CONFIDENTIAL CLOSE CALL REPORTING SYSTEM

NASA C³RS: Communication Works For Those Who Work At It!

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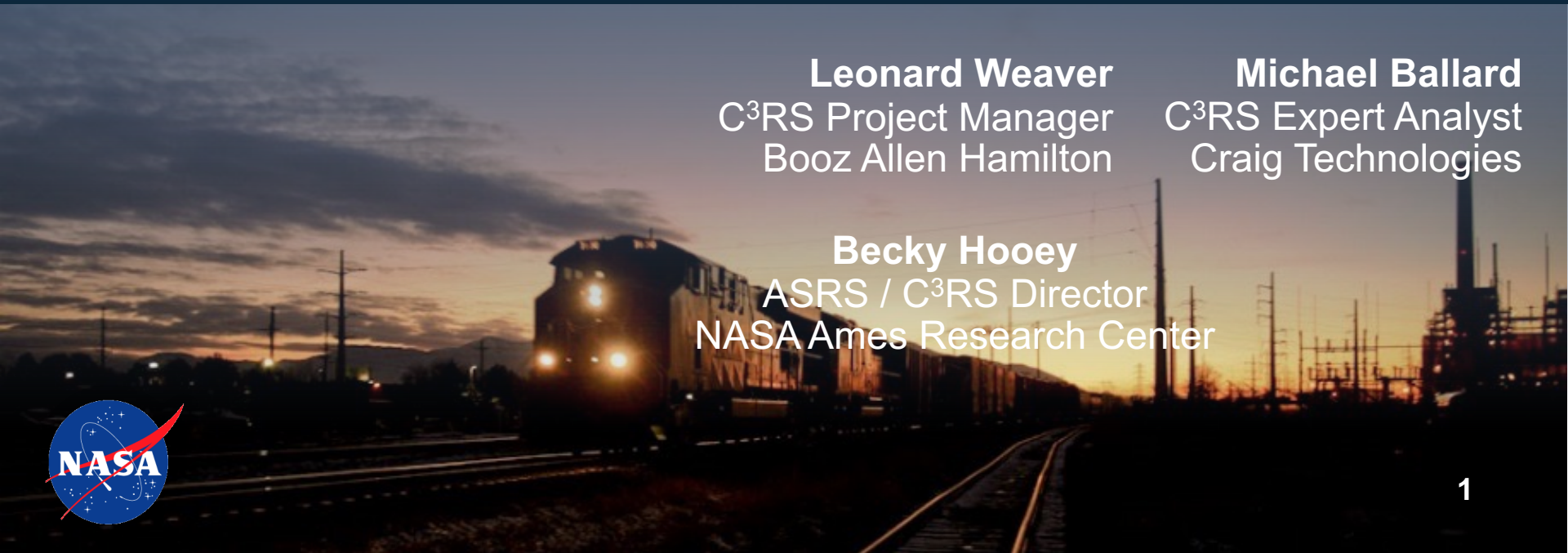


Agenda

- Background / Secondary Analysis Development
- Coding Form Data
  - Reporter Demographics
  - Event Type, Result, Contributing Factors
- Secondary Analysis Findings
  - Written Communication Issues
  - Verbal / Nonverbal Communication Issues
  - Communication between Parties
  - Additional Human Factors
  - Strategies Gathered from Reporter Self Assessments
- Summary

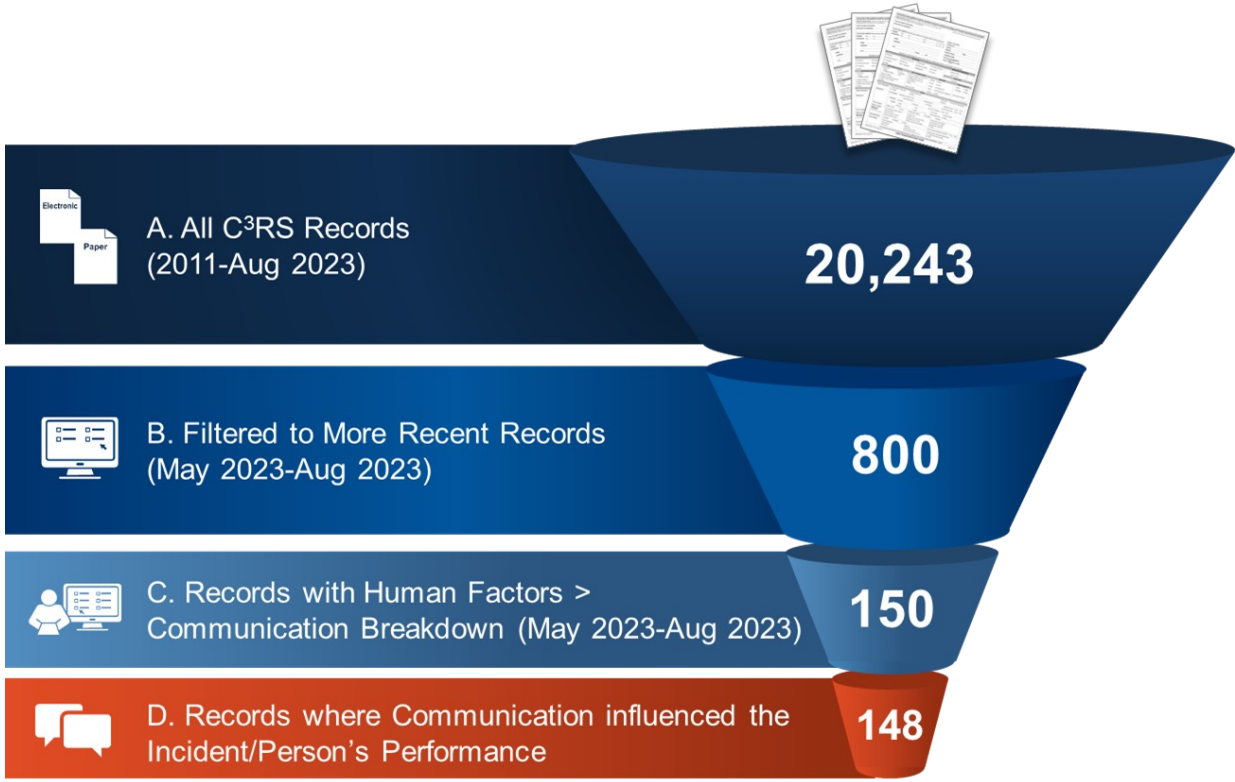
Background / Secondary Analysis Development

Background

- C^3RS is a voluntary reporting program designed to discover potential safety hazards that may otherwise go undetected.
- The **objective** of the special study is to learn about Communication Breakdown related to safety events reported to the C^3RS program. Studying the reported close calls can **yield information about communication breakdowns that may be present in the railroad operations.**
- Generally, this research will accomplish three things:
  1. Demonstrate the usefulness of C^3RS data analysis
  2. Provide insight and descriptions of recent Communication Breakdown events reported to C^3RS
  3. Outline specific strategies to identify and help mitigate communication breakdown events

Background

- Conducted C³RS Database Query Tool (DBQT) Topical Search
  - Human Factors Communication Breakdown
  - Reports screened for relevancy



Secondary Analysis Development

- **Developed secondary coding instrument**
  - Secondary analysis conducted by C^{3}RS Expert Analysts
- **Categories for 24 questions involved:**
  - Verbal & Nonverbal Communication Issues
    - Lack of Communication, Miscommunication, Readback / Hearback, Hand Signal Issues, Transmission Issues, Job Safety Briefings, and Supervisor Communication
  - Written Communication Issues
    - Written Authority Issues, Transcription Issues, Incomplete Documentation, Misinterpretation, Missing Documentation
  - Additional Human Factors Issues
    - Time Pressure, Distraction, and Workload
  - Strategies from Reporter Self Assessments

