary pipeline mechanisms is employee referrals, and employees have relatively neutral work satisfaction, then the pipeline in its current state is sure to suffer. Taken together, these points further emphasize the need for industry leaders to diversify recruitment methods and improve overall employee satisfaction.

Work Opinion Results from Focus Groups

Focus group participants were also asked about their likes and dislikes about the load-handling field. These results are summarized below, with the details being provided in Tables 33 through 50 in Appendix C. Promisingly, there were nearly two times as many like comments (*n* = 277) compared to dislike comments (*n* = 140) said collectively during the focus group sessions.

When focus group participants were asked about the nature of their work, there were nearly two times as many like comments (*n* = 277) compared to dislike comments (*n* = 140).

Likes

With regard to what employees like about the load-handling field, participants most frequently cited three broad categories. That is, *interpersonal connection* (*n* = 57), *career elements* (*n* = 49), and *meaningful/fulfilling work* (*n* = 43, Table 33).

Within the broad *interpersonal connection* category, participants most often indicated they like opportunities to engage in *teamwork* (*n* = 18) and establishing *general interpersonal connections* (*n* = 13, Table 34). For the broad *career elements* category, the majority of respondents indicated they like the *compensation* (e.g., pay and benefits) they receive within the load-handling field (*n* = 31, Table 35). Lastly, with regard to the broad *meaningful/fulfilling work* category, most participants indicated having *general positive feelings about the field* (e.g., passion, enthusiasm, *n* = 17) and feeling a *sense of accomplishment* in their work (*n* = 14, Table 36).

Dislikes

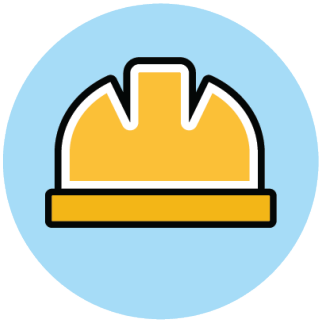
Focus group participants also indicated several dislikes within the load-handling field (Table 43). Broadly, these included *interpersonal interactions* (e.g., issues with teammates' work, management issues; *n* = 41), *health/well-being* (e.g., stress, lack of work-life balance; *n* = 40), and certain aspects of the *nature of the job* (e.g., safety concerns, repetitive nature of work; *n* = 30).

Regarding the broad *interpersonal interactions* category, working with *teammates who lack technical skills* (*n* = 12) and *poor management* (*n* = 6) were the most frequently cited dislikes (Table 44). For the broad *health/well-being* category, the most frequently cited dislikes were *burnout/stress* (*n* = 10) and *long hours* (*n* = 8, Table 45). Finally, regarding the broad *nature of the job* category, *general safety issues* were by far the most frequently cited dislike (*n* = 30, Table 46).

Conclusions on Focus Group Work Opinions

In general, the findings from the focus groups are consistent with the survey in that workers tended to like that their work was enjoyable and meaningful but disliked the stress associated with the job. One interesting trend is that interpersonal connection/interactions were both the most *and* least liked aspects of the field.

Similarly, poor management was listed as a reason why interpersonal interactions are disliked. As noted in the *Performance Elements* subsection, interpersonal interactions are a crucial element of day-to-day work in the load-handling field. Industry leaders and organizations should work to systematically and scientifically analyze load-handling jobs (i.e., job analysis) in order to better understand the interpersonal skills involved in the work at various levels (e.g., entry level, management). After the necessary interpersonal skills are identified, then organizations can conduct skill gap analyses to see where their workforce stands compared to what each load-handling job requires. By accomplishing these aforementioned steps, organizations can then recruit, hire, and/or train employees for the critical interpersonal skills identified.



One interesting trend is that interpersonal connection/interactions were both the most *and* least liked aspects of the field.

Moreover, like the survey data results, focus group participants consistently mentioned issues related to stress, burnout, and a lack of work-life balance as disliked aspects of the job. Organizations would benefit from implementing strategies to reduce stress and improve work-life balance wherever possible. For example, this may include offering more vacation days, required time off after overtime hours, minimizing shift time to 8 hours at most, not requiring excessive travel for work, etc. If organizations cannot envision a future where the current system of working hours changes, then perhaps offering increased compensation would be a tradeoff, so that employees have financial benefits in exchange for the stress and lack of work-life balance that they experience.

Survey Tables: Work Opinions

Note: Heat maps have been included for each table to assist with interpretation. For tables representing multiple survey questions, heat map color schemes are based on each question and not across questions. Dark red represents the lowest number of the question results, and dark blue represents the highest number of the question results (see graphic below). Please read the notes section at the bottom of each table for detailed information about interpretation.

Table 17: Work Views Overview

	Mean	Standard Deviation
Overall satisfaction with work	3.63	0.55
I feel I am currently being paid a fair amount for the work I do.	3.36	1.13
I feel satisfied with my chances for salary increases.	3.45	1.07
My efforts to do a good job are rarely blocked by red tape.	3.52	1.04
Many of our rules and procedures make doing a good job easy.	3.55	0.97
I feel a sense of pride in doing my job.	4.46	0.76
My job is enjoyable.	4.13	0.84
The work I do contributes positively to society.	4.17	0.79
I was aware of the positive and negative aspects of my job before starting.	3.72	0.92
My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	3.27	1.10
My supervisor is competent in doing his/her job.	3.66	1.02
My coworkers are competent in doing their jobs.	3.61	0.92
I enjoy interacting with my coworkers.	3.94	0.79
I am able to successfully communicate my thoughts and ideas with my coworkers.	3.94	0.83
I rarely experience language barriers while communicating with my coworkers.	3.61	1.12
My workplace values and promotes cultural diversity.	3.63	0.85
I rarely observe instances of cultural insensitivity or discrimination in my workplace.	3.64	0.95
I am able to collaborate successfully with my coworkers.	3.95	0.73
My coworkers and I are able to quickly resolve conflict.	3.87	0.77
I feel respected when I am at work.	3.90	0.89
I believe that employees at my workplace are treated with respect, regardless of their position or role.	3.67	0.95
I rarely feel stressed at work.	2.96	1.08
I rarely feel like my work interrupts my personal life.	2.81	1.13
I feel like the hours that I work are reasonable.	3.45	0.97
I enjoy traveling for work.	3.09	1.12
Recent advances in technology help me do my job better.	3.63	0.88
My coworkers effectively utilize new technology to do their jobs.	3.46	0.84

Note: Dark red represents the lowest number in the column and dark blue represents the highest number in the column. Means and standard deviations are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree.

Table 18: Work Views by Role

	Mean	Operator	Rigger	Signalperson	Site Supervisor	Trainer	Crane Inspector	Lift Director	Retired	Other
Sample size	1204[a]	931	34	8	74	37	14	24	31	51
Overall satisfaction with work	3.63	3.62	3.58	3.81	3.67	3.92	3.86	3.77	3.68	3.54
I feel I am currently being paid a fair amount for the work I do.	3.36	3.31	3.24	3.50	3.59	3.92	3.43	3.50	3.59	3.49
I feel satisfied with my chances for salary increases.	3.45	3.40	3.39	3.62	3.68	4.03	3.79	3.75	3.53	3.27
My efforts to do a good job are rarely blocked by red tape.	3.52	3.52	3.32	3.75	3.64	3.65	3.93	3.46	3.33	3.37
Many of our rules and procedures make doing a good job easy.	3.55	3.55	3.50	3.63	3.52	3.67	3.71	3.92	3.37	3.47
I feel a sense of pride in doing my job.	4.46	4.46	4.12	4.50	4.53	4.59	4.64	4.67	4.61	4.18
My job is enjoyable.	4.13	4.13	4.06	4.13	4.07	4.24	4.64	4.38	4.33	3.72
The work I do contributes positively to society.	4.17	4.15	4.03	4.38	4.24	4.41	4.50	4.46	4.35	3.86
I was aware of the positive and negative aspects of my job before starting.	3.72	3.73	3.68	3.88	3.69	3.92	3.71	3.79	3.68	3.53
My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	3.27	3.23	3.03	3.50	3.46	3.70	3.50	3.54	3.35	3.35
My supervisor is competent in doing his/her job.	3.66	3.63	3.79	3.88	3.88	4.00	3.86	3.75	3.32	3.61
My coworkers are competent in doing their jobs.	3.61	3.60	3.56	3.88	3.64	4.00	3.79	3.75	3.48	3.47
I enjoy interacting with my coworkers.	3.94	3.92	3.88	3.75	3.91	4.24	4.14	4.17	4.10	3.78
I am able to successfully communicate my thoughts and ideas with my coworkers.	3.94	3.93	3.85	3.62	3.93	4.24	4.21	4.13	4.03	3.78
I rarely experience language barriers while communicating with my coworkers.	3.61	3.59	3.62	4.00	3.41	3.89	3.71	3.63	3.74	3.73
My workplace values and promotes cultural diversity.	3.63	3.63	3.53	3.88	3.64	4.00	3.57	3.67	3.60	3.33
I rarely observe instances of cultural insensitivity or discrimination in my workplace.	3.64	3.62	3.39	3.88	3.69	4.14	3.71	3.83	3.57	3.73
I am able to collaborate successfully with my coworkers.	3.95	3.94	4.06	3.88	3.89	4.22	4.14	3.96	4.00	3.84
My coworkers and I are able to quickly resolve conflict.	3.87	3.85	3.91	4.00	3.96	4.08	3.86	4.08	3.81	3.80
I feel respected when I am at work.	3.90	3.89	3.58	3.88	4.01	4.16	3.93	4.17	4.00	3.71
I believe that employees at my workplace are treated with respect, regardless of their position or role.	3.67	3.64	3.58	3.63	3.91	4.11	3.50	3.67	3.65	3.66
I rarely feel stressed at work.	2.96	2.95	3.39	3.50	2.82	3.05	3.36	2.67	3.10	2.94
I rarely feel like my work interrupts my personal life.	2.81	2.79	3.00	3.50	2.58	3.11	2.93	2.75	2.94	3.00
I feel like the hours that I work are reasonable.	3.45	3.39	3.70	4.00	3.54	3.70	4.21	3.67	3.73	3.49
I enjoy traveling for work.	3.09	3.06	3.30	2.83	3.13	3.26	3.77	3.09	3.19	3.02
Recent advances in technology help me do my job better.	3.63	3.63	3.30	3.75	3.69	3.70	4.07	3.79	3.65	3.47
My coworkers effectively utilize new technology to do their jobs.	3.46	3.44	3.30	3.75	3.43	3.73	3.79	3.67	3.55	3.41

Note: Dark red represents the lowest number in the table and dark blue represents the highest number in the table. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a] Not all participants answered the role question, indicating a lower total in the top row.

Table 19: Work Views by Length of time in the field

	Mean	< 1	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25	26 – 30	31 – 35	> 35
Sample size	1203[a]	36	142	169	138	157	190	128	91	152
Overall satisfaction with work	3.63	3.55	3.69	3.67	3.58	3.60	3.60	3.57	3.73	3.70
I feel I am currently being paid a fair amount for the work I do.	3.36	3.17	3.27	3.33	3.23	3.27	3.31	3.53	3.43	3.63
I feel satisfied with my chances for salary increases.	3.45	3.56	3.38	3.42	3.26	3.32	3.49	3.51	3.52	3.68
My efforts to do a good job are rarely blocked by red tape.	3.52	3.42	3.61	3.63	3.51	3.45	3.49	3.52	3.48	3.53
Many of our rules and procedures make doing a good job easy.	3.55	3.64	3.78	3.69	3.51	3.42	3.56	3.34	3.57	3.48
I feel a sense of pride in doing my job.	4.46	4.14	4.45	4.48	4.38	4.45	4.49	4.42	4.57	4.50
My job is enjoyable.	4.13	3.92	4.19	4.15	3.99	4.06	4.13	4.07	4.22	4.26
The work I do contributes positively to society.	4.17	3.86	4.24	4.25	4.09	4.10	4.08	4.15	4.29	4.27
I was aware of the positive and negative aspects of my job before starting.	3.72	3.67	3.75	3.71	3.59	3.67	3.68	3.73	3.91	3.83
My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	3.27	3.25	3.35	3.28	3.23	3.24	3.18	3.18	3.40	3.39
My supervisor is competent in doing his/her job.	3.66	3.72	3.77	3.70	3.64	3.66	3.63	3.49	3.77	3.66
My coworkers are competent in doing their jobs.	3.61	3.53	3.71	3.67	3.72	3.53	3.58	3.51	3.71	3.54
I enjoy interacting with my coworkers.	3.94	3.58	3.99	3.96	3.92	3.92	3.94	3.83	4.07	3.99
I am able to successfully communicate my thoughts and ideas with my coworkers.	3.94	3.64	3.94	4.02	3.92	3.87	3.90	3.90	4.10	3.97
I rarely experience language barriers while communicating with my coworkers.	3.61	3.83	3.74	3.74	3.64	3.66	3.46	3.51	3.59	3.49
My workplace values and promotes cultural diversity.	3.63	3.42	3.58	3.74	3.67	3.71	3.57	3.59	3.70	3.54
I rarely observe instances of cultural insensitivity or discrimination in my workplace.	3.64	3.50	3.80	3.75	3.67	3.64	3.50	3.55	3.66	3.66
I am able to collaborate successfully with my coworkers.	3.95	3.89	4.03	4.02	3.96	3.92	3.95	3.78	4.00	3.95
My coworkers and I are able to quickly resolve conflict.	3.87	3.78	3.96	3.92	3.92	3.85	3.88	3.68	3.92	3.81
I feel respected when I am at work.	3.90	3.49	3.80	3.96	3.80	3.83	3.95	3.77	4.03	4.14
I believe that employees at my workplace are treated with respect, regardless of their position or role.	3.67	3.58	3.70	3.66	3.61	3.69	3.61	3.56	3.82	3.78
I rarely feel stressed at work.	2.96	3.19	2.93	2.95	2.86	2.92	2.85	2.91	3.09	3.21
I rarely feel like my work interrupts my personal life.	2.81	2.81	2.91	2.75	2.67	2.84	2.75	2.67	3.00	2.95
I feel like the hours that I work are reasonable.	3.45	3.56	3.51	3.42	3.34	3.46	3.29	3.47	3.62	3.57
I enjoy traveling for work.	3.09	3.09	3.24	3.04	2.82	3.10	3.13	3.20	3.22	3.01
Recent advances in technology help me do my job better.	3.63	3.64	3.72	3.71	3.64	3.57	3.56	3.59	3.63	3.67
My coworkers effectively utilize new technology to do their jobs.	3.46	3.47	3.47	3.48	3.46	3.33	3.44	3.38	3.62	3.55

Note: Dark red represents the lowest number in the table and dark blue represents the highest number in the table. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. Not all participants answered the Length of time in the field question, indicating a lower total in the top row.

Table 20: Work Views by Race

	Mean	American Indian or Alaska Native	Asian	Black or African American	Hispanic or Latino	Native Hawaiian or Pacific Islander	White or Caucasian	Other	Unknown	Prefer Not to Answer	Multi-Racial
Sample size	1202[a]	17	10	32	111	5	916	15	5	48	43
Overall satisfaction with work	3.63	3.80	3.50	3.60	3.81	3.68	3.63	3.54	3.75	3.24	3.66
I feel I am currently being paid a fair amount for the work I do.	3.36	3.53	3.20	2.97	3.39	2.60	3.39	2.93	3.60	3.00	3.47
I feel satisfied with my chances for salary increases.	3.45	3.76	3.60	3.13	3.50	3.40	3.47	3.47	4.00	2.90	3.47
My efforts to do a good job are rarely blocked by red tape.	3.52	3.53	3.10	3.47	3.59	3.80	3.54	3.27	3.60	3.13	3.53
Many of our rules and procedures make doing a good job easy.	3.55	3.47	3.60	3.87	3.84	3.60	3.53	3.67	3.40	3.04	3.60
I feel a sense of pride in doing my job.	4.46	4.12	3.80	4.56	4.47	4.40	4.47	4.13	4.60	4.38	4.56
My job is enjoyable.	4.13	4.12	3.80	4.25	4.24	4.40	4.13	3.80	4.80	3.88	4.14
The work I do contributes positively to society.	4.17	4.06	3.70	4.41	4.31	3.80	4.16	4.20	4.80	4.00	4.05
I was aware of the positive and negative aspects of my job before starting.	3.72	3.94	3.50	3.91	3.86	3.60	3.71	3.60	4.00	3.56	3.67
My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	3.27	3.71	3.40	3.28	3.37	3.60	3.26	3.53	3.00	2.71	3.53
My supervisor is competent in doing his/her job.	3.66	3.88	3.20	3.34	3.75	4.00	3.68	3.60	3.80	3.02	4.02
My coworkers are competent in doing their jobs.	3.61	3.65	3.30	3.84	3.77	3.80	3.60	3.60	4.00	3.21	3.67
I enjoy interacting with my coworkers.	3.94	3.82	3.60	4.19	4.06	4.00	3.94	3.73	4.20	3.67	3.70
I am able to successfully communicate my thoughts and ideas with my coworkers.	3.94	3.88	3.90	4.19	4.10	3.80	3.93	3.80	4.00	3.74	3.67
I rarely experience language barriers while communicating with my coworkers.	3.61	3.82	3.60	3.69	4.05	3.60	3.57	3.40	3.00	3.19	3.65
My workplace values and promotes cultural diversity.	3.63	3.88	3.60	3.25	3.88	3.40	3.61	3.60	4.00	3.42	3.70
I rarely observe instances of cultural insensitivity or discrimination in my workplace.	3.64	4.00	3.60	2.91	3.61	3.40	3.67	3.93	3.60	3.52	3.60
I am able to collaborate successfully with my coworkers.	3.95	3.94	3.70	4.09	4.15	3.60	3.95	3.67	3.80	3.60	4.00
My coworkers and I are able to quickly resolve conflict.	3.87	4.06	3.80	3.88	4.17	4.00	3.86	3.33	4.20	3.38	3.77
I feel respected when I am at work.	3.90	4.18	3.90	3.28	4.03	3.60	3.93	4.00	3.80	3.40	3.84
I believe that employees at my workplace are treated with respect, regardless of their position or role.	3.67	4.00	3.40	3.19	3.78	3.80	3.69	3.60	3.40	3.23	3.65
I rarely feel stressed at work.	2.96	2.94	3.10	2.94	3.33	3.00	2.93	2.93	3.20	2.56	3.09

Table 20: Work Views by Race

	Mean	American Indian or Alaska Native	Asian	Black or African American	Hispanic or Latino	Native Hawaiian or Pacific Islander	White or Caucasian	Other	Unknown	Prefer Not to Answer	Multi-Racial
I rarely feel like my work interrupts my personal life.	2.81	3.12	2.80	3.03	3.17	3.40	2.76	2.60	3.00	2.52	2.88
I feel like the hours that I work are reasonable.	3.45	3.65	3.70	3.34	3.72	3.80	3.43	3.53	4.20	2.92	3.63
I enjoy traveling for work.	3.09	4.18	3.30	3.56	3.46	4.25	3.02	3.29	2.60	2.65	3.14
Recent advances in technology help me do my job better.	3.63	3.88	3.50	3.78	3.82	3.60	3.65	3.40	3.80	2.90	3.58
My coworkers effectively utilize new technology to do their jobs.	3.46	3.76	3.20	3.28	3.59	3.60	3.48	3.33	3.20	2.90	3.35

Note: Dark red represents the lowest number in the table and dark blue represents the highest number in the table. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a] Not all participants answered the race question, indicating a lower total in the top row.

