

FATALITY INVESTIGATION REPORT

INCIDENT FACTS

DATE:

April 2, 2020

TIME:

10:00 a.m.

VICTIM:

55-year-old tree trimmer

INDUSTRY/NAICS CODE:

Landscaping Services,
NAICS 561730

EMPLOYER:

Tree removal service

SAFETY & TRAINING:

No accident prevention
program (APP), no safety
meetings or committee

SCENE:

Residence

LOCATION:

Washington

EVENT TYPE:

Fall from boom lift platform

REPORT #: 52-48-2021

REPORT DATE: 05/31/2021

Operator Falls from Boom Lift while Tree Trimming

SUMMARY

On April 2, 2020, a 55-year-old operator died after he fell from the basket of a boom lift while trying to pull cut tree branches into the basket.

On the day of the incident, the operator was working as part of a three-person crew to remove trees at a residence. It was their first day on the site. Their plan was for the operator and a coworker to first work in the elevated boom lift to limb trees with chainsaws.

They decided to bring the cut branches into the basket to prevent them from damaging a garage and shed. They had been working for about an hour. To get the branches into the basket, the operator opened the side access gate of the basket. As he leaned forward through the gate, he fell from the basket to the roof of the shed 12 feet below.

[READ THE FULL REPORT > \(p. 4\)](#)

CONTRIBUTING FACTORS

Key contributing factors identified in this incident include:

- Not wearing personal fall protection.
- Working in boom lift basket with access gate open.
- Overreaching to cut and pull branches into the basket.
- Crowding and trip hazards possibly caused by tree branches in the basket.
- No accident prevention program (APP).
- No job hazard analysis (JHA).

RECOMMENDATIONS

Washington State Fatality Assessment and Control Evaluation investigators concluded that to protect employees from similar hazards employers should:

- Train workers on how to safely operate and work in boom lifts.
- Ensure that workers always wear personal fall protection when they are exposed to fall hazards while working in boom lifts.
- Develop an accident prevention program (APP) that describes the hazards associated with tree trimming and tree removal and how to control them.
- Conduct a job hazard analysis (JHA) before starting a new job to identify the hazards associated with each step and how they will control them.



DEFINITION

APP	Accident Prevention Program
DOSH	Division of Occupational Safety and Health
JHA	Job Hazard Analysis
L&I	Washington State Department of Labor and Industries
MEWP	Mobile Elevating Work Platform
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SRL	Self-retracting Lanyard
SHARP	Safety and Health Assessment and Research for Prevention Program
WA FACE	Washington State Fatality Assessment and Control Evaluation Program
WAC	Washington Administrative Code

WASHINGTON STATE FACE PROGRAM INFORMATION

The Washington State Fatality Assessment and Control (WA FACE) program is one of many workplace health and safety programs administered by the Washington State Department of Labor & Industries' Safety & Health & Research for Prevention (SHARP) program. It is a research program designed to identify and study fatal occupational injuries. Under a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH grant# 5 U60OH008487), WA FACE collects information on occupational fatalities in WA State and targets specific types of fatalities for evaluation. WA FACE investigators evaluate information from multiple sources. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future. These recommendations are distributed to employers, workers, and other organizations interested in promoting workplace safety. NIOSH-funded, state-based FACE programs include: California, Kentucky, Massachusetts, Michigan, New York, Oregon, and Washington. WA FACE does not determine fault or legal liability associated with a fatal incident. Names of employers, victims and/or witnesses are not included in written investigative reports or other databases to protect the confidentiality of those who voluntarily participate in the program.

Additional information regarding the WA FACE program can be obtained from:

www.lni.wa.gov/safety-health/safety-research/ongoing-projects/work-related-fatalities-face