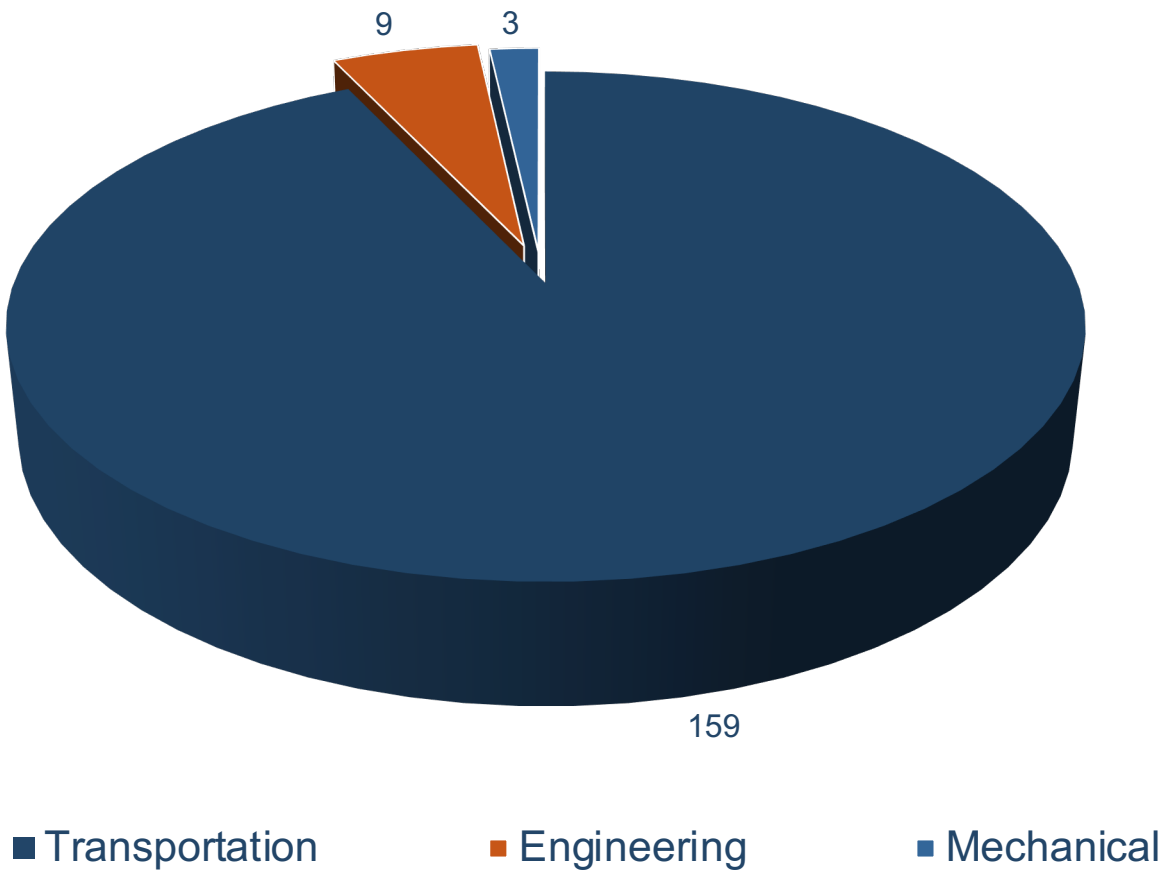
Secondary Analysis Data Caveats

- C^3RS reports are voluntarily submitted, and thus cannot be considered a measured random sample of the full population of like events.
- Not all railroad carriers participate in C^3RS. To date, there are 26 carriers participating. The majority are passenger operations and there are no Class I carriers in the program.
- Of the participating carriers, not all employees are equally aware of the C^3RS program or may be equally willing to report.
- Reporting biases, which are not fully known or measurable, may influence C^3RS information.
- With these statistical limitations in mind, the real power of C^3RS data is the qualitative information contained in report narratives.

Coding Form Data

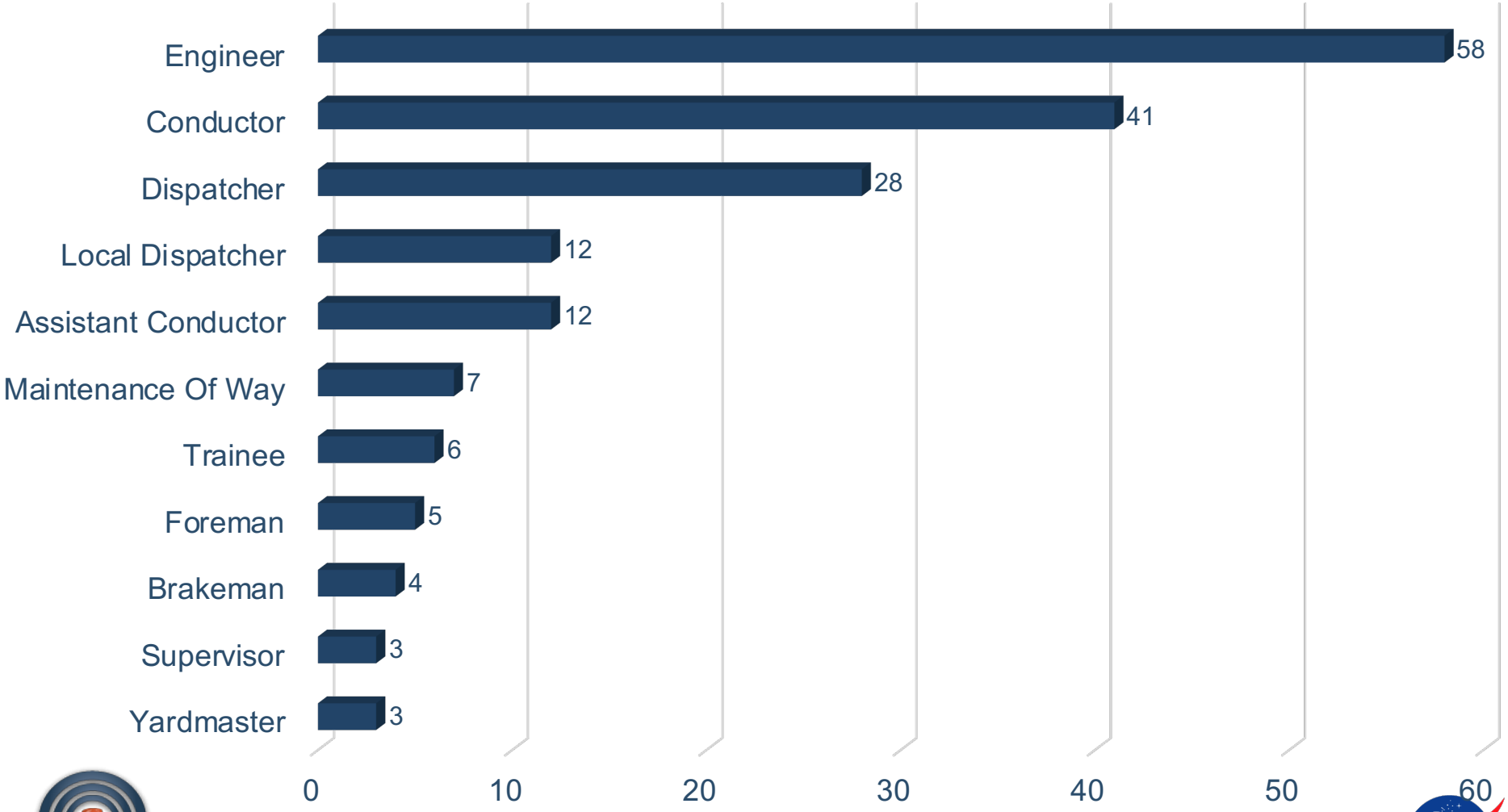
1. Reporter Demographics
2. Event Type / Anomaly
3. Result
4. Contributing Factors

