



Operating Experience Summary

OES 2025-05

April 2025

A Preventable Tragedy – Tree Trimming Requires Rigorous Planning and Hazard Mitigation

Translating Investigations into Prevention & Learning



This Operating Experience Summary (OES) provides a concise and informative synopsis of a Department of Energy (DOE) accident investigation and, through the lens of Integrated Safety Management (ISM), converts the outcomes into actionable and practical steps to help DOE organizations prevent similar serious events from impacting our workforce and mission in the future.

Imagine This

A Tree Trimmer employee leaves their home and family one morning, for a “routine” tree limb removal job just as they had other days that week. But on this day, existing weaknesses in the work planning and control process prevented them from ever going home again. This isn't hypothetical. It's a reality that occurred on the Oak Ridge Reservation on August 11, 2023. Nobody, including the employee, expected or planned to be struck and killed by a force exceeding 1,000 pounds... but it happened.

Why This Matters to You

Tree trimming is consistently ranked among the most dangerous jobs in the United States. Even experienced professionals can fall victim to hazards if safety protocols are not closely followed in work planning and execution. The risk is higher when multiple contractors and subcontractors are involved. Whether you are a manager, supervisor, work planner or craftsman, consider if lessons in this OES can help prevent worker injury, reduced workforce morale, project delays, and other burdens at your site.

The Incident

On August 11, 2023, two subcontractors began cutting down a known, hazardous, large dead limb from a scarlet oak tree just outside the fence line of a historical cemetery on the Oak Ridge Reservation. When the final cut was made, the base of the dead limb struck the ground with the upper portion contacting adjacent trees. This resulted in the top portion of the dead limb breaking into two pieces, one about 4 feet in length, the other 10 feet in length. Unfortunately, the sub-contractor performing the final cut was struck on the head by the 10-foot section. Though wearing a safety helmet, they were instantly rendered unconscious given the massive forces involved. Due to their serious injuries, they were airlifted to a nearby Level 1 Trauma Center, where they later died. On August 14, 2023, the Office of Science Deputy Director for Operations chartered a DOE Accident Investigation Board (AIB) to identify the causes related to the accident ([Investigation Report](#)).

Key Takeaways: Identified Weaknesses in the Safety Net

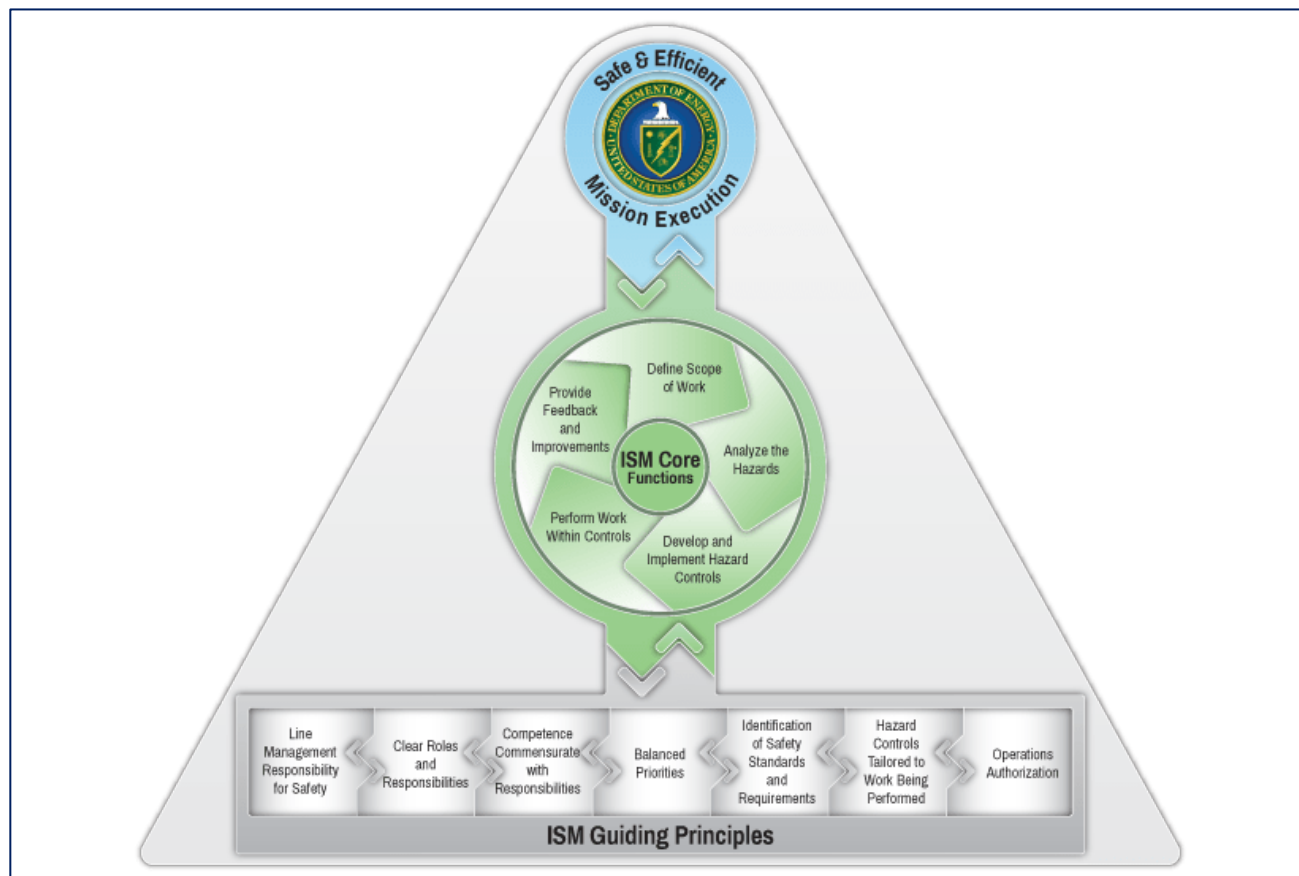
The AIB investigation uncovered significant weaknesses in the application of the Integrated Safety Management (ISM) system, highlighting areas where improvements are essential to prevent recurrence:

