

Exhibit No. 10

DECLARATION

Background

DR. ROBERT HARRISON, DR. DAVID REMPEL, AND. DR CARISA HARRIS ADAMSON jointly declare as follows: We are all over the age of eighteen, citizens of the United States, and otherwise competent to testify. We make these statements based on personal knowledge and belief. We have been retained by the State of Washington as expert witnesses in the above matter. We decided that submitting a joint declaration would reduce overlap in opinions and be more efficient for the parties and the Board. Our respective qualifications include:

Robert Harrison, MD, MPH has authored or co-authored more than 40 medical and scientific articles in peer-reviewed journals, more than 35 other publications, including book chapters, contributed articles, and letters to journal editors, and more than 25 governmental and other reports. I am the co-editor of the major textbook in the field of occupational medicine (*Ladou and Harrison, Eds. Current Diagnosis and Treatment: Occupational and Environmental Medicine, McGraw-Hill, 2021*). In the course of my clinical work at the University of California San Francisco, I have examined and treated thousands of patients with occupational and environmental injuries and diseases. In my work as a physician and internal medicine specialist, I have treated and consulted with patients who have work-related musculoskeletal disorders (WRMSDs). As an occupational medicine physician, and as an Independent Medical Examiner and Qualified Medical Examiner for the State of California, I have evaluated the cause of patients' WRMSDs. In so doing, I have prepared reports concluding that WRMSDs in workers were caused by occupational exposure to ergonomic hazards. These reports have been accepted and relied upon by the Workers' Compensation Appeals Board in awarding California workers benefits for such work-related injuries. Over the past 30 years, I have consulted with, prepared reports, and testified for Federal OSHA on citations involving companies with hundreds of workers with WRMSDs. With my colleagues Carisa Harris-Adamson, PhD, I conducted a site visit to the Amazon BFI4 warehouse on January 4, 2022. Attached please find my recent *curriculum vitae*.

David Rempel, MD, MPH, CPE is an Occupational Medicine Physician and Certified Professional Ergonomist with greater than 30 years of consulting and research experience in industrial and office ergonomics and occupational medicine. I am board certified in internal medicine, occupational medicine, and ergonomics. I am a licensed physician in the State of California. I was a public health medical officer for the State of California from 1985 to 1990, where one of my responsibilities was to serve as consultant to Cal-OSHA on various projects including warehouse work. I founded the University of California Ergonomics Program at UC Berkeley in 1990 where I was responsible for research and the training of ergonomics to occupational medicine physicians, occupational health nurses, and industrial engineering, industrial hygiene, and ergonomics graduate students. I was also responsible for the clinical training of Occupational Medicine Fellows on the diagnosis, treatment and prevention of work-related musculoskeletal disorders. I provided continuing education in ergonomics and the medical management of work-related musculoskeletal disorders to health and safety professionals throughout North America. I was a Qualified Medical Examiner for the State of California and evaluated patients with MSDs and made determinations on whether the conditions were work-related and how they should be treated. I retired from the University of California in 2015 but continue to conduct ergonomics consulting with government agencies and international companies. I remain on faculty as Professor Emeritus in the Department of Bioengineering at the UC at Berkeley and in the Department of Medicine, Division of Occupational Medicine at the UC at San Francisco. I have published and presented over 500 peer-reviewed scientific papers, book chapters and abstracts on issues related to ergonomics and work-related musculoskeletal disorders. I served on a Board and Panel on human factors, ergonomics, and musculoskeletal disorders for the National Academy of Sciences and continue to serve on the Physical Agents Committee of the ACGIH. I conducted detailed job analyses with Carisa Harris Adamson, PhD at the Kent warehouse on December 15, 2021. Attached please find my recent *curriculum vitae*.

Carisa Harris Adamson, PhD, CPE is an Associate Professor in the Department of Medicine at the University of California at San Francisco (UCSF) with a secondary appointment at the University of California at Berkeley in the Division of Environmental Health Sciences. I have authored/co-authored more than 40 peer reviewed publications, 4 book chapters, and co-authored a report for the International Labor Organization on Principles & guidelines for human

factors/ergonomics design and management of work systems. I am the Director of the UCSF/UC Berkeley Ergonomics Research & Graduate Training Program located at the Richmond Field Station, an annex of the UC Berkeley School of Engineering. Additionally, I am the Director of the Northern California Center of Occupational and Environmental Health (COEH) at UC Berkeley and the Northern California NIOSH Education and Research Center (ERC). I received a PhD in Environmental Health Sciences with an emphasis in Ergonomics from UC Berkeley and hold three Master's Degrees in related fields. I have worked in Occupational Health and Ergonomics for about 20 years; my experience ranges from treating occupational health injuries as a prior Physical Therapist to managing an R&D team for a national providers of injury prevention and treatment services. As head of R&D, I consulted for large Fortune 500 businesses, most of whom were self-insured and were interested in implementing robust injury prevention programs. I conducted detailed job analyses at the Kent warehouse on December 15, 2021 and on January 4-5, 2022. Attached please find my recent *curriculum vitae*.

