FINAL REPORT

Intervention with a Joint Labor Management Health and Safety Committee

In a Dual-lingual High Hazard Industry

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Executive Summary

Methods

Researchers in the Department of Environmental and Occupational Health Sciences at the University of Washington conducted an 18-month-long intervention study funded by the Washington State Safety and Health Investment Program (SHIP) to develop a model dual-lingual health and safety committee (HSC) and to evaluate its effects on health and safety at a high-hazard worksite. The study consisted of a comprehensive baseline assessment of health and safety throughout the worksite, a training intervention for the health and safety committee, post-training support for the committee, and a post-intervention comprehensive health and safety assessment. It was hypothesized that the training intervention would ultimately result in improvements in health and safety performance.

The training intervention was developed to address need for increased worker involvement in health and safety; need for improved group dynamics within the committee; and need for improved HSC policies and procedures as revealed in the baseline health and safety assessment. A primary focus of the intervention was to increase cooperation within the committee; activities were chosen to promote group development and teamwork and were based on adult education principles, participatory training methods, and empowerment education techniques. The training was delivered by study staff and a bilingual facilitator to all committee members. Following the training, study staff continued to attend HSC activities, and provided support and resources to the committee as needed.

Results

Overall, several positive outcomes were observed following the implementation of the HSC training intervention. These included notable accomplishments of the committee, such as the development of a mission statement and charter, writing formal recommendations to management, and establishing an approach to regularly engage the workforce through the departmental safety meetings. Function within the HSC also improved, including dual-lingual communications enabling enhanced collaboration among members, more focused direction for health and safety actions, and higher levels of engagement and participation among worker members on the committee. Changes seen within the large workforce included trends of decreasing hazards and exposures and increased use of PPE, a decrease in self-reported injuries, an increase in awareness of and reporting to the HSC, and a decrease in the degree to which language was a barrier to raising health and safety issues. The committee faced a variety of

challenges throughout the study period, including language barriers and variable levels of management support for health and safety activities and HSC meetings.

Recommended best practices for HSCs

Similar interventions for HSCs may provide benefits in health and safety for other worksites. Based on what was learned throughout the study period, the following is recommended for optimizing HSC function in addition to the current Washington State requirements:

- **Committee composition**: For effective committee functioning, it is vital that the committee is representative of the workforce. Ensure adequate representation of all work departments/areas on the committee. It is also helpful to have a committee that reflects the demographics of the worker population to facilitate any multi-lingual communications. In efforts to promote worker-member participation and to foster open expression of opinions without fear of repercussions, it may be useful to minimize upper management presence on the committee and to encourage union involvement with the committee (i.e. shop steward, members or other union representative).
- **Committee function:** In order to maximize group functioning and HSC effectiveness, it is important to establish clear expectations and procedures for committee work. Develop a written mission statement for the HSC, as well as a charter identifying member roles and responsibilities. In addition, consider utilizing work plans to outline timelines, necessary steps, and key personnel to accomplish HSC priorities and health and safety issues. Formal written communications to management are also useful tools for recommending health and safety improvements and establishing accountability for their completion.
- **Meetings and logistics:** Consistency is important for effective committee functioning. Conduct HSC meetings in a space where interruptions are unlikely. In addition, schedule meetings regularly and minimize rescheduling due to production pressures or other issues. It may also be necessary to allow for additional time outside of meetings for necessary committee activities (i.e. committee member trainings, walkthrough inspections, accident investigations). Also important is to ensure that all HSC meetings and communications are multi-lingual, as necessary
- **Workforce engagement:** As the goal of an HSC is to provide employees a voice in health and safety matters, committee activities should promote worker engagement. Make all HSC materials available to the workforce (i.e. agendas, minutes), and provide translated materials as appropriate. It may be effective to have committee members lead some health and safety activities such as departmental safety meetings or trainings. A method for workers to report

hazards can also be a helpful way to connect the workforce to the HSC, and is also useful in calling attention to issues that the HSC can address.

Conclusions

In this particular worksite, the development of a model HSC was observed to give rise to a variety of positive effects throughout the company. This indicates that given some support and guidance, HSCs can facilitate worker involvement in health and safety and make a positive impact on health and safety conditions. However, it is unclear if the changes made will be sustainable without involvement by the research team, what level of effort would be needed to produce similar changes elsewhere, and if the magnitude of change was sufficient to have lasting and significant impact on overall health and safety.