Reporter Craft



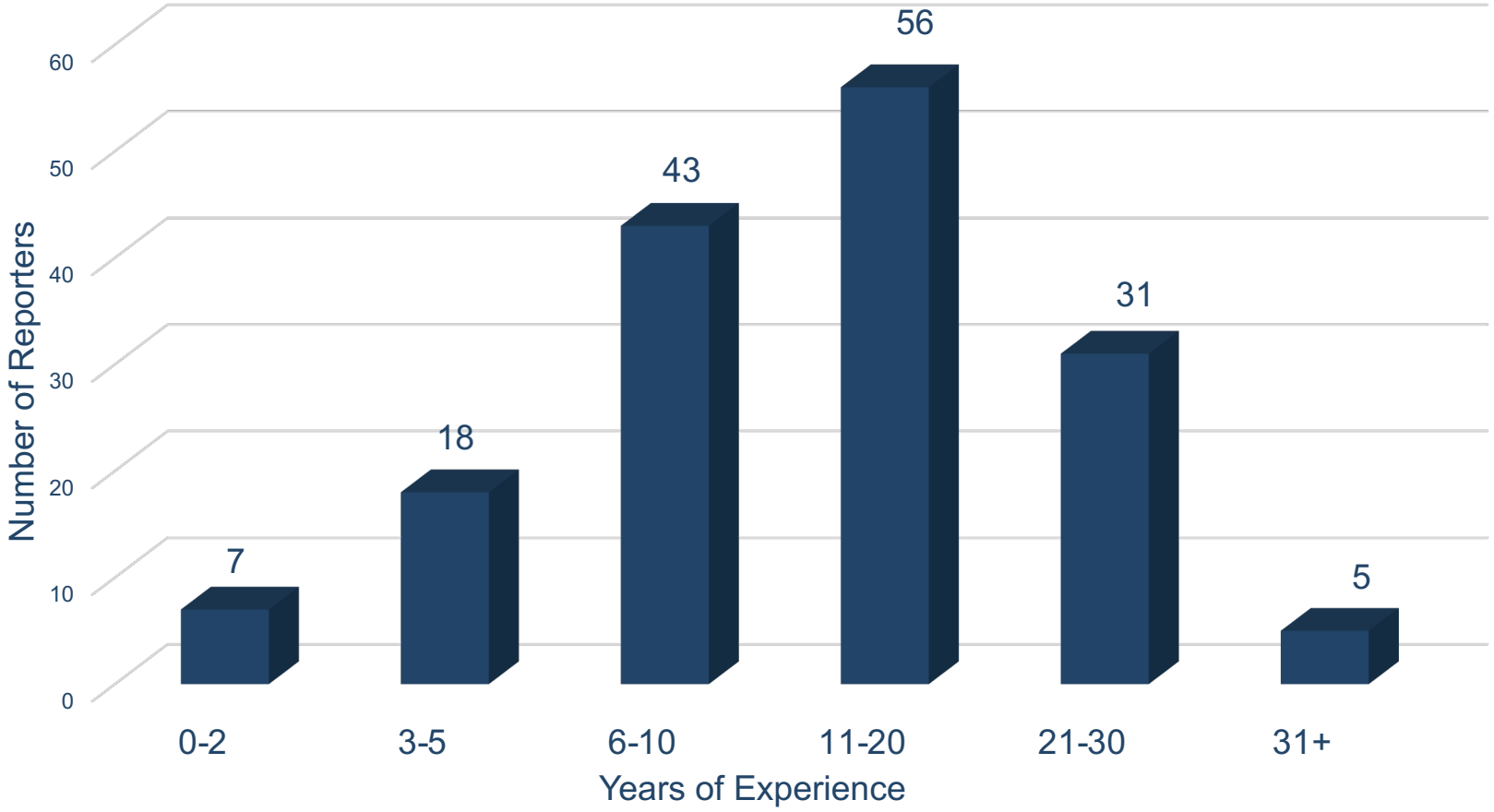
n=171 reporters of 148 records. Data coded by C3RS Expert Analysts during Full Form Analysis.

Reporter Function



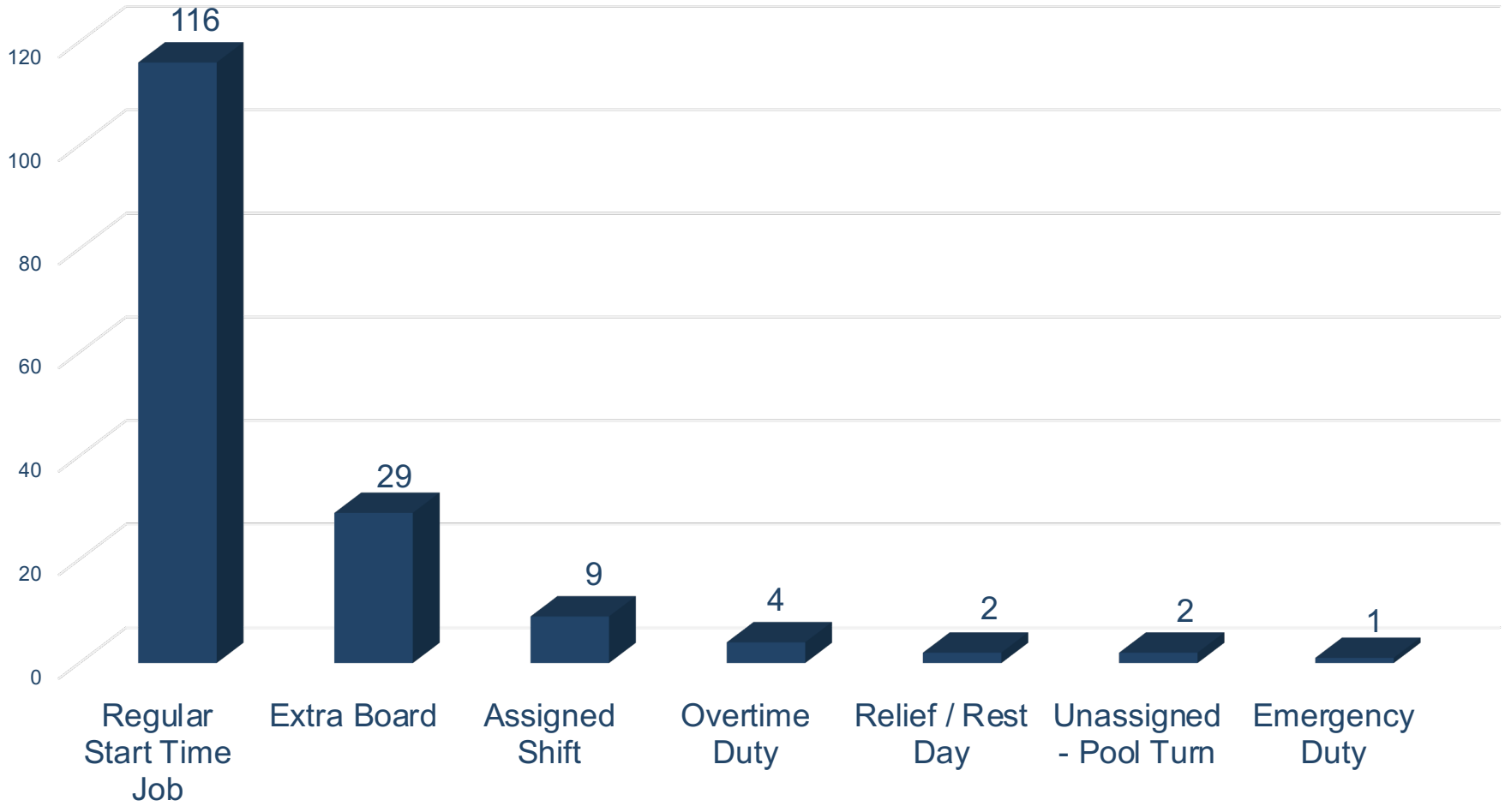
n=171 reporters of 148 records. Not mutually exclusive. Data coded by C3RS Expert Analysts during Full Form Analysis. Top 11 Functions shown.