We have reviewed the following data and documents:

- L&I WIN Enforcement Case File Information #20340782 (3/22/21);
- WA DOSH Inspection #317961850;
- WIN_WISH-CNN_317961850;
- 2022-05-02 AMA (BFI4) MPA ISO Request for Stay of Abatement ;
- 2022-05-02 AMA (BFI4) Mills Declaration ISO Amazon's Motion to Stay Abatement, compressed ;
- 2022-05-02 AMA (BFI4) Racco Declaration ISO Amazon's Motion to Stay Abatement;
- Declaration of G Brown
- Amazon Safety Committee (ASC) Meeting Minutes (#18) from January to September 2021
- Amazon Documents
- Attachment E – Safer Start
- Attachment B – WHS Ergonomics Program Procedures NA
- Attachment K – Biomechanical Assessment of Pick
- Attachment D – Safety Rodeo
- Attachment F – Safer Start Training Records
- Attachment A – Amazon BFI4 Injury and Illness Prevention Program
- Attachment G – Safety Rodeo Training Records
- Attachment J – AR Pick Job Hazards Analysis 2021

Based on that review, it is our opinion, on a more probable than not basis, that there will be many more serious musculoskeletal injuries to Amazon employees at its Kent warehouse if Amazon's duty to abate the alleged violations is stayed while this matter is in litigation. We have reached this conclusion for the following reasons:

Injury Rates at Kent are High Relative to All Other Warehouses.

The OSHA 300A data for the Kent (BFI4) warehouse records are summarized in the table below. The number of injuries and rates of injuries (DART rate) changed from year to year with a reduction in DART rates between 2019 and 2020 when there was a large increase in reported total work hours. However, the number of cases and number of days of job transfer or restrictions have steadily increased from year to year. Most OSHA 300 recordable injuries and illnesses and workers compensation cases are musculoskeletal injuries. It should be noted that work related musculoskeletal disorders are classified differently over time, with most classified as injuries in 2016-2019 but in 2020 there was a shift to classifying more cases as illnesses.

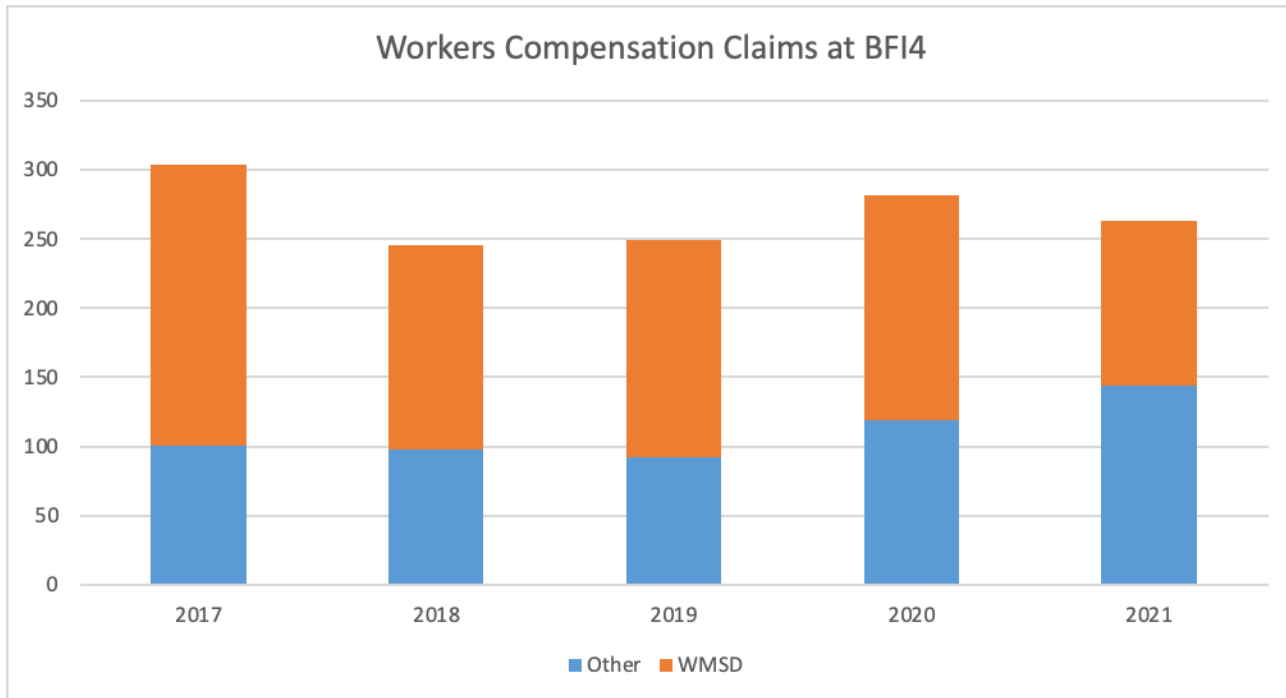
While the DART rates at the Kent warehouse dropped between 2019 and 2020, the rates were still well above the average 2020 DART rate of 6.3 for all Amazon warehouses in the US. Furthermore, in 2020, 2019, and 2018 the DART rates for all warehouses in the US were 4.0, 3.9, and 4.0, respectively (https://www.bls.gov/web/osh/summ1_00.htm (accessed 04 24 2022); NAICS code 49311). Using Federal OSHA data, which has 300A data for 2020 for every enterprise in the US with 100 or more workers, the DART rate, for all warehouses, except Amazon, was 1.9 (<https://www.osha.gov/Establishment-Specific-Injury-and-Illness-Data>). In 2020, for Amazon warehouses with 100 or more workers, the DART rate was 9.0.