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CONTENTS

READ THE FULL REPORT..... 1

CONTRIBUTING FACTORS..... 1

INTRODUCTION..... 4

EMPLOYER..... 4

OPERATOR AND WORKER INFORMATION 4

SAFETY PROGRAMS and TRAINING..... 4

EQUIPMENT 4

INCIDENT SCENE..... 5

WEATHER 5

INVESTIGATION 5

CAUSE OF DEATH 12

CONTRIBUTING FACTORS..... 12

RECOMMENDATIONS/DISCUSSION 12

ADDITIONAL RESOURCES 15

REFERENCES..... 15

INVESTIGATOR INFORMATION 16

ACKNOWLEDGEMNTS..... 16

DISCLAIMER..... 16



INTRODUCTION

In April of 2020, the Washington State Department of Labor and Industries' (L&I) Division of Occupational Safety and Health (DOSH) notified the Washington State Fatality Assessment and Control Evaluation (WA FACE) Program of the death of a 55-year-old operator who was working with a crew to remove trees from a residence. While working from an elevated boom lift basket, the operator was attempting to pull cut branches into the basket when he fell through the gate opening of the basket onto the shed roof below.

Washington State FACE investigators reviewed multiple sources of information during the course of this investigation including the DOSH inspection file, the victim's death certificate, police report, witness statements, and the medical examiner's report.

EMPLOYER

The employer that initially contracted with the homeowner to do the job sub-contracted the job to another employer. The sub-contractor will be referred to hereafter as the employer. The employer said he had been in business for 15 years and had been doing tree removal and similar work for 50 years. The employer had previously operated a logging company.

OPERATOR AND WORKER INFORMATION

In addition to the employer, an operator and another worker were on site. The operator had worked for the employer on and off for 15 years. He had previous work experience in logging and tree removal. He was hired to operate the boom lift because he had more experience as an operator than the employer. His training and experience as an operator of Mobile Elevating Work Platforms (MEWPs) is unknown. At the time of the incident, the operator was wearing a hard hat, safety glasses, and safety boots.

The other worker in the basket reported directly to the employer and had worked for him for seven or eight years. He had been doing tree removal and similar work for 35 years. He normally worked two to five days per week. He said he had been trained on the job and there had been no safety orientation or training. He had taken first-aid training several years prior but was not currently certified.

SAFETY PROGRAMS and TRAINING

At the time of the incident, the employer had no written accident prevention program (APP). An APP is required for employers in Washington State.¹ He said that he verbally communicated safety information to workers and they were to report safety concerns to him. He said they did not do a safety orientation or walk around on the day of the incident because he did not believe it was needed.

According to the other worker who was interviewed, they had not held safety meetings. This was confirmed by the employer. He also said he had received first aid training several years ago, but he had no refresher training.

EQUIPMENT

The boom lift and chipper were rented by the employer. The boom lift was manufactured by Haulotte, model number HT67RTJO. This model is a self-propelled telescopic boom lift and is an example of a Type 3, Group B mobile elevating work platform (MEWP). It had a platform load capacity rated at 500 pounds. The boom lift was equipped with a steering wheel and control panel on the base and an in-basket control panel and was fully controllable by operators in the basket. The basket had an access gate on one side that swung into the basket when opened. Anchorages for connecting fall protection harness lanyards were built into the boom lift basket.

INCIDENT SCENE

The incident occurred on the property of a residential home in Western Washington State. The residence consisted of a single home and a detached garage. The property had a flat driveway in front of the garage where the work crew parked the boom lift. From that location, the boom lift basket was able to reach the limbs of the first trees the crew intended to remove. The trees they intended to remove were located between the garage of the homeowner and the house of a separate residence next door. The trees were closer to the garage than to the house next door and the house likely did not interfere with the work. There was a small shed located in front of and between the garage and the house. It was owned by the neighbor and may have been at risk of being hit by falling limbs.

WEATHER

Weather at the time of the incident was partly sunny and approximately 42 degrees Fahrenheit. Sunrise was at 6:45 a.m.²

INVESTIGATION

On the morning of the incident, the three-person crew arrived at the worksite at approximately 8:30 a.m. The worksite was a residential home (see photos 1 and 2). The trees next to the homeowner's garage needed to be taken down because they were damaging the foundation of the garage (see photo 3).

The job was initially contracted between the owner of the home and a logging company. That company then subcontracted the job to the employer who owned a small tree removal and landscaping company. The crew consisted of the company owner, the boom lift operator, and another worker. The three had worked together doing similar jobs in the past. According to the employer, he hired the operator because he knew he had experience operating the boom lift.



Photo 1: Incident scene driveway of residence with boom lift that workers were using to limb trees.