Background

Employee participation has been identified as a key element to the success of occupational health and safety programs (Barbeau et al., 2004; LaMontagne et al., 2004; U.S. Dept. of Labor OSHA, 2012; Shannon et al. 1996, 1997). It is thought that because workers often have a good understanding of their work and its hazards, valuable information can be gained about the type of hazards in the workplace and potential control methods by fostering their participation in health and safety activities (Gjessing et al., 1995; Khai et al., 2011). In addition, using participatory approaches may enhance worker motivation and satisfaction and lead to greater acceptance of changes in the workplace (Gjessing et al., 1994). One common method for engaging workers in health and safety is through the use of joint labor-management health and safety committees (HSCs) in which worker representatives act as liaisons between the workforce and management, and members work together to identify and address health and safety issues. In several states in the U.S., including Washington, and in other countries around the world, establishing joint labor-management health and safety committees has become a regulatory requirement of employers.

Despite the wide presence of HSCs, some small businesses have noted the need for increased worker involvement in health and safety, which may indicate that some HSCs are not effective in maximizing employee involvement (Barbeau et al., 2004). Effective involvement of workers may become even more challenging in the face of increasingly diverse workforces. Immigrant workers or workers with limited English proficiency may be difficult to engage due to language and cultural differences (McCauley, 2005; Parker et al., 2007). For instance, in one group of Latino workers, over half reported being greatly concerned about difficulties communicating with their supervisors about health and safety issues (Williams et al., 2010). Language barriers may also prevent some workers from serving on health and safety committees, often a primary method of promoting worker participation. Minimal guidance exists for how to best engage immigrant workers or workers with limited English proficiency in health and safety activities, particularly in the context of HSCs.

As one of the handful of U.S. states requiring committees, Washington currently mandates employers with more than 10 employees to have a joint health and safety committee (HSC), with at least as many worker-elected members as management-appointed members (Washington Administrative Code 296-800-130). The legislation also requires recordkeeping of meeting attendance and meeting minutes, and

regular review of inspection reports and accident investigations during meetings. The regulation, however, provides no guidance to employers for developing a committee that is actually effective in improving health and safety conditions in the workplace. Furthermore, no guidance is offered for developing successful health and safety committees for multi-lingual worksites, an increasingly common challenge in this state and throughout the U.S.

In an effort to improve understanding in this area, Researchers in the Department of Environmental and Occupational Health Sciences at the University of Washington (UW) conducted an 18-month-long intervention study funded by the Washington State Safety and Health Investment Program (SHIP) to develop a model dual-lingual health and safety committee and to evaluate its effects on health and safety at a high-hazard worksite.

Methods

Project description and timeline

The study consisted of a comprehensive baseline assessment of health and safety throughout the worksite, a training intervention for the health and safety committee, post-training support for the committee, and a post-intervention comprehensive health and safety assessment. It was hypothesized that the training intervention would ultimately result in improvements in health and safety performance.

Conducted in the fall of 2010, the baseline assessment included a questionnaire administered to the workforce, a questionnaire administered to the HSC, use of a semi-quantitative hazard observation tool (HOT), industrial hygiene measurements, and qualitative observations of the HSC and the general work environment. These tools provided information on exposures to occupational hazards and their control, perceptions of the health and safety environment, and perceptions of HSC function and effectiveness. This information was then used in the development of the HSC intervention, which was implemented in November of 2010. Research staff continued providing support to the committee for the following year. In the fall of 2011, the post-intervention assessment took place, utilizing the same tools as the baseline assessment, with the addition of a semi-structured interview administered to HSC members.

Prior to data collection, all research activities and protocols were reviewed and approved by the University of Washington Human Subjects Division. Workers at the facility were given a brief overview of the study design and methods (in both English and Spanish) during a regularly scheduled safety meeting; interested volunteers then signed an informed consent form and were enrolled in the study.

Study setting

The study took place at a small scrap metal recycling business employing 46 production workers at the outset of the study, which will be referred to as Scrap Metal Recyclers (SMR). The company buys metal-containing objects from companies and individuals, breaks down materials into small pieces, and sorts the metals by type to be resold. The majority of their business involves buying and shredding used cars, buses, and other large vehicles and appliances. Scrap metal recycling is considered a high-hazard industry, and presents myriad hazards including dust and metal fume, high noise levels, work at heights, chemical exposures, traffic hazards, and machine hazards (OSHA, 2008).

SMR has been a family-owned business for 75 years.. A production manager oversees four supervisors who manage the various work areas on site. The majority of employees work the day shift; however a team of 3 workers and a supervisor work the evening shift and do maintenance throughout the site. All production workers are represented by the Teamsters Local 117 union, with the exception of the crane operators and truck drivers who are represented by other unions. Despite union representation, it was unclear if a shop steward had been appointed or trained for the SMR worksite.