- **Scope of Work:** The review process for sub-contracted work lacked the necessary rigor to ensure a comprehensive definition of the scope of work and identification of associated hazards.
- **Hazard Analysis:** Hazardous tree removal was not explicitly identified in the Prime Contractor's Worker Safety and Health Plan (WSHP), hindering effective hazard assessment and mitigation from occurring.
- **Hazard Controls:** Focus shifted from relying on formal hazard controls to utilizing skill-based controls.
- **Work Performance:** Work was performed outside established administrative and physical controls.
- **Feedback/Improvement:** There was no effective mechanism in place for the Site Office, prime contractor, or other sub-contractors to provide feedback and perform issue follow-up, hindering continuous improvement.

Integrated Safety Management (ISM) System

In this OES, we will observe the event through the lens of the ISM framework to identify potential areas that can be strengthened in our work processes across the Department. How can we more effectively use the structured and consistent set of ISM tools in the work planning and control cycle to incorporate critical requirements such as [10 CFR 851 \(Worker Safety and Health Program\)](#) and to safely plan and execute our complex and high-risk mission work?

DOE has implemented the ISM Policy ([DOE P 450.4A, Chg1](#)) to integrate safety into management and work practices at all levels in the planning and execution of work. This policy sets expectations for a systematic approach to work planning and control for the DOE complex for the protection of workers, the public and the environment. All organizations develop, maintain, and implement ISM systems into their operations and work practices based upon the ISM Guiding Principles and Core Functions, shown in the DOE ISM pictogram:



Guiding Principles (GPs)

The guiding principles, shown above, are the foundational framework for developing and implementing an effective ISM System.

Core Functions (CFs)

Core functions build on the guiding principles - providing the necessary structure for any work activity that could potentially affect workers (as well as the public and environment) and are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and hazards involved.

The [DOE G 450.4-1C, Integrated Safety Management System Guide](#) provides valuable additional information, including helpful terminology and narrative that describes the relationship between ISM principles, functions, operational work, and performance results.

NOTE: DOE requirements for implementing an ISM System are contained in [DOE O 450.2, Integrated Safety Management](#) (for federal organizations) and DOE Acquisition Regulation (DEAR) clause [48 CFR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution](#) (for DOE contractors).

Work Location and Activity

The work activity planned for Friday, August 11, 2023 (day of event) involved trimming trees in the vicinity of a historical cemetery, and included cutting down a large dead limb from a scarlet oak tree located just outside the perimeter fence of the cemetery. This particular scarlet oak was one of 96 hazardous trees identified for removal in both a 2016 and subsequent 2023 "*Draft Cemetery Hazard Tree Designation*" report. The primary contractor for the roads and grounds maintenance of the Oak Ridge Reservation Management sub-contracted the performance of tree work out to tree specialists located in Knoxville, TN.