Photo 2: Incident scene driveway and garage of residence. Workers were in the boom lift basket limbing trees on the right side of the garage.



Photo 3: Incident scene garage of residence that hired the employer to remove the trees. Workers were in the process of limbing the tree on the right side of the garage in preparation to remove the tree when the operator fell from the basket.

The employer rented the boom lift, the wood chipper, and the personal fall protection gear that they needed to do the job. The boom lift was a Haulotte, model number HT67RTJO. The boom lift basket was rated for two workers or a maximum weight of 500 pounds. Their fall protection consisted of two personal fall protection harnesses and lanyards.

The area where they needed to locate the boom lift basket to work was between the garage of the residence whose owner contracted the job and the home and shed of the adjacent residence. The shed was 8 feet tall and located in front of the garage (see photo 4). This meant they would need to position the boom lift basket above the garage and the shed in order to limb the trees.



Photo 4: Tree that workers were in the process of limbing. The building on the right side of the tree is the adjacent residence. The roof of a small shed can be seen in the foreground (circled). The limb scars indicate that some of the limbs were several inches in diameter. Note the amount of space between the tree and the structures that would have allowed the crew to rig and lower cut branches to the ground.

Before the crew started the job, they did not have a meeting to discuss the job in general or any task-specific hazards they may encounter. They did not review the boom lift operator's manual or manufacturer's safety precautions (see photo 5) before operating the boom lift. The employer brought the personal fall protection equipment, but he did not communicate to the workers that they should wear them while working in the basket. The coworker stated that they did not wear the fall protection because they thought it got in the way of their work.

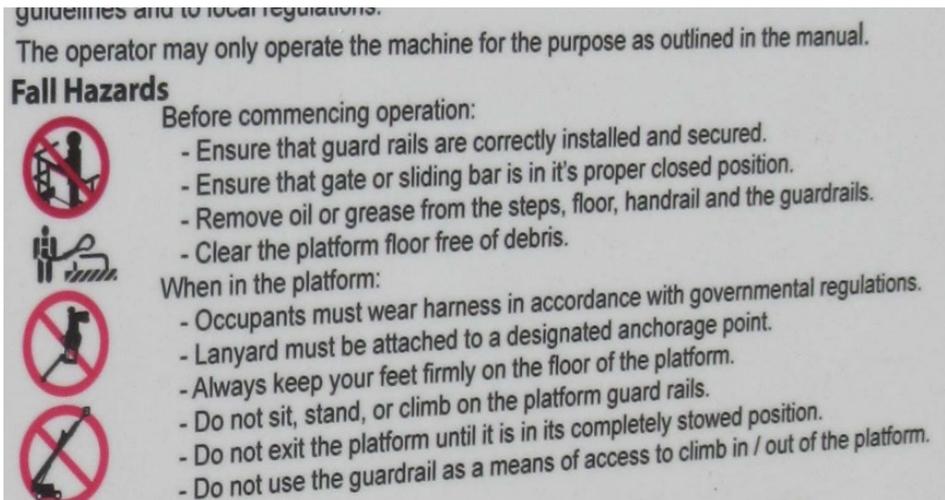


Photo 5: Photo of “Fall Hazards” section of the warning sign affixed next to the control panel in the boom lift basket. The sign explicitly states that when in the platform, occupants must wear a harness and its lanyard must be attached to a designated anchor point.

Shortly after arriving on site, the operator and his coworker entered the basket (see photo 6). The operator controlled the boom lift from the basket and elevated it to approximately 20 feet above the ground where they could reach the lower limbs of the tree. The bottom of the basket was approximately 12 feet above the roof of the shed. They decided they needed to pull the cut branches into the basket to keep them from falling and damaging the roof of the garage and the shed. The company owner remained on the ground to operate the chipper.



Photo 6: View of front of boom lift basket. The basket had a capacity rating for two workers or a maximum of 500 lbs.

They were wearing hard hats, safety glasses, and safety boots so there was an awareness of and attention to safety hazards. It is unknown if they were using any other safety equipment at the time of the incident. They were not wearing their fall protection harnesses even though they were in the basket (see photo 7).