Reporter Years of Experience



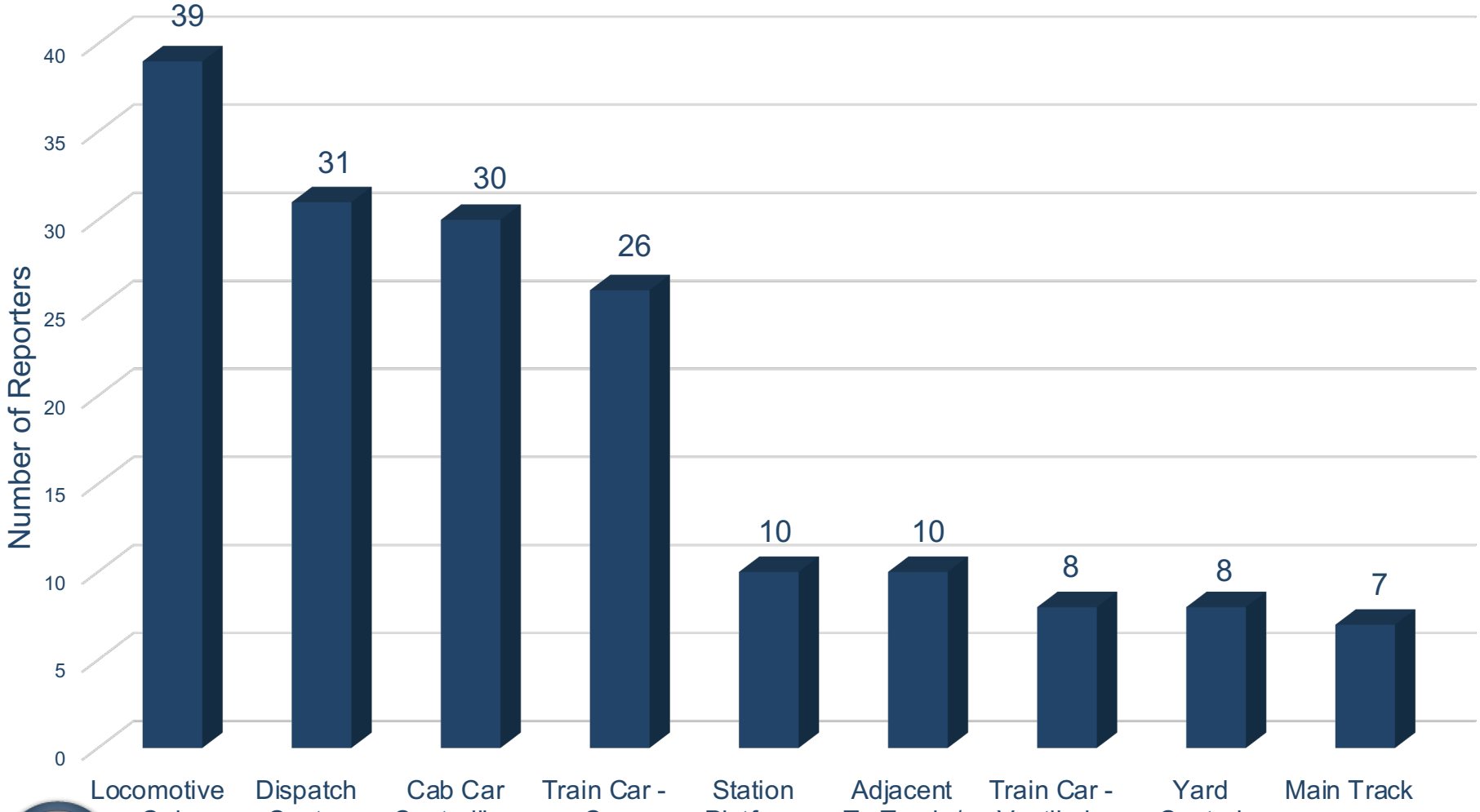
n=160 of 171 reporters provided information for 148 records. Data coded by C^{3}RS Expert Analysts during Full Form Analysis.

Reporter Shift During Event



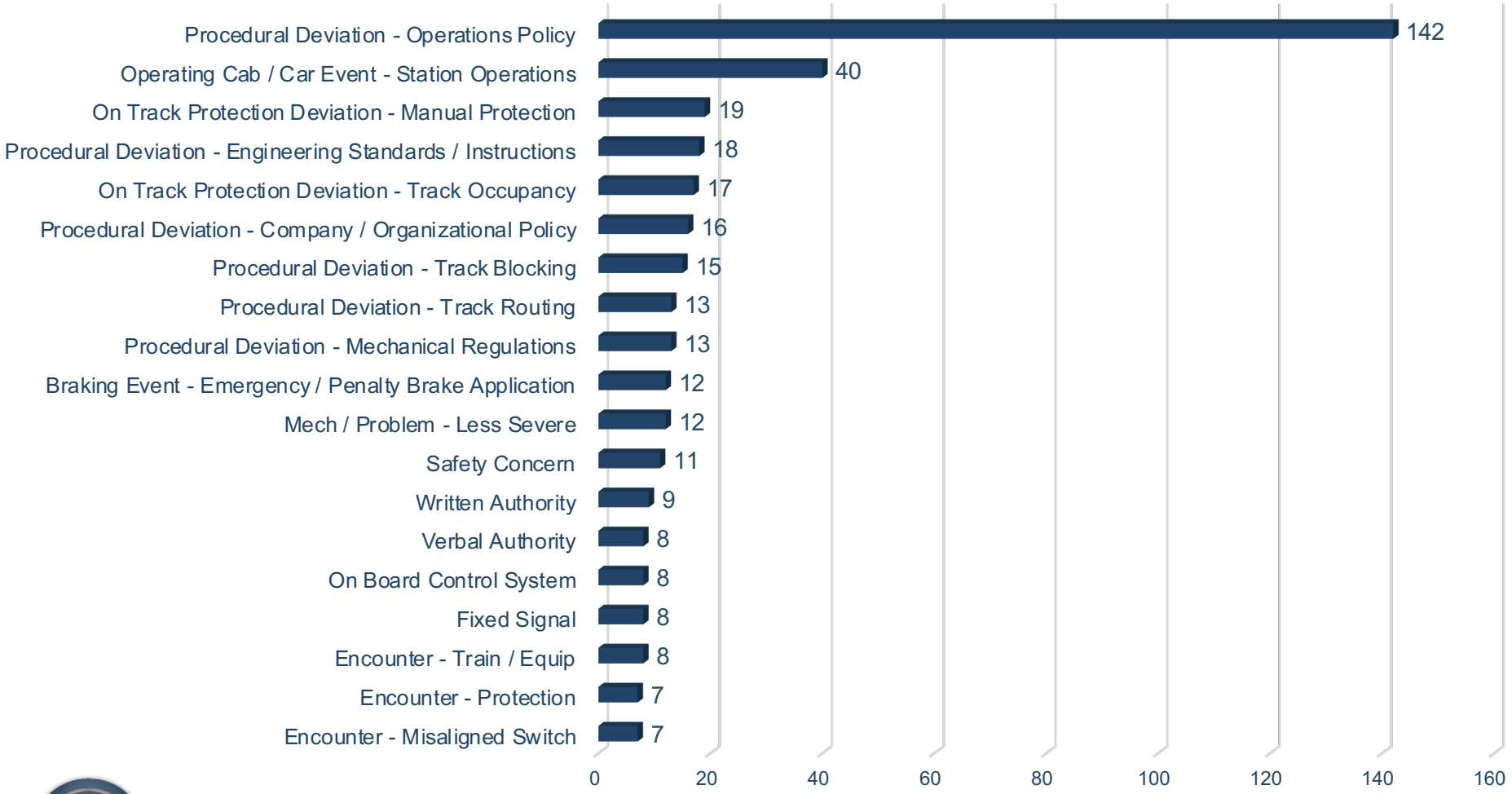
n=163 of 171 reporters provided information for 148 records. Data coded by C³RS Expert Analysts during Full Form Analysis.