In 2007, workers were repairing the large shredder when a piece of equipment fell and crushed them, killing one and seriously injuring two others (Sullivan, 2007). Investigations and citations by Labor and Industries ensued, as did public media attention. This prompted management to hire a full-time safety director in 2008. The safety director served as the chair of the HSC and was the primary contact at the worksite for the study duration.

The health and safety committee

At the beginning of the study, the HSC had not met for several months, and was preparing to have elections for new committee members. Not all work areas were represented in the committee, and very few Spanish-speakers participated in the HSC, despite a large proportion of Spanish-speaking employees in the workforce. A handful of upper management representatives also participated on the committee, including one of the owners of the company and a vice president. In general, the committee

was in compliance with the very basic Washington State regulation for health and safety committees. However, the safety director and other management representatives, as well as the union representative expressed interest in improving committee function to address the perceived lack of committee effectiveness.

Observations of committee meetings prior to the training intervention revealed that the safety director did the bulk of the committee work, including preparing agendas, recording minutes, chairing committee meetings, acting as liaison with management and the workforce, and responding to any health or safety issues raised. Meetings were conducted in English, and all materials were available only in English. It did not appear that committee members, particularly worker members, were involved in health and safety activities outside of the meeting setting such as inspections, incident investigations, or worker health and safety trainings. The safety director would speak for the majority of the meeting, providing updates on recent incidents and issues raised in previous meetings. The last 10 or 15 minutes of the meeting consisted of a round-robin session with each member having the opportunity to discuss health and safety issues. While the safety director took notes during these sessions, it was unclear how and by whom the issues would be addressed. At meetings, some members expressed confusion about their role as a committee member and the role of the committee in general. In addition, interactions between members appeared to be divided between supervisors, US-born workers, and immigrant workers.

After observing some of the preliminary meetings before final HSC membership had been established, the UW research team recommended that the owner sitting on the committee no longer participate. This recommendation was intended to increase comfort and collaboration, particularly for worker members, and was well received and eventually implemented. The union representative was also invited to attend committee meetings in efforts to promote worker member comfort. Elections took place in the summer of 2010, and committee membership was finalized. Four of the six management members continued their work on the committee, as well as four of the five worker members. They were joined by five additional worker members for a total of four management-appointed members and nine worker-elected members. Six of the worker members were Spanish speakers with varying English abilities. Between the worker and management members, all production departments were represented on the committee

HSC Intervention

HSC Training

Training development

Only limited guidance is available on training methods for improving HSC effectiveness. Previous published work in this area has consisted of training only a few members of an HSC, or involves passive workbook type activities (Ostry & Yassi, 2004; SPR Associates Inc. as cited in O'Grady, 2000; NJ PEOSH, 2008; Worksafe BC, 2009). It is also unclear what the impact of these methods has been in increasing HSC effectiveness. As the intention was to administer training for the entire HSC, the research team felt that existing materials were insufficient, and that an original training curriculum should be developed to best address the goal of improving HSC effectiveness at SMR.

The baseline assessment informed the focus and development of the training by identifying the following three HSC weaknesses: need for increased worker involvement in health and safety; need for improved group dynamics within the committee, need for improved HSC policies and procedures. As a primary focus of the intervention was to increase cooperation within the committee, activities were chosen to promote group development and teamwork. And, because the committee consisted of adult individuals with their own experiences and knowledge of health and safety, adult education principles, participatory training methods, and empowerment education techniques were incorporated into activities to maximize engagement and meaningful learning (Gjessing et al, 1994; Rosskam, 2001; Wallerstein & Weinger, 1992).

Another important consideration when developing the training intervention was the fact that about half of the HSC members were immigrants who spoke Spanish as a first language with varying English language abilities. Early in the training development, it was decided that it would be important to utilize a skilled bilingual and bicultural facilitator to ensure comprehension and promote participation for all HSC members. A consultant with significant experience working with immigrant and bilingual communities was engaged, and was a very useful resource in planning appropriate activities that would encourage participation from all committee members. Training agendas and schedules were designed to allow sufficient time for interpretation between Spanish and English for all activities and discussions. In addition, all presentations, handouts and materials were translated into Spanish by a native Spanish-speaker on the research team and were available to all HSC members. See Appendix A for training materials, presentations and handouts.

Training implementation

The research team and SMR management negotiated the duration, time and place for the training to take place. The company was reluctant to remove 13 employees from production for the intervention, but eventually settled on allowing the HSC members to leave their work two hours early (at 2pm) for two separate four-hour training sessions. Workers were paid with funds from the SHIP grant for their time at the trainings, including the two hours of overtime incurred at each of the sessions. The agenda for the two training sessions was reviewed by and approved by SMR's safety director as well as the Teamsters Local 117 union representative. While the union representative was invited to the trainings to promote worker member comfort and participation, she was unable to attend.