Table 21: Work Views by Gender

	Mean	Male	Female	Other	Prefer Not to Answer
Sample size	1191[a]	1148	27	2	14
Overall satisfaction with work	3.63	3.64	3.60	3.13	3.33
I feel I am currently being paid a fair amount for the work I do.	3.36	3.37	3.41	3.00	2.57
I feel satisfied with my chances for salary increases.	3.45	3.46	3.33	4.00	2.71
My efforts to do a good job are rarely blocked by red tape.	3.52	3.53	3.63	3.50	3.21
Many of our rules and procedures make doing a good job easy.	3.55	3.56	3.44	2.50	3.07
I feel a sense of pride in doing my job.	4.46	4.45	4.74	4.50	4.64
My job is enjoyable.	4.13	4.12	4.33	4.00	4.29
The work I do contributes positively to society.	4.17	4.16	4.41	3.50	4.36
I was aware of the positive and negative aspects of my job before starting.	3.72	3.72	3.63	3.50	4.21
My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	3.27	3.28	3.07	2.50	2.71
My supervisor is competent in doing his/her job.	3.66	3.67	3.74	2.50	2.79
My coworkers are competent in doing their jobs.	3.61	3.62	3.78	3.00	3.36
I enjoy interacting with my coworkers.	3.94	3.94	4.11	3.00	4.14
I am able to successfully communicate my thoughts and ideas with my coworkers.	3.94	3.95	3.70	3.00	3.86
I rarely experience language barriers while communicating with my coworkers.	3.61	3.61	3.63	2.50	3.21
My workplace values and promotes cultural diversity.	3.63	3.63	3.67	3.00	3.57
I rarely observe instances of cultural insensitivity or discrimination in my workplace.	3.64	3.66	3.11	3.00	3.36
I am able to collaborate successfully with my coworkers.	3.95	3.96	3.92	3.00	3.79
My coworkers and I are able to quickly resolve conflict.	3.87	3.88	3.74	3.00	3.57
I feel respected when I am at work.	3.90	3.91	3.52	3.50	3.57
I believe that employees at my workplace are treated with respect, regardless of their position or role.	3.67	3.68	3.48	3.50	3.29
I rarely feel stressed at work.	2.96	2.96	3.07	3.00	2.64
I rarely feel like my work interrupts my personal life.	2.81	2.81	2.88	2.50	2.50
I feel like the hours that I work are reasonable.	3.45	3.46	3.63	3.00	2.86
I enjoy traveling for work.	3.09	3.09	3.35	3.00	2.69
Recent advances in technology help me do my job better.	3.63	3.66	3.07	3.50	2.93
My coworkers effectively utilize new technology to do their jobs.	3.46	3.48	3.04	2.50	2.71

Note: Dark red represents the lowest number in the table and dark blue represents the highest number in the table. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a] Not all participants answered the gender question, indicating a lower total in the top row.

Views on Certification within the Load-handling Industry

Section Summary

A majority of survey respondents reported having Mobile Crane Operator certification, with many survey respondents holding more than one load-handling certification. Despite survey respondents commonly holding multiple certifications, respondents generally averaged between neutral feelings and moderate agreement with the idea that it is important to hold multiple certifications. Certification bodies should heavily consider these perceptions and work to understand the circumstances in which cross-certification is important and demonstrate the value to relevant employment populations.

Regarding the general sentiment surrounding certification, survey respondents, on average, agreed that their certifications were important. Survey respondents and focus group participants both noted that certification demonstrates safety skills, technical knowledge, credibility, and improves job opportunities. However, 6.1% of survey respondents saw no benefits of load-handling certifications, with Site Supervisors, Trainers, and Operators being some of the most likely job roles to cite no benefits of certification. Similarly, females and those participants preferring not to answer the gender demographic question were more than twice as likely than males to cite no benefits of certification. Industry leaders and certification bodies should be inclined to improve the perceptions of certification and should conduct additional research with the goal of understanding why there are group differences in negative certification perceptions.

With respect to the barriers individuals face when becoming certified, focus group participants and survey respondents aligned in their views that cost, exam difficulty/format, and access to training were the top three barriers to becoming certified. However, nearly a quarter of survey respondents reported that there are no barriers to certification. Notably, there was a prominent trend based on the length of time in the field, where those individuals with less experience in the field were less likely to cite no barriers and were much more likely to cite cost as a barrier to certification. If employees with less experience are perceiving more barriers to certification, particularly cost barriers, then industry leaders and certification bodies should look to alleviate the cost barrier through different methods, such as scholarship programs, subsidies, reimbursements, etc.

The findings outlined throughout this report section discuss the current state of load-handling certification and also underline important perceptions about such. Certification bodies, industry leaders, and organizations should work to understand the needs of individuals seeking certification and make improvements where possible, while also communicating the value and importance of certifications.

Certification bodies and industry leaders should work to understand the needs of individuals seeking certification and make improvements where possible, while also communicating the value and importance of load-handling certifications.

Certifications Held

Survey respondents were asked about the certifications that they currently hold and focus group participants were asked about their views on having multiple certifications. While the results outlined in this subsection tend to focus on the survey research results, you will see reference to focus group results as well (see Appendix C).

Current Certifications Held

Survey respondents reported on the certifications that they hold (see Table 22). A total of 1205 survey respondents reported a collective 3264 certifications, indicating that it is common for employees in the load-handling field to hold more than one certification at a time. The survey data showed that the most commonly held certification was *Mobile Crane Operator* (84.1%), followed by *Rigger* (38.6%), *Signalperson* (34.9%), and *Service Truck Crane Operator* (30.1%). These findings coincide with the role demographic information collected for the survey, which indicated that most survey respondents were crane operators.

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Value of Multiple Certifications

With respect to the focus group research, participants cited the *value of multiple certifications* (*n* = 30) seven times more often than the *downside of multiple certifications* (*n* = 4). Please see Table 51 for more details.

Regarding the survey research, survey respondents were asked the extent to which they agree with the statement, “I think that it is important to hold more than one load-handling certification” (5-point Likert scale; 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree,

5 = Strongly agree). The mean response to this survey question was 3.85, indicating that, on average, respondents felt between “Neither agree nor disagree” and “Agree” (see Table 22).

Data for the aforementioned survey question was also broken down based on numerous variables, including by *Certifications Held* (Table 22), *Role* (Table 24), *Length of Time in the Field* (Table 25), *Race* (Table 26), and *Gender* (Table 27). Generally, mean responses to this survey statement did not vary widely based on certifications held, length of time in the field, race, and/or gender. However, there was more variability when broken down by certifications held and primary job role, indicating that the value of holding multiple certifications may be influenced more by the job that someone has within the load-handling industry. For example, *Crane Inspectors* (*M* = 4.21), *Riggers* (*M* = 4.15), *Signalpersons* (*M* = 4.13), and *Trainers* (*M* = 4.11) were more likely to agree that holding multiple certifications was important, whereas *Site Supervisors* (*M* = 3.67) and *Operators* (*M* = 3.84) were less likely to agree with the importance of such. Given how tied certification is to safety and demonstrating technical knowledge (please see the *Benefits of Certification* subsection below), it is concerning that Operators and Site Supervisors averaged below the “agree” Likert point. Perhaps some jobs, particularly in the case of Site Supervisors, may depend more heavily on knowledge and skills acquired outside of the certification process (e.g., communication skills, leadership skills, time management skills, etc.). These findings provide an opportunity for employers and certification bodies to explore additional domains for which they could train and certify individuals in, especially for domains that are currently untested but are highly related to the skills needed on the job (e.g., teamwork skills, attention to detail, problem-solving, adaptability, etc.).

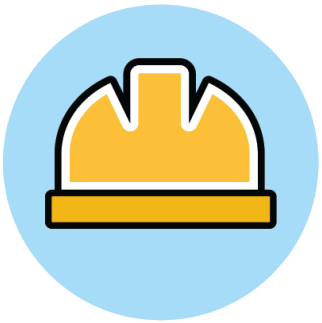
These findings provide an opportunity for employers and certification bodies to explore additional domains for which they could train and certify individuals in, especially for domains that are currently untested but are highly related to the skills needed on the job (e.g., teamwork skills, attention to detail, problem-solving, adaptability, etc.).

Views of Certification

Focus group participants were asked about their views on their load-handling certifications and survey respondents were asked several questions related to the perceived value of their load-handling certifications. While the results outlined in this subsection tend to focus on the survey research results, you will see reference to focus group results (see Appendix C). The results of the survey research were averaged for all survey respondents, but were also broken down by other variables, including by *certifications held* (Table 22), *role* (Table 24), *length of time in the field* (Table 25), *race* (Table 26), and *gender* (Table 27). The results are outlined in the subsequent report subsections.

Value of Certifications

Focus group participants cited the *value of certifications* (*n* = 137) much more often compared to the *issues associated with certification* (*n* = 62) or the *downsides of certification* (*n* = 19). Please see Table 51 for an overview and Table 52 for more detail on the value of certification according to focus group participants.



Focus group participants cited the value of certifications (*n* = 137) much more often compared to the issues associated with certification (*n* = 62) or the downsides of certification (*n* = 19).

With respect to the survey research, survey respondents were asked the extent to which they agree with the statement, “I think that the load-handling certifications I hold are valuable.” The overall average response was 4.12, indicating that most respondents agreed with the aforementioned survey statement.

On average, survey respondents believed that their certifications are valuable.

An interesting trend can be found in Table 25, which breaks down certification value by length of time in the field. Notably, those very early in their load-handling career (i.e., <1 year) and those with 26 years or more of experience in the field showed less agreement with the statement compared to those with 1-25 years of experience. Perhaps those with less than 1 year of experience have not had the opportunity to see the value of their load-handling certifications on the job and those with 26 years or more of experience in the field feel as though the value of their experience outweighs the value of certification.

Another interesting trend can be found in Tables 24, 26, and 27, which are the certification value breakdowns for role, race, and gender, respectively. In Table 24, those individuals who answered “Other” for their role were less likely to agree with the statement, “I think that the load-handling certifications I hold are valuable,” (*M* = 3.76). Similarly, in Tables 26 and 27, those individuals who selected “’Prefer not to answer” for *race* (*M* = 3.81) and *gender* (M = 3.79) were less likely to agree with the statement. Conversely, survey respondents belonging to

underrepresented racial groups including *American Indian or Alaska Native* (*M* = 4.18), *Black or African American* (*M* = 4.50), *Hispanic or Latino* (*M* = 4.44), *Native Hawaiian or Pacific Islander* (*M* = 4.40) were more likely to endorse the statement compared to *White or Caucasian* (*M* = 4.08) and *Asian* (*M* = 3.90) individuals.

Taken together, these exploratory findings offer unique insights into diversity, equity, and inclusion considerations. Those individuals who preferred not to answer the race and gender demographic questions may have been reluctant to do so. This reluctancy may somehow connect to their value of certification and warrants additional investigation. Moreover, most underrepresented racial groups had higher value of certification compared to *White or Caucasian* and *Asian* survey respondents. Here, it may be worth explaining the intersectionality of race and socioeconomic status as a key component that can clarify these interesting findings. Namely, researchers have found that: (a) "Among racial/ethnic groups, Asian-American families, on average, have the highest median family income; Black families have the lowest." and (b) "Nationally, 19 percent of children live in poverty. The percentages increase to nearly a third or more of Black, American Indian/Alaskan Native, and Hispanic children,"[1]. Put more plainly, it appears that racial groups that are associated with lower socioeconomic status (e.g., familial income) were more likely to think that their load-handling certifications were valuable compared to racial groups that are associated with higher socioeconomic status.

Racial groups that are associated with lower socioeconomic status (e.g., familial income) were more likely to think that their load-handling certifications were valuable compared to racial groups that are associated with higher socioeconomic status.

Please note that the data breakdowns referenced above include some small sample sizes. Consequently, it becomes difficult to compare groups and draw robust conclusions. Certification bodies and industry leaders should look to sample more individuals from underrepresented groups to understand whether subgroup differences persist with larger sample sizes. If the trends persist, then organizations should work to understand *why* there are group differences regarding the value of certification. Once the phenomena have been fully investigated, organizations can address the concerns that certain groups of employees have about the value of certification. Similarly, organizations can create systems and marketing materials that can positively influence negative perceptions of certification value.

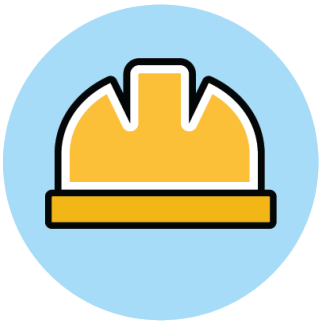
[1] Barton, P. E., & Coley, R. J. (2007). *The family: America's smallest school*. Princeton, NJ: Educational Testing Service.

Benefits of Certification

Primary Benefits

Survey respondents were asked, "Which is the primary benefit of having a load-handling certification?" where they were provided with response options informed by the focus group research effort. Overall, the top reported benefits were *demonstrates safety knowledge and skills* (25.7%), *demonstrates credibility/professionalism* (22.2%), *demonstrates technical knowledge and skills* (17.1%), and *improved job opportunities* (16.7%). Please see Table 23 for more details.

Focus group results mirror the survey findings, with participants most often citing *demonstrates competency/credibility/qualifications* (*n* = 21) and *better employment opportunities/marketable* (*n* = 20). Please see Table 52 in Appendix C for more details.



The top reported benefits of certification were demonstrates safety knowledge and skills (25.7%), demonstrates credibility/ professionalism (22.2%), demonstrates technical knowledge and skills (17.1%), and improved job opportunities (16.7%).

Perceptions of No Benefits of Certification

With respect to the focus group research, participants made comments about the *downsides of certification* (*n* = 19), including *does not guarantee adequate performance/safety/knowledge* (*n* = 6). Please see Table 52 in Appendix C for more details.

Regarding the survey research results, 6.1% of respondents cited *no benefits* of certification. When analyzing the *no benefits* data breakdown by *length of time in the field* (Table 25), there does not appear to be a meaningful pattern, indicating that the perception that there are no benefits of certification is not necessarily tied exclusively to experience.

However, when analyzing this data point broken down by *role* (Table 24), we find that those indicating *Other* (13.7%), *Site Supervisors* (8.1%), *Trainers* (8.1%), and *Operators* (5.9%) were the most likely to cite *no benefits* of certification. It is surprising that *Site Supervisors*, *Trainers*, and *Operators* were some of the most likely roles to cite no benefits of certification given the advance-level ranking of these positions within the load-handling field. However, certifications can be more important for certain roles (e.g., those directly working with load-handling equipment) compared to other roles (e.g., those who do not work directly with load-handling equipment). While some employees in the load-handling field may find that certifications do not benefit them in their particular role or circumstance, they may still support the idea of certification more generally, which is not represented by the data. Conversely, if individuals in advance-level positions such as these do not generally support of certification, then their influence and position on a job site may negatively impact their colleagues' and subordinates'

perceptions of certification. These findings warrant additional investigation to better understand the nuances involved.

Additionally, when analyzing the *no benefits* data breakdown by *race* (Table 26), survey respondents belonging to underrepresented racial groups—including *American Indian or Alaska Native* (0.0%), *Black or African American* (0.0%), *Hispanic or Latino* (0.9%), *Native Hawaiian or Pacific Islander* (0.0%)—were much less likely to cite *no benefits* of certification compared to all other racial groups, including *White or Caucasian* (6.3%) and *Asian* (20.0%) individuals. As pointed out in the *Perceived Value of Certifications* subsection above, these findings based on race should be interpreted within the intersection of race and socioeconomic status, where racial groups that are associated with lower socioeconomic status (e.g., familial income) were more likely to perceive benefits of load-handling certifications compared to racial groups that are associated with higher socioeconomic status, who were more likely to perceive no benefits of certification.

Finally, when analyzing the *no benefits* data breakdown by *gender* (Table 27), *females* (14.8%) and those individuals selecting *prefer not to answer* (14.3%) were more than twice as likely to indicate that there are no benefits of certification compared to *males* (5.8%), indicating gender differences in the perceived benefits of load-handling certifications. Given the disproportionate ratio of males to females in the survey sample as well as the load-handling field more broadly, it may be that having an underrepresented gender identity (e.g., female) in a male-dominated field negatively effects a person's perceptions of certification. This finding has important implications for diversity, equity, and inclusion within the field.

Taken as a whole, the results described above highlight very critical perceptions of certification. It was found that several advance-level positions (i.e., Site Supervisors, Trainers, and Operators) were more likely see no benefits of certification. Similar findings can be found for Asian and White/Caucasian individuals as well as females. Please note that the data breakdowns include some small sample sizes. Consequently, it becomes difficult to compare groups and draw robust conclusions. Certification bodies and industry leaders should look to sample more individuals from underrepresented groups to understand whether subgroup differences persist with larger sample sizes. If the trends persist, industry leaders and certification bodies should work to improve the perceived value of certification and address the concerns that particular groups have about the value of certification.

Barriers to Becoming Certified

With respect to the focus group research, participants made numerous comments about the *issues/barriers associated with certification* (n = 62), highlights of which will be outlined in the report subsections below. Please see Table 53 in Appendix C for more details.

Regarding the survey research results, survey respondents were asked, "Which is the primary barrier to getting certified in the load-handling field?" where they were provided with response options informed by the focus group research effort. Data for this survey question was additionally broken down based on numerous variables, including *certifications held* (Table 22), *role* (Table 24), *length of time in the field* (Table 25), *race* (Table 26), and *gender* (Table 27). The results are outlined below. Overall, the top reported barriers were *cost barriers* (20.6%), *exam difficulty* (16.5%), and *training difficulty* (16.2%).

Cost

With respect to the focus group research, participants most often cited *cost/lack of funding* (*n* = 13) as an *issue/barrier associated with certification*. Please see Table 53 in Appendix C for more details.

Regarding the survey research and the *cost barriers*, there does not appear to be a meaningful pattern based on *role* (Table 24), *race* (Table 26), or *gender* (Table 27) indicating that the perception of the cost certification barriers is not necessarily tied exclusively to one's job role, gender, and/or race.

However, when analyzing this data point broken down by *length of time in the field* (Table 25), there is a clear pattern of less experienced survey respondents citing cost as a primary barrier to certification. It is likely that years of experience is also positively correlated with income, so it stands to reason that those with lower incomes due to being more junior in the field would experience the cost barrier of certification more than tenured employees in the field. Organizations and industry leaders concerned with recruitment and pipeline considerations should keep in mind this certification barrier finding and explore options for reducing/offsetting certification costs, especially for more junior employees in the field.

Exam Difficulty and Format

With respect to the focus group research, participants often cited the *test medium* (*n* = 6) as an issue/barrier associated with certification. In other words, the test format (e.g., computerized testing) is a hurdle associated with obtaining certification in the load-handling field. Please see Table 53 in Appendix C for more details.