Photo 7: The two rented fall protection harnesses in the boom lift basket (circled). Also pictured are the control panel and the foot pedal that was required to be depressed in order to operate the basket.

The coworker was cutting branches with his chainsaw while the operator was pulling the branches into the basket. They were doing this for approximately an hour. The operator opened the side access gate of the basket (see photo 8) in an attempt to get some branches into the basket. The coworker said he was reaching down to pick up his chainsaw when he saw the operator fall from the basket onto the roof of the shed 12 feet below (see photo 9). It is unknown if the operator was leaning outside of the basket and lost his balance while trying to maneuver limbs into the basket or tripped over branches in the basket or the toe board.



Photo 8: View of side access gate of boom lift basket. The gate had a mechanical latch (circled) and swung into the basket when opened. Note that the toe board is in place.

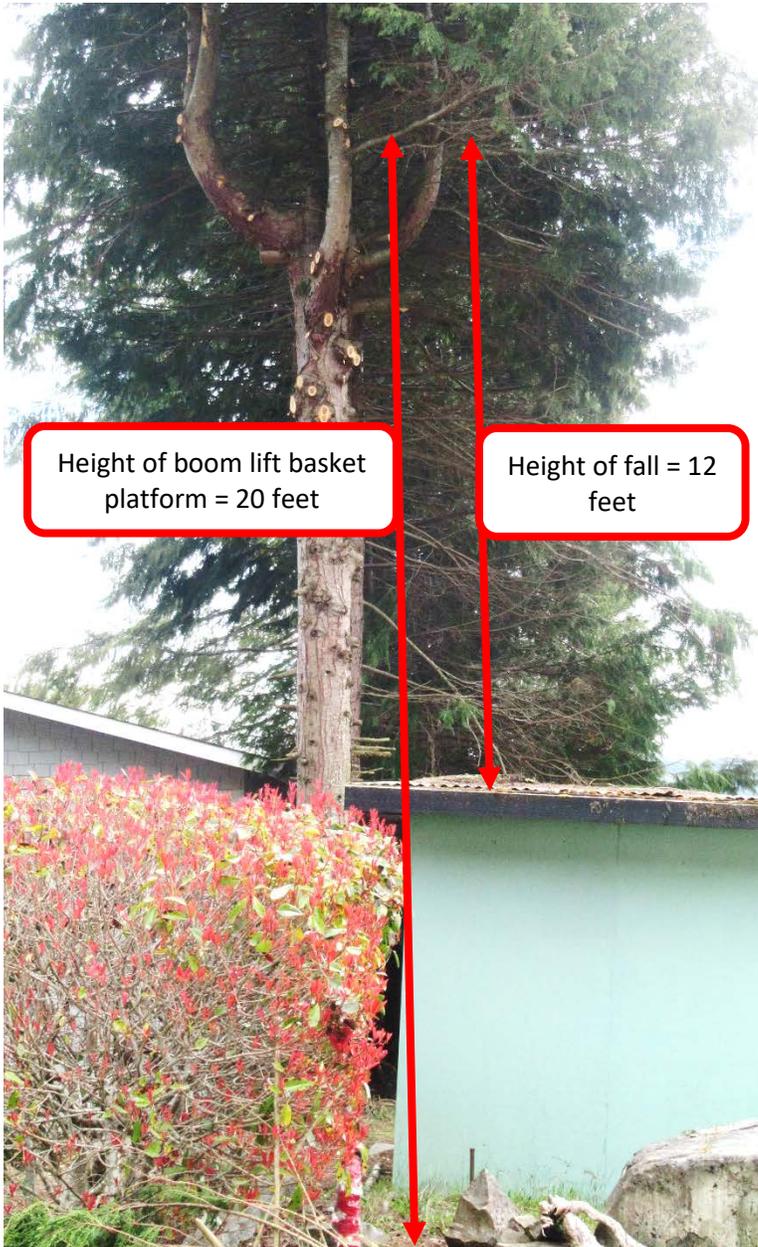


Photo 9: Incident scene tree that workers were limbing and shed that operator fell onto. Red arrows show approximate location and height of boom lift basket and operator's operator fall.

After the operator fell, the employer instructed the coworker to start CPR. They called 911 and the operator was airlifted to a local hospital. He died two days later.