2016 – 2020 Summary of Kent BFI4 OSHA 300A Log Reports.

	2016	2017	2018	2019	2020	2021
Total hours worked by all employees	3,783,797	5,080,214	4,397,107	4,407,907	6,498,400	5,892,153
No. of cases with days away from work	189	265	228	176	175	145
No. of cases with job transfer or restrictions	77	104	54	131	165	164
No. of other recordable cases	27	58	34	17	12	38
No. of days away from work	10,689	12,699	9,894	6,191	5,798	4,421
No. of days of job transfer or restrictions	7,112	9,141	7,349	12,282	13,591	16,471
No. of injuries	286	415	307	324	352	347
No. of other Illnesses	7	10	9	23	153	66
DART Rate	14.1	14.5	12.8	13.9	10.5	10.5

The figure below summaries of the number of workers’ compensation cases by year for WMSDs and other injuries. As can be seen there is little change in serious injury numbers over the past 5 years.

Number of WMSD and other workers’ compensation injuries at the Kent warehouse by year.



This evidence clearly shows that the manual materials handling tasks at the BFI4 warehouse expose Amazon employees to hazards that are well known to cause serious and disabling MSDs. If Amazon does not take the necessary steps to

immediately correct these hazards, employees will continue to be exposed to these hazards and will experience serious physical harm while this matter is pending at the Board.

The Safety Interventions Used at BFI4 to Prevent Musculoskeletal Injuries are Limited to Coaching Workers on Ways to Lift and Handle Material, Stretching, and other Behavioral Based Methods. This Approach is Not an Ergonomics Program and it Will Not Reduce Risk.

The Amazon Corporate Ergonomic Procedures standard (WHS Ergonomics Procedures, March 20, 2020, Version 10.0, 44 pages) provides a well-designed standard for ergonomics program requirements. The document outlines the responsibilities of the leadership, safety teams, and associates, required training on ergonomics processes, work design guidelines, reporting and record keeping requirements, and recommendations for risk assessment tools to use for assessing risks for musculoskeletal disorders and muscle fatigue. Ten risk assessment tools are recommended in the standard including the Revised NIOSH Lifting Equation (RNLE) and the ACGIH Hand Activity TLV. An Ergonomic Analysis Report Template is described for summarizing the risk methods used, findings, and recommendations. The standard also lists examples of engineering solutions for reducing biomechanical risk factors in Appendix K - General Engineering Controls Guideline Document.

Unfortunately, it does not appear that management at the Kent (BFI4) warehouse followed this standard. Furthermore, there was no evidence that standard ergonomics risk assessment tools, that are widely used in North American, such as the Revised NIOSH lifting equation, the ACGIH Hand Activity TLV, the ACGIH Upper Limb Localized Fatigue TLV, the Strain Index, or the Ohio State Push/pull Guidelines were used for risk assessment at these warehouses.