Regarding the survey research and the exam difficulty and format barriers, there does not appear to be a meaningful pattern based on *role* (Table 24), *length of time in the field* (Table 25), *race* (Table 26), or *gender* (Table 27) indicating that the perception of certification barriers is not necessarily tied exclusively to one's job role, experience in the field, gender, and/or race. Even though the exam difficulty barrier is ostensibly unrelated to the breakdown variables included in this research effort, it still remains a highly cited certification barrier. It would be incumbent on organizations and certification bodies to better understand the perceptions of their exam difficulty and remedy any myths or concerns related to such.

Training Barriers

With respect to the focus group research, participants often cited *inadequate/unavailable training* (*n* = 7) as an issue/barrier associated with certification. Please see Table 53 in Appendix C for more details.

Regarding the survey research and the training barriers, there does not appear to be a meaningful pattern based on *length of time in the field* (Table 24), *race* (Table 26), or *gender* (Table 27) indicating that the perception of certification barriers is not necessarily tied exclusively to one's experience in the field, gender, and/or race. However, when analyzing this data point broken down by *role*, *Site Supervisors* (25.7%) were more likely to cite training as a barrier to certification compared to all other roles.

The training barrier was a consistently cited certification barrier across all groups and breakdowns. If industry leaders and organizations wish to have robust recruitment pipelines to ensure an adequate talent pool in the load-handling field, they should address and remedy the ubiquitous perceptions that training is a primary barrier to becoming certified. As mentioned in the *Recruitment and Pipeline Recommendations* subsection, there is opportunity for industry leaders and organizations to rethink the way that training and entry into the field works. In the *Current Employment* subsection, we noted that employees viewed structured training (i.e., union apprenticeship programs, employer-sponsored training) as the highest quality forms of training and rated less structured training (e.g., on-the-job, self-funded, and self-taught training) lower on quality. Perhaps there are alternative, structured routes for training that certification bodies and organizations can invest more resources into.

Perceptions of No Certification Barriers

Importantly, the most selected response option for the survey question, "Which is the primary barrier to getting certified in the load-handling field?" was *no barriers* (23.2%). Indicating that nearly a quarter of all survey respondents believed that there are no barriers to becoming certified in the load-handling field.

Nearly a quarter of all survey respondents believed that there are no barriers to becoming certified in the load-handling field.

When analyzing this data point broken down by *role* (Table 24), *Lift Directors* (45.8%), *Crane Inspectors* (42.9%), and *Trainers* (29.7%) were much more likely to cite *no barriers* to getting certified compared to all other role categories. These are advanced-level positions within the load-handling field, so perhaps there is a disconnect between the perceptions of barriers for those in advanced-level positions compared to low- and mid-level positions. This perception gap might be detrimental to early career professionals in the low- and mid-level positions because their supervisors and leaders may not understand the barriers that they face regarding certification. Conversely, low- and mid-level positions may not be aware of the opportunities that more senior-level positions know about. Certification bodies and industry leaders could bridge this understanding gap with various methods including additional research and improved communication strategies to members of the field.

When analyzing the barriers to certification data broken down by *length of time in the field* (Table 25), there is a clear pattern of less experienced survey respondents (i.e., 0-10 years of experience) citing *no barriers* much less than more experienced employees (i.e., 11 years or more of experience). It may be that less-experienced load-handling employees are not aware of the opportunities available to them. Conversely, it may be that the barriers being faced are a new phenomenon primarily impacting early-career professionals. Along similar lines, it is also

possible that these barriers are long-lasting, however more experienced employees are further removed from the hurdles they faced in their early careers and therefore have become disconnected with the difficulties faced.

With respect to the perception that there are *no barriers*, there does not appear to be a meaningful pattern based on *race* (Table 26) or *gender* (Table 27) indicating that the perception that there are no barriers to certification is not necessarily tied exclusively to one's race and/or gender.

Survey Tables: Views on Certification

Note: Heat maps have been included for each table to assist with interpretation. For tables representing multiple survey questions, heat map color schemes are based on each question and not across questions. Dark red represents the lowest number of the question results, and dark blue represents the highest number of the question results (see graphic below). Please read the notes section at the bottom of each table for detailed information about interpretation.

Table 22: Certifications Held and Value of Certification

	Which load-handling certifications do you currently hold?		I think that the load-handling certifications I hold are valuable.	I think that it is important to hold more than one load-handling certification.
	n	**%**	**Mean**	**Mean**
Mobile Crane Operator	1014	84.1	4.09	3.85
Service Truck Crane Operator	363	30.1	4.08	3.96
Tower Crane Operator	140	11.6	4.21	4.02
Overhead Crane Operator	170	14.1	4.10	3.98
Articulating Crane Operator	178	14.8	4.18	3.92
Digger Derrick Operator	47	3.9	4.04	3.89
Dedicated Pile Drive Operator	41	3.4	3.98	4.05
Drill Rig Operator	22	1.8	4.36	4.23
Concrete Pump Operator	12	1.0	4.58	4.25
Telehandler Operator	241	20.0	4.05	3.98
Signalperson	421	34.9	4.17	3.99
Rigger	465	38.6	4.11	3.98
Crane Inspector	59	4.9	4.31	4.17
Lift Director	81	6.7	4.11	4.01
No Active Certification	10	0.8	-	-
Missing	-[a]	-	-[d]	-[d]
Total or Average	3264[b]	-[c]	4.12	3.85

Note: Heat maps color schemes are based within each column and not across columns. Dark red represents the lowest number in a column and dark blue represents the highest number in a column. The sample sizes (*n*) represent the maximum number of respondents for a given row label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a]Since participants had the option to select multiple responses, there is no clear way to differentiate how many people did not answer the question. [b]Participants had the option of selecting more than one response for the question depicted in columns two and three, therefore the total number of responses is higher than the total number of survey respondents (*n* = 1205). [c]The sum of percentages for column three will not add up to 100% given that respondents were allowed to select more than one response. [d] Means were not calculated for those who did not specify which certifications they held.

Table 23: Certification Value Overview

	n	%
Which is the primary benefit of having a load-handling certification?		
Demonstrates technical knowledge and skills	206	17.1
Demonstrates safety knowledge and skills	310	25.7
Demonstrates credibility/professionalism	267	22.2
Improved opportunity for higher pay	73	6.1
Improved job opportunities	201	16.7
Improved promotional opportunities	21	1.7
Other	53	4.4
No benefits	73	6.1
Missing	1	0.1
Total	1205	100
Which is the primary barrier to getting certified in the load-handling field?		
Cost barriers	248	20.6
Geographic barriers (e.g., access to testing)	46	3.8
Time barriers	112	9.3
Training barriers	195	16.2
Language barriers	11	0.9
Exam difficulty	199	16.5
Difficulty meeting requirements	44	3.7
Other	70	5.8
No barriers	280	23.2
Missing	-	-
Total	1205	100

Note: Heat maps color schemes are based within each question and not across questions. Dark red represents the lowest number in a question and dark blue represents the highest number in a question.

Table 24: Certification Value by Role

	Total	Operator	Rigger	Signalperson	Site Supervisor	Trainer	Crane Inspector	Lift Director	Retired	Other
Sample size	1204[a]	931	34	8	74	37	14	24	31	51
	Mean	**Mean**								
I think that the load-handling certifications I hold are valuable.	4.12	4.13	4.06	4.50	3.96	4.22	4.79	4.21	4.23	3.76
I think that it is important to hold more than one load-handling certification.	3.85	3.84	4.15	4.13	3.67	4.11	4.21	4.04	4.19	3.51
	n	**%**								
Which is the primary benefit of having a load-handling certification?										
Demonstrates technical knowledge and skills	206	16.6	14.7	12.5	23.0	21.6	21.4	20.8	12.9	15.7
Demonstrates safety knowledge and skills	310	24.3	23.5	75.0	28.4	24.3	35.7	37.5	32.3	31.4
Demonstrates credibility/professionalism	267	22.4	26.5	12.5	17.6	21.6	35.7	12.5	22.6	23.5
Improved opportunity for higher pay	73	6.6	5.9	0.0	4.1	10.8	7.1	0.0	3.2	2.0
Improved job opportunities	201	17.8	26.5	0.0	13.5	10.8	0.0	16.7	12.9	7.8
Improved promotional opportunities	21	1.7	0.0	0.0	2.7	2.7	0.0	4.2	3.2	0.0
Other	53	4.6	0.0	0.0	2.7	0.0	0.0	8.3	9.7	5.9
No benefits	73	5.9	0.0	0.0	8.1	8.1	0.0	0.0	3.2	13.7
Missing	1	-	2.9	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100
Which is the primary barrier to getting certified in the load-handling field?										
Cost barriers	248	20.6	20.6	12.5	16.2	29.7	42.9	12.5	19.4	19.6
Geographic barriers (e.g., access to testing)	46	4.1	0.0	0.0	0.0	0.0	7.1	4.2	12.9	3.9
Time barriers	112	8.6	26.5	25.0	14.9	13.5	0.0	4.2	3.2	5.9
Training barriers	195	16.5	14.7	12.5	25.7	13.5	0.0	12.5	9.7	9.8
Language barriers	11	0.8	0.0	0.0	2.7	0.0	0.0	0.0	3.2	2.0
Exam difficulty	199	17.1	11.8	12.5	12.2	10.8	0.0	16.7	22.6	19.6
Difficulty meeting requirements	44	3.4	2.9	25.0	4.1	2.7	0.0	4.2	3.2	5.9
Other	70	5.6	5.9	0.0	6.8	0.0	7.1	0.0	3.2	17.6
No barriers	280	23.3	17.6	12.5	17.6	29.7	42.9	45.8	22.6	15.7
Missing	-	-	-	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within each question and not across questions, apart from means, which are grouped together. Dark red represents the lowest number in a question and dark blue represents the highest number in a question. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a]Not all participants answered the role question, indicating a lower total in the top row.

Table 25: Certification Value by Length of Time in Field

	Total	< 1	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25	26 – 30	31 – 35	> 35
Sample size	1203[a]	36	142	169	138	157	190	128	91	152
	Mean	**Mean**								
I think that the load-handling certifications I hold are valuable.	4.12	3.81	4.25	4.33	4.14	4.15	4.15	3.91	3.95	4.03
I think that it is important to hold more than one load-handling certification.	3.85	3.97	3.96	3.92	3.80	3.89	3.82	3.82	3.88	3.72
	n	**%**								
Which is the primary benefit of having a load-handling certification?										
Demonstrates technical knowledge and skills	206	11.1	20.4	16.6	18.1	17.8	15.8	19.5	17.6	13.8
Demonstrates safety knowledge and skills	310	19.4	26.8	23.1	25.4	27.4	24.7	25.8	18.7	32.9
Demonstrates credibility/professionalism	267	22.2	18.3	26.6	24.6	20.4	21.6	18.8	27.5	21.1
Improved opportunity for higher pay	73	2.8	10.6	5.3	8.0	5.7	4.2	3.9	7.7	5.3
Improved job opportunities	201	25.0	14.8	18.3	14.5	17.2	22.1	14.1	20.9	8.6
Improved promotional opportunities	21	0.0	3.5	3.0	0.7	1.3	1.1	1.6	0.0	2.6
Other	53	5.6	1.4	3.6	1.4	8.3	4.7	6.3	2.2	5.9
No benefits	73	11.1	4.2	3.6	7.2	1.9	5.8	10.2	5.5	9.9
Missing	1	2.8	-	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100
Which is the primary barrier to getting certified in the load-handling field?										
Cost barriers	248	36.1	25.4	24.3	20.3	18.5	20.0	14.1	17.6	19.1
Geographic barriers (e.g., access to testing)	46	8.3	4.9	5.3	3.6	2.5	2.1	3.1	4.4	3.9
Time barriers	112	0.0	14.1	8.9	9.4	12.1	6.8	10.2	8.8	7.2
Training barriers	195	19.4	14.1	19.5	14.5	12.7	13.2	20.3	18.7	17.1
Language barriers	11	0.0	2.1	0.0	0.7	0.6	0.5	2.3	0.0	1.3
Exam difficulty	199	13.9	12.7	17.2	21.7	20.4	12.6	16.4	13.2	18.4
Difficulty meeting requirements	44	8.3	0.7	3.0	1.4	3.2	4.7	3.9	8.8	3.9
Other	70	5.6	4.9	5.9	2.2	8.3	7.9	7.8	5.5	3.3
No barriers	280	8.3	21.1	16.0	26.1	21.7	32.1	21.9	23.1	25.7
Missing	-	-	-	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within each question and not across questions, apart from means, which are grouped together. Dark red represents the lowest number in a question and dark blue represents the highest number in a question. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a]Not all participants answered the Length of Time in Field question, indicating a lower total in the top row.

Table 26: Certification Value by Race

	Total	American Indian or Alaska Native	Asian	Black or African American	Hispanic or Latino	Native Hawaiian or Pacific Islander	White or Caucasian	Other	Unknown	Prefer Not to Answer	Multi-Racial
Sample size	1202[a]	17	10	32	111	5	916	15	5	48	43
	Mean	Mean									
I think that the load-handling certifications I hold are valuable.	4.12	4.18	3.90	4.50	4.44	4.40	4.08	4.33	3.80	3.81	4.02
I think that it is important to hold more than one load-handling certification.	3.85	4.00	3.30	4.38	4.13	3.80	3.80	4.20	3.00	3.69	4.12
	n	%									
Which is the primary benefit of having a load-handling certification?											
Demonstrates technical knowledge and skills	206	23.5	20.0	31.3	18.0	20.0	16.0	6.7	0.0	25.0	18.6
Demonstrates safety knowledge and skills	310	23.5	30.0	34.4	37.8	40.0	25.1	20.0	0.0	12.5	16.3
Demonstrates credibility/professionalism	267	11.8	30.0	18.8	14.4	0.0	23.7	6.7	40.0	18.8	25.6
Improved opportunity for higher pay	73	0.0	0.0	6.3	5.4	0.0	5.8	20.0	20.0	10.4	7.0
Improved job opportunities	201	29.4	0.0	6.3	19.8	40.0	16.3	13.3	20.0	16.7	23.3
Improved promotional opportunities	21	0.0	0.0	0.0	2.7	0.0	1.5	13.3	0.0	2.1	2.3
Other	53	11.8	0.0	3.1	0.0	0.0	5.2	6.7	0.0	2.1	0.0
No benefits	73	0.0	20.0	0.0	0.9	0.0	6.3	13.3	20.0	12.5	7.0
Missing	1	-	-	-	0.9	-	-	-	-	-	
Total	1205	100	100	100	100	100	100	100	100	100	100
Which is the primary barrier to getting certified in the load-handling field?											
Cost barriers	248	11.8	0.0	25.0	22.5	20.0	20.9	26.7	0.0	18.8	18.6
Geographic barriers (e.g., access to testing)	46	0.0	10.0	6.3	0.0	0.0	4.0	13.3	0.0	2.1	7.0
Time barriers	112	23.5	10.0	6.3	7.2	0.0	9.4	6.7	0.0	10.4	11.6
Training barriers	195	29.4	10.0	12.5	18.0	20.0	15.6	26.7	0.0	20.8	14.0
Language barriers	11	0.0	10.0	0.0	2.7	0.0	0.8	0.0	0.0	0.0	0.0
Exam difficulty	199	11.8	10.0	9.4	17.1	0.0	16.5	13.3	40.0	25.0	16.3
Difficulty meeting requirements	44	0.0	0.0	0.0	2.7	0.0	4.1	0.0	0.0	4.2	2.3
Other	70	5.9	10.0	0.0	7.2	20.0	6.0	0.0	0.0	2.1	7.0
No barriers	280	17.6	40.0	40.6	22.5	40.0	22.7	13.3	60.0	16.7	23.3
Missing	-	-	-	-	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within each question and not across questions, apart from means, which are grouped together. Dark red represents the lowest number in a question and dark blue represents the highest number in a question. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a]Not all participants answered the race question, indicating a lower total in the top row.

Table 27: Certification Value by Gender

	Total	Male	Female	Other	Prefer Not to Answer
Sample size	1191[a]	1148	27	2	14
	Mean	Mean			
I think that the load-handling certifications I hold are valuable.	4.12	4.12	4.07	4.00	3.79
I think that it is important to hold more than one load-handling certification.	3.85	3.86	3.81	3.50	3.43
	n	%			
Which is the primary benefit of having a load-handling certification?					
Demonstrates technical knowledge and skills	206	17.3	11.1	0.0	21.4
Demonstrates safety knowledge and skills	310	25.0	44.4	50.0	7.1
Demonstrates credibility/professionalism	267	22.4	18.5	50.0	21.4
Improved opportunity for higher pay	73	6.3	0.0	0.0	7.1
Improved job opportunities	201	17.0	3.7	0.0	21.4
Improved promotional opportunities	21	1.8	0.0	0.0	0.0
Other	53	4.4	3.7	0.0	7.1
No benefits	73	5.8	14.8	0.0	14.3
Missing	1	-	3.7	-	-
Total	1205	100	100	100	100
Which is the primary barrier to getting certified in the load-handling field?					
Cost barriers	248	20.5	25.9	50.0	28.6
Geographic barriers (e.g., access to testing)	46	4.0	0.0	0.0	0.0
Time barriers	112	9.4	7.4	0.0	7.1
Training barriers	195	16.3	18.5	0.0	0.0
Language barriers	11	1.0	0.0	0.0	0.0
Exam difficulty	199	16.3	11.1	50.0	35.7
Difficulty meeting requirements	44	3.8	0.0	0.0	0.0
Other	70	5.7	11.1	0.0	0.0
No barriers	280	23.0	25.9	0.0	28.6
Missing	-	-	-	-	-
Total	1205	100	100	100	100

Note: Heat maps color schemes are based within each question and not across questions, apart from means, which are grouped together. Dark red represents the lowest number in a question and dark blue represents the highest number in a question. The sample sizes represent the maximum number of respondents for a given column label. Some questions were not answered by all respondents. Means are based on a 5-point Likert scale; 1 = strongly disagree and 5 = strongly agree. [a]Not all participants answered the gender question, indicating a lower total in the top row.

Performance and the Future

Section Summary

Focus group participants were asked about performance elements that promote success in load-handling jobs. They were also asked about the biggest changes that they have seen in the field in recent years. Survey respondents were also asked about their perceptions on the most important skills to hold in the load-handling field. The following section briefly overviews these findings.

Overall, both the survey and focus group results emphasized the importance of technical skills, safety skills, as well as interpersonal skills, such as communication.

Moreover, improved technology was recognized as the biggest change in the load-handling field. See below for additional discussion.

Overall, both the survey and focus group results emphasized the importance of technical skills, safety skills, as well as interpersonal skills, such as communication.

Performance Elements

To investigate the elements involved in successful performance, both survey respondents and focus group participants were asked about which skills they found to be most important for jobs in the load-handling field. The results are outlined below and can also be found in Tables 28-32, where findings are broken down by role, length of time in the field, race, and gender. Again, note the small sample sizes for some of these breakdown groups. Especially in the case of smaller samples, it is possible that the results would differ if those sample sizes increased.

Important Skills to Hold

Across all survey respondents (*n* = 1205), *decision making skills* (23.4%) was recognized as the most important skill to hold in the load-handling field, followed by *safety skills* (20.9%), *communication skills* (17.8%) and *technical/mechanical skills* (15.3%). See Table 28 for more detail.

Focus group results showed that *safety skills* (*n* = 17), *drive/work ethic* (*n* = 16), and *ability/motivation* to learn were the most important skills for successful performance in the load-handling industry (see Tables 63-66 in Appendix C).

