



**Spring
Failure
on a
Flat Ramp
Telescoping
Gangway
Causes
Severe
Injuries**

A maintenance mechanic with less than two-years of service in the workplace, working alone, who was new (green) to working with a flat ramp telescoping gangway, was responding to a work order because the equipment was difficult to raise and lower. While attempting to lower the equipment for further evaluation, the equipment suddenly fell to the lowered position, causing him to fall forward. The mechanic then fell through the opening between the gangway and tank car, down the side of the tank car to the concrete ground resulting in severe fracturing of both arms. With very limited use of one arm, he managed to make an emergency call for help to his co-worker who was in the maintenance shop, by using his radio microphone/speaker that was clipped to his shirt. His co-worker immediately responded to the site, called for emergency assistance, and provided support.

The equipment involved was located at a turpentine unloading platform. It was found to have a crack initiation at the inner surface of the assist spring, and was most likely associated with pitting damage. The fractured surface in the initiation region was oxidized, and contained evidence of beach marks (concentric rings in a fatigue region which resemble tide marks on a beach). These features suggest that the initial mode of failure was fatigue. Corrosion deposits on the inside of the assist spring were more heavily concentrated to one side, corresponding with the fracture initiation region.

Corrosive elements of sulfur, calcium, and potassium were detected from the inner surface deposits. These corrodents are known to attack alloy steel materials.



Recommendations:

- Audit all flat ramp telescoping gangway platforms for compliance with the manufacturer’s guidelines, and take corrective actions as needed.
- Assess equipment to ensure it is not subjected to hazardous substances or other environmental factors that may cause harm to the equipment and it’s components.
- Develop, establish, and maintain a periodic, preventative, and predictive maintenance program per the manufacturer’s guidelines. Eyebolts, shackles and pins can wear from usage, and should be replaced periodically. Note: for chain replacement, verify chains match the original chain size and length.
- Develop, establish, and maintain an inspection program per the manufacturer’s guidelines for loose and damaged connections, missing and damaged hardware, proper lubrication, and spring adjustments.
- Train all maintenance employees and operators on use, care, maintenance, inspection, operation, and troubleshooting of telescoping gangway platforms using the manufacturer’s guidelines.
- Negotiate ‘working alone’ provisions with employers in collective bargaining agreements so that no employee is working alone in areas where hazardous conditions exist, that endanger their safety where they cannot communicate with others, be heard, or seen, per a union-management risk assessment.
- Utilize a union-management health and safety committee, as well as an education-training committee to assess, and focus on staffing issues that lead to green-on-green hazards. Include seasoned, intermediate, and newer employees in addressing green-on-green issues, as well as understaffing.



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This hazard alert is based on an actual incident, and reflects our best understanding of the incident at the time it was written. However, many incidents have multiple causes; this alert may not cover all of them. The purpose of the alert is to illustrate workplace hazards; it is not intended to be a comprehensive report on the incident.