The trainings took place November 4th and 8th, 2010 in a large, clean, well-lit common room at the worksite. A projector was set up to view the prepared PowerPoint presentations, and large easel pads were used to take notes and make lists at the front of the room. Round tables were clustered toward the front of the room, with chairs positioned to enable visualization of presentations at the front of the room as well as to promote interaction and conversation amongst the participants. Each committee member was provided with a nametag, pen and paper. A variety of snacks and beverages were also made available to participants throughout the sessions. In addition to the facilitator and the committee members, four members of the UW research team were present at the training sessions: the principal investigator, a research scientist, a research coordinator (native Spanish-speaker), and a graduate student research assistant (conversant in Spanish). While the facilitator served as an emcee and led the majority of discussions during the training, UW staff presented health and safety-specific content, served as note-takers, and helped facilitate the small group activities.

Training evaluation

To evaluate the short-term outcomes of the training intervention, a pretest-posttest evaluation was conducted (Appendices B and C). All HSC members were given a short written questionnaire in either English or Spanish one week before the first training session and were asked to bring the completed questionnaire to the training. A similar post-training questionnaire was given to members at the completion of the second training session, and was collected at the worksite in the following weeks.

The seven pre-intervention questionnaire items were developed to assess baseline comfort participating in committee activities, perceptions of committee cooperation, clarity of committee roles, and

individual comfort with health and safety skills. These items appeared again on the post-training questionnaire to assess any changes that might have been attributable to training activities. The post-training questionnaire also had items to assess HSC member satisfaction with the training. Matched analyses were performed to evaluate changes from pre- to post-intervention.

As seen in Table 1, initial scoring of the evaluation items was moderately high, with mean responses of 3.77 and higher (on a 1-5 scale) for all items. Nonetheless, average increases in scoring by all members were seen for all factors; particularly in comfort speaking up in the committee setting (change of 0.46), clarity of the individual members' roles (change of 0.42), and clarity of the committee's role in health and safety (change of 0.54). On average, committee members reported being satisfied with the training on the post-training questionnaire (Table 2). They indicated that the facilitator was clear and encouraged participation from all members and that the information presented and handed out was useful. Overall HSC members rated satisfaction at 4.69 out of 5. Satisfaction with training elements was very similar between management and worker members. The responses to the open-ended items on the post-training questionnaire also revealed that committee members were generally satisfied with the training intervention. When asked which elements of the training were the most useful, many members cited the integration, collaboration, and participation of all committee members, particularly between workers and management, and English speakers and Spanish speakers.

Table 1: HSC member evaluation of training intervention

		All (n=13)	**Management (n=4)**	**Workers (n=9)**
*Mean (SD) score**	Pre	Pre-Post Change	Pre-Post Change	Pre-Post Change
Comfort interacting in HSC setting	4.31 (0.75)	0.38 (0.87)	-0.25 (0.50)	0.67 (0.87)
Comfort speaking up in HSC setting	4.15 (1.07)	0.46 (0.78)	0.00 (0.00)	0.67 (0.87)
Level of cooperation among HSC members	4.23 (0.60)	0.23 (0.83)	0.41 (0.82)	0.33 (0.87)
Individual role clarity	4.00 (0.85)	0.42 (0.67)	0.50 (0.58)	0.38 (0.74)
HSC role clarity	3.77 (1.01)	0.54 (0.97)	0.50 (1.29)	0.56 (0.88)
Comfort with hazard identification	4.15 (1.28)	0.38 (0.77)	0.00 (0.00)	0.56 (0.88)
Comfort developing solutions to hazards	4.23 (0.83)	0.31 (0.75)	0.25 (0.50)	0.33 (0.87)

**Scale: 1=strongly disagree, 5 = strongly agree*

Table 2: HSC member satisfaction with training intervention

*Mean (SD) score**	**All (n=13)**	**Mgmt (n=4)**	**Worker (n=9)**
Ability of facilitator to encourage participation	4.77 (0.60)	5.00 (0.00)	4.67 (0.71)
Clarity of facilitator	4.69 (0.48)	5.00 (0.00)	4.56 (0.53)
Usefulness of information	4.62 (0.51)	4.50 (0.58)	4.67 (0.50)
Usefulness of handouts	4.50 (0.90)	4.67 (0.58)	4.44 (1.01)
Future use of handouts	4.45 (0.69)	4.67 (0.58)	4.38 (0.74)
Overall satisfaction	4.69 (0.48)	4.75 (0.50)	4.67 (0.50)

**Scale: 1=strongly disagree, 5 = strongly agree*

Results from the evaluation of the training intervention indicate that HSC members were satisfied with the training, and that some change in participation, cooperation, role clarity and comfort with health and safety skills may have resulted from the intervention. The high satisfaction ratings on the post-training questionnaire along with the fact that members appeared to be engaged and interested during the training suggest that the intervention methods and activities were appropriate for the audience. We believe much of this success can be attributed to the use of a bilingual facilitator, flexibility of time for agenda items, and the variety of activities making up the training.