At approximately 0730, two primary contractor employees met up with two of the sub-contracted tree specialists at the Central Training Facility (CTF) where the historical cemetery and Scarlet Oak tree were located. The morning activities for the two tree specialists included using a "bucket truck" to cut back cedar branches from a separate tree located near the front of the same cemetery. The cedar branches were then moved to the back of that cemetery where they were thrown over the fence next to the Scarlet Oak tree, which was to be worked later in the day.

Around 1300, both tree specialists transitioned to the rear of the cemetery to work on the dead limb of the Scarlet Oak where the cedar branches were placed earlier that morning. It is unknown why the bucket truck was not used for this work; however, it is assumed that the sacred nature of the cemetery and the limited physical space in which to operate the bucket truck, likely negated them from using it.

Prior to taking down (dropping) the dead limb, the tree specialists placed both a lower tag line at the base and an upper rigging line approximately 45 feet up from the base of the dead limb.

Once rigged, one of the tree specialists (CoTW-2) held the lower tag line while the other tree specialist (CoTW-1) began using a chainsaw to make multiple cuts in which to drop the dead limb. When the final cut was made, the base of the dead limb struck the ground, while the upper portion contacted the adjacent trees, causing the top 14 feet of the dead limb to break into two pieces. One piece measured approximately 4 feet long and the other, approximately 10 feet long.

The 10-foot section of dead limb struck CoTW-1 directly on the head, and even though they were wearing a safety helmet, the 50-pound dead limb piece had an estimated force transmission far exceeding the helmet's rated capacity. The two prime contractor workers at the site responded to the scene, moved the 10-foot section of dead limb, and called 911 while CPR was immediately initiated by CoTW-2. Emergency Management Services (EMS) arrived from both the town of Oak Ridge and Y-12, and once stabilized, CoTW-1 was transported to Oak Ridge Methodist Medical Center and subsequently airlifted to the University of Tennessee Medical Center where they succumbed to their injuries.

Figures 1 through 4 provide a visual representation of the accident sequence (not to scale)