When interviewed, the employer said he did not know why the workers in the basket were not wearing their personal fall protection.

The remains of the cut limbs on the tree indicate that some of the limbs they had cut may have been several inches in diameter. This may have made the limbs difficult to bring into the basket. Some of the smaller limbs can be seen in photo 10. There is no evidence that the boom lift basket moved or shifted prior to the operator falling.



Photo 10: Some of the smaller limbs that the workers collected into the boom lift basket.

A representative from the equipment rental company was interviewed. He confirmed that the employer rented two fall personal protection systems along with the equipment. He also confirmed that the boom lift came with an operator's manual that stated that workers in the basket must wear personal fall protection. He added that the manufacturer recommends to not bring objects into the basket that may exceed the weight capacity or impair the stability of the basket.



CAUSE OF DEATH

According to the death certificate, the medical examiner reported the cause of death as “injuries to the head and neck.”

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. Washington FACE investigators identified the following as key contributing factors in this incident:

- Not wearing personal fall protection.
- Working in boom lift basket with access gate open.
- Overreaching to cut and pull branches into the basket.
- Crowding and trip hazards possibly caused by tree branches in the basket.
- No accident prevention program (APP).
- No job hazard analysis (JHA).

RECOMMENDATIONS/DISCUSSION

Recommendation: *Ensure that workers are trained on how to safely operate and work in boom lifts.*

Discussion: To prevent a fall like the one in this incident, employers should ensure that workers are trained on how to safely operate and work in boom lifts. Currently, there are no OSHA or DOSH standards that specifically cover the safe operation of boom lifts in the tree care industry. There are specific safety requirements regarding the safe use of MEWPs contained in Safety Standards for Elevating Work Platforms, Washington Administrative Code (WAC) 296-869.³ Consensus standards published by the American National Standards Institute (ANSI) cover the safe use of boom lifts, training requirements, and safety requirements for the operation of boom lifts in the tree care industry. These standards are incorporated by reference into DOSH and OSHA standards:

- ANSI/SAIA A92.22-2020: Safe Use of Mobile Elevating Work Platforms (MEWPs)⁴
- ANSI/SAIA A92.24-2018: Training Requirements for the Use, Operation, Inspection, Testing and Maintenance of Mobile Elevating Work Platforms (MEWPs)⁵
- ANSI Z133-2017: American National Standard for Arboricultural Operations - Safety Requirements⁶

The specific ANSI requirements that apply and may have helped prevent this incident had they been implemented include:

- Operators shall only operate MEWPs that they are trained, authorized, and have been familiarized to operate.
- Training shall include both theory (classroom/online) training and practical (hands-on) operation and evaluation.
- All group B MEWP operators and occupants shall use personal fall arrest or fall restraint systems at all times.
- Access gates shall be closed when the boom lift basket is occupied and elevated per the manufacturer’s instructions.

According to the WAC that covers boom lift operator requirements, employers must ensure that operators are trained and qualified before they are authorized to operate boom lifts.⁷ According to ANSI 92.20-2020, a qualified person is one who, through training and experience, has successfully demonstrated their ability to solve or resolve problems related to the work. ANSI also states that training should include knowledge regarding hazards. Even though the employer considered the operator more experienced than him, it is unknown if the operator was trained and qualified to operate the boom lift in this incident in accordance with the WAC requirements or ANSI standard.



The workers involved in this incident also should have been trained on the proper use of full-body harnesses and lanyards, the approved attachment points for their lanyards, not to open the side access gate while the boom lift is elevated, and the appropriate lanyards to prevent them from falling and landing on the structures below. If using a fall arrest system, it must be rigged to allow a maximum free fall distance of six feet nor allow an employee to contact any lower level.⁸ If using a fall restraint system, an adjustable non-shock absorbing lanyard configured to keep workers on the platform and inside the railing while allowing them to do their work and is an option. Another option is a self-retracting lanyard (SRL) which can be used in arrest or restraint mode. Some SRLs are not designed to be used where the attachment point to the anchor is lower than the attachment point to the user so the manufacturer's specifications must be reviewed.