Post-training committee support activities

Following the training intervention, the study staff provided ongoing support for the committee for one year following the training. This included attending HSC meetings, meeting individually with the committee chair (the company's safety director), meeting with union members and their representative, and providing interpretation and translation services for committee materials and activities to promote momentum from the training. One such activity involved the development of an extensive report outlining the findings from the baseline comprehensive health and safety assessment (Appendix D). The UW research team presented the findings to the health and safety committee, who then used it to identify priority issues in health and safety on the worksite. In addition, the research team developed and implemented two health and safety initiatives based on the priorities identified by the HSC. These two initiatives were a traffic safety evaluation and the development of toolbox training materials.

Traffic study

The health and safety committee identified traffic hazards as a safety priority at the SMR facility. Flow of traffic at SMR is constant and workers are in close proximity to moving vehicles during normal work routines. The internal flow of traffic bringing scrap metal in and out of the facility includes privately own vehicles and semi-trucks, as well as company-owned trucks and heavy equipment (i.e. cranes, bobcats, fork lifts). The area available for traffic movement is limited both by the small size of the facility and by large and constantly-changing piles of metal scrap. The roads are narrow and uneven, with numerous blind spots, and there is little room for maneuvering. Also, vehicles and pedestrian traffic often share the same space. The traffic flow is controlled by a small group of workers with little or no formal traffic training. The UW team sought approval from the HSC to enlist support from the UW's College of Engineering traffic specialists to assess the traffic hazards at SMR. The engineering researchers performed the traffic assessment by visiting the site, observing traffic patterns, and interviewing workers, managers and supervisors in January and February 2011.

The study results were documented in a report (see Appendix E) and presented to the HSC with suggested recommendations in May 2011. Two types of recommendations were proposed: operational changes and facility-level improvements. Operational changes would minimally disrupt normal day-to-day operations while facility-level improvements would require larger investment and increased coordination and integration of work processes. Examples of the operational improvements included improving markings, signage and signaling; increasing the use of high visibility clothing among traffic controllers; and changes to traffic management and coordination between controllers. Facility-level changes suggested included widening roadways and rerouting traffic; scheduling and dispersing deliveries; and obtaining certification for traffic controllers.

The committee discussed the results and recommendations, and a formal written recommendation was submitted to management in July 2011. In this first formal communication with management, the HSC recommended implementing clear marking of the roads to define pedestrian pathways; replacement and installation of new traffic signs throughout the facility; provision of reflective clothing to employees; and the completion of formal training for all traffic personnel. While no written response was given to the HSC from management, the safety director reported that the company was willing to provide resources for these changes. However, despite purchase of traffic signs, identification of a course for traffic safety certification, and obtaining cost estimates for road resurfacing and marking, none of these

things were observed to be implemented in the following months by the research team, and it is unclear if any changes are planned to be made.

Toolbox training

The second health and safety initiative focused on the development of toolbox training materials to promote safety discussions among workers. Through discussions with the safety director and a formal vote by the HSC, twelve topics were selected to be presented at the biweekly departmental safety meetings. A handout was developed for each safety topic, which included six key points related to the main topic. A supporting handout providing additional detailed information was also developed for each topic to allow individuals delivering the training to become more familiar with the topic. Handouts were available in both English and Spanish, and were designed to be easy to read and understand with clear graphics and minimal text. Topics included "Why working safely needs to be a priority," "What to do if you see a hazard," and "How to protect yourself against hearing loss." Appendix F contains copies of all twelve handouts and supporting materials.

All HSC members received training from the UW research team preparing them to deliver the information at the departmental safety meetings, with opportunities for demonstration and practice. Beginning in the fall of 2011, the toolbox training materials were delivered by the committee members to fellow workers, with observation and evaluation by the UW research team. Implementation varied slightly between departments, with meetings lasting between 10 and 20 minutes. Some groups chose to deliver the information in separate groups of English and Spanish speakers, while others presented the information to an entire group, alternating English and Spanish. At the beginning of the toolbox training delivery period, some committee members were observed having difficulty engaging workers, or had not prepared adequately for the training, and resorted to reading the materials verbatim. Committee members received feedback about the quality of their presentation and were provided with ideas to improve their delivery. Safety talks improved over time: the more familiar and enthusiastic presenters were with the topic, the more workers participated. Workers' interest and participation appeared to increase over time, as they raised questions and made comments pertinent to the topics at the meetings. Workers and supervisors reported valuing having the materials in two languages, which enabled inclusion of all participants and provided a forum to discuss health and safety concerns regardless of English ability. In addition, the use of interpreters provided an opportunity for bilingual HSC members to play a role in garnering worker involvement in health and safety. HSC members have

expressed that these meetings have contributed to raising the level of awareness of the committee, and its activities in the workplace.