Reporter Location during Event



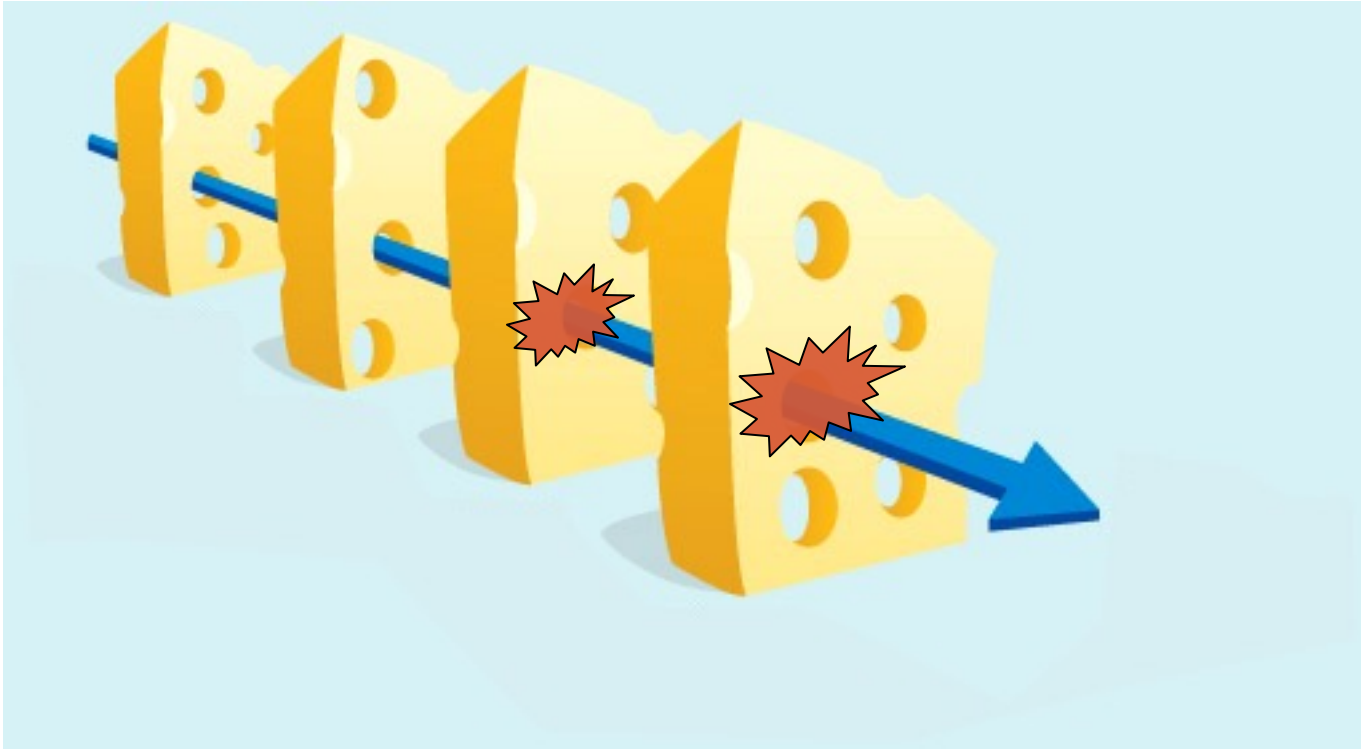
n=171 reporters of 148 records. Not mutually exclusive. Data coded by C³RS Expert Analysts during Full Form Analysis.

Event Type / Anomaly



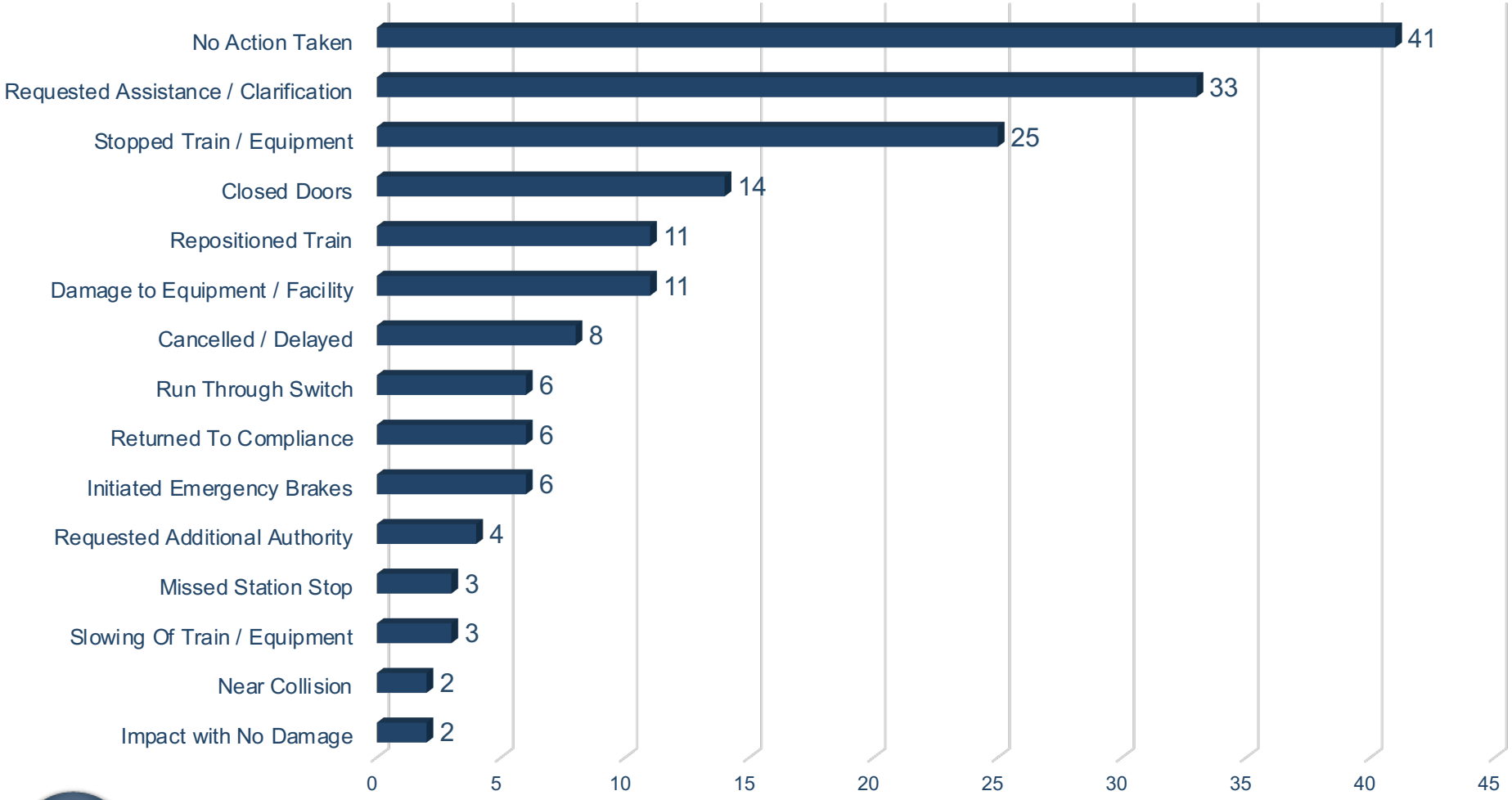
n=148. Categories are not mutually exclusive. Data coded by C³RS Expert Analysts during Full Form Analysis.

Model of Accident Causation*



*Reason, James. Human error models and management. West J Med. 2000 June; 172(6): 393–396.

Results / Interventions



n=148. Results, Unknown is 17. Categories are not mutually exclusive. Data coded by C^{3}RS Expert Analysts during Full Form Analysis.