The Kent warehouse written Injury and Illness Prevention Program (05/04/2021) focuses primarily on identifying employee behavioral problems for reducing risks for injuries and there is almost no mention of identifying engineering interventions. For example, to prevent musculoskeletal disorders the document lists training on “proper lifting technique” (p14). In each of the Kent warehouse monthly Amazon Safety Committee (ASC) meeting notes (January to September 2021, Days and Nights), the high rates of injuries/musculoskeletal disorders are reviewed along with their associated biomechanical risk factors, such as repetitive motions; overreaching; handling and lifting heavy cases; lifting & twisting; unlabeled items above 50 lbs.; reaching above shoulder height; etc. However, almost all solutions recommended are behavioral, e.g., huddle engagements; avoid awkward postures; take time to recover from exertions; engage your core when lifting; take short bursts of frequent microbreaks to perform stretches; use a handshake wrist position; shoulders back when lifting; activate the hip muscles when lifting; mind & body moments; take 10 seconds every half hour to shake out the hands/arms; etc. The 2020 BFI4 (Kent) Safety Rodeo slides on Ergonomics (v 2.45) only discuss “appropriate” postures during movements – there is nothing about standard ergonomic processes. Working Safely – AR, V3 17.05.21 discusses body mechanics (e.g., power zone, the C-grip for the hand not the L-grip, never twist your back, bend at hips and knees never at your waist, etc.) and stretching – again nothing about standard ergonomic processes.

While Amazon claims that BFI4 is successfully implementing an ergonomics program by hiring Injury Prevention Specialists (“IPS”), the focus of this intervention is on “coaching” workers on how to perform work more safely. Based on Mr. Brown’s declaration, there is substantial focus on coaching workers and expecting them to prevent injury using stretching, wellness knowledge, and safe lifting techniques while performing jobs that are inherently hazardous by design.

- “... monitor weekly injury reports and reviews trends monthly. If we identify patterns indicative of ergonomic risk in certain process paths, we prioritize these processes for individual assessment and coaching with the associates.”
- “Proper body mechanics and individualized assessments are reinforced daily by BFI4’s IPSs, who are required to complete individual supportive coaching encounters with associates during their shifts as a part of their daily standard work.”
- “BFI4 has also implemented the WorkingWell Program, which uses academic research and Certified Athletic Trainers to educate new employees about their bodies, health... Associates are required to participate in monthly WorkingWell Huddles where they meet with an Area Manager or Site Lead in small groups to learn proper body mechanics, proactive wellness, and safety.”

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- “WorkingWell also includes a stretching program where a manager or “Lead” guides associates through preventative stretching exercises at least once per shift.”

The May 5, 2022 declaration of Mr. Brown outlines their “ergonomics program” to address the high injury rate. But the program as described is primarily a body mechanics program and not an ergonomics program. The DOSH investigation (Case File) reports that management’s focus at BFI4 is on lifting techniques and stretching. These are not components of an effective ergonomics program and do not address the musculoskeletal hazards at BFI4. Although Mr. Brown refers to basing interventions on the well-known, standard occupational health and safety understanding of hierarchy of interventions (elimination of risk, engineering controls, administrative controls, then behavioral controls such as worker training and PPE), this hierarchy is not followed in the list of interventions that he provides which includes the “Safety School”, the “Working Well Program” and Athletic Trainers who “coach” the employees while they work. Further, the one engineering control that Mr. Brown did refer to (the destuffer) could not have been evaluated properly since its implementation; although the destuffer reduced some awkward posture it increased other awkward postures and dramatically increased the rate of work. Because of the way this engineering control was implemented, it was ineffective in reducing risk of injury.

Comments on ASC February 2021 Nights meeting minutes note, that when recommended stretches pop up on employees’ screens, employees reported that the time counts against them and can affect their work rates or penalize them by giving them TOT (time off task). There is a note that stretching should not count against their time. There is a note (ASC Meeting Minutes, April 2021 Days) that site safety resources include (1) Onsite Medical Representatives (OMRs) who are EMTs, (2) Injury Prevention Specialists (IPs) are “Nationally and state certified Athletic Trainers” who “improve setup and body mechanics”, and (3) Safety Specialists. There is no evidence that these resources have training or experience with ergonomic procedures. A note from ASC Meeting Minutes July 2021 Nights suggests creating a plan to use pallet lifts, which is an effective engineering intervention. However, no pallet lifts were observed during our site visits.

The physical demands of the work processes at BFI4 are so high that only engineering abatements, reduced work hours, or reduced pace of work will lower the risk of injury. There are feasible engineering interventions for abatement, that, if immediately and properly implemented, would reduce the risk of serious physical injury. It is well understood in the medical and scientific literature that the early reporting and identification of musculoskeletal symptoms and immediate correction of the ergonomic hazards can reduce the risk of serious, disabling work-related MSDs. Consistent with scientific literature, the behavioral training provided at the Kent warehouse has little or no effect on reducing injuries.