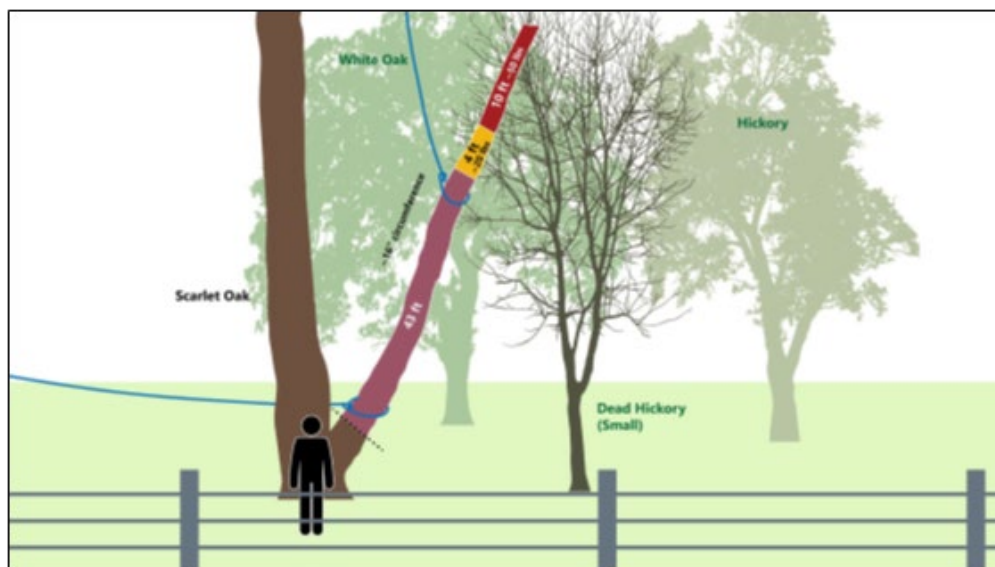


Figure 1

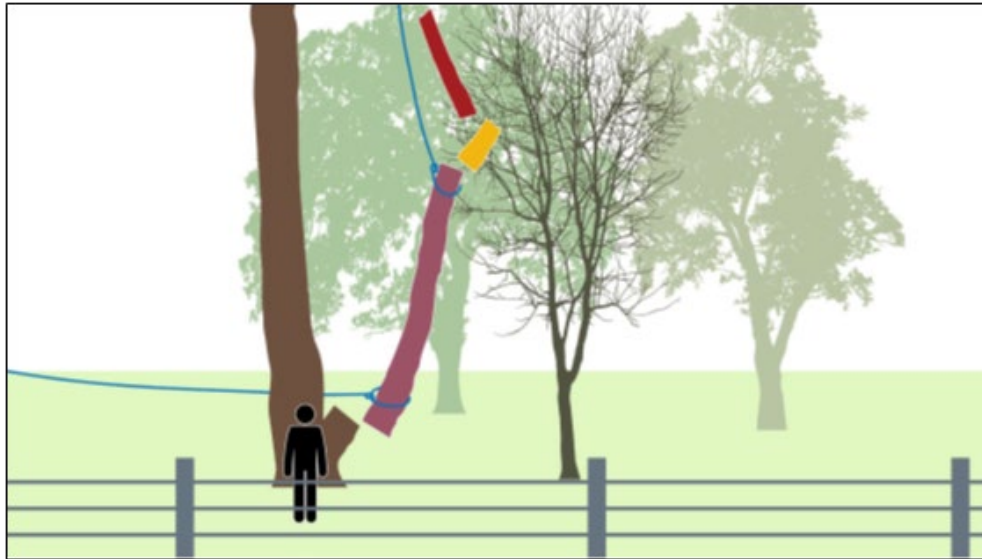


Figure 2

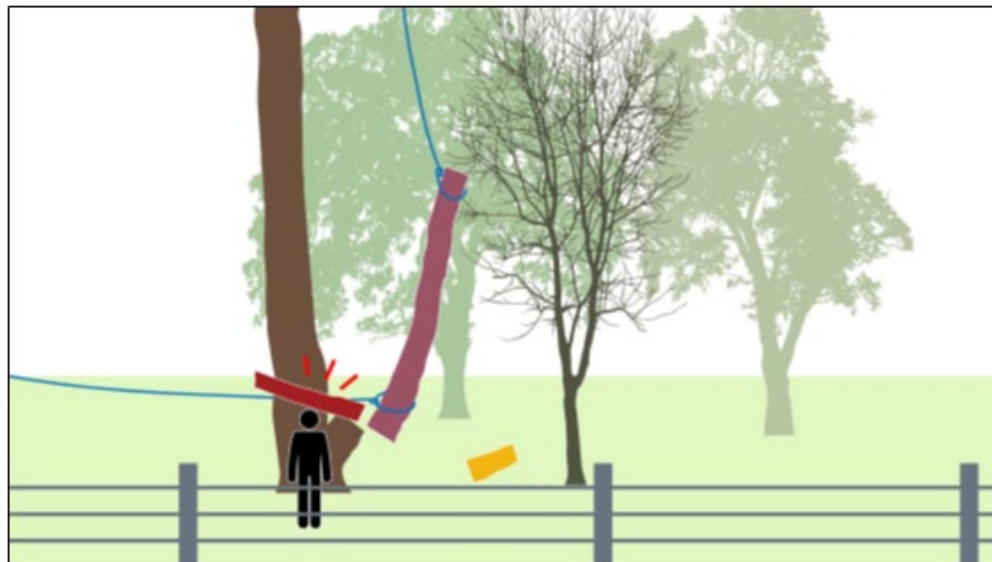


Figure 3

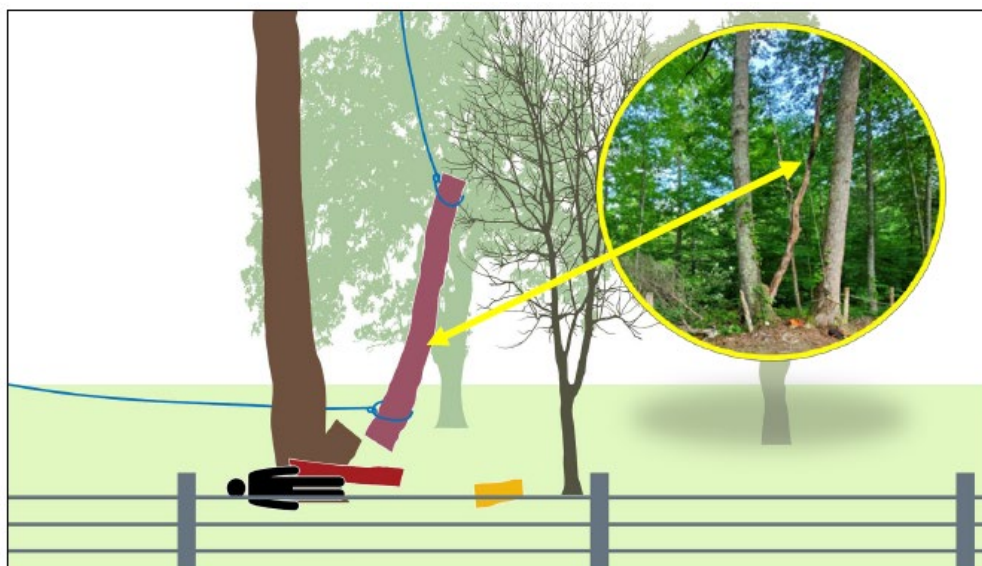


Figure 4

The Event as seen through the Eyes of the ISM system

During their investigation, the AIB noted organizational weaknesses in all five of the ISM Core Functions that contributed to the serious injuries sustained by CoTW-1. Though human performance issues were also at play during the event, the goal of this OES is to build organizational resilience and increase the level of awareness of the organizational performance deficiencies leading up to the accident.

The following provides a synopsis of the weaknesses in each ISM Core Function. These weaknesses are further identified in the Oak Ridge Reservation Accident Investigation Report that can be found here: [Oak Ridge 2023 Accident Investigation Report](#).

CF-1: Define the Scope of Work

The Bottom Line: The Work Planning and Control process lacked a disciplined and rigorous review process to ensure sub-contracted work adequately defined the overall scope of work and, subsequently, the unique and associated hazards for each planned sub-activity.

Supporting Facts

- ✓ Each tree slated for removal had unique hazards. Additional information regarding scope of work, including access to the tree and the type of mechanical equipment available to remove the trees (e.g., backhoe, chain saw, bucket truck, etc.) was not provided in contractor and sub-contractor Task Orders.
- ✓ Increase in scope of work resulted in additional hazards being introduced into the task.
- ✓ The prime contractor's Plan of the Day only describes the toolbox safety topic as "Stay Focused". This provided no additional value to those tasked with removing the tree.
- ✓ No sub-contractor employees attended the prime contractor's Plan of the Day on the day of the event.
- ✓ The prime contractor's Plan of the Day had devolved to a point where little to no value was provided in adequately defining the scope of work for those involved in executing the day's activities.

CF-2: Analyze the Hazards