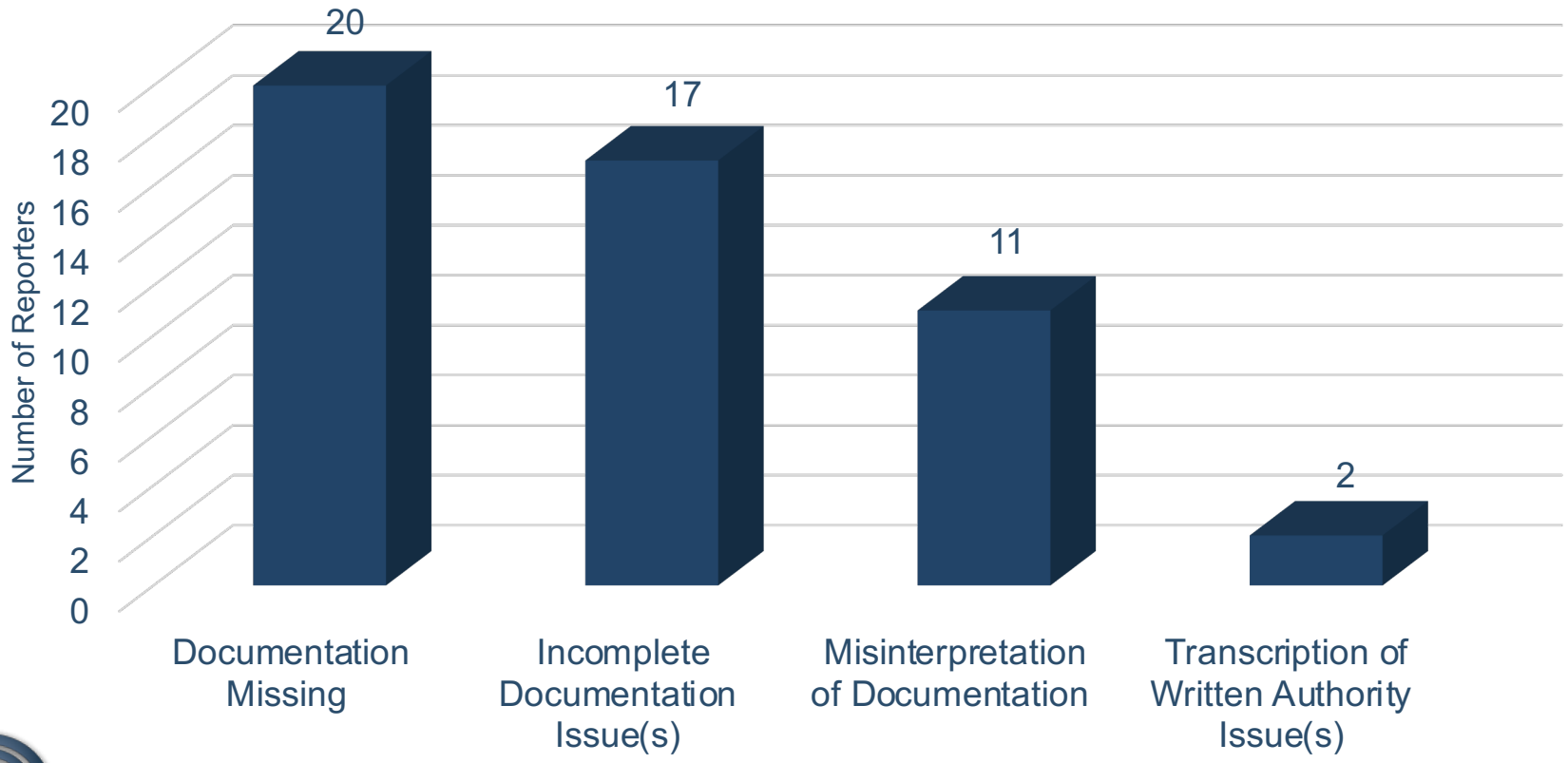
Secondary Analysis Findings

1. Written Communication
2. Verbal / Nonverbal Communication
3. Communication between Parties
4. Additional Human Factors
5. Strategies from Reporters
6. Summary

Written Communication

Written Communication

25% of records in this dataset involved written communication issues (e.g., Track Bulletins, Turnovers, Track Authority)



n=148 records. Not mutually exclusive

Written Communication

Written Communication Breakdown – Reporter Excerpts

Written Communication – Missing Issues

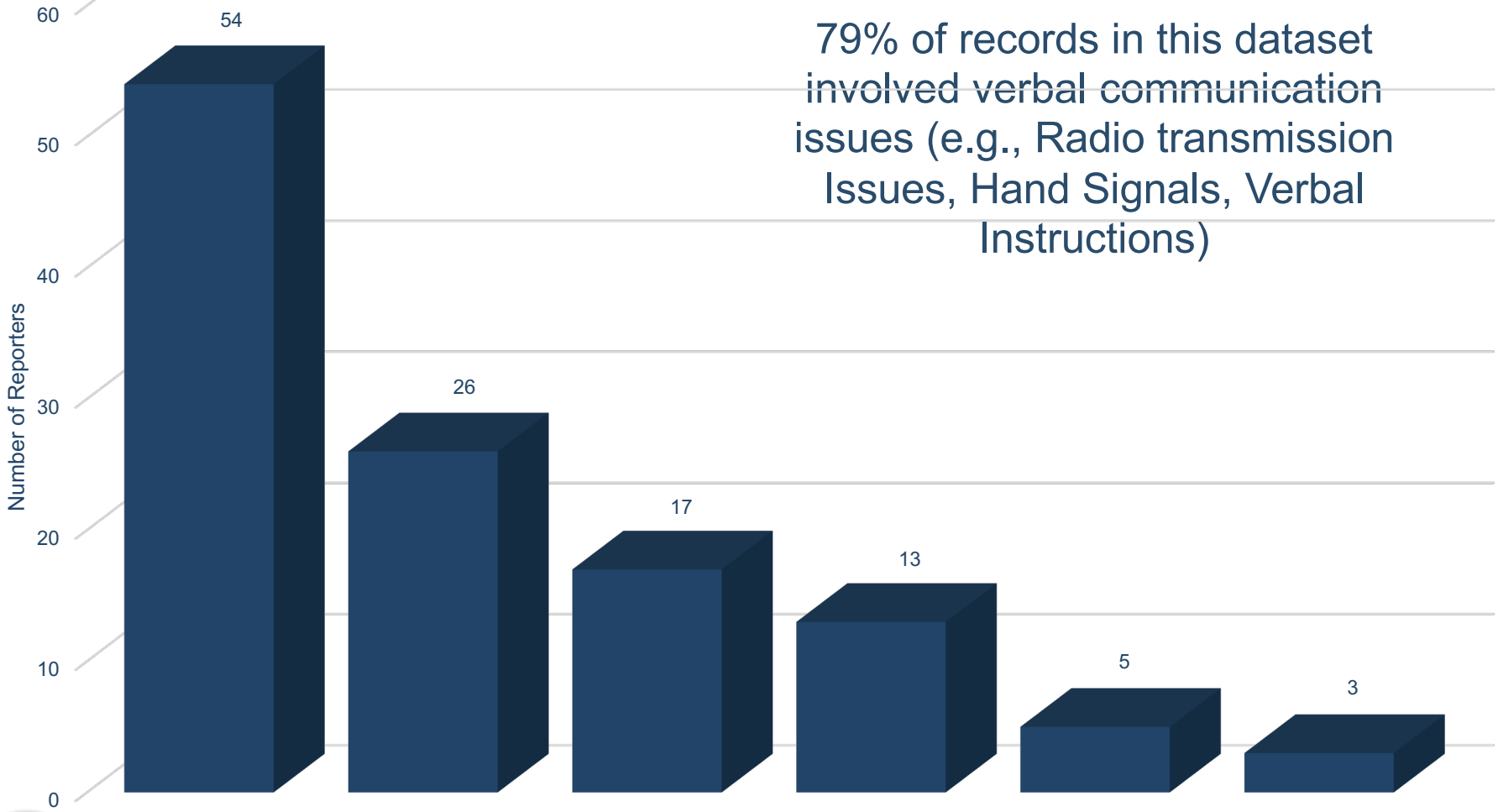
[Dispatcher reported] …because of the lack of documentation or notification in the turnover, the train was later routed into a restricted segment of track.

[Engineer reported] …I found that PTC had been cut out…There was nothing on our paperwork…I was under the impression the PTC was cut-in and operating as intended..

[Conductor reported] …My Engineer and I were both confused as this was not on our Daily Operating Bulletin and was not mentioned when we verified our Daily Operating Bulletin

Verbal / Nonverbal Communication

Verbal / Nonverbal Communication



79% of records in this dataset involved verbal communication issues (e.g., Radio transmission Issues, Hand Signals, Verbal Instructions)

n=148 records. Not mutually exclusive

Verbal Communication

Verbal Communication Breakdown – Reporter Excerpts

Lack of Communication Issue

[Conductor reported] Later, I realized that Mechanical and the Dispatcher had not been called and asked the Engineer why he didn't call.