Risk Assessments of Work Processes at BFI4 Identify Serious Hazards.

The tools described by Mr. Brown for evaluating job risks, RULA and REBA, are useful for initial screening, but the high-risk jobs observed at BFI4 should be evaluated with more detailed risk assessment tools that are commonly used by industry in North America, such as the Revised NIOSH Lifting Equation. A well-developed ergonomics program uses management methods that identifies and tracks high risk jobs, identifies and designs engineering interventions to reduce those risks, assigns responsibility for executing the interventions, tracks completion dates, and re-evaluates risks.

The initial Washington L&I inspections were triggered by complaints from BFI4 workers. Usual practices for identifying hazards were used during the walkthroughs while accompanied by Amazon Managers and/or Safety personnel. Ultimately, jobs (also referred to as “process paths”) were selected for detailed analyses based on the walkthroughs, the review of injury data from the warehouse, and past experience or knowledge of evaluating risks of warehouse jobs. The exposure assessment methods we used are those commonly used by ergonomists in North America that assess physical exposures associated with regional body pain, musculoskeletal fatigue, and musculoskeletal disorders. The methods included employee surveys, videos of jobs, measurements of workstations and body postures, measurements of applied forces, measurement of weights of objects handled, and the use of other measurement devices.

Because there are no Washington State workplace standards that limits physical exposures at work, such as repeated lifting or repetitive use of the hands, the standard risk assessment tools widely used by U.S. industry and by ergonomics practitioners, were used to identify hazardous jobs and tasks. These were the Revised NIOSH Lift Equation, the Ohio Bureau of Workers’ Compensation (OBWC) Guidelines for Pushing and Pulling, the Liberty Mutual tables, the 2020 ACGIH Hand Activity TLV (HA TLV), and the 2020 ACGIH Upper Limb Localized Fatigue TLV (ULLF-TLV). Data

for the risk calculations were collected using video, survey assessments, workstation measurements, force measurements, scales to measure the weights of boxes and objects handled, and other instruments (e.g., Lumbar Motion Monitor). The methods used to quantify the hand forces applied by workers were the worker-rated BORG CR-10 scale and a biomechanical calculation based on the weights of the objects handled.

Based on the detailed exposure measurements and risk assessments, the risk of injury for the following jobs (process paths) analyzed at the Kent Warehouse can be summarized as:

- (1) The Inbound Unloading process performed manually poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor indicated that workers have a moderate to high probability of being at risk for low back disorders when handling loads 28.9lbs or higher; 25% of loads handled during this process exceeded 28.9lbs. The Revised NIOSH Lift Index threshold limit value of 1.0 was exceeded when handling loads more than 5lbs; 79% of the items we weighed exceeded 5lbs. Additionally, the high stacks and stairs pose additional safety hazards of getting struck by objects or falling.
- (2) The Inbound Unloading process performed using the destuffer poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor findings indicated that workers have a moderate to high probability of being at risk for low back disorders when handling loads above 13.9lbs and 28.9lbs, respectively. Fifty percent of loads measured were above 13.9lbs and 25% of loads measured were above 18.9lbs. The Revised NIOSH Lift Index could not be calculated because the average lift rate of 15.6lifts per minute exceeded the allowable lift rate for any duration of time; thus, the lift is considered unsafe.
- (3) The Inbound Palletizer process poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor findings indicated that workers have a moderate to high probability of being at risk for low back disorders when handling loads above 8.9lbs and 28.9lbs, respectively. Seventy-five percent of loads measured were above 8.9lbs and 25% of loads measured were above 28.9lbs. Based on the Revised NIOSH Lift Equation and given the characteristics of the lifts, the frequency for items weighing 2.5lbs or less should be 8 lifts or fewer per minute; for items weighing 7.5 pounds or less, the frequency of lifts should be 3 lifts per minute or less. The average lift rate measured was 10.6 lifts per minute.
- (4) The Inbound/Outbound Waterspider requires pulling loaded pallets with a pallet jack which poses a **hazardous risk** for low back musculoskeletal disorders. Based on the OSU OBWC Guidelines, at this handle height, if the pull force exceeds 44 lbs then the task is a moderate-risk hazard, and if it exceeds 53 lbs it is high-risk hazard. Based on the Liberty Mutual equations and considering pulling a cart for 194' (average of measured distances), with an average pull force of 29.9 lbs, then to accommodate the 25th percentile female, the maximum frequency of pulls would be one every 2 minutes.
- (5) The Stow process poses a **hazardous risk** for upper extremity musculoskeletal disorders. Based on the ACGIH Hand Activity TLV and the ACGIH Upper Limb Localized Fatigue (ULLF) TLV, the average item weight was well above the maximum loads calculated to be acceptable to accommodate the 25th% female.
- (6) The Pick process poses a **hazardous risk** for upper extremity musculoskeletal disorders. Based on the ACGIH Hand Activity TLV and the ACGIH Upper Limb Localized Fatigue (ULLF) TLV, the average item weight was well above the maximum loads calculated to be acceptable to accommodate the 25th% female.
- (7) The Pack Singles process poses a **hazardous risk** for upper extremities musculoskeletal disorders. Based on the ACGIH Hand Activity TLV and the ACGIH Upper Limb Localized Fatigue (ULLF) TLV, the average item weight was well above the maximum loads calculated to be acceptable to accommodate the 25th% female.
- (8) The AFE Rebin process poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor indicated that handling weights in every weight category yielded a high probability of workers being at risk for low back disorders.
- (9) The Outbound Scanner process poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor findings indicated that handling weights in every weight category yielded a moderate or high probability of workers being at risk for low back disorders when handling loads above 2.3lbs and 39.8lbs,