The Bottom Line: Neither the Prime Contractor nor their Worker Safety and Health Plan (WSHP) identified hazardous tree removal as an activity, preventing an effective awareness and analysis of the associated hazards.

Supporting Facts

- ✓ No evidence is available to confirm the sub-contractors went through a disciplined process of reviewing and submitting their own WSHP to the prime contractor for approval and implementation.
- ✓ Hazards and requirements were identified, however, neither were formally brought into work planning and control processes. As the scope of work increased, no additional measures were taken to identify or assess the increased risk associated with the additional work and previously identified hazards.
- ✓ The prime contractor's Safety Task Analysis Risk Reduction Talk (STARRT) card used to identify work and associated hazards for the week only describes the work assigned as "Fall Trees at the OR Reservation..."
- ✓ No evidence supports that a formal pre-job briefing was conducted by the sub-contractor on the day of the accident.

CF-3: Develop and Implement Hazard Controls

The Bottom Line: The development and implementation of hazard controls for the work activity was inadequate in reducing the risk associated with the task.

Supporting Facts

- ✓ The prime contractor's WSHP does not contain tree trimming/felling safety measures since they do not perform this work. Therefore, the prime relied on the sub-contractor's job hazard analysis (JHA)

to develop and implement the controls for this task.

- ✓ The sub-contractor used a broad JHA work planning and control process that was accepted by the prime but lacked the specificity needed for daily activity level work.
- ✓ Based on consultation with tree industry arborists and physical evidence, the manual method chosen to cut the dead limb did not appear to follow industry practices and standards for tree felling.
- ✓ The sub-contractor “Six Steps of Precision Tree-Felling Plan” requires the establishment of “Escape Routes/Retreat Path”, Notch and Hinge Plan, and Back Cut Plan, however, no evidence supports that any of these controls were implemented that day.