Transmission Issue

[Local Dispatcher reported]… the Local Dispatcher Trainee has a very low voice, and the Trainer could barely hear the radio transmission between the Train Crew and the Local Dispatcher Trainee.

Verbal - Transmission Issues

Radio transmission issues with equipment – Cited 26 times

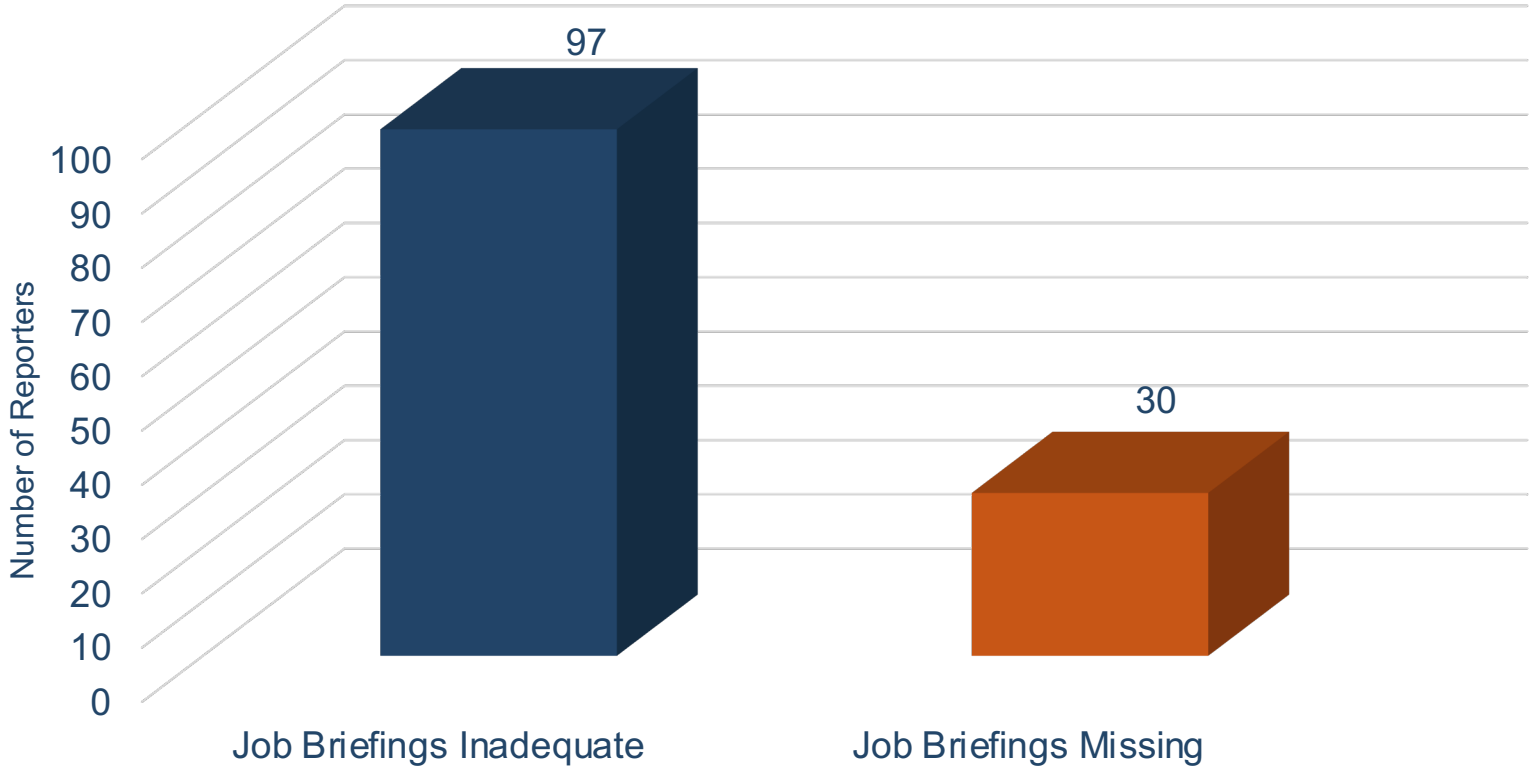
[Conductor reported]: We all feel very unsafe going into a terminal so far underground when we can't even relay information to each other.

[Engineer reported]: Poor radio communication led to this and him being a new conductor as well.

[Conductor reported]: With all the commotion, it was forgotten, and we did not hear the Trainman.

Verbal Communication – Job Safety Briefings

78% of records in this dataset involved missing or inadequate Job Safety Briefings



n=148 records. Not mutually exclusive

Verbal Communication – Job Safety Briefings

Job Safety Briefings / Communication Breakdown – Reporter Excerpts

INADEQUATE

[Assistant Conductor reported] …The Engineer at [the] last minute before station decided to hang the north door off the platform without updating the Job Safety Briefing…

MISSING

[Conductor reported] …When we arrived to Track X there was standing equipment. It was not unusual for there to be equipment, but the Yardmaster would normally inform us…

INADEQUATE

[Conductor reported] During the commotion of what was happening inside the train, I did not give a proper enroute Job Safety Briefing after the conditions of the job changed.

Communication Between Parties

Communication Breakdown

Parties Involved

Communication Breakdown between Train Crew and other Parties Involved

n = 148 Records

Train Crew – Train Crew

Train Crew Involvement Excerpts

[Brakeman reported]
Conductor reminded me to line the bottom of the loading station… The Switch was not mentioned to me… I presumed [the] Conductor had already handled it.

[Conductor reported]
the Engineer stated the train would be "a little long"… we noticed the train had started shoving back toward the platform without any notice or instruction being given…

Train Crew - Dispatcher

Train Crew Involvement Excerpts

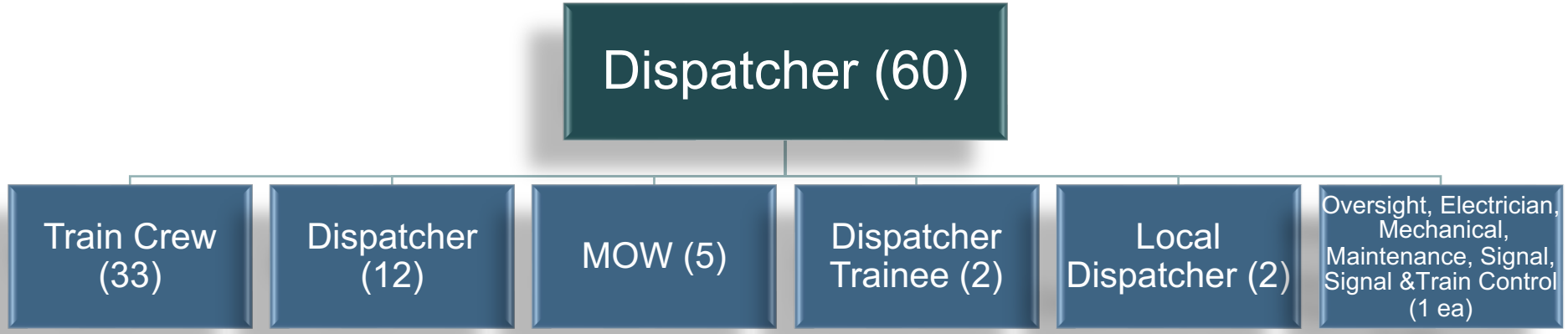
[Conductor reported]
… [We] were told by [the] Dispatcher to hold there until [we] heard from him… [the] Dispatcher called a Foreman in a track car who reported clear. This is the first we heard of a track car being out there.

[Dispatcher reported]
A Maintenance of Way Foreman called me to put up two [Temporary] Speed Restrictions… It didn't dawn on me until after the fact that I gave [the] Train the wrong speed on their Track Bulletin addition.