Assessment Tools

Questionnaires

Worker questionnaire

A 96-item questionnaire was developed for production workers (Appendix G). This questionnaire was written at a 7th grade level (Flesch-Kincaid Scale, Microsoft Word, Microsoft Corp, Redmond, WA) and administered by bilingual research staff in either English or Spanish based on subject preference. It consisted of original survey items as well as an existing validated scale for safety climate (Zohar, 2000), and scales for psychological job demands, coworker support, and supervisor support based on the Job Content Questionnaire (Karasek et al, 1998). Items developed specifically for this study asked subjects about their exposures and related controls including use of personal protective equipment, recent histories of injuries and near misses, perceptions of HSC function and effectiveness, and demographic information.

HSC member questionnaire

A 49-item questionnaire was developed for HSC members (Appendix H). This HSC member questionnaire was composed of a variety of original items regarding HSC function. These included questions about the committee's policies and procedures such as committee structure, meeting activities, communication methods, in addition to questions about perceived effectiveness of the committee. Response formats of this questionnaire were very similar to the worker questionnaire in order to maintain consistency. The questionnaire was available in both English and Spanish, and was handed out to HSC members to be completed independently and returned to study staff. Thirteen individuals completed the HSC member questionnaire; all eight continuing members, one individual who had recently rotated off the committee, and five of the six new members. The sixth new member joined several weeks after the new committee was initially formed, and did not complete the questionnaire.

Questionnaire analysis

Questionnaire responses were entered into an Access database (Microsoft, Redmond, WA) and were further analyzed using Stata 11 (StataCorp, College Station, TX). The safety climate scaleand elements derived from the Job Content Quesitonnaire from the worker questionnaire were scored according to standard guidelines (Zohar, 2000). Matched analyses were performed to evaluate changes from pre- to post-intervention. As it was of interest to assess for any discrepancies in experiences or perceptions among the workforce in order to understand how to best develop the training intervention, subgroups analyses were conducted based on management/supervisor status, or by a combination of supervisor status and nativity. Although one supervisor was born outside the US, all supervisor responses were analyzed as a single group due to small sample size.

As sample sizes were small for both the worker and HSC member questionnaires, particularly with subgroup analysis, statistical power was extremely limited. As a result, findings were not expected to be statistically significant, and are not discussed in terms of significance. Rather, questionnaire analyses were considered to be exploratory, serving as only one of multiple methods used to understand the health and safety environment at the worksite.

Semi-Quantitative Hazard Observation Tool (HOT)

A 33-item semi-quantitative Hazard Observation Tool (HOT) designed to collect information about workers' exposures and protective conditions for multiple hazards was developed for the study (Appendix I). HOT observations were conducted by researchers walking along a set observation route through the facility. Researchers stopped at each observation location and conducted an observation on each worker they could see. Information collected in each HOT observation included work area, work activity, and semi-quantitative ratings of the magnitude of exposure to the following 13 hazards: falls from height, noise, eye hazards, dusts and fumes, struck by objects, traffic safety, machine guarding, lockout/tagout, poor walking and working surfaces, lacerations and abrasions, and a number of ergonomic hazards, including repetitive motion, lifting, and awkward postures. Exposures to these hazards were rated as not present, low magnitude, or high magnitude. In addition to rating the intensity of these exposures, personal protective equipment (PPE) use and exposure controls were rated for these hazards as used, not used, or uncertain. An observation of an individual worker evaluated the workers' working conditions and behaviors at the moment the observation began; in other words, observations did not integrate workers' activities over any period of time, but rather represented a moment-in-time snapshot. Hazard observations were recorded by research staff using an HP iPaq

personal digital assistant (Hewlett-Packard, US). HOT observation data were analyzed descriptively by work area and hazard.

