Fatality Analysis of Maintenance-of-way Employees and Signalmen

FAMES

December 3, 2019

Dedication:
The FAMES Committee dedicates its efforts to all roadway workers who have lost their lives in the performance of duty and to the families, loved ones, and coworkers they have left behind.

Fatal Accidents Involving Boom/Crane Usage on Roadway Maintenance Machines

Mission Statement:
The Mission of the Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES) Committee is to analyze all fatalities and selected related incidents in order to make recommendations to reduce the risk of future occurrences and eliminate fatalities to roadway workers.

Fatal Accidents Involving Boom/Crane Usage on RMMs

The FAMES Committee reviewed available data[1] from 9 fatal railroad accidents occurring since 1997 in which a boom on an RMM was in use.

Roadway workers and machine operators can become engrossed in their tasks when assigned to work with or near boom-equipped RMMs[2] and various tasks often require ground workers to be in close proximity to the *swing radius*.

The available data indicates that noise, communication challenges, machine operator line of sight, and the presence of moving loads increase the complexity of the task. These factors warrant heightened safety awareness and hazard mitigation.

Findings:

- In fifty-six percent **(56%)** of the fatal accidents, lack of communication or improper communication was identified.
- In fifty-six percent **(56%)**, insufficient training and/or lack of skill was identified.
- In forty-four percent **(44%)**, insufficient management oversight or problems with supervision was identified.
- In forty-four percent **(44%)**, the job briefing or on-track safety briefing was found to be insufficient or absent.
- In thirty-three percent **(33%)**, the load shifted or there was an unexpected release of stored energy because the load was binding or hung up.

The FAMES Committee makes the following recommendations:

- The job briefing should:
    - Identify booms/cranes to be used and safeguard against any hazards or risks;
    - Define safe and proper clearances for nearby obstructions and equipment;
    - Establish how workers on the ground will maintain a safe distance from any equipment or load;
    - Identify and mitigate line-of-sight limitations or noise interference;
    - Identify nearby electrical lines and establish safe clearance distances;
    - Define communication procedures between the operator and ground personnel which should be distinctive, clear, understood, and acknowledged.

Clear communication is imperative!

[1] Overall, the Committee has analyzed 80 fatal roadway worker accidents which have occurred since 1997.

[2] For purposes of this report, "boom-equipped RMM" means a Roadway Maintenance Machine (RMM) equipped with a boom with a hoist, hook, bucket, clamping jaw, or knuckle used to lift or move or scoop heavy items, e.g.: boom truck, speed swing, backhoe, crane, grapple truck, etc.

- A person designated to direct the operator with either verbal or non-verbal communication is needed whenever the following conditions exist:
    - The point of operation is not in full view of the operator;
    - The operator's view is otherwise obstructed;
    - Noise interferes with communication;
    - Either the operator or the ground workers determine that a person is needed to direct the operator for safety reasons.
- While the operator is moving the boom, no employee should be within the swing radius unless duties require; and then only with clear communication with the operator. Employees must **never** be under a suspended load.
- Tag line(s) should be used when it is necessary for ground employees to guide a load.
- Suspended loads should be kept as close to the ground as practicable.
- If a load binds or becomes hung up, stop all work to identify and correct the problem.
    - Anticipate the release of stored energy and never place yourself in a location where you could be struck, crushed, or pinned by a load or equipment.
- If working near adjacent track, determine if the moving or lifting operations have the potential to foul the adjacent track and take adequate precautions to eliminate the risk.
- RMM operators must have proper training and understand the equipment's load capacities, capabilities, and limitations.
- Ground workers should have proper training on working with and in close proximity to boom-equipped RMMs.
- The person designated to give signals to the operator should have proper training on the use of hand signals and have an understanding of equipment operation and limitations.
- Managers, supervisors, and foremen must ensure that their employees are trained and qualified for their assigned tasks and that proper procedures are followed.

The FAMES Committee consists of safety representatives from a cross section of rail labor, railroad management, and federal regulators. FAMES is a continuous improvement process that relies on the candid sharing of available data and the views of its participants. To enable the process, FAMES explicitly refrains from making any findings regarding whether any past or present practice or protocol satisfies any legal duty or standard of care.

The views, opinions, and recommendations contained in this report are those of the FAMES Committee and do not necessarily represent the views, opinions, or recommendations of any specific railroad, labor organization, or governmental agency.