Communication Breakdown

Parties Involved

Communication Breakdown between Dispatcher and other Parties Involved



n = 148 Records

Dispatcher - Dispatcher

Dispatcher Involvement Excerpts

[Dispatcher reported]
… he had, in fact, issued the Foul Time to the Signal Maintainer for the section of track that was not his territory… resulted in the Foul Time being issued while a scheduled train was signaled through the requested territory of another Dispatcher's territory.

[Dispatcher reported]
… I applied a track block, gave permission to operate [the] switch and derail, and gave authority to occupy Main Track. I went wrong by not getting a block on Main Track at a Control Point from the adjoining railroad.

Dispatcher - MOW

Dispatcher Involvement Excerpts

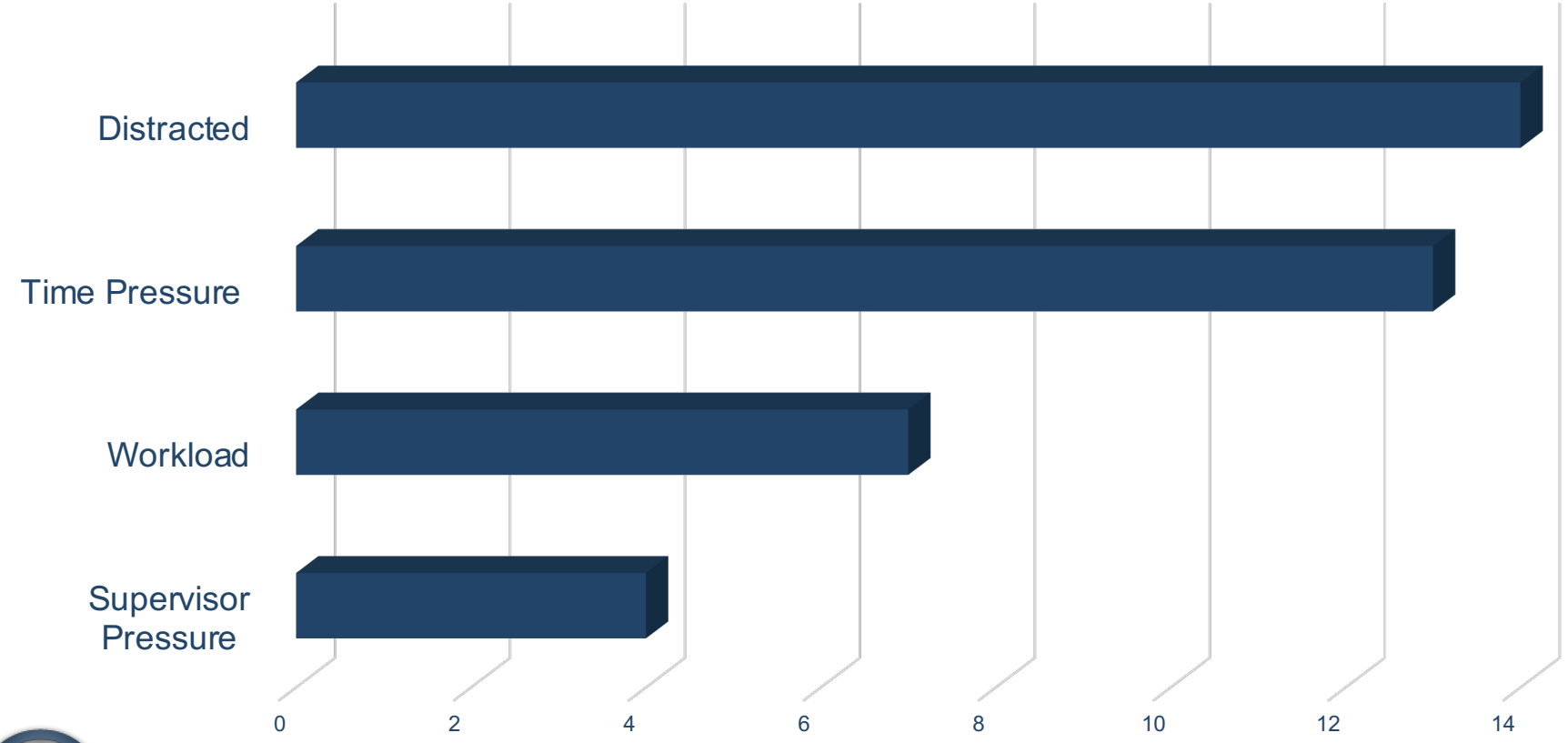
[Dispatcher reported]
[The] Signal Maintainer never called and confirmed [the] switch was clamped... I threw [the] switch back and called Signal Maintainer. [The] Signal Maintainer should have called and confirmed that the switch was clamped normal, miscommunication.

[Dispatcher reported]
…the problem was within the order of the request…The request was given improperly, and due to an uncommon situation, my judgement was to follow the lead of the Foreman and process the request…

Additional Human Factors

Human Factors

19% of records in this dataset involved additional human factors as mentioned by the reporter



n=148 records. Not mutually exclusive

Human Factors

Human Factors – Reporter Excerpts

Distraction

[Engineer reported]

No track flags were displayed, the PTC was supposed to give an advanced warning like they do at other speed restrictions, and the Conductor was supposed to give warning but was busy with a passenger with no ticket.

Distraction / Time Pressure

[Signal Foreman reported]

The reporter explained that the Dispatcher seemed to have a lot going on at this location and sounded very flustered and confused.

Strategies Gathered from Reporter Self Assessments

Strategies Gathered from Reporter Self Assessments

- Reporters often offer strategies, assessments, and recommendations for what they would have done differently

- C^{3}RS Expert Analysts categorized these into three main areas:
  - Improvements to Job Safety Briefings
  - Hardware Improvement Strategies
  - Enhanced Training

Strategies from Reporters

Improvements to Job Safety Briefings

[Conductor reported]…During the commotion of what was happening inside the train, I did not give a proper enroute Job Safety Briefing after the conditions of the job changed.

[Dispatcher reported]…told boards for an Out of Service Track were not removed when [the] track was given back. He failed to transfer this information to the next shift.

[Dispatcher reported]… [The] Job [Safety] Briefing was done in the morning…. [The] Signal Maintainer should have called and confirmed that the switch was clamped normal, miscommunication.

Strategies from Reporters

Hardware Improvement Strategies

[Local Dispatcher reported]…The reporter suggested implementing a clearer communications system.

[Conductor reported]…Maybe if [the] public address system was working properly this would have [not] happened."

[Engineer reported] "I feel the track flags would have helped me the most, especially when it is a new speed restriction."

Strategies from Reporters

Enhanced Training

[Dispatcher reported] …a review of the procedures regarding this incident could help avoid this situation in the future.

[Dispatcher reported] "…the Power Desk is not your normal Dispatching Desk…Anyone working it should be well trained and refreshed more than normal."

[Dispatcher reported] "It wouldn't hurt to double-check that restrictions are correct before dictating to a train or Local Dispatcher."

Summary

Summary

- Faulty radio equipment can hinder rail communications by introducing disruptions, signal interference, and potential breakdowns in the transmission of critical information
  - The clarity and timeliness of information exchange among railway personnel is vital to accident prevention and well-coordinated movements.
- By fostering a culture of attentiveness and accountability, these briefings empower railway workers to make informed decisions, respond effectively to unforeseen circumstances, and ultimately contribute to enhancing rail safety.
- Human factors, such as distractions, high workload, time pressure, and supervisor pressure, can adversely affect communication quality, emphasizing the importance of protocols and training.

Summary

- Job safety briefings further enhance the communication framework, providing a structured platform to address potential risks and uncertainties, fostering a safety-conscious culture, shared understanding of tasks, and potential hazards
- This intentional pause in operations allows for a focused discussion among crew members, ensuring a shared understanding of the task, potential risks, and the application of safety protocols.
- Investing time and effort in comprehensive job briefings is instrumental in creating a safer, more resilient rail environment for both workers and the carriers they serve.
- Communication plays a pivotal role in ensuring the safety of rail movement, involving written, verbal, nonverbal, and radio transmissions.