Decision making (23.4%) was recognized as the most important skill to hold in the load-handling field, followed by safety skills (20.9%), communication skills (17.8%) and technical/mechanical skills (15.3%) .

Both the survey and focus group results emphasize the importance of technical skills and safety skills, which is unsurprising given how obviously critical those skills are for work in the load-handling field. Interestingly, survey respondents and focus group participants also emphasized the importance of less obvious non-cognitive skills, such as communication, work ethic, and motivation to learn. Recall from the *Work Opinion Results from Focus Groups* subsection that teamwork and interpersonal interactions were both the most liked *and* most disliked aspects of work in the load-handling field. Clearly work in the load-handling field is dependent upon working and interacting with others and load-handling employees understand the critical nature of such.

Industry leaders and organizations should work to systematically and scientifically analyze load-handling jobs (i.e., job analysis). For those jobs skills that are needed upon entry, organizations should ensure that their recruitment and hiring processes are adequately assessing these skills. For job skills that can be developed over time, organizations should scientifically build training programs that can help their employees develop these skills.

Changes in the Field

Survey respondents were asked about changes they have noticed in the past or anticipate in the future. Moreover, focus group participants provided rich details about these topics (please see Tables 69–73 in Appendix C. Focus group participants noted four main categories of change within the load-handling field. That is, *work and environmental changes*, *procedural changes*, *workforce changes*, and *increased requirements.* The two most mentioned categories are broken down below.

Work and Environmental Changes

Focus group participants detailed the changing nature of the load-handling industry by discussing changes related to the ways that work is being conducted. The most mentioned change was *improved technology* (*n* = 29), such as LMI systems, training simulators, and online certification, followed by *improved equipment* (*n* = 7), such as strand jacks and specialized mobile transporters. See Table 70 in Appendix C for more details on *work and environmental changes.*

Procedural Changes

Focus group participants mentioned that there have been procedural changes that have taken place in the load-handling field, such as an increased emphasis on *safety processes* (*n* = 10) and an increased emphasis on *training* (*n* = 5) within the load-handling field. See Table 71 in Appendix C for more focus group data on *Procedural Changes*.

Survey Tables: Performance and the Future

Note: Heat maps have been included for each table to assist with interpretation. For tables representing multiple survey questions, heat map color schemes are based on each question and not across questions. Dark red represents the lowest number of the question results, and dark blue represents the highest number of the question results (see graphic below). Please read the notes section at the bottom of each table for detailed information about interpretation.

Table 28: Performance Elements Overview

	n	%
What is the most important skill to have in the load-handling field?		
Technical/mechanical skills	184	15.3
Communication skills	215	17.8
Safety skills	252	20.9
Physical aptitude	16	1.3
Adaptability skills	101	8.4
Time management skills	5	0.4
Leadership skills	40	3.3
Decision making skills	282	23.4
Teamwork skills	80	6.6
Other	29	2.4
Missing	1	0.1
Total	1205	100

Note: Dark red represents the lowest number in the column and dark blue represents the highest number in the column.

Table 29: Performance Elements by Role

	Total	Operator	Rigger	Signalperson	Site Supervisor	Trainer	Crane Inspector	Lift Director	Retired	Other
What is the most important skill to have in the load-handling field?	1204[a]	931	34	8	74	37	14	24	31	51
	n	%								
Technical/mechanical skills	184	15.8	8.8	0.0	9.5	18.9	28.6	12.5	12.9	17.6
Communication skills	215	17.0	35.3	25.0	21.6	18.9	7.1	20.8	12.9	19.6
Safety skills	252	21.4	23.5	50.0	14.9	16.2	28.6	16.7	25.8	15.7
Physical aptitude	16	1.2	0.0	12.5	2.7	2.7	0.0	0.0	0.0	2.0
Adaptability skills	101	9.1	5.9	0.0	10.8	2.7	0.0	0.0	6.5	5.9
Time management skills	5	0.3	0.0	0.0	1.4	0.0	0.0	0.0	0.0	2.0
Leadership skills	40	2.7	0.0	0.0	5.4	10.8	7.1	12.5	3.2	2.0
Decision making skills	282	23.1	14.7	0.0	27.0	27.0	28.6	33.3	25.8	23.5
Teamwork skills	80	6.8	11.8	12.5	6.8	0.0	0.0	0.0	12.9	5.9
Other	29	2.6	0.0	0.0	0.0	2.7	0.0	4.2	0.0	5.9
Missing	1	0.1	-	-	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within column and not across columns. Dark red represents the lowest number in a column and dark blue represents the highest number in a column. [a]Not all participants answered the role question, indicating a lower total in the top row.

Table 30: Performance Elements by Length of Time in Field

	Total	< 1	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25	26 – 30	31 – 35	> 35
What is the most important skill to have in the load-handling field?	1203[a]	36	142	169	138	157	190	128	91	152
	n	%								
Technical/mechanical skills	184	13.9	9.9	12.4	13.8	19.7	14.2	21.1	25.3	11.2
Communication skills	215	22.2	15.5	18.3	16.7	18.5	18.9	21.1	15.4	16.4
Safety skills	252	22.2	28.2	24.9	21.0	23.6	16.8	20.3	9.9	19.1
Physical aptitude	16	0.0	2.8	1.8	0.7	0.0	1.6	0.8	2.2	1.3
Adaptability skills	101	2.8	12.0	10.7	12.3	5.7	8.4	4.7	6.6	5.9
Time management skills	5	0.0	0.7	1.2	0.7	0.6	0.0	0.0	0.0	0.0
Leadership skills	40	0.0	3.5	1.8	3.6	4.5	2.1	5.5	2.2	4.6
Decision making skills	282	22.2	17.6	18.9	24.6	16.6	26.8	21.1	34.1	31.6
Teamwork skills	80	11.1	6.3	7.7	4.3	8.3	7.9	4.7	3.3	7.2
Other	29	5.6	3.5	2.4	2.2	2.5	2.6	0.8	1.1	2.6
Missing	1	-	-	-	-	-	0.5	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within column and not across columns. Dark red represents the lowest number in a column and dark blue represents the highest number in a column. [a]Not all participants answered the Length of Time in Field question, indicating a lower total in the top row.

Table 31: Performance Elements by Race

	Total	American Indian or Alaska Native	Asian	Black or African American	Hispanic or Latino	Native Hawaiian or Pacific Islander	White or Caucasian	Other	Unknown	Prefer Not to Answer	Multi-Racial
What is the most important skill to have in the load-handling field?	1202[a]	17	10	32	111	5	916	15	5	48	43
	n	%									
Technical/mechanical skills	184	11.8	0.0	12.5	5.4	0.0	16.5	20.0	0.0	22.9	16.3
Communication skills	215	17.6	30.0	21.9	12.6	20.0	18.6	26.7	40.0	12.5	11.6
Safety skills	252	23.5	40.0	25.0	38.7	20.0	19.1	20.0	0.0	8.3	18.6
Physical aptitude	16	0.0	0.0	0.0	0.9	0.0	1.2	0.0	0.0	6.3	0.0
Adaptability skills	101	5.9	0.0	12.5	8.1	20.0	8.2	20.0	0.0	6.3	11.6
Time management skills	5	0.0	0.0	3.1	0.0	0.0	0.3	0.0	0.0	0.0	2.3
Leadership skills	40	0.0	0.0	3.1	3.6	20.0	3.5	0.0	0.0	2.1	2.3
Decision making skills	282	23.5	0.0	9.4	10.8	20.0	25.0	6.7	40.0	33.3	32.6
Teamwork skills	80	0.0	10.0	6.3	17.1	0.0	5.8	6.7	0.0	4.2	4.7
Other	29	17.6	20.0	6.3	1.8	0.0	1.9	0.0	20.0	4.2	0.0
Missing	1	-	-		0.9	-	-	-	-	-	-
Total	1205	100	100	100	100	100	100	100	100	100	100

Note: Heat maps color schemes are based within column and not across columns. Dark red represents the lowest number in a column and dark blue represents the highest number in a column. [a]Not all participants answered the race question, indicating a lower total in the top row.

Table 32: Performance Elements by Gender

	Total	Male	Female	Other	Prefer Not to Answer
What is the most important skill to have in the load-handling field?	1191[a]	1148	27	2	14
	n	%			
Technical/mechanical skills	184	15.3	11.1	0.0	21.4
Communication skills	215	18.2	11.1	0.0	14.3
Safety skills	252	20.3	33.3	50.0	14.3
Physical aptitude	16	1.4	0.0	0.0	0.0
Adaptability skills	101	8.3	22.2	0.0	0.0
Time management skills	5	0.4	0.0	0.0	0.0
Leadership skills	40	3.3	3.7	0.0	0.0
Decision making skills	282	23.7	7.4	50.0	35.7
Teamwork skills	80	7.0	0.0	0.0	0.0
Other	29	2.0	11.1	0.0	14.3
Missing	1	0.1	-	-	-
Total	1205	100	100	100	100

Note: Heat maps color schemes are based within column and not across columns. Dark red represents the lowest number in a column and dark blue represents the highest number in a column. [a]Not all participants answered the gender question, indicating a lower total in the top row.

KEY TAKEAWAYS AND RECOMMENDATIONS

Key Takeaways and Recommendations

It is best practice to begin workforce endeavors with an initial step of information gathering and research. It is less desirable to develop or otherwise change human capital systems without first fully understanding the domain at hand. With quality information in hand, organizational experts can create efficient, useful, and enduring systems that result in exponential benefits for both organizations and employees alike.

In an effort to fulfill their goals of *research*, *education*, and *workforce development*, the NCCCO Foundation partnered with HumRRO to conduct a seminal workforce research study that will hopefully create the foundation for significant improvements in the load-handling field.

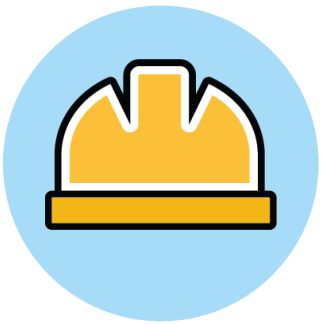
For this initial research effort, the NCCCO Foundation wanted to focus on understanding several topics of interest, including the demographic makeup of load-handling employees, the state of the current recruitment pipeline, as well as better understanding how load-handling employees view their jobs as well as certification.

Throughout this report, the authors have outlined and synthesized the results and have offered suggestions for future research and organizational development efforts. Below you will find a list and brief explanation of the primary suggestions mentioned throughout the report. Please note that these recommendations are based on extensive research and data analyses conducted by the HumRRO research team. The recommendations and conclusions represent the professional opinion of the HumRRO research team and may not necessarily correspond with the perspectives or strategies of the NCCCO Foundation. For more information on the HumRRO research team backgrounds, please see Appendix D.

Diversify the recruitment pipeline to expand the potential recruitment pool

The research results showed that the load-handling field pipeline heavily relies on two primary recruitment methods. That is, recruiting individuals from adjacent industries (e.g., construction) or through informal referrals from personal connections (e.g., family member, friend). The data also showed that most employees enter the load-handling field mid-career and it is not their first job.

If industry leaders look to improve the recruitment pipeline and ensure its long-term robustness, there needs to be a focus on formal outreach programs including improved industry branding, social media campaigns, outreach in educational settings, internship programs, and more. Emphasis should be placed on recruiting and training early-career talent, especially those individuals who have not yet entered the workforce (e.g., recent high school graduates), as well as individuals from underrepresented groups (e.g., women, racial minorities).



If industry leaders look to improve the recruitment pipeline and ensure its long-term robustness, there needs to be a focus on formal outreach programs.

Emphasis should be placed on recruiting and training early-career talent as well as individuals from underrepresented groups (e.g., women, racial minorities).

Decrease identified barriers for entering the field and becoming certified

Throughout this report, we discuss the barriers that individuals faced when entering the load-handling field as well as becoming certified, which primarily center on the high costs of training and lack of access to quality training. It is critical to address and reduce the hurdles for entering the field so that the long-term talent pipeline can improve.

Here, there is an opportunity for industry leaders and organizations to rethink the way that their current training systems work. Although the initial investment for creating standardized, formal, and funded training programs will be high, the long-term benefits of developing highly skilled and productive employees who exhibit ideal levels of person-job-fit can pay dividends in the long term. Industry leaders should explore the possibility of internship programs, scholarship programs, etc. in order to increase the opportunity for interested applicants to find quality training, while reducing personal costs for such.

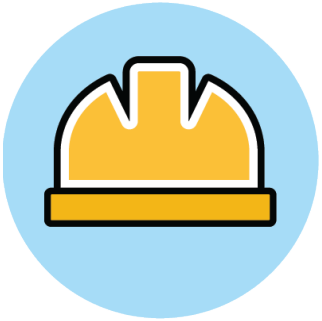
There is an opportunity for industry leaders and organizations to rethink the way that their current training systems work.

Reanalyze the skills needed for jobs in the load-handling field to improve recruitment, hiring, and training efforts

First and foremost, load-handling work is high stakes, where mistakes can mean the difference between life and death. Moreover, load-handling work is dynamic, where at any given minute a slew of factors could change and require employees to adapt and modify their approach. Load-handling work is also collaborative and requires cohesive teamwork in order to successfully and efficiently accomplish tasks.

The research results from this effort highlighted several skill areas that are obviously needed for load-handling work, such as technical skills and safety skills. The research also highlighted several domains of "soft skills" that are crucial for successful performance but may be less emphasized in hiring and training practices within the field. These soft skills include interpersonal skills (e.g., teamwork, communication), leadership skills, attention to detail, problem-solving, and adaptability.

Industry leaders and organizations should work to systematically and scientifically analyze load-handling jobs (i.e., job analysis) in order to better understand the broad array of skills involved in load-handling work at various levels (e.g., entry level, management). After the necessary skills are identified, organizations can then conduct skill gap analyses to see where their workforce stands compared to what each load-handling job requires. These suggested steps can assist organizations with recruiting, hiring, and training employees for the critical array of skills necessary for successful performance.



Industry leaders and organizations should work to systematically and scientifically analyze load-handling jobs (i.e., job analysis) in order to better understand the broad array of skills involved in load-handling work.

Address and improve overall job satisfaction

Research participants' overall satisfaction with work was only somewhat above neutral, although, levels of satisfaction did vary across different areas. Namely, employees find load-handling work meaningful and fulfilling, but also find the demands of the job stressful and report a lack of work-life balance. An important thing to note here is that one of the primary recruitment methods for the field is employee referrals. If employees have relatively neutral work satisfaction, then the pipeline in its current state will likely face negative outcomes, which emphasize the need for industry leaders to diversify recruitment methods and improve overall employee satisfaction.

Additionally, it is critical to recognize the long-term consequences of employee dissatisfaction or disengagement, which can have far reaching negative implications for both the organization and employees. Negative outcomes include low productivity, high turnover, decreased organizational commitment, worse employee health, and more. With this in mind, we encourage industry leaders to implement strategies aimed at reducing stress and improving work-life balance. For example, this may include offering more vacation days, minimizing the length of works shifts, hiring additional staff to spread workload, etc. If organizations cannot envision a future where the current system of workload/work hours changes, then organizations should consider offering other benefits. Namely, increased compensation so that employees can reap financial benefits in exchange for the stress and lack of work-life balance that they experience.

We encourage industry leaders to implement strategies aimed at reducing stress and improving work-life balance.

Research and address the perspectives and needs of underrepresented groups

There were numerous instances where the research findings from this effort highlighted additional avenues for research. One area worth mentioning was the lack of representation from various demographic groups, including females, racial minorities, and early career professionals (e.g., 18–25-year-olds). Although the number of survey participants was quite large, the sample sizes for these demographic groups were relatively small. Consequently, it becomes difficult to draw robust conclusions from the data breakdowns and group comparisons.

It is critical for industry leaders and organizations to better understand the perspectives of underrepresented groups. By understanding their views, organizations are in a better position to create systems, policies, training programs, etc., that target the needs of these underrepresented communities, which can result in a better recruitment pipeline, improved employee well-being (e.g., less turnover, improved job satisfaction), which can therefore improve overall organizational success.

It is critical for industry leaders and organizations to better understand the perspectives of underrepresented groups. By understanding their views, organizations are in a better position to create systems, policies, training programs, etc., that target the needs of these underrepresented communities.

APPENDIX A:
BACKGROUND RESEARCH

Appendix A: Background Research

NCCCO Foundation Workforce Research: Project Background Research

To help inform the NCCCO Foundation's workforce study's research questions and ensure a more comprehensive understanding of the load-handling field and crane operation profession, some preliminary background research was conducted. Please not that each superscript number refers to a reference listed at the end of Appendix A.