IH Measurements

Personal quantitative full-shift measurements were conducted for four different exposures at the facilities: noise, carbon monoxide (CO), airborne particulate (including gravimetric measurements of total dust as well as analysis of concentrations of 13 individual metals, including lead, nickel, cadmium, cobalt, copper, and others). Noise was measured using datalogging Q-300 and NoisePro DLX dosimeters (Quest Technolologies, a 3M Company, Oconomowoc, WI) configured in accordance with the Washington State Permissible Exposure Limit (PEL) for noise (Washington Administrative Code 296-817): 90 dBA criterion level, 5 dB exchange rate, 80 dBA threshold, slow response. Measurements were compared to the Washington State Permissible Exposure Limit of 85 dBA for an 8-hr Time-Weighted Average (TWA). CO was measured using a datalogging direct-reading instrument (Dräger Pac 700, Dräger Safety Inc, Pittsburgh PA). CO measurements were compared to the Washington State PELs of 35 parts per million (PPM) TWA, 200 PPM (Short-Term Exposure Limit, or STEL) and 1500 PPM (ceiling limit) (Washington Administrative Code 296-841). Total dust was measured using mixed cellulose ester filters and air sampling pumps (SKC AirCheck 2000, SKC, Inc, Eighty Four, PA) with a flowrate of 2.0 L/min. Total dust was compared to the Washington State PEL of 10 mg/m^3 for total particulate (not otherwise specified) (Washington Administrative Code 296-841). Metals analysis was conducted using EPA method 6020a "Instrumental Analysis of Elements by Inductively-Coupled Plasma-Mass Spectroscopy" by the University of Washington Environmental Health Laboratory, a laboratory accredited by the American Industrial Hygiene Association. Full-shift concentrations of specific metals were compared to the relevant Washington State PELs (Washington Administrative Code 296-841). All measurement instruments were calibrated pre- and post-shift. Researchers placed these instruments on workers at the start of the measured shift and removed them at the end of the shift. Descriptive analyses were performed for air sampling and noise measurements by work area, and exceedance percentages were computed for each of these hazards by comparing measured levels to the relevant PELs.

In addition to the above measurements made directly by research staff, we obtained participating workers' consent to provide the results of their most recent blood lead levels measured as part of the facility's ongoing blood lead level measurement program. We received directly from the independent laboratory service that conducted the testing the following information for each subject in the

monitoring program: blood lead level (in μg/dL), zinc protoporphyrin (ZPP, in μg/dL), and free erythrocyte porphyrins (FEP, in μg/dL). Blood lead level results were compared to the Washington State limit of 40 μg/dL (Washington Administrative Code 296-62-07521).

Qualitative and anecdotal information

In addition to the questionnaires, a variety of informal interviews and observations were conducted at study baseline. During data collection periods, study staff were able to observe a variety of work processes and interactions between employees and to frequently speak with all committee members and most of the employees. In addition, study staff attended all HSC meetings and had many meetings with the site's health and safety director. Notes were recorded for the majority of the meetings and observations, and a timeline was created to document various incidents at the worksite as well as study milestones (Appendix J).

Results

Worker Questionnaire

Forty-six production workers (100%) completed the worker questionnaire pre-intervention, while fifty-two (100%) completed the questionnaire post-intervention. Results presented are restricted to those of the forty-two individuals that completed both pre- and post-intervention questionnaires. This included four supervisors and 38 workers, 9 of whom were born in the US and 29 born outside the US. As seen in Table 3, the four supervisors tended to be older, had worked more years in the scrap metal recycling industry in general and at SMR. Workers born in the US and workers born outside of the US had relatively similar experience. Supervisors and workers born in the US were much more likely to have at least a high school education, to speak English at home, and to report being comfortable reading and speaking English than workers born outside the US.

Table 3: SMR employee demographics

Mean (SD)	**All**	**Supervisors**	**Workers Born in US**	**Workers Born Outside US**
n	42	4	9	29
Age	45.5 (10.7)	53.3 (5.5)	48.1 (9.4)	43.6 (11.1)
Years in scrap metal recycling	12.3 (10.5)	24.8 (10.6)	14.0 (11.7)	10.1 (9.1)
Years at SMR	9.6 (8.0)	16 (9.7)	11.9 (11.1)	8.0 (6.1)
Years in US (foreign born)				18.8 (12.4)
Hours worked per week	41.6 (7.3)	46.3 (4.8)	42.7 (2.2)	40.6 (8.3)
n (%)				
Born in US	12 (29%)	3 (75%)	9 (100%)	0 (0%)
Speak English at home	20 (48%)	3 (75%)	9 (100%)	8 (28%)
Completed high school	29 (69%)	4 (100%)	7 (78%)	18 (62%)
% comfortable speaking English	19 (45%)	3 (75%)	9 (100%)	7 (24%)
% comfortable reading English	18 (43%)	3 (75%)	8 (89%)	7 (24%)