respectively. Seventy-five percent of loads measured were above 2.3lbs and the maximum weight measured was 39.8lbs. The average lift rate of 19 lifts/minute exceeded the maximum allowable frequency limit of 15 lifts/minute, which assumes that all other characteristics of the lifts are ideal, for any duration of time.

- (10) The Outbound Trailer Loading process poses a **hazardous risk** for low back musculoskeletal disorders. The Lumbar Motion Monitor findings indicated that handling weights in every weight category yielded a moderate or high probability of workers being at risk for low back disorders. Seventy-five percent of loads measured were above 2.3lbs and the maximum weight measured was 39.8lbs. Based on the Revised NIOSH Lift Equation (RNLE), the observed frequency of 12-15 lifts per minute is not safe for any loads handled greater than 1 hour. Thus, the frequency of lifts and the duration of lifting exceed safe limits. Additionally, multiple characteristics of the lifts exceeded any safe load amount. Specifically, the horizontal distance of 25” and vertical distance of 82” both exceed safe lifts for any load.

Many Engineering Interventions are Available that will Reduce Risks for Musculoskeletal Injuries, but these Have Not Been Adopted at BFI4.

The elements of a proper ergonomics program for warehouses and other similar work are well described in the literature and in Amazon’s own material. The Amazon Corporate Ergonomic Procedures standard (WHS Ergonomics Procedures, March 20, 2020, Version 10.0, 44 pages) provides a well-designed standard for ergonomics program requirements (see above for details). Other examples from the literature are: A Best Practices Guide for the Reduction of Musculoskeletal Disorders in Food Distribution Centers by William Marras et al., Institute for Ergonomics, The Ohio State University, 2005. Also, Industrial Ergonomics, A Practitioner’s Guide, by David Alexander et al., Institute for Industrial Engineers, 1985. Also, Grocery Warehousing eTool. OSHA, Occupational Safety and Health Administration, U.S. Department of Labor, n.d. Web, <https://www.osha.gov/etools/grocery-warehousing>.

In addition, there are many ergonomics experts in the U.S. who are experienced with establishing well-designed ergonomics programs for warehouse work. There are some among the health and safety staff at Amazon headquarters. There are also experts at large health and safety consulting companies, such as Velocity EHS. Despite Amazon’s own materials on good ergonomic practices, and the well-known ergonomic practices listed in this and other literature, the safety program at BFI4 is focused on behavioral interventions, that are known to be ineffective in preventing musculoskeletal injuries.

A well-developed ergonomics program systematically identifies biomechanical risks for processes, workstations, and tools and implements engineering interventions to reduce those risks, followed by re-assessments to ensure that new risks are not introduced. Many such widely available interventions were identified for each of the work processes at BFI4:

- (1) For the Inbound/Outbound Unloading/Loading & Waterspider processes:
 - a. Eliminate manual unloading/loading of floor stacked boxes altogether.
 - b. Use forklifts, motorized pallet jacks, or manual pulled Go Carts to move boxes in and out of the trailer rather than floor loading/unloading of boxes.
 - i. The pull and push forces involved in manually moving pallet jacks and Go Carts should be within the yellow or green zone of forces listed in “An Objective Set of Guidelines for Pushing and Pulling” that is published by the Ohio Bureau of Workers’ Compensation and Ohio State University.
 - c. If the trailer must be floor stacked, the loading/unloading of boxes should be performed using a destuffer modified to reduce twisting, plus the pace of work should be set using appropriate risk assessment tools to identify safe frequency of lifts.
 - d. A system should be developed to train workers to identify and sideline Go Carts or pallet jacks with stiff/defective wheels so that those devices are not used until the wheels are repaired.