According to the Occupational Information Network (O*NET), Crane and Tower Operators broadly refer to workers who, "operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions."[1] Within the load-handling field, there are many role that are distinct yet related to crane operation for which one can obtain certification (e.g., Digger Derrick Operator, Signalperson, Rigger, Crane Inspector, Lift Director).[2] Examples of related occupations include Continuous Mining Machine Operators, Excavating and Loading Machine and Dragline Operators, and Hoist and Winch Operators.[1]

According to O*NET, some important skills and abilities crane operators need to possess include operations monitoring, critical thinking, control precision, and multi-limb coordination.[1] Knowledge of mechanical and mathematical principles is also useful. In terms of vocational interests, which refer to people's preferences for the type of work they like to engage in[3], crane operators are often individuals who enjoy work that involves designing, building or repairing equipment/structures, engaging in physical activity/working outdoors, and following procedures and regulations to achieve goals.[1] Moreover, in a National Commission for the Certification of Crane Operators (NCCCO) survey of three-time recertificates, several respondents indicated that their reason for entering and remaining within the crane operator profession was because the work provided them with a sense of personal accomplishment due to the lasting impact of their work on society and that it was rewarding to see their accomplishments at the end of the day.[4]

While the data is limited regarding what specific industries those in the load-handling field work in, our background research indicates that the construction industry is a primary employer. According to the National Institute for Occupational Safety and Health (NIOSH)[5] and the Bureau of Labor Statistics (BLS)[6], within the construction industry broadly, there were approximately 11.4 million workers employed within the United States in 2019. Of these construction workers, approximately 91% were male (compared to 53% within the general US workforce), 61% were white, and 30% were Hispanic (compared to 16% within the general US workforce). As of 2022, the average construction worker's salary was $40,750,[7] though the salary varies considerably across different construction occupations.[8] While data on the load-handling field and crane operator profession is somewhat more sparse, the estimates that are available from 2022-2023 somewhat align with the construction industry such that 86%–97% of employees are male, 65%–78% are white, with the median age being 44.1 years old.[9, 10, 11] According to BLS, the average crane operator's salary was $65,220 in 2022.[12]

Due to the dangerous and physically demanding[1, 13] tasks performed by crane operators and other non-operators within the load-handling field, safety is a critical concern and topic of much research and regulation. For example, in an analysis of BLS Census of Fatal Occupational Injuries (CFOI) data, the Center for Construction Research and Training estimated there were 323 crane-related fatalities between 1992 and 2006[14] with the BLS CFOI reporting 297 crane-related fatalities between 2011 and 2017.[15] Crane-related incidents and/or fatalities can occur for various mechanical (e.g., rigging operations failures), organizational (e.g., poor communication, training), personnel (e.g., mental or physical lapses), design (e.g., poor line of sight), or environmental (e.g., bad weather) reasons.[16] For instance, in an analysis of Occupational Safety and Health Administration (OSHA) data from 1997 to 2003, researchers found that 44% of crane fatalities were due to being struck by a load or a boom/cable failure.[17] Moreover, in an analysis of 75 crane accidents that occurred from 2004 to 2010, it is estimated that 43% of these were attributable to operator failure in responsibilities[18], thereby underlying the critical role the crane operators play in occupational safety. For this reason, much research is focused on improving the safety of crane operators and their environments. There is a particularly heavy focus on leveraging technologies to enhance safety (e.g., remote sensors, artificial intelligence, automation), which indicates that skills related to safety technologies are likely to become increasingly important to the future of the profession as rapid technological advances continue to be made.[19, 20, 21]

There are several career paths to becoming an operator within the load-handling field. This usually involves some combination of education (e.g., GED or Associate's degree), vocational training, apprenticeships, certification or licensing, and/or on-the-job experience, though obtaining certification is arguably the most crucial requirement in most cases.[1, 22] As mandated by OSHA (Rule 29 CFR 1926.1427(c)(2)), all crane operators within the construction industry are required to be certified, with recertification occurring every five years (effective November 10, 2018).[23, 24] A certification typically needs to be obtained from an organization recognized by the National Commission of Certifying Agencies (NCCA) or American National Standards Institute (ANSI), such as NCCCO, or less commonly the Crane Institute Certification (CIC), Operating Engineer Certification Program (OECP) or National Center for Construction Education and Research (NCCER). It is possible to also meet OSHA requirements by obtaining a license through a state/local government or an employer-audited program, though these are limited in that the license will only be applicable to the state/local government or employer where it was issued.[25] As noted earlier, there are many different types of certifications available depending on one's area of specialization within the load-handling field (e.g., Overhead Crane Operator, Rigger, Drill Rig Operator, Lift Director, etc.).[2] There is some very preliminary evidence that certification is viewed positively within the load-handling field and can entail various benefits. For example, in an NCCCO survey of three-time recertificants, several respondents indicated that the OSHA rule concerning certification helps improve job safety.[4] Furthermore, in another NCCCO survey of Certified Crane Operators (CCO) that have held certification for more than 10 years, improved workplace safety was almost always cited as the key benefit of certification. Respondents also indicated that being certified enhances communication on the job site and opens additional employment/career opportunities.[26] While these benefits are primarily at the individual (i.e., employee) level, certification can also be beneficial at the organizational level. For instance, an NCCCO interview with a panel of executives indicated that CCO certification increased their organization's professionalism, improved their knowledge of best practices, helped them expand their business, yielded marketing and insurance benefits (due to fewer accidents), increased customer confidence, and improved job safety.[27]

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APPENDIX B:
SURVEY DETAILS

Appendix B: Survey Details

[SURVEY WELCOME SCREEN]

If you already completed the survey, please do NOT fill out the survey again, your answers have been recorded.

The NCCCO Foundation has partnered with the Human Resources Research Organization (HumRRO) to execute a workforce research project. The purpose of this research project is to learn more about the people who work in the load-handling field and use that information to promote workforce development and further education and research endeavors in the field.

We expect that it will take between 15 and 20 minutes to complete the survey. We understand your time is precious and are sincerely grateful for your participation in this study. Please note that your responses will be anonymous and will not be linked back to you in any way. You may skip any questions you do not wish to answer. Your responses are voluntary and confidential. We will not share any personally identifiable information. If you complete the survey, you are eligible to be entered into a raffle for a $25 gift card. Upon completion of the survey, you will be given a link to take you to a separate survey to enter the raffle and provide your name and email. This way, your survey responses will not be tied to your personal information.

By completing this survey, it is implied that you consent to participate. We appreciate your time and participation!

If you are willing to complete this survey, please navigate to the next screen for instructions.

If you would like more information about this study, please contact T.J. Cantwell at tcantwell@ncccofoundation.org. If you have questions about the confidentiality of your responses or how to complete the survey, please contact HumRRO staff member Sam Elliott at selliott@humrro.org.

[SURVEY INSTRUCTION SCREEN]

Please note that we use the term "load-handling field" throughout this survey. Load-handling field refers to any jobs related to load-handling, such as Operator, Rigger, Signalperson, Crane Inspector, etc. Keep this in mind as you are filling out the survey.

Follow the on-screen prompts to navigate through the survey. If you want to come back to the survey at a later time, please click the "Continue Later" button and copy the survey link that follows on the screen.

While nearly all of questions on this survey are multiple choice, there will be a chance at the end of the survey to provide additional feedback and thoughts in an open-ended text box. As you are completing this survey, if there is anything you would like to elaborate on, please utilize this open-ended text box at the end of the survey.

IMPORTANT: To save your survey progress, please click the "Next" or "Back" buttons on the bottom of the page shown below:

If you close the browser without clicking either of the buttons, your progress on the current page will be lost.

Question Number	Item Stem	Response Option	Item Type
General Career and Training Questions			
1	Before getting a job in the load-handling field (e.g., Crane Operator, Rigger, Signalperson), what types of industries have you worked in previously? Please select all that apply.	• Agriculture and Farming • Automotive • Construction • Customer Service • Education • Energy and Utilities • Environmental Services • Fashion and Retail • Finance and Banking • Food Service and Restaurants • Government and Public Administration • Healthcare • Hospitality and Tourism • Human Resources • Information Technology (IT) • Manufacturing • Maritime • Media and Journalism • Military and Defense • Retail • Sales • Sports and Recreation • Telecommunications • Transportation and Logistics • Other • No other experience outside of the load-handling field	Multiple-select (i.e., select one or more) Check boxes

Question Number	Item Stem	Response Option	Item Type
2	Before getting a job in the load-handling field (e.g., Crane Operator, Rigger, Signalperson), which industry did you work in ***directly before*** entering the field?	• Agriculture and Farming • Automotive • Construction • Customer Service • Education • Energy and Utilities • Environmental Services • Fashion and Retail • Finance and Banking • Food Service and Restaurants • Government and Public Administration • Healthcare • Hospitality and Tourism • Human Resources • Information Technology (IT) • Manufacturing • Maritime • Media and Journalism • Military and Defense • Retail • Sales • Sports and Recreation • Telecommunications • Transportation and Logistics • Other • No other experience outside of the load-handling field	Multiple-choice (i.e., select only one option) Radio-buttons
3	When you first started working in the load-handling field, which of the following aspects appealed most to you?	• Pay • Benefits • Travel opportunities • Career advancement opportunities • Apprenticeship program • Job site culture • Safety aspects • Supervisor relationship • Coworker relationships • Technology • Growth opportunities • Outdoor work • Equipment (e.g., cranes) • Other	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
4	Which best describes how you were introduced to jobs in the load-handling field (e.g., Crane Operator, Rigger, Signalperson)?	• Working in a related field (e.g., non-load-handling construction work, mechanic, agriculture work) • Referral from a personal connection working in the field (e.g., family member, friend) • Online job board or website (e.g., Indeed) • Social media (e.g., Facebook, Twitter) • Recruitment agency • School or educational program • Job fair • Conference • Other	Multiple-choice (i.e., select only one option) Radio-buttons
5	Which do you believe is the best path for entering the load-handling field (e.g., Crane Operator, Rigger, Signalperson)?	• Apprenticeship program (union) • Apprenticeship program (non-union) • Vocational/tech school • Work in the load-handling field (entry-level work) • Network with individuals in the load-handling field • Attend a crane/training program (paid for by the individual) • Attend a crane/training program (paid for by employer) • Attend industry conferences • Obtain a load-handling related certification (paid for by the individual) • Obtain a load-handling related certification (paid for by employer) • Other	Multiple-choice (i.e., select only one option) Radio-buttons
6	Which aspects should the load-handling field highlight or emphasize to attract more applicants? Please select all that apply.	• Pay • Benefits • Travel opportunities • Career advancement opportunities • Apprenticeship program • Job site culture • Safety aspects • Supervisor relationship • Coworker relationships • Technology • Growth opportunities • Outdoor work • Equipment (e.g., cranes) • Other	Multiple-select (i.e., select one or more) Check boxes

Question Number	Item Stem	Response Option	Item Type
7	Which outreach methods would you recommend the load-handling field use to attract more applicants? Please select all that apply.	• Educational outreach (e.g., high schools, vocational schools, community colleges) • Industry associations • Industry conferences • Job fairs • Online job board or website (e.g., Indeed, LinkedIn) • Recruitment agencies • Referral from a personal connection working in the field (e.g., family member, friend) • Social media • Other	Multiple-select (i.e., select one or more) Check boxes
8	Which best describes how you received training to work in the load-handling field?	• Employer-sponsored training (e.g., training paid for by employer) • On-the-job training (e.g., received training after being hired) • Self-funded training (e.g., paid for training out of pocket) • Union apprenticeship program • Non-union apprenticeship program • Vocational/tech school • College • Self-taught (e.g., independent study) • No formal training • Other	Multiple-choice (i.e., select only one option) Radio-buttons
9	How would you describe the quality of the load-handling training that you received?	• Very low quality • Somewhat low quality • Neutral • Somewhat high quality • Very high quality	Multiple-choice (i.e., select only one option) Radio-buttons
Current Employment and Certification Questions			
10	What best describes your primary role?	• Operator • Rigger • Signalperson • Site Supervisor • Trainer • Crane Inspector • Lift Director • Retired from load-handling • Other	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
11	How long have you been working in your current role?	• Less than 1 year • 1-5 years • 6-10 years • 11-15 years • 16-20 years • 21-25 years • 26-30 years • 31-35 years • Over 35 years • Retired from load-handling	Multiple-choice (i.e., select only one option) Radio-buttons
12	Which of the following categories best represents your employer's primary industry?	• Agriculture/Forestry • Construction • Manufacturing • Mining/Quarrying • Refining • Transportation & Warehousing (not Maritime) • Transportation & Warehousing (Maritime) • Utilities • Wholesale Trade (includes Metal Recycling) • Other	Multiple-choice (i.e., select only one option) Radio-buttons
13	How long have you been working (or did work, if retired) in the load-handling field? In other words, adding up all of your years of experience, how long have you held any of the following jobs combined? • Operator • Rigger • Signalperson • Site Supervisor • Trainer • Crane Inspector • Lift Director	• Less than 1 year • 1-5 years • 6-10 years • 11-15 years • 16-20 years • 21-25 years • 26-30 years • 31-35 years • Over 35 years	Multiple-choice (i.e., select only one option) Radio-buttons
14	On average, in a typical month, how many days do you spend traveling for work, where you stay overnight away from your usual residence?	• 0 • 1-4 • 5-9 • 10-14 • 15-19 • 20-24 • 25+	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
15	Which load-handling certifications do you currently hold? Please select all that apply.	• Mobile Crane Operator • Service Truck Crane Operator • Tower Crane Operator • Overhead Crane Operator • Articulating Crane Operator • Digger Derrick Operator • Dedicated Pile Drive Operator • Drill Rig Operator • Concrete Pump Operator • Telehandler Operator • Signalperson • Rigger • Crane Inspector • Lift Director • I do not have an active certification at this time	Multiple-select (i.e., select one or more) Check boxes
16	Thinking about the certification that is most relevant to your current job, how long have you held that load-handling certification?	• Less than 1 year • 1-4 years • 5-9 years • 10-14 years • 15-19 years • 20-24 years • 25-29 years • 30-35 years • Over 35 years • I do not have an active certification at this time	Multiple-choice (i.e., select only one option) Radio-buttons
Education and Demographic Background Questions			
17	What is the highest level of education that you completed?	• Some high school • High school diploma/GED • Vocational training or trade school • Some college, no degree • Associate degree • Bachelor's degree • Master's degree • Doctoral degree	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
18	If you completed vocational training or trade school, which programs did you complete? Please select all that apply.	• Commercial Truck Driving • Welder • Carpenter • Automotive Technician • Equipment Operator • Electrician • Plumber • HVAC Technician • Computer Programming • Graphic Design • Culinary Arts • Medical Assistant • Dental Assistant • Pharmacy Technician • I did not complete vocational training or trade school • Other	Multiple-select (i.e., select one or more) Check boxes
19	If you completed a college degree, what was your area of study? Please select all that apply.	• I did not complete a college degree • Accounting • Architecture • Biology • Business Administration and Management • Building/Construction Science • Chemistry • Communications • Computer Science • Construction Management • Criminal Justice • Economics • Elementary Education • Engineering – Architectural • Engineering – Civil • Engineering – Construction • Engineering – Electrical • Engineering – Mechanical • English • Finance • History • Marketing • Nursing • Political Science • Pre-Medical Studies • Psychology • Sociology • Major is not listed	Multiple-select (i.e., select one or more) Check boxes

Question Number	Item Stem	Response Option	Item Type
20	What is your age?	[FILL IN THE BLANK – NUMERICAL RESPONSES ONLY]	Open-ended (i.e., whole number responses with no restriction)
21	What is your race? Please select all that apply.	• American Indian or Alaska Native • Asian • Black or African American • Hispanic or Latino • Native Hawaiian or Other Pacific Islander • White or Caucasian • Other • Unknown • Prefer not to answer	Multiple-select (i.e., select one or more) Check boxes
22	What is your gender identity?	• Male • Female • Other • Prefer not to answer	Multiple-choice (i.e., select only one option) Radio-buttons
23	What is your annual income (from solely your current position within the load the handling field)?	• $0 – $19,000 • $20,000 – $39,000 • $40,000 – $59,000 • $60,000 – $79,000 • $80,000 – $99,000 • $100,000 – $119,000 • $120,000 – $139,000 • $140,000 – $159,000 • $160,000 – $179,000 • $180,000 – $199,000 • $200,000 + • Prefer not to answer	Multiple-choice (i.e., select only one option) Radio-buttons
Location and Language Questions			
24	Which country do you currently live in?	[DROPDOWN MENU WITH ALL COUNTRIES]	List (i.e., select only one option) Drop-down list
25	For those living in the U.S., which state do you currently live in?	[DROPDOWN MENU WITH ALL U.S. STATES AND TERRITORIES, INCLUDING WASHINGTON D.C.]	List (i.e., select only one option) Drop-down list

Question Number	Item Stem	Response Option	Item Type
26	What region do you primarily work in?	• Northeast (CT, MA, ME, NH, RI, VT) • Mid Atlantic (NJ, NY, PA) • South Atlantic (DC, DE, FL, GA, MD, NC, SC, VA, WV, PR) • North Central (IA, IL, IN, MI, MN, OH, ND, NE, SD, WI) • South Central (AL, AR, LA, KS, KY, MO, MS, OK, TN, TX) • Mountain (AZ, CO, ID, MT, NM, UT, WY) • Pacific (AK, CA, HI, NV, OR, WA) • Outside of the U.S.	Multiple-choice (i.e., select only one option) Radio-buttons
27	What is your native language? In other words, what is the language that you learned as a child and consider your first language?	• English • Spanish • Chinese (including Mandarin and Cantonese) • Tagalog (Filipino) • Vietnamese • Arabic • French (including Haitian Creole) • Korean • Russian • German • Portuguese • Italian • Polish • Urdu • Gujarati • Other	Multiple-choice (i.e., select only one option) Radio-buttons
28	For those who hold a load-handling certification, which language were your study materials in?	• English • Spanish • Chinese (including Mandarin and Cantonese) • Tagalog (Filipino) • Vietnamese • Arabic • French (including Haitian Creole) • Korean • Russian • German • Portuguese • Italian • Polish • Urdu • Gujarati • Other	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
29	Which language did you take your load-handling certification tests in?	• English • Spanish • Chinese (including Mandarin and Cantonese) • Tagalog (Filipino) • Vietnamese • Arabic • French (including Haitian Creole) • Korean • Russian • German • Portuguese • Italian • Polish • Urdu • Gujarati • Other	Multiple-choice (i.e., select only one option) Radio-buttons
Media Questions			
30	How do you stay up to date on news and information about the load-handling field? Please select all that apply.	• Social media • Online forums and discussion boards • LinkedIn groups • Newsletters • Equipment manufacturers' websites • Industry associations • Trade magazines and journals • Webinars and seminars • Coworkers/colleagues • Other	Multiple-select (i.e., select one or more) Check boxes
31	Thinking about your general social media use, please indicate which social media platforms you use at least one time per week. Please select all that apply.	• Facebook • YouTube • Instagram • Reddit • TikTok • X (Twitter) • LinkedIn • Snapchat • Pinterest • Discord • I do not use social media	Multiple-select (i.e., select one or more) Check boxes

Question Number	Item Stem	Response Option	Item Type
32	Thinking about your general social media preferences, which social media platform do you spend the most time using? In other words, what is your single most preferred social media platform?	• Facebook • YouTube • Instagram • Reddit • TikTok • X (Twitter) • LinkedIn • Snapchat • Pinterest • Discord • I do not use social media	Multiple-choice (i.e., select only one option) Radio-buttons
33	Which social media platform should the load-handling field utilize to connect with and attract more applicants to the field?	• Facebook • YouTube • Instagram • Reddit • TikTok • X (Twitter) • LinkedIn • Snapchat • Pinterest • Discord	Multiple-choice (i.e., select only one option) Radio-buttons
Work Attitudes			
34	I feel I am currently being paid a fair amount for the work I do.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
35	I feel satisfied with my chances for salary increases.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
36	My efforts to do a good job are rarely blocked by red tape.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
37	Many of our rules and procedures make doing a good job easy.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
38	I feel a sense of pride in doing my job.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
39	My job is enjoyable.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
40	The work I do contributes positively to society.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
41	I was aware of the positive and negative aspects of my job before starting.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
42	My supervisor shows a lot of interest in the feelings and thoughts of subordinates.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
43	My supervisor is competent in doing his/her job.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
44	My coworkers are competent in doing their jobs.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
45	I enjoy interacting with my coworkers.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
46	I am able to successfully communicate my thoughts and ideas with my coworkers.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
47	I rarely experience language barriers while communicating with my coworkers.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
48	My workplace values and promotes cultural diversity.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
49	I rarely observe instances of cultural insensitivity or discrimination in my workplace.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
50	I am able to collaborate successfully with my coworkers.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
51	My coworkers and I are able to quickly resolve conflict.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
52	I feel respected when I am at work.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
53	I believe that employees at my workplace are treated with respect, regardless of their position or role.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
54	I rarely feel stressed at work.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
55	I rarely feel like my work interrupts my personal life.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
56	I feel like the hours that I work are reasonable.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
57	I enjoy traveling for work.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree • I do not travel for work	Multiple-choice (i.e., select only one option) Radio-buttons
58	Recent advances in technology help me do my job better.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
59	My coworkers effectively utilize new technology to do their jobs.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
Performance Elements			
60	What is the most important skill to have in the load-handling field?	• Technical/mechanical skills • Communication skills • Safety skills • Physical aptitude • Adaptability skills • Time management skills • Leadership skills • Decision making skills • Teamwork skills • Other	Multiple-choice (i.e., select only one option) Radio-buttons
Certification Attitudes			
61	I think that the load-handling certifications I hold are valuable.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons
62	I think that it is important to hold more than one load-handling certification.	• Strongly disagree • Disagree • Neither agree nor disagree • Agree • Strongly agree	Multiple-choice (i.e., select only one option) Radio-buttons

Question Number	Item Stem	Response Option	Item Type
63	Which is the primary benefit of having a load-handling certification?	• Demonstrates technical knowledge and skills • Demonstrates safety knowledge and skills • Demonstrates credibility/professionalism • Improved opportunity for higher pay • Improved job opportunities • Improved promotional opportunities • Other • No benefits	Multiple-choice (i.e., select only one option) Radio-buttons
64	Which is the primary barrier to getting certified in the load-handling field?	• Cost barriers • Geographic barriers (e.g., access to testing) • Time barriers • Training barriers • Language barriers • Exam difficulty • Difficulty meeting requirements • Other • No barriers	Multiple-choice (i.e., select only one option) Radio-buttons
Open Ended Question			
65	Is there anything else that you would like to tell us about the load-handling field? If so, please describe in the text box provided.	[FILL IN THE BLANK]	Open-ended text box (i.e., large sized text box)

[GIFT CARD SCREEN]

Thank you for completing the NCCCO Foundation workforce research survey. As a thank you, we will be randomly selecting 20 participants to receive a $25 Amazon gift card at the conclusion of the survey in mid-November. **If you would like to enter the drawing you must provide your name and email address by completing the form linked below.** Please note that this will not be connected to your anonymous responses on the survey and there is no requirement to participate in the drawing.

https://forms.gle/HcUc15bJ1tw1MFVv9

[COMPLETION SCREEN]

Thank you for your participation in this survey. If you have any questions about this study, please contact T.J. Cantwell at tcantwell@ncccofoundation.org. If you have questions about the confidentiality of your responses or how to complete the survey, please contact HumRRO staff member Sam Elliott at selliott@humrro.org.