CF-4: Perform Work Within Controls

The Bottom Line: Work was performed outside the administrative and physical controls established prior to the activity.

Supporting Facts

- ✓ The sub-contractor did not perform the tree felling within the hazard controls specified in their own JHA (i.e., Six Steps of Precision Tree Felling Plan).
- ✓ Adequate escape routes prescribed by tree trimming industry standards were not identified or made available to CoTW-1.
- ✓ The prime contractor STARRT card provided no additional controls to perform this work and simply identified the task as “Fall Trees.”
- ✓ With the exception of personal protective equipment, all controls used during the performance of the task were informal (i.e., verbally issued) and solely based on the training and experience of sub-contractor personnel.

CF-5: Provide Feedback and Continuous Improvement

The Bottom Line: There is no effective mechanism in place that allowed the Site Office, prime contractor, or other sub-contractors to provide feedback. This resulted in missed opportunities to improve operations.

Supporting Facts

- ✓ The Site Office failed to perform annual reviews as required by 10 CFR 851 of the contractor and subcontractor WSHP.
- ✓ The Site Office did not identify and assess the addition of hazardous work involved in tree trimming/felling work.
- ✓ Opportunities were missed by the Site Office to provide feedback and improvement after two significant near misses occurred during reservation work prior to this accident:
 1. Sub-contractor employee became entangled with a tree limb being fed into the chipper and had to activate the emergency e-stop to avoid being pulled in; and
 2. Prime contractor worker deviated from an approved work scope and used heavy equipment to move some soil, inadvertently digging up an energized electrical line.
- ✓ No assessments were conducted by the prime contractor for any road and grounds work including tree felling activities.
- ✓ The prime contractor had no corrective action program in place to adjudicate identified issues.

Take the Next Steps: Implementing the ISM Lessons

This tragic incident at Oak Ridge underscores the need for a relentless focus on safe work practices, including rigorous work planning, comprehensive hazard analysis, and effective communication at all levels. By learning from these mistakes, we can prevent similar tragedies in the future and ensure the safety of all DOE workers.

Many of the event takeaways reinforce the importance of active involvement of all personnel, from managers to workers, in identifying hazards, implementing controls, and continuously seeking ways to improve safety performance. The ISM System is only as good as those who are implementing it and DOE workers should recognize that any core function can continue to evolve during the execution of work from planning to “wrench turning.” With that in mind, consider asking the following questions prior to commencing work:

- Have we clearly defined the roles and responsibilities for each aspect of the work planning cycle and for each participating organization? Have all groups who are needed to holistically plan and safely execute the work (given the amount of risk present) been consulted and agreed to the plan?
- Does our work planning and control process provide our workers with ready access to adequate tools and resources identify and mitigate all identified hazards and prepare for any additional hazards not initially recognized?
- Are we set up to accommodate change management? As the scope of work expands, are further measures needed to identify or assess the increased risk associated with the additional work or changes in the previously identified hazards?
- Do members of our team adequately leverage the power of simple work planning and control tools? Is our Plan of the Day a valuable and essential tool to be used meaningfully, or has it devolved to a point where we are just “Checking the box” because of some “requirement”? Have we honestly asked the following questions:
 - Are we adequately defining the scope of work for all of those involved with executing it for the day?
 - Are we adequately communicating the risks associated with the work to those performing it?

In Closing

This Operating Experience Summary tells the story of a tragic accident to help prevent one like it from happening again. Tree trimming is inherently dangerous.

Regardless of if you’re a senior manager, work planner, supervisor, or craftsman, consider asking “Is the organization that I’m a part of, including myself, doing everything reasonably possible to help ensure my “work family” goes home today?” In doing so, we pay tribute to those who no longer can work with us, and honor those with whom we still do.

Think About This: As you read this OES, don’t ask “How did they let that happen?”. Instead, ask “Could this happen to us?” and, more importantly, “How will we prevent it from happening to us?”.

Don’t let this incident fade into memory. Use it as a catalyst for change, to reinforce your commitment to safety, and to ensure that everyone on your team goes home safe each day.

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Operating Experience Summary

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