- (2) For the manual Palletizing process:

- a. Improve the characteristics of the lift by using a cart that has a height adjustable bottom.
 - b. Reduce the frequency of lifts per minute
 - c. Eliminate lifts by replacing them with slides
 - d. Provide vacuum lifts to move heavy boxes
 - e. Provide pallet lifts that also rotate
- (3) For the Stow and Pick processes:
- a. The pace of work should be set using the results of modeling and ergonomics analysis methods such as the ACGIH TLVs.
 - b. Heavy items should be programmed to be placed in the robot racks that are near optimal height (e.g., 30" above the floor); they should not be stored in the upper or lower racks. The upper and lower racks should be programmed for storage of lightweight items.
- (4) For the Pack Singles process:
- a. Modify the process to eliminate or reduce the duration of the pinch, gripping, and lifting of items weighing more than 0.5 lbs.
 - b. Reduce the frequency and duration of item and box handling so that the task does not exceed the ACGIH Hand Activity TLV or the ACGIH Upper Limb Localized Fatigue TLV.
 - c. Modify the scanner support device so that the scanner can be easily removed and returned when hand scanning.
 - d. Adjust the bench height and the height of frequently handled items, especially heavier items, to a more optimal height for material handling (between the waist and shoulder).
- (5) For the AFE Rebin process:
- a. Eliminate the use of the lowest height shelf.
 - b. Heavy items should be programmed to be set in the AFE racks at near optimal height (e.g., 30" above the floor). In addition, heavy items should be programmed to be set in racks to reduce their carrying distance. Light weight items should be programmed to go to the low or high shelves.
 - c. The maximum lift rate should be reduced so that the Lift Index of the Revised NIOSH Lifting Equation does not exceed 1.0 based on the weights of items handled, the vertical height of the cubby, and the frequency of lifting.
- (6) For the Outbound Scan & Cart Loading process:
- a. Reduce bending or overhead reaching when filling a cart by using carts that have a height adjustable bottom.
 - b. Reduce the frequency of lifts per minute
 - c. Eliminating lifts by replacing a lift with a slides
 - d. Providing vacuum lift systems for lifting heavier boxes.

The pace of work at Amazon poses a serious risk of WRMSDs to Amazon Kent warehouse employees.

Amazon's assertions regarding efforts to reduce the high rate of injuries do not touch on the issues of the pace of work required of its employees; the role of the quota system; the hours worked (especially over-time); and provision of breaks. These factors are very important contributors to muscle fatigue and injury. When the muscles of the shoulders, arms, back or legs are fatigued, and a worker is compelled to continue working, they are at increased risk of injury. When muscles are

fatigued and the worker continues performing the same task, they will modify their work postures and motions, and load other muscles to compensate - muscles that are not appropriate for the loads handled.

The pace of work at BFI4 poses a serious risk of WRMSDs to employees. In describing their productivity goals, Amazon claims that “In reality, Amazon, like most businesses, sets achievable quality and productivity expectations. These include, for example, expectations for the amount of product that associates move during their work shifts. Amazon measures associate performance by comparing each employee’s performance against the actual performance of their peers.” Brown Decl., “Only when that performance falls below 95% of an employees’ peers does Amazon provide training and support to individual associates. Id. BFI4’s productivity measurements allow associates to work comfortably and safely, and the Division offers nothing but conclusory statements to the contrary.” In fact, if the pace of work is not reduced or breaks are not provided, or mandatory over-time is not discontinued, serious injuries will occur. Training in “proper biomechanics” of lifting or load handling will not mitigate the risk of fatigue.

Contrary to Amazon’s argument that they maintain a safe work environment at BFI4, our quantitative risk assessments, applied throughout the facility, identified repetition and frequency of material handling as hazards, with inadequate recovery time based on the pace of work for the loads handled. Indeed, we have documented that excessive work pace, with consequent excessive repetition and frequency rate of work, without adequate time for recovery, poses a serious risk of WRMSDs at BFI4. Most tellingly, the high injury rates at BFI4 bely Amazon’s assertion that “productivity measurements allow associates to work comfortably and safely.” If this was the case, we would expect injury rates at BFI4 that were similar or lower than injury rates at other warehouses.