APPENDIX C:
FOCUS GROUP RESULTS

Appendix C: Focus Group Results

Likes About the Field

Table 33: Likes Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Interpersonal Connection	*Individuals enjoy having interpersonal connections (e.g., teamwork, diversity of people, friends) in the load-handling field*	57	25	18	14
Career Elements	*Individuals enjoy career elements (e.g., pay, developmental opportunities, career mobility) in the load-handling field*	49	11	11	27
Meaningful/ Fulfilling Work	*Individuals feel they have meaningful/fulfilling work (e.g., having a sense of accomplishment) in the load-handling field*	43	9	12	22
Challenging Work	*Individuals enjoy challenging work (e.g., problem solving, opportunities to learn) in the load-handling field*	32	10	11	11
Environment Likes	*Individuals enjoy the environment (e.g., exposure to different scenery, outdoors) in the load-handling field*	31	5	7	19
Nature of the Job	*Individuals enjoy the nature of the job (e.g., work variety, safety measures) in the load-handling field*	27	11	2	14
Equipment/ Technical Skill Likes	*Individuals enjoy working with equipment (e.g., cranes) and utilizing technical skills in the load-handling field*	17	7	3	7
General Likes	*Individuals generally enjoy the load-handling field and have not considered leaving*	11	2	3	6
Physical Likes	*Individuals enjoy physical aspects (e.g., physical activity on the job, ability to sit periodically) of the load-handling field*	10	5	2	3
Total		277	85	69	123

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 34: Interpersonal Connection Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Teamwork	*Individuals enjoy positive aspects of teamwork (e.g., cooperation, group contribution) in the load-handling field*	18	8	6	4
General Interpersonal Connection	*Individuals enjoy different aspects of interpersonal connection in the load-handling field*	13	2	8	2
Diversity of People	*Individuals enjoy working with people from many different backgrounds in the load-handling field*	7	7	0	0
Friendship/ Strong Bonds	*Individuals value the friendships made and bonds formed with other individuals in the load-handling field*	7	3	2	2
Positive Communication	*Individuals enjoy communication (e.g., listening/discussing new ideas) in the load-handling field*	6	5	1	0
Mentoring/ Teaching	*Individuals enjoy acting as a mentor and teaching load-handling related skills to others*	5	0	0	5
Positive Leadership	*Individuals enjoy the leadership style of their supervisor in the load-handling field*	1	0	1	0
Total		**57**	**25**	**18**	**13**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 35: Career Elements Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Compensation	*Individuals enjoy the pay and benefits (e.g., health insurance) in the load-handling field*	31	7	8	16
Developmental Opportunities/ Career Mobility	*Individuals enjoy the developmental opportunities (e.g., opportunities for specialization and skill advancement) and career mobility (e.g., promotions) offered in the load-handling field*	15	4	3	8
Job Security	*Individuals enjoy the job security offered in the load-handling field*	3	0	0	3
Total		**49**	**11**	**11**	**27**

Note: Total participants, n = 38; Participants with < 5 years of experience, n = 12; Participants with 5 – 10 years of experience, n = 9; Participants with > 10 years of experience, n = 17.

Table 36: Meaningful/Fulfilling Work Theme Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
General Meaningful/ Fulfilling Work	*Individuals have passion, enthusiasm, and feel a sense of worth in the load-handling field*	17	6	4	7
Sense of Accomplishment	*Individuals feel a sense of accomplishment (e.g., driving by a completed project, pride) in the load-handling field*	14	2	0	12
Exciting/ Interesting Work	*Individuals find the work to be exciting and interesting in the load-handling field*	8	1	5	2
Increases Self-Efficacy/ Confidence	*Individuals gain confidence (e.g., overcoming fear of heights, reaching new goals) by working in the load-handling field*	4	0	3	1
Total		**43**	**9**	**12**	**22**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 37: Challenging Work Theme Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Mentally Challenging					
Problem Solving	*Individuals enjoy coming up with alternative methods to resolve issues in the load-handling field*	12	5	3	4
Cognitively Challenging	*Individuals enjoy the cognitive challenges of their job (e.g., calculation, critical thinking) in the load-handling field*	7	1	5	1
Opportunity to Learn	*Individuals enjoy the opportunity to learn new skills and pieces of equipment in the load-handling field*	5	4	1	0
Generally Challenging					
Generally Challenging	*Individuals find the challenges faced in the load-handling field engaging, fun, and enjoyable*	6	0	2	4
Never Bored	*Individuals enjoy that they are never board at work in the load-handling field*	2	0	0	2
Total		**32**	**10**	**11**	**11**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 38: Environment Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Exposure to Different Places/ Beautiful Scenery	*Individuals enjoy opportunities to work in different geographical locations (e.g., different states, different countries) in the load-handling field*	23	5	5	13
Weather/ Outdoors	*Individuals enjoy working outside in the fresh air in the load-handling field*	6	0	2	4
General Environmental Likes	*Individuals like the environment (e.g., clean sites) in the load-handling field*	2	0	0	2
Total		**31**	**5**	**7**	**19**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 39: Nature of the Job Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Work Variety	*Individuals enjoy the breadth of tasks they can engage in within the load-handling field*	9	2	1	6
Safety Measures	*Individuals enjoy that safety is emphasized in the load-handling field*	7	1	0	6
Autonomy	*Individuals enjoy the autonomy/flexibility offered in the load-handling field*	3	2	0	1
Positive Onboarding Experience	*Individuals had a positive experience (e.g., learning skills quickly, adapting quickly) when first entering the load-handling field*	3	3	0	0
Consistency in Work	*Individuals enjoy the consistent/repetitious nature of tasks in the load-handling field*	2	1	1	0
General Exposure	*Individuals enjoy the general exposure that work in the load-handling field gives them*	2	2	0	0
Low Pressure	*Individuals enjoy the lack of pressure faced from leaders in the load-handling field*	1	0	0	1
Total		**27**	**11**	**2**	**14**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 40: Equipment and Technical Skill Likes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Working with Machinery/ Equipment	*Individuals enjoy working with machinery (e.g., rigs, cranes) and equipment (e.g., pallet jacks) in the load-handling field*	14	5	2	7
Technology	*Individuals enjoy working with modern technologies introduced in the load-handling field*	2	2	0	0
Improve Technical Skills	*Individuals enjoy the opportunity to improve their technical skills in the load-handling field*	1	0	1	0
Total		**17**	**7**	**3**	**7**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 41: General Likes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Never Considered Leaving	*Individuals have never considered leaving the load-handling field*	6	1	0	5
Everything	*Individuals enjoy all aspects/have no dislikes of their job in the load-handling field*	5	1	3	1
Total		**11**	**2**	**3**	**6**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 42: Physical Likes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Physically Rewarding	*Individuals enjoy the physical, hands-on aspects of their jobs in the load-handling field*	7	5	2	0
Physically Relaxing	*Individuals enjoy the physically relaxing aspects of their job (e.g., A/C in cab, sitting down) in the load-handling field*	3	0	0	3
Total		**10**	**5**	**2**	**3**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Dislikes About the Field

Table 43: Dislikes Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Interpersonal Interactions	*Individuals dislike interpersonal interactions (e.g., management issues, language barriers) in the load-handling field*	41	2	12	27
Health/Well-Being Dislikes	*Individuals dislike aspects that hinder their well-being (e.g., lack of work-life balance, stress) in the load-handling field*	40	11	9	20
Nature of the Job	*Individuals dislike job elements (e.g., safety issues, repetitive work) in the load-handling field*	30	12	4	14
Career Elements	*Individuals dislike career elements (e.g., lack of career progression, constant turnover) in the load-handling field*	13	3	3	7
Equipment and Technical Skill Dislikes	*Individuals dislike equipment aspects (e.g., outdated equipment, technological overreliance) in the load-handling field*	9	1	3	5
Physical Dislikes	*Individuals dislike physically demanding aspects (e.g., performing maintenance) in the load-handling field*	4	4	0	0
Environment Dislikes	*Individuals dislike environmental aspects (e.g., poor weather) in the load-handling field*	3	0	2	1
Total		**140**	**33**	**33**	**74**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 44: Interpersonal Interactions Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Teammates Lacking Technical Skills	*Individuals dislike working with other individuals that lack technical skills or abilities (e.g., inability to signal properly, improper rigging abilities) within the load-handling field*	12	0	4	8
Poor Management	*Individuals dislike bad leadership styles (e.g., foremen, supervisors, management) in the load-handling field*	6	1	1	4
General Difficulties Interacting with Teammates	*Individuals face difficulties interacting with other individuals (e.g., rudeness, unpleasant) in the load-handling field*	4	0	2	2
Language Barriers with Teammates	*Individuals dislike the language barriers (e.g., not speaking the same language as their colleagues) that are present in the load-handling field because it prevents them from successfully completing their jobs*	4	1	3	0
Ego Issues	*Individuals dislike ego issues (e.g., cockiness) in individuals in the load-handling field*	4	0	0	4
New Hires Being Inflexible/ Stubborn	*Individuals dislike when inexperienced employees in the load-handling field are not receptive to process improvement feedback*	3	0	0	3
Unmotivated Employees	*Individuals dislike when employees lack drive, passion, or motivation for their jobs in the load-handling field*	2	0	0	2
Tenured Employees Being Inflexible/ Stubborn	*Individuals dislike when employees with experience in the load-handling field are not receptive to process improvement feedback*	2	0	1	1
Leadership not Listening to Employees	*Individuals dislike that leaders in the load-handling field are not receptive/do not listen to employee feedback*	2	0	0	2
Employees Breaking Rules	*Individuals dislike when employees break the rules at work in the load-handling field*	1	0	0	1
Getting Yelled At	*Individuals do not like being yelled at their jobs in the load-handling field*	1	0	1	0
Total		**41**	**2**	**12**	**27**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 45: Health/Wellbeing Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Lack of Work-Life Balance					
Long Hours	*Individuals dislike the long hours/shifts required to work in the load-handling field*	8	5	1	2
Night Shifts/Early Mornings/ Weekends	*Individuals dislike the schedules (e.g., night shifts, early mornings, weekends) within the load-handling field*	5	3	1	1
Away from Family/Friends	*Individuals dislike being away from their families/friends for extended periods of time in the load-handling field*	5	1	1	3
General Work-Life Balance Dislikes	*Individuals feel a lack of work-life balance (e.g., uncertainty in shifts) in the load-handling field*	4	1	0	3
Too Much Travel	*Individuals dislike the traveling aspect of work in the load-handling field*	3	0	0	3
Lack of Breaks	*Individuals dislike the lack of breaks they receive in the load-handling field*	2	0	1	1
Burnout/Stress					
Burnout/Stress	*Individuals dislike the stress that is involved in certain load-handling positions (e.g., superintendents, crane operators)*	10	1	2	7
Loneliness on the Job					
Loneliness on the Job	*Individuals dislike the isolation/loneliness (e.g., lack of human interaction) in their jobs in the load-handling field*	3	0	3	0
Total		**40**	**11**	**9**	**20**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 46: Nature of the Job Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Safety Issues					
General Safety Issues	*Individuals dislike the safety hazards in the load-handling field*	19	9	2	8
Unpredictable	*Individuals dislike the unpredictable nature of accidents in the load-handling field*	3	2	0	1
Shortcuts	*Individuals dislike that other employees in the load-handling field take shortcuts on safety to save time*	3	0	0	3
Responsibility	*Individuals (e.g., crane operators) dislike the responsibility they hold in the event of accidents in the load-handling field*	2	0	1	1
Repetitive Work					
Repetitive Work	*Individuals dislike repetitive work and get bored with their jobs in the load-handling field*	1	1	0	0
Expectation of Bad Days					
Expectation of Bad Days	*Individuals dislike that leaders emphasize that bad days at work will occur in the load-handling field*	1	0	0	1
Pressure to Never Call In					
Pressure to Never Call In	*Individuals dislike the pressure to never call in to work (e.g., sickness) in the load-handling field*	1	0	1	0
Total		**30**	**12**	**4**	**14**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 47: Career Elements Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Lack of Career Progression Opportunities	*Individuals dislike the lack of opportunities to advance their careers in the load-handling field*	4	2	0	2
Constant Turnover in the Field	*Individuals dislike the continual cycle of turnover within the load-handling field*	3	0	0	3
No Streamlined Education of Regulations/Laws	*Individuals dislike that regulations/procedures/rules are not regularly communicated to employees that need to be aware of them in the load-handling field*	3	0	1	2
Job Not What Was Studied/ Trained For	*Individuals dislike the gap between what they studied and what they actually do in their load-handling jobs*	2	1	1	0
Easy to Replace	*Individuals dislike the notion that they are easily replaceable in the load-handling field*	1	0	1	0
Total		**13**	**3**	**3**	**7**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 48: Equipment and Technical Skill Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Equipment Issues/ Outdated	*Individuals dislike when equipment (e.g., outdated) does not function as it should in the load-handling field*	5	1	3	1
Technology Overreliance	*Individuals dislike when employees rely on technology (e.g., LMI systems) and do not utilize technical skills (e.g., reading load charts)*	4	0	0	4
Total		**9**	**1**	**3**	**5**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 49: Environment Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Weather	*Individuals do not like experiencing bad weather (e.g., cold, rainy) in the load-handling field*	3	0	2	1
Total		**3**	**0**	**2**	**1**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 50: Physical Dislikes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Physically Demanding	*Individuals dislike the physically demanding aspects (e.g., heavy lifting, body stiffness) of the load-handling field*	3	3	0	0
Performing Maintenance	*Individuals dislike performing equipment/machinery maintenance in the load-handling field*	1	1	0	0
Total		**4**	**0**	**0**	**0**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Views on Certification

Table 51: Certification Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Value of Certification					
Value of Certification	*Positive outcomes associated with getting certified for individuals (e.g., demonstrate competency) and organizations (e.g., decrease company liability) in the load-handling field*	137	33	44	60
Issues Associated with Certification					
Issues Associated with Certification	*Certification issues/barriers (e.g., fairness, training challenges) faced by individuals in the load-handling field*	62	17	12	33
Multiple Certification					
Value of Multiple Certifications	*Positive outcomes associated with obtaining multiple certifications (e.g., demonstrates range of knowledge) in the load-handling field*	30	8	11	11
Some More Important than Others	*Certain certifications are more important than other certifications (e.g., rigging, signaling) in the load-handling field*	14	0	1	13
None More Important than Others	*All certifications are equally important in the load-handling field*	4	0	2	2
Downsides of Multiple Certifications	*Negative outcomes associated with obtaining multiple certifications (e.g., too much effort to obtain) in the load-handling field*	4	2	2	0
Downsides of Certification					
Downside of Certification	*Negative outcomes associated with getting certified (e.g., does not guarantee knowledge, increased responsibility) in the load-handling field*	19	0	2	17
Total		**270**	**60**	**74**	**136**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 52: Value of Certification Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Value for Individual Employment					
Demonstrates Competency/ Credibility/ Qualifications	*Obtaining a relevant certification demonstrates competency/credibility/qualifications among individuals in the load-handling field*	21	7	8	6
Better Employment Opportunities/M arketable	*Obtaining a relevant certification increases marketability/employment opportunities (e.g., promotions, new positions) among individuals in the load-handling field*	20	11	6	3
Improves/ Demonstrates Safety	*Obtaining a relevant certification demonstrates and increases safe practices among individuals in the load-handling field*	13	5	2	6
Opportunity to Improve Knowledge	*Obtaining a relevant certification increases the opportunity to improve knowledge (e.g., continuous learning) among individuals in the load-handling field*	9	1	7	1
Increased Pay	*Obtaining a relevant certification increases pay (e.g., raises, bonuses) among individuals in the load-handling field*	8	2	1	5
Increases Knowledge, Skills, Abilities	*Obtaining a relevant certification increases knowledge, skills, and abilities (e.g., reading load charts) among individuals in the load-handling field*	5	2	0	3
Increases Efficiency	*Obtaining a relevant certification increases work efficiency among individuals in the load-handling field*	1	0	0	1
Job Security	*Obtaining a relevant certification increases job security among individuals in the load-handling field*	1	0	0	1
Value for Organizations/Field					
Required by Law and Organizations	*Load-handling certifications are obtained due to organization/legal requirements (e.g., OSHA, ASME)*	16	0	6	10
Decreases Company Liability	*Obtaining a relevant certification decreases company liability in the event of an accident and places it on the individual with the certification*	7	0	2	5
Improves Professionalism /Credibility in the Field	*Obtaining a relevant certification improves professionalism/credibility of the load-handling field*	5	1	1	3
Identification Tool	*Load-handling certifications act as an identification tool to investigate accidents/issues caused by individuals in the load-handling field*	2	1	0	1
Value for Individual Character					
Increases Worth as Employee/ Growth	*Obtaining a relevant certification increases individuals' worth and growth (e.g., personal growth, professional growth) in the load-handling field*	5	1	0	4
Intrinsic Motivation	*Obtaining a relevant certification increases excitement/intrinsic motivation to do work for individuals in the load-handling field*	5	0	0	5
Pride	*Obtaining a relevant certification increases pride among individuals in the load-handling field*	4	0	3	1