In addition, employers should train workers to limit the amount of items brought into the basket and to keep the basket clear of trip hazards. By gathering cut branches into the basket, the workers may have created cramped conditions or trip hazards. ANSI Z133-2017 specifically states that aerial devices shall not be used as cranes or hoists to lift, support, or lower tree parts unless where designed by the manufacturer to do so.

A tree removal safety specialist was interviewed about the practice of gathering cut branches into the basket. He related that he did not think it was common practice in the tree care industry. His rationale was that gathering branches in the basket made working difficult and that crews use rigging techniques to move cut branches to the ground. In this incident, there appears to have been sufficient distance between the tree and the structures for the crew to have used a high anchor with a pulley or a high anchor in conjunction with satellite anchors and pulleys to lower cut branches directly to the ground below. The crew could have also used a targeted-side line, also known as a speed line technique where cut branches are transported in a sling down a line to a drop zone on the ground. These techniques can protect customer property, deliver branches near the chipper, and increase crew efficiency. Crews must be properly trained prior to attempting these techniques.⁹

Recommendation: Ensure that workers always wear personal fall protection when they are exposed to fall hazards while working in boom lifts.

Discussion: In order for tree care industry employers to have effective fall prevention for workers in boom lifts, they should ensure that workers use proper fall protection equipment and follow safety procedures. To ensure this, employers should communicate the identified fall hazards and their plans for controlling them to workers.

After workers are informed of fall hazards and safety controls, employers should get a confirmation from workers that they understand. Employers should then ask workers for a commitment that they agree to use fall protection and follow the safety procedures prior to the start of each job. This can be done with an informal verbal confirmation or a written JHA signed by all involved.

There is an explicit WAC¹⁰ and OSHA standard¹¹ that requires fall protection for workers in boom lift baskets. The requirement is not specific to the tree-care industry but applies to all workers on boom-supported elevating work platforms. It states that employers must make sure workers wear a full body harness and lanyard fixed to manufacturer provided and approved anchorage points.



Recommendation: Develop an accident prevention program (APP) that describes the hazards associated with tree trimming and tree removal and how to control them.

Discussion: An APP is the foundation of a company’s safety program. It is required for all employers in Washington State and should be developed when the company is formed and before any work begins. At a minimum, the APP should include a list of all known and expected hazards associated with specific jobs. In this case, the employer’s APP should have included sections covering the fall hazards associated with working in boom lifts.

To develop a new APP or to review an existing APP, employers can use a sample template¹ and review the previously referenced ANSI standards and WACs. In addition, tree care industry employers can review the following WACs to help identify hazards they may encounter and how to control them:

- Line-clearance tree-trimming operations, WAC 296-45-455¹²
- Safety Standards—Logging Operations, WAC 296-54¹³
- General Industry Standards, WAC 296-800¹⁴

Employers should frequently review their APP to add newly identified hazards and more details about known hazards and the safety procedures they will implement to control them. For each hazard, the APP should include procedures for how employers and workers plan to control hazards to prevent injuries.

Recommendation: Conduct a job hazard analysis¹⁵ (JHA) before starting a new job to identify the hazards associated with each step and how they will control them.

Discussion: While an employer’s APP should cover common and expected hazards like falls and how to prevent them, every job poses unique hazards. A JHA is a simple risk assessment tool used to go step-by-step through a job to identify the hazards associated with each step. For each identified hazard, employers should develop safety procedures and choose the right tools and protective gear to prevent injuries.

Employers should do a JHA before the start of each new job to address the unique hazards. It should be done with the entire crew prior to doing the work. Employers are specifically required to do and document a hazard assessment for PPE.¹⁵ For each step employers and crews should ask, “What could go wrong and how can we prevent being injured?” The JHA should be revisited if the work changes significantly or new hazards are identified during the job.

The ANSI Safe Use of MEWPs standard states that is the user’s (the employer in this incident) responsibility to ensure a risk assessment is performed by a qualified person. In addition to identifying and controlling the hazards, ANSI requires that a risk assessment include rescue plans when working at heights and that the results of the risk assessment be communicated to all involved with the work.