The hours of the work shifts (10 hours) and requirement for mandatory overtime for some jobs exceeds the norm for the standard risk assessment tools that we employed. Amazon safety and ergonomic experts should be aware of this important risk factor – total hours worked per day or week. Obviously, the more time employees are exposed to an ergonomic hazard, the greater the risk of WRMSDs. Amazon’s statement that this is a “comfortable work environment” suggests a lack of awareness of injury rates, fatigue, and pain experienced by workers. We surveyed 51 workers during our site visits. Workers who performed a wide range of processes were surveyed. Approximately half (53%) of the workers rated their perceived exertion between somewhat hard to maximal exertion. Between 61% and 70% reported feeling moderately to extremely fatigued by the end of their workday and work week, respectively. Twelve of the 18 workers who responded that they had pain in the past 7 days reported taking medication for relief of their pain and 10 of the workers reported at least some difficulty keeping up with their work pace due to their pain. This does not support Amazon’s claim that they provide a “comfortable work environment.” Furthermore, although 7 of the 18 workers received treatment for their pain, only 4 of received treatment from Amazon and 5 workers reported that their symptoms prevented them from doing important activities at home.

The productivity measurement of “time off task” (TOT) for employees creates incentives and penalizes employees for taking the breaks that are needed for adequate recovery time that is medically necessary to prevent fatigue and injuries to the tendons, soft tissues, muscles and nerves. Moreover, penalizing employees for not keeping up with the work pace of co-workers and meeting productivity goals creates substantial work organization stress that independently contributes to risk of WRMSDs. One worker stated “I would like to have lower target rates so that we can be more safe. Safety is reduced when trying to reach targets because we have to go faster.” This statement summarizes in lay terms what should be well known to Amazon’s own safety and ergonomic experts: the current pace of work and job demands are risk factors for injuries at BFI4.

The target for productivity of 95% of peers at BFI4 is far too high to ensure that workers are not exposed to biomechanical hazards that pose a serious risk of WRMSDs given the wide variability in worker age, strength, endurance, stature, and other factors. The injury data at BFI4 clearly show that workers suffer excessive risk of WRMSDs. Therefore, it is evident that the “productivity” expectation that an employee must meet 95% of the average means that many workers at BFI4 will continue to be at high risk for WRMSDs. Again, this is a basic tenet of ergonomics. Amazon should strive to minimize the risk of injuries to their employees. It is evident that Amazon argues that “productivity” and “comfort” (in itself a term that does not pertain to a medical condition or injury) is a priority, and does not mention the prevention of serious WRMSDs (such as lumbar disc herniation, rotator cuff tear, tenosynovitis, muscle or tendon strain, ligament sprain, or nerve entrapment).

As noted, there are feasible and immediate abatement measures that can be implemented at BFI4 that will reduce the risk of WRMSDs caused by the excessive work pace. These include eliminating the requirement for mandatory overtime, maintaining adequate staffing to reduce the physical job demands, and creating a safety culture where penalties and reprimands are not tied to excessive productivity requirements that places priority for product delivery over employee safety.

Conclusions

The abatement steps that are required under the citation are straightforward and will have immediate impact on reducing the risk of serious harm. Five steps are outlined in the citation to correct the injury hazards: (1) Evaluation of engineering/administrative control options; (2) Selection of optimum and feasible control methods and completion of design; (3) Procurement, implementation and installation of control measures.; (4) Testing, modification, and acceptance of controls; and (5) Provide quarterly written updates detailing abatement progress. These are well known steps in health and safety management for addressing work-related MSDs. The longer the hazards at BFI4 remain unabated, the more disabling nerve, tendon, muscle, and joint injuries will be experienced by Amazon employees.

Amazon claims that “this is the complex world of ergonomics, applied to a vast and complex warehouse operation.” In fact, the outlined approach and the interventions listed in the case file can readily be applied to the BFI4 warehouse operations. The current approach used at BFI4 to address the hazards, relying primarily on body mechanics and stretching, will not reduce the hazards at BFI4, and continuing to rely on this approach will lead to more serious injuries to Amazon employees.

We declare under penalty of perjury of the laws of the State of Washington the foregoing is true and correct.

DATED this 12th day of May 2022, in San Francisco, CA



Robert Harrison, MD, MPH

DATED this 12th day of May 2022, in Inverness, CA



David Rempel, MD, MPH, CPE

DATED this 12th day of May 2022, in Walnut Creek, CA



Carisa Harris Adamson, PhD, CPE