Table 52: Value of Certification Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Improves Confidence	*Obtaining a relevant certification improves confidence among individuals in the load-handling field*	2	1	1	0
Demonstrates Dedication	*Obtaining a relevant certification demonstrates dedication (e.g., going above and beyond) among individuals in the load-handling field*	2	1	1	0
Respect	*Obtaining a relevant certification increases the respect received from colleagues in the load-handling field*	2	0	2	0
Increases Trustworthiness	*Obtaining a relevant certification increases trustworthiness received from colleagues in the load-handling field*	1	0	0	1
No Downsides					
No Downsides	*Obtaining a relevant certification is only associated with positive outcomes among individuals in the load-handling field*	7	0	4	3
No Barriers					
No Barriers	*There are no barriers/hurdles for individuals attempting to become certified in the load-handling field*	1	0	0	1
Total		**137**	**33**	**44**	**60**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 53: Issues Associated with Certification Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Fairness					
Cost/Lack of Funding	*Costs (e.g., study materials, trainings) are a hurdle associated with obtaining certification in the load-handling field*	13	4	5	4
Language Barriers	*Language barriers (e.g., not speaking language the test is in) are a hurdle associated with obtaining certification in the load-handling field*	5	2	1	2
Discrimination	*Discrimination (e.g., racial discrimination, learning disability discrimination) is a hurdle associated with obtaining certification in the load-handling field*	4	1	0	3
Geographic Location	*Geographic factors (e.g., distance to testing/training centers) are a hurdle associated with obtaining certification in the load-handling field*	3	0	2	1
Tests not Designed by Technical Experts	*Test developers (e.g., test creators not being aware of job content) are a hurdle associated with obtaining certification in the load-handling field*	3	0	0	3
Training and Test Preparation					
Inadequate/ Unavailable Training	*Receiving low-quality training is a hurdle associated with obtaining certification in the load-handling field*	7	4	2	1
Inadequate Time to Train/Study	*Not having enough time to train/study for the test is a hurdle associated with obtaining certification in the load-handling field*	3	1	1	1
Limited or no Access to Equipment	*Limited access to training equipment (e.g., simulators) is a hurdle associated with obtaining certification in the load-handling field*	1	1	0	0
Test Considerations					
Test Medium	*Test format (e.g., computerized testing) is a hurdle associated with obtaining certification in the load-handling field*	6	0	0	6
Appropriateness of Test Content	*Test content missing important components (e.g., ability to use new technologies) is a hurdle associated with obtaining certification in the load-handling field*	4	0	0	4
Observer Effects	*Being monitored by leaders during practicals/examinations is a hurdle associated with obtaining certification in the load-handling field*	1	0	0	1
Requirements					
Lack Necessary Knowledge/ Skills	*Lacking necessary knowledge or skills (e.g., ability to take percentages) is a hurdle associated with obtaining certification in the load-handling field*	4	1	1	2
Difficulty Meeting Requirements	*Not meeting necessary requirements (e.g., experience requirements, application requirements) is a hurdle associated with obtaining certification in the load-handling field*	3	1	0	2

Table 53: Issues Associated with Certification Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Individual Barriers					
Lack of Motivation	*Not being motivated/serious about taking the test is a hurdle associated with obtaining certification in the load-handling field*	5	2	0	3
Total		**62**	**17**	**12**	**33**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 54: Multiple Certifications Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Value of Multiple Certifications					
Demonstrates Breadth of Knowledge/ Skills	*Obtaining multiple certifications demonstrates breadth of knowledge/skills among individuals in the load-handling field*	12	3	4	5
Generally Better to Have More	*It is generally valuable to obtain multiple certifications in the load-handling field*	11	3	6	2
Increased Opportunities	*Obtaining multiple certifications increases employment opportunities/marketability (e.g., different types of jobs) among individuals in the load-handling field*	4	0	1	3
Increased Pay	*Obtaining multiple certifications increases pay (e.g., raises, bonuses) among individuals in the load-handling field*	2	1	0	1
Demonstrates Greater Understanding of Safety	*Obtaining multiple certifications increases/demonstrates safety at work among individuals in the load-handling field*	1	1	0	0
Some More Important than Others					
Rigging	*The rigging certification is an important certification for individuals to obtain in the load-handling field*	6	0	0	6
General Importance	*Some certifications are more important, but it differs among individuals depending on different factors (e.g., relevance to specific job roles, industry standards)*	5	0	1	4
Signaling	*The signaling certification is an important certification for individuals to obtain in the load-handling field*	2	0	0	2
Load Dynamics	*The load dynamics certification is an important certification for individuals to obtain in the load-handling field*	1	0	0	1
None More Important than Others					
None More Important than Others	*All certifications are equally important in the load-handling field*	4	0	2	2
Downsides of Multiple Certifications					
Too Much Effort/Work	*It is too much work (e.g., study time, amount of material) to obtain multiple certifications in the load-handling field*	2	1	1	0
Not Useful Unless Being Used	*Obtaining multiple certifications is not useful unless they are being frequently utilized among individuals in the load-handling field*	1	0	1	0
Lack of Concentration	*Obtaining multiple certifications limits individuals' ability to concentrate/specialize in one specific area of the load-handling field*	1	1	0	0
Total		**52**	**10**	**16**	**26**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 55: Downsides of Certification Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Does not Guarantee Adequate Performance/ Safety/ Knowledge	*A certification does not guarantee that an individual will have good performance and/or adequate safety knowledge and is a negative outcome associated with obtaining certification in the load-handling field*	6	0	2	4
Increased Liability/ Responsibility	*Increased liability/responsibility in certain roles (e.g., crane operator) is a negative outcome associated with obtaining certification in the load-handling field*	5	0	0	5
Certification Requirements are not Stringent Enough	*Less stringent certification requirements (e.g., being able to lie about experience hours) is a negative outcome associated with obtaining certification in the load-handling field*	3	0	0	3
State Certification Required in Addition	*Obtaining a state certification in addition to a load-handling certification is a negative outcome associated with obtaining certification*	2	0	0	2
Prevents One from Gaining Experience in Other Specialties	*Becoming too specialized (e.g., getting pigeon-holed) in one area is a negative outcome associated with obtaining certification in the load-handling field*	2	0	0	2
Overqualification	*Being overqualified for some positions is a negative outcome associated with obtaining certification in the load-handling field*	1	0	0	1
Total		**19**	**0**	**2**	**17**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Getting into the Field

Table 56: Getting into the Field Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Recommendations for Pipeline/Getting into the Field					
Recommendations for Organizations	*Recommendations for organizations/agencies in the load-handling field to increase recruitment (e.g., increasing advertisements)*	69	8	22	39
Recommendations for Individuals	*Recommendations for individuals getting into the load-handling field (e.g., professional programs, research)*	67	12	24	31
Learning about the Field					
Learning about the Field	*Individuals describe how they learned about the load-handling field (e.g., previous connections, school, online)*	81	16	22	43
Hurdles for Entering the Field					
Hurdles for Entering the Field	*Individuals describe hurdles for entering the load-handling field (e.g., lack of industry awareness, training challenges)*	25	4	10	11
Total		**242**	**40**	**78**	**124**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 57: Recommendations for Individuals Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Professional Programs					
Training/Crane School	*Individuals should enter the load-handling field through crane training programs/crane school*	17	5	2	10
Apprenticeships	*Individuals should enter the load-handling field through apprenticeships (e.g., union, non-union)*	7	0	2	5
Union	*Individuals should enter the load-handling field by getting involved with unions.*	4	0	3	1
Certification	*Individuals should enter the load-handling field by obtaining a relevant certification (e.g., crane operator certification)*	3	1	0	2
Conferences	*Individuals should enter the load-handling field by attending relevant conferences (e.g., ConExpo)*	2	0	1	1
Research and Network					
Industry Connections	*Individuals should enter the load-handling field by making connections in the industry and utilizing existing connections in the industry*	10	0	8	2
Do Research	*Individuals should do research (e.g., reading/studying relevant books) before entering the load-handling field*	4	1	1	2
Identify Similar Industries	*Individuals should enter the load-handling field by identifying and working in similar industries (e.g., driving, iron, oil/gas)*	3	1	2	0
Identify Interests	*Individuals should enter the load-handling field by identifying interests within the field (e.g., cranes, rigging, maintenance)*	2	2	0	0
Work in the Load-handling Field					
Entry-Level Work	*Individuals should enter the load-handling field by doing entry-level work in the field (e.g., sweeping floors)*	7	2	0	5
Journeyman	*Individuals should enter the load-handling field by becoming a journeyman*	2	0	2	0
Crane-Related Positions	*Individuals should enter the load-handling field by getting exposure to different crane-related positions (taxi cranes, large cranes)*	1	0	1	0
Personal Disposition					
Work Hard/Improve Work Ethic	*Individuals should have a strong work ethic (e.g., show up, don't be late) when they enter the load-handling field.*	3	0	2	1
Have an Enthusiastic Attitude	*Individuals should have excitement/passion when entering the load-handling field*	2	0	0	2
Total		**67**	**12**	**24**	**31**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 58: Recommendations for Organizations Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Advertisement Platforms and Outlets					
Outreach in Schools	*Organizations should increase outreach in schools (e.g., high school, college) to bring individuals into the load-handling field*	10	1	5	4
Social Media	*Organizations should increase outreach on social media (e.g., LinkedIn, Facebook) to bring individuals into the load-handling field*	5	0	1	4
Job Fair	*Organizations should get involved with job/career fairs to recruit individuals into the load-handling field*	5	0	2	3
Job Postings	*Organizations should increase number of job postings (e.g., online) to bring individuals into the load-handling field*	3	2	0	1
News Outlets	*Organizations should promote jobs within the load-handling field via news outlets to bring individuals into the field*	1	0	0	1
General Pipeline Advice for Organizations					
Improve Access to Information	*Organizations should improve access to information to the public (e.g., advertising seminars, posting flyers) to bring individuals into the load-handling field*	9	3	3	3
Youth Outreach	*Organizations should increase outreach to younger generations (e.g., emphasize debt-free life) to bring individuals into the load-handling field*	6	0	1	5
Real Life Exposure	*Organizations should increase job content exposure (e.g., simulators, safety aspects) to bring individuals into the load-handling field*	6	0	0	6
Reducing Industry Stigma	*Organizations should decrease stigmas (e.g., backbreaking work) in the load-handling field to bring individuals into the field*	3	0	1	2
Advertisement Content Suggestions					
Pay	*Organizations should increase pay/salary advertisements to bring individuals into the load-handling field*	3	0	1	2
Travel Opportunities	*Organizations should increase travel opportunity advertisements to bring individuals into the load-handling field*	2	0	1	1
Job Security	*Organizations should advertise job security to bring individuals into the load-handling field*	2	0	1	1
Benefits	*Organizations should advertise benefits of the load-handling field (e.g., health insurance, retirement programs) to bring individuals into the field*	2	0	1	1
Job Satisfaction Anecdotes	*Organizations should promote personal stories of job satisfaction of current employees to bring individuals into the load-handling field*	2	0	1	1
Similarity to Video Games	*Recommendation for organizations to increase advertisements that compare work to video games to bring individuals into the load-handling field*	1	0	0	1
Safety	*Organizations should advertise safety measures/orientation to bring individuals into the load-handling field*	1	0	0	1

Table 58: Recommendations for Organizations Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Recruitment Suggestions					
No Need for Recruitment	*The load-handling field does not need more individuals to join the field*	2	0	2	0
Recruiting Target Audience	*Organizations should recruit target audiences (e.g., individuals in agriculture settings, hard workers) to the load-handling field*	2	0	1	1
Encourage Applicants	*Organizations should recruit applicants to the load-handling field by making them feel encouraged and welcomed*	1	1	0	0
Create More Apprenticeship Programs	*Organizations should recruit applicants to the load-handling field by creating more apprenticeship programs in conjunction with unions*	1	0	0	1
Simplify Application Process	*Organizations should simplify the application process for applicants to join the load-handling field*	1	1	0	0
Capitalize on Different Crane Groups	*Organizations should enable specific groups within the load-handling field (e.g., women crane operators' group) to recruit applicants*	1	0	1	0
Total		**69**	**8**	**22**	**39**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 59: Learning about the Field Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Connections to the Industry					
Currently Working in the Industry	*Individuals learned about the load-handling field by already working in the industry (e.g., construction sites, rigging)*	16	4	6	6
Family	*Individuals learned about the load-handling field from a familial connection (e.g., father, uncle)*	11	0	1	10
Friend	*Individuals learned about the load-handling field from a friend*	8	7	1	0
General Word of Mouth	*Individuals learned about the load-handling field by general word of mouth (e.g., classroom chat, happenstance, luck)*	8	0	5	3
Professional Contact/ Recruiter	*Individuals learned about the load-handling field from a professional contact (e.g., recruiter, coach)*	7	1	3	3
Exposure to the Work	*Individuals learned about the field by observing different load-handling positions (e.g., crane operators)*	6	0	1	5
Apprenticeship	*Individuals learned about the load-handling field by joining an apprenticeship (e.g., union)*	5	0	2	3
Similar Interests and Experience					
Machines/ Mechanics	*Individuals learned about the load-handling field by having previous interest/experience in machines/mechanics (e.g., forklifts, tractors)*	10	1	2	7
Military	*Individuals learned about the load-handling field by having previous experience in the military*	1	0	0	1
Farm/ Agricultural	*Individuals learned about the load-handling field by having previous interest/experience in farming/agricultural work*	1	0	0	1
Enjoy the Outdoors	*Individuals learned about the load-handling field by having previous interest in outdoor-oriented labor*	1	0	0	1
School/Programs					
General School	*Individuals learned about the load-handling field through school (e.g., college, crane classes)*	3	1	0	2
Online Information					
Advertisements	*Individuals learned about the load-handling field through online advertisements (e.g., pay advertisements)*	3	2	0	1
Job Postings	*Individuals learned about the load-handling field through online job postings*	1	0	1	0
Total		81	16	22	43

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 60: Hurdles for Entering the Field Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Lack of Knowledge about the Field					
Lack of Discussion about Trades in Schools	*There is a lack of discussion/emphasis regarding trades in school-settings (e.g., high school) and the rise of discussion of other routes (e.g., college)*	5	0	0	5
General Lack of Knowledge about the Field	*There is a lack of knowledge among the general population, especially younger generations, of the load-handling field*	4	0	2	2
Lack of Exposure within Trades about Cranes	*There is a lack of exposure of the load-handling field within trades (e.g., electricians, plumbers)*	1	0	0	1
Training					
Costly	*The high cost of training is a hurdle for individuals entering the load-handling field*	3	1	1	1
Difficulty	*The difficult nature of training is a hurdle for individuals entering the load-handling field*	3	1	2	0
Time Consuming	*The long duration of training is a hurdle for individuals entering the load-handling field*	2	0	2	0
Too Much Competition from Apprentices	*There are a very high number of apprentices waiting to join the field (e.g., already in line)*	1	0	1	0
Inadequate Trainers	*Poor quality training is a hurdle for entering the load-handling field*	1	0	1	0
General Challenges					
Geographic Restrictions	*Geographic restrictions (e.g., trainings, apprenticeship programs) are a hurdle for individuals entering the load-handling field*	2	0	1	1
General Challenges Faced	*There are general difficulties in entering the load-handling field*	1	1	0	0
Must Work Your Way Up	*The gradual/slow career progression is a hurdle for individuals entering the load-handling field*	1	0	0	1
Wait Time After Applying	*Long application processes are a hurdle for individuals entering the load-handling field*	1	1	0	0
Total		**25**	**4**	**10**	**11**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Previous Employment

Table 61: Previous Employment Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Jobs Within the Load-handling Industry	*Individuals already held positions (e.g., construction worker, forklift operator, material delivery driver) in the load-handling field*	33	10	5	18
Transportation and Logistics	*Individuals held positions in the transportation industry (e.g., delivery, CDL driving, logistics) before joining the load-handling field*	18	10	8	0
Public Service and Military	*Individuals were in the public service domain (e.g., firefighter, EMS) or military (Army, Coast Guard) before joining the load-handling field*	13	1	4	8
Education	*Individuals were in the education sector (student, teacher) before joining the load-handling field*	12	1	5	6
Oil/Gas Field	*Individuals held positions in the oil/gas field before joining the load-handling field*	8	0	2	6
Food Service and Grocery	*Individuals held positions in the food service industry (e.g., restaurant, grocery store) before joining the load-handling field*	7	3	2	2
Healthcare	*Individuals held positions in the healthcare field (e.g., caregiver, nurse) before joining the load-handling field*	5	4	0	1
Maritime	*Individuals held positions in a maritime-related job (e.g., commercial diving) before joining the load-handling field)*	5	0	0	5
Business Ownership/ Family Business	*Individuals worked within a family-owned small business or owned their own small business before joining the load-handling field*	4	0	0	4
Customer Service and Administrative Support	*Individuals worked in the customer service and/or administrative support field (e.g., administrative assistant, retail) before joining the load-handling field*	4	1	2	1
Utilities and Building Services	*Individuals worked in the utilities and building services field (e.g., pest control, cleaning, electrician) before joining the load-handling field*	4	3	0	1
Agriculture	*Individuals worked in the agriculture field (e.g., farming, arborist) before joining the load-handling field*	3	0	1	2
Technology and Computers	*Individuals worked in the technology sector (e.g., software engineer, web developer) before joining the load-handling field*	3	0	1	2
Total		**119**	**33**	**30**	**56**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 62: Previous Employment Category Breakout

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Jobs Within the Load-handling Industry					
Construction	*Individuals held jobs in the construction industry*	6	2	0	4
Truck Driving/Delivery	*Individuals held jobs as drivers/material delivery*	5	2	1	2
Forklift Operator	*Individuals had experience as a forklift operator/telehandler*	4	3	0	1
Building Materials	*Individuals held jobs within the building materials sector (e.g., material testing, warehouse material handler)*	3	1	1	1
Foreman/Heavy Equipment Operator	*Individuals held jobs as a foreman/heavy equipment operator*	2	0	1	1
Rigging	*Individuals already held jobs in the construction industry*	2	0	0	2
Training	*Individuals held jobs as trainers*	2	0	0	2
Unloader	*Individuals held jobs as unloaders*	2	2	0	0
Contractor	*Individuals held jobs as contractors in construction companies*	1	0	1	0
Excavation	*Individuals held jobs in excavation crews*	1	0	1	0
Mechanic	*Individuals held jobs as a diesel mechanic*	1	0	0	1
Pipe Fitter	*Individuals held jobs as a pipe fitter*	1	0	0	1
Signaling	*Individuals held jobs in the signaling industry*	1	0	0	1
Taxi Cranes	*Individuals held jobs working on taxi cranes*	1	0	0	1
Test Loads	*Individuals held jobs working with test loads*	1	0	0	1
Transportation and Logistics					
Truck Driver (CDL; Non-Load-handling Field/Not Specified)	*Individuals held jobs as truck drivers before entering the load-handling field.*	8	3	5	0
Delivery	*Individuals held jobs as delivery drivers before entering the load-handling field (e.g., food delivery)*	6	6	0	0
Logistics	*Individuals held jobs within the logistics field (e.g., logistics manager, logistics assessment) before entering the load-handling field*	3	1	2	0
Aviation	*Individuals held jobs in the aviation industry (e.g., airport) before entering the load-handling field*	1	0	1	0
Public Service and Military					
Military	*Individuals held positions in the military (e.g., Coast Guard) before entering the load-handling field*	4	0	1	3
Firefighter	*Individuals held positions as firefighters (e.g., volunteer, firefighter paramedic) before entering the load-handling field*	4	0	3	1
EMS	*Individuals held positions in emergency services before entering the load-handling field*	2	0	0	2
Rescue	*Individuals held rescue positions (e.g., ocean rescue, search and rescue) before entering the load-handling field*	2	0	0	2
Safety Officer	*Individuals held positions as safety officers before entering the load-handling field*	1	1	0	0