By doing a JHA for this job, the employer should have identified the fall and high-voltage power line hazards associated with working in an elevated boom lift basket and the hazards associated with using chainsaws. The employer should have also reviewed and incorporated specific sections on the appropriate personal protective equipment (PPE) such as helmets, face shields, hearing protection, protective footwear and clothing like chaps that should be worn by workers doing these jobs. Had the employer and the crew done a JHA to assess and control their risks, it should have also identified the risk of falling from the boom lift platform through the open access gate. The resulting safe work procedures should have included to never open the side access gate when the boom lift is elevated and to use the supplied personal fall protection to prevent workers from landing on the garage and shed below in the event of a fall.

ADDITIONAL RESOURCES

Hazard Alert: Falls from Elevating Work Platforms

www.lni.wa.gov/safety-health/preventing-injuries-illnesses/hazardalerts/ElevatingWorkPlatforms.pdf

Fall Protection Work Plan Template

www.lni.wa.gov/forms-publications/F417-272-000.pdf

Aerial Lift Safety - CPWR

www.cpwr.com/wp-content/uploads/2013/12/Aerial-Lift-Safety-TBT_0.pdf

PSHA Fact Sheet - Aerial Lifts

www.osha.gov/sites/default/files/publications/aerial-lifts-factsheet.pdf

REFERENCES

1. Accident Prevention Program
www.lni.wa.gov/safety-health/preventing-injuries-illnesses/create-a-safety-program/accident-prevention-program
2. Weather Underground
www.wunderground.com/history/daily/us/wa/seatac/KSEA/date/2020-4-2
3. Safety Standards for Elevating Work Platforms, WAC 296-869
www.apps.leg.wa.gov/wac/default.aspx?cite=296-869
4. ANSI/SAIA A92.22-2020: Safe Use of Mobile Elevating Work Platforms (MEWPs)
<https://shop.saiaonline.org/shopexd.asp?id=104>
5. ANSI/SAIA A92.24-2018: Training Requirements for the Use, Operation, Inspection, Testing and Maintenance of Mobile Elevating Work Platforms (MEWPs)
<https://shop.saiaonline.org/shopexd.asp?id=102>
6. ANSI Z133-2017: American National Standard for Arboricultural Operations - Safety Requirements
www.tcia.org/tcia/News/Business/ANSI_Z133_2017_Revision_Overview.aspx
7. Elevating Work Platforms, Operator Requirements, WAC 296-869-20020
www.app.leg.wa.gov/wac/default.aspx?cite=296-869-20020
8. Personal fall arrest system requirements, WAC 296-880-40020
www.app.leg.wa.gov/wac/default.aspx?cite=296-880-40020
9. Rigging Introduction
www.wesspur.com/info/rigging-introduction.html
10. Elevating Work Platforms, Working From the Platform, WAC 296-869-20045
www.app.leg.wa.gov/wac/default.aspx?cite=296-869-20045
11. Occupational Safety and Health Standards- Vehicle-mounted elevating and rotating work platforms
www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.67
12. Line-clearance tree-trimming operations, WAC 296-45-455
www.app.leg.wa.gov/wac/default.aspx?cite=296-45-455
13. Safety Standards—Logging Operations, WAC 296-54
www.apps.leg.wa.gov/wac/default.aspx?cite=296-54
14. General Industry Standards, WAC 296-800
www.apps.leg.wa.gov/wac/default.aspx?cite=296-800
15. Job Hazard Analysis, OSHA 3071
www.osha.gov/sites/default/files/publications/osha3071.pdf
16. Hazard Assessment for PPE, WAC 296-800-16005
www.app.leg.wa.gov/wac/default.aspx?cite=296-800-16005



INVESTIGATOR INFORMATION

Todd Schoonover has a PhD in Industrial Hygiene from the University of Illinois at Chicago. He is a Certified Industrial Hygienist (CIH) and Certified Safety Professional (CSP). Todd is currently the Principle Investigator for the WA FACE Program.

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ACKNOWLEDGEMENTS

This report was reviewed by stakeholders from labor and business communities and various Washington State and Federal worker safety agencies. Though we are unable to acknowledge specific individuals for their contributions to this report, we would like to recognize the following for their help and support of the FACE mission and objectives:

- Division of Occupational Safety and Health (DOSH)
- Federal FACE Program management (NIOSH)
- Safety & Health Assessment & Research for Prevention (SHARP)

DISCLAIMER

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