Table 62: Previous Employment Category Breakout

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Education					
Student	*Individuals were students before entering the load-handling field (e.g., high school, college)*	10	1	5	4
Teaching	*Individuals were teachers before entering the load-handling field*	2	0	0	2
Oil/Gas Field					
General Oil/Gas Field	*Individuals held positions in the oil/gas field (e.g., oilers, drivers) before entering the load-handling field*	8	0	2	6
Food Service and Grocery					
Restaurant	*Individuals held positions in restaurants (e.g., cook, chef) before entering the load-handling field*	4	0	2	2
Grocery Store	*Individuals held positions in grocery stores before entering the load-handling field*	2	2	0	0
Bakery	*Individuals held positions in bakeries before entering the load-handling field*	1	1	0	0
Healthcare					
General Healthcare	*Individuals held healthcare-related positions (e.g., caregiver, nurse) before entering the load-handling field*	5	4	0	1
Maritime					
General Maritime	*Individuals held positions in the maritime industry (e.g., able-bodied seaman, sailing) before entering the load-handling field*	3	0	0	3
Commercial Diving	*Individuals held positions in commercial diving (e.g., underwater welding) before entering the load-handling field*	2	0	0	2
Business Ownership/Family Business					
General Business Ownership/ Family Business	*Individuals owned small businesses or worked in family small businesses (e.g., sand & gravel, sporting goods) before entering the load-handling field*	4	0	0	4
Customer Service and Administrative Support					
Administrative Assistant	*Individuals held administrative assistant roles (e.g., receptionist) before entering the load-handling field*	2	1	0	1
Retail	*Individuals held positions in retail (e.g., retail management) before entering the load-handling field*	1	0	1	0
Call Center	*Individuals held call center positions before entering the load-handling field*	1	0	1	0
Utilities and Building Services					
Pest Control	*Individuals held positions in the pest control industry (e.g., household, commercial) before entering the load-handling field*	1	0	0	1
Cleaning	*Individuals held positions in the cleaning industry before entering the load-handling field*	1	1	0	0
Electrician	*Individuals held positions as electricians before entering the load-handling field*	1	1	0	0
Plumbing	*Individuals held positions as plumbers before entering the load-handling field*	1	1	0	0

Table 62: Previous Employment Category Breakout

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Agriculture					
Farming	*Individuals worked as farmers before entering the load-handling field*	2	0	0	2
Arborist	*Individuals worked as arborists (e.g., tree climbers before entering the load-handling field*	1	0	1	0
Technology and Computers					
Software Engineer	*Individuals worked as software engineers before entering the load-handling field*	1	0	1	0
Web Developer	*Individuals worked as web developers before entering the load-handling field*	1	0	0	1
General Technology	*Individuals received a technology degree before entering the load-handling field*	1	0	0	1
Total		**119**	**33**	**30**	**56**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Performance Elements

Table 63: Performance Elements Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Aspects that Promote Good Performance					
Noncognitive	*Aspects that promote good performance in the load-handling field are related to noncognitive traits (e.g., personal dispositions, interpersonal interactions)*	92	25	15	52
Technical and Job-Related Skills	*Aspects that promote good performance in the load-handling field are related to technical and job-related skills (e.g., safety skills, crane specific skills)*	66	12	14	40
Cognitively Based Skills (Non-Technical)	*Aspects that promote good performance in the load-handling field are related to cognitive traits (e.g., motivation to learn, concentration)*	20	2	6	12
Aspects that are Challenging to Develop					
Noncognitive	*Aspects that are challenging to develop in the load-handling field are related to noncognitive traits (e.g., soft skills, teamwork)*	7	3	3	1
Technical and Job-Related Skills	*Aspects that are challenging to develop in the load-handling field are related to technical and job-related skills (e.g., machine language, math skills)*	4	2	2	0
Aspects that Prevent Good Performance					
Aspects Related to Nature of Work	*Aspects that prevent good performance in the load-handling field are related to nature of work aspects (e.g., language barriers, leader traits)*	4	2	1	1
Noncognitive Skills	*Aspects that prevent good performance in the load-handling field are related to noncognitive traits (e.g., extrinsic motivation)*	2	0	0	2
Technical Skills	*Aspects that prevent good performance in the load-handling field are related to technical and job-related skills (e.g., inability to read load charts)*	1	0	0	1
Total		**196**	**46**	**41**	**109**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 64: Noncognitive Aspects that Promote Good Performance Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Personal Disposition					
Drive/High Effort/Work Ethic	*Having a strong drive/work ethic and caring about the work promotes good performance in the load-handling field*	16	4	3	9
Attention to Detail/ Awareness	*Having awareness (e.g., attention to detail) and making few mistakes at work promotes good performance in the load-handling field*	6	1	2	3
Efficiency	*Being efficient/quick promotes good performance in the load-handling field*	5	2	0	3
Good Attitude	*Having a good attitude (e.g., positive mindset) promotes good performance in the load-handling field*	5	0	1	4
Able to Depend on/Trustworthy	*Being trustworthy (e.g., dependable, consistency in behavior) promotes good performance in the load-handling field*	5	0	0	5
Confidence/ Assertive	*Being confident/assertive promotes good performance in the load-handling field*	4	2	2	0
Commitment	*Being committed/dedicated to an individual's job promotes good performance in the load-handling field*	4	3	0	1
Adaptability	*Being adaptable in work-related situations promotes good performance in the load-handling field*	4	0	2	2
Balancing Traits	*Being able to balance personality traits in the form of knowing when it is appropriate to present traits via situational awareness promotes good performance in the load-handling field*	3	2	0	1
Continuous Improvement	*Being dedicated to constant improvement (e.g., performance, process) promotes good performance in the load-handling field*	3	1	1	1
Patience	*Being patient promotes good performance in the load-handling field*	3	1	0	2
Repetition	*Repetition of job-related tasks promotes good performance in the load-handling field*	2	0	1	1
Flexibility	*Being flexible in terms of task completion promotes good performance in the load-handling field*	1	1	0	0
Resiliency	*Being resilient (e.g., able to bounce back quickly after setbacks) promotes good performance in the load-handling field*	1	1	0	0
Seriousness	*Having a serious demeanor at work promotes good performance in the load-handling field*	1	1	0	0
Humility	*Being humble promotes good performance in the load-handling field*	1	0	0	1
Discipline	*Being disciplined (e.g., ignoring distractions at work) promotes good performance in the load-handling field*	1	0	0	1
Interest/Excitement/Extrinsic Motivation	*Having interest and excitement for an individual's job promotes good performance in the load-handling field*	1	0	0	1

Table 64: Noncognitive Aspects that Promote Good Performance Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Interpersonal					
Cooperative/ Teamwork	*Being cooperative and working well on a team promotes good performance in the load-handling field*	9	3	1	5
Mentor-Oriented	*Having a mentor-orientation (e.g., showing new employees how to complete tasks) promotes good performance in the load-handling field*	3	0	0	3
Leadership Skills	*Having a good leader (e.g., supervisor) promotes good performance in the load-handling field*	2	1	0	1
Diversity	*Being in a diverse environment promotes good performance in the load-handling field*	1	0	0	1
Communication					
Communication Skills	*Being able to effectively convey or communicate information promotes good performance in the load-handling field*	7	1	2	4
Listening	*Being able to listen to messages or information promotes good performance in the load-handling field*	4	1	0	3
Total		**92**	**25**	**15**	**52**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 65: Technical and Job-Related Aspects that Promote Good Performance Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Safety Skills	*Practicing safety regulations to avoid incidents promotes good performance in the load-handling field*	17	5	6	6
Crane Specific	*Being proficient with crane-specific skills (e.g., calculating load forces, hand signals) promotes good performance in the load-handling field*	11	0	4	7
Mechanical	*Being proficient with operating relevant machines (e.g., understanding operational limits/capacities) promotes good performance in the load-handling field*	9	3	3	3
Familiarity with Technological Aspects	*Being proficient with technological aspects of work (e.g., computer literacy) promotes good performance in the load-handling field*	6	0	1	5
Physical Aptitude	*Having physical skills (e.g., depth perception, motor skills, hand-eye coordination, lifting) promotes good performance in the load-handling field*	5	2	0	3
Experience	*Having experience with relevant knowledge, skills, and abilities promotes good performance in the load-handling field*	5	1	0	4
Proficiency with Multiple Industries	*Being involved with other industries (e.g., rigging, carpentry) promotes good performance in the load-handling field*	4	0	0	4
Licensure/ Certification/ Training	*Obtaining a relevant license/certification/training promotes good performance in the load-handling field*	2	1	0	1
OEM	*Being familiar with OEM/having OEM training promotes good performance in the load-handling field*	2	0	0	2
Trigonometry	*Being familiar with trigonometry concepts and application promotes good performance in the load-handling field*	2	0	0	2
Maintaining Equipment Condition	*Being able to maintain equipment (e.g., keeping machines clean) promotes good performance in the load-handling field*	1	0	0	1
Apprenticeship Background	*Having completed an apprenticeship promotes good performance in the load-handling field*	1	0	0	1
Multiple Certifications	*Having multiple certifications promotes good performance in the load-handling field*	1	0	0	1
Total		**66**	**12**	**14**	**40**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 66: Cognitively Based (Non-Technical) Aspects that Promote Good Performance Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Ability/ Motivation to Learn	*Having motivation/ability to expand an individual's knowledge of the field promotes good performance in the load-handling field*	14	1	5	8
Concentration	*Having concentration/focus promotes good performance in the load-handling field*	2	0	0	2
Problem Solving	*Being able to solve problems/issues promotes good performance in the load-handling field*	2	0	1	1
Project Management	*Having project management skills promotes good performance in the load-handling field*	1	0	0	1
Risk Assessment	*Being able to anticipate and prevent risks via critical thinking promotes good performance in the load-handling field*	1	1	0	0
Total		**20**	**2**	**6**	**12**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 67: Aspects that are Challenging to Develop Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Noncognitive					
Soft Skills	*Soft skills (e.g., general labor skills/work ethic) are challenging to develop in the load-handling field*	2	0	2	0
Teamwork	*Working on a team is challenging in the load-handling field*	2	2	0	0
Communication	*Being able to effectively communicate is challenging in the load-handling field*	2	1	1	0
Motivation to Learn	*Being open to learning/feedback is challenging for groups (e.g., experienced individuals) to develop in the load-handling field*	1	0	0	1
Technical and Job-Related Skills					
Machine Language	*Developing familiarity with machines and equipment is challenging in the load-handling field*	2	2	0	0
Math Skills	*Math skills (e.g., understanding sling angles) are challenging to develop in the load-handling field*	1	0	1	0
Rigging	*Rigging skills (e.g., knowledge of different knots) are challenging to develop in the load handing field*	1	0	1	0
Total		**11**	**5**	**5**	**1**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 68: Aspects that Prevent Category Performance

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Aspects Related to Nature of Work					
Language Barriers	*Language barriers (e.g., in signaling) can prevent good performance in the load-handling field*	2	0	1	1
Leader Traits	*Having a poor leader (e.g., supervisor) can prevent good performance in the load-handling field*	1	1	0	0
High Pressure Environment	*Facing a lot of pressure at work can prevent good performance in the load-handling field*	1	1	0	0
Noncognitive					
Extrinsic Motivation	*Lacking excitement/interest about the work can prevent good performance in the load-handling field*	1	0	0	1
Not Open to Suggestions	*Not being open to others' suggestions can prevent good performance in the load-handling field*	1	0	0	1
Technical and Job-Related Skills					
Inability to Read Load Chart	*Being unable to read a load chart can prevent good performance in the load-handling field*	1	0	0	1
Total		**7**	**2**	**1**	**4**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Changes in the Field

Table 69: Changes in the Field Dimension Overview

Category	Description	Total	Years of Experience		
			< 5	5 - 10	> 10
Work and Environmental Changes	*Changes associated with how individuals complete job duties (e.g., technology, equipment) and changes related to careers and the nature of work (e.g., pay, work environment)*	44	8	9	27
Procedural Changes	*Changes associated with job procedures (e.g., safety, training)*	16	6	1	9
Workforce Changes	*Changes associated with the workforce (e.g., number of employed individuals, employment opportunities)*	11	7	1	3
Increased Requirements	*Changes associated with increased employment requirements from different bodies (e.g., OSHA) and increased certification requirements*	6	1	2	3
Total		**77**	**22**	**13**	**42**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17. To see a breakdown of each dimension component (i.e., category), please see the corresponding category breakdown tables.

Table 70: Work and Environmental Changes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Improved Technology	*Increased use of technology (e.g., LMI systems, training simulators, online certification) in the load-handling field*	29	5	8	16
Improved Equipment	*Quality of different equipment (e.g., strand jacks, specialized mobile transporters)*	7	1	0	6
Fewer Individual Responsibilities	*Responsibilities are more evenly distributed and no longer solely placed on operators*	3	1	0	2
Pay and Benefits	*Increased compensation and benefits (e.g., improved health insurance)*	1	1	0	0
More Pleasant Environment	*Work environment is more pleasant to come to and work at*	1	0	0	1
Decreased Stress	*Individuals face decreased stress as a result of improved safety*	1	0	0	1
More Available Certifications	*Increased load-handling-related certifications available for individuals to pursue*	1	0	0	1
Increased Innovation	*Increased efficiency and innovation within the load-handling field*	1	0	1	0
Total		**44**	**8**	**9**	**27**

Note: Total participants, n = 38; Participants with < 5 years of experience, n = 12; Participants with 5 – 10 years of experience, n = 9; Participants with > 10 years of experience, n = 17

Table 71: Procedural Changes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Safety					
Safety and Process Related Changes	*Increased safety procedures (e.g., lift plans) and technological considerations for safety (e.g., LMI systems) result in a safer environment*	10	3	1	6
Training					
Increased Quantity of Training Facilities	*Number of training facilities increased (e.g., trade centers, technical colleges)*	3	2	0	1
Improved Quality of Training Facilities	*Improved quality of training procedures within the load-handling field*	2	1	0	1
Decreased Quantity of Training Facilities	*Number of load-handling training facilities has decreased (e.g., certifying organizations)*	1	0	0	1
Total		**16**	**6**	**1**	**9**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 72: Workforce Changes Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Increased Employment Numbers	*Increased quantity of individuals in the load-handling field due to different factors (e.g., recruitment, better outreach)*	4	4	0	0
Employment Opportunities	*Growing job market within the load-handling field makes it easier to get employed*	3	3	0	0
Increased Need for Qualified Employees	*Increased need for qualified operators*	2	0	0	2
Increased Workforce Input	*Taking employees' thoughts and opinions into account more often*	1	0	1	0
Decreased Employment Numbers	*Decreased quantity of individuals in the load-handling field in lower-level positions*	1	0	0	1
Total		**11**	**7**	**1**	**3**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Table 73: Increased Requirements Category Breakdown

Theme	Description	Total	Years of Experience		
			< 5	5 – 10	> 10
Increased Certification Requirements	*Increased requirements to get certified for different positions in the load-handling field (e.g., signalperson, rigger, operators)*	3	1	1	1
Agency Requirements	*More regulatory requirements enforced by agencies (e.g., OSHA)*	2	0	1	1
General Requirements	*General changes related to increased regulatory requirements in the load-handling field*	1	0	0	1
Total		**6**	**1**	**2**	**3**

Note: Total participants, *n* = 38; Participants with < 5 years of experience, *n* = 12; Participants with 5 – 10 years of experience, *n* = 9; Participants with > 10 years of experience, *n* = 17.

Appendix D: About the Research Team

HumRRO Research Team Professional Backgrounds

Dr. Samantha (Sam) Elliott is a Research Scientist at HumRRO and served as the Project Director for this effort. She finished her PhD in Industrial-Organizational Psychology with a minor in Applied Statistics at the University of Oklahoma in 2021. She has extensive experience with applied organizational research. For example, she worked with the Army Research Institute for the Behavioral and Social Sciences (ARI) in multiple capacities, including on their Team Effectiveness Research Unit and Senior Leader Development Research Unit.

Dr. Elliott also has years of experience conducting qualitative research. For example, she helped lead a multi-year focus group effort to comprehensively evaluate the Armed Services Vocational Aptitude Battery (ASVAB), which is the assessment battery used for selection and classification in the U.S. Military. As a final note, Dr. Elliott has extensive experience with professional dissemination and has presented/lectured 29 times, at national conferences for example, and has 24 published articles, book chapters, and technical reports.

Dr. Nathaniel (Nate) Voss is a Research Scientist at HumRRO and served as a task lead and contributor for this project. He received his PhD in Industrial-Organizational Psychology from Kansas State University in 2021. He has substantial experience conducting applied research with various public and private sector organizations, including, but not limited to, multiple units of the United States Army Research Institute for the Behavioral and Social Sciences (ARI), Association of Certified Anti-Money Laundering Specialists (ACAMS), National Science Foundation (NSF), United States Department of Agriculture (USDA), RAND Corporation, and Indeed.

Dr. Voss' areas of expertise include job analysis and competency modeling, workforce planning/research, survey development and administration, psychometrics, and advanced data analytics (e.g., machine learning and natural language processing). Dr. Voss is also an active member of the I-O psychology community. For example, he is currently the Co-Chair of the Society for Industrial and Organizational Psychology (SIOP) HR/Business Subcommittee of the Visibility Committee, a former board member of the Personnel Testing Council of Metropolitan Washington (PTCMW), and has over 30 scientific conference presentations/journal article publications.

Mr. Coleman Gentry is a Research Associate at HumRRO and served as a task lead and contributor for this project. He obtained his Master's degree in Industrial-Organizational Psychology from Radford University in 2023. Mr. Gentry has extensive applied organizational research experience with an emphasis on qualitative research. For example, he served as a Consultant Fellow for Corning, where he evaluated, analyzed, and presented qualitative employee data. He additionally had the opportunity to serve as an Intern for TE Connectivity, where he executed qualitative employee interviews and led the data analysis effort for such.

In addition to his experience with qualitative research, Mr. Gentry also has experience with other workforce development research efforts and served as a Consultant for Inorganic Ventures, where he developed and implemented a performance management system. Moreover, he served as a Consultant for Grupo Phoenix, where he worked on a workforce development project to gather and analyze employee engagement data and make recommendations based on the data findings.

Ms. Amy McKee is Director of Talent Management and Credentialing at HumRRO and served as the Technical Advisor for this project. She has led teams and consulted on recruitment, selection, onboarding, and related functions at private sector companies for over 25 years. She has hands-on experience navigating the complexities of competing goals within companies and has interfaced effectively with legal and compliance stakeholders, human resource professionals, end users from distribution/operations/sales, and executives.

Ms. McKee understands the importance of the candidate experience and the natural tension between recruitment (attracting candidates) and selection (screening candidates). She has successfully utilized realistic job previews for candidate engagement, self-selection, and assessment to enhance job fit. Ms. McKee balances rigor and pragmatism as she shapes the implementation of an assessment process with an eye on maximizing ROI while minimizing risk. For example, for a financial services organization, she increased licensing exam pass rates and financial advisor retention while decreasing adverse impact by re-ordering and differentially weighting the assessments used in a multiple hurdle battery. For a pharmaceutical company, she led a transformation of the sales performance management process to rely on objective knowledge and behavioral assessments, resulting in more equity by eliminating bias in compensation and promotion decisions. Ms. McKee has been an active member of the Society for Industrial and Organizational Psychology (SIOP) for over two decades.

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