Self-reported exposures

Employees reported on a range of occupational exposures, use of PPE and exposure controls, and safety training. Exposures and PPE use frequency were reported in terms of days on a scale of 0-4 (i.e. 0=Never or almost never exposed, 4= Always exposed, exposed most days). In general, only small differences in exposure levels were seen post-intervention. The most commonly reported exposure was noise, with a mean pre-intervention score of 3.26 out of four, and only a modest decrease of 0.10 at post-intervention. Other common exposures included traffic and vehicle hazards (2.93) dust and fumes (2.76), repetitive motion (2.60), and machine hazards (2.15). Small reductions in reported exposures were noted for seven out of the ten hazards assessed. Some small changes were seen in PPE and control use among those who reported exposures, such as an increase of 0.20 in PPE use score for fall hazards post-intervention, an increase of 0.37 for dust and fume exposures, and interestingly, a decrease of 0.27 for traffic and vehicle hazards.

Table 4: Self-reported exposures

	Pre			Pre-Post Change	
	Exposure Score* *Mean (SD)*	PPE/Control Score among exposed* *Mean (SD)*	Training *(%)*	Exposure Score*	PPE/Control Score*
Falls	1.64 (1.66)	2.54 (1.79)	13 (31.0)	0.17	0.20
Noise	3.26 (1.31)	3.05 (1.53)	33 (78.6)	-0.10	0.05
Chemicals	0.93 (1.40)	2.42 (1.89)	8 (19.0)	-0.12	-0.12
Dust/fume	2.76 (1.56)	1.85 (1.61)	23 (54.8)	-0.11	0.37
Traffic/vehicle	2.93 (1.42)	2.32 (1.83)	25 (59.5)	0.10	-0.27
Machine hazards**	2.15 (1.34)	3.71 (2.14)	25 (59.5)	-0.09	0.10
Repetitive motion	2.60 (1.59)	-		-0.14	-
Lifting	0.85 (1.25)	-		-0.15	-
Ergonomic hazards***	0.87 (1.00)	-	19 (45.2)	0.09	-
Vibration	0.60 (1.04)	-		-0.07	-

**Scale: 0 = never/almost never exposed, 4= always/almost always exposed*

*** Machine hazard summary: mean of items 17-19 (caught, cut, trap)*

**** The mean of ergonomic: mean of item 24-26 (reach, bend, kneel)*

Injuries and near-miss experiences

Almost one third of employees reported having had an injury in the 12 months pre-intervention, with a 10% decrease post-intervention (Table 5). All injuries were experienced by workers, with slightly more occurring among workers born outside the US. Six of the thirteen (46%) of the pre-intervention injuries resulted in missed work, while 8 of 9 (89%) of post-intervention injuries resulted in missed work. Most injuries resulting in missed work pre- and post-intervention occurred in workers born outside the US. Average days missed pre-intervention was 2.4, which increased to 18.7 post-intervention due to two serious injuries, one requiring 45 days off work and another requiring 90. About one quarter of workers, most of whom were foreign born workers, reported almost having an accident (e.g., a "near-miss") on half or more of their workdays pre-intervention, which decreased by 9% post-intervention.

Table 5: Injury and near-miss experiences

	All (n=42)		Supervisors (n=4)		Workers Born in US (n=9)		Workers Born Outside US (n=29)	
	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change
Injured in Past Year *(n,%)*	13 (31%)	-10%	0	0%	3 (33%)	-11%	10 (35%)	-10%
Injuries in Past Year *(m, sd)*	0.5 (±0.8)	-0.24	0	0	0.6 (±1.0)	-0.3	0.5 (±0.8)	-0.2
Of Those with Injury								
Missed Work *(n, %)*	6 (46%)	43%	0	0%	0	11%	6 (21)	3%
Work with light duty *(n, %)*	7 (54%)	-43%	0	0%	3 (33%)	-22%	4 (14)	-14%
# Days Missed *(m,sd)*	2.4 (±4.4)	16.3	0	0	0	1	3.1 (±4.8)	20.8
Near miss frequency								
Never *(n, %)*	24 (57%)	14%	3 (75%)	0%	6 (67%)	11%	15 (52%)	17%
<half of days *(n, %)*	8 (19%)	-5%	1 (25%)	0%	1 (11%)	0%	6 (21%)	-7%
Half or > half of days *(n, %)*	4 (10%)	-2%	0	0%	1 (11%)	0%	3 (10%)	-3%
Almost daily *(n, %)*	6 (14%)	-7%	0	0%	1 (11%)	-11%	5 (17%)	-7%

Table 6: Health and safety experiences and perceptions

	All (n=42)		Supervisors (n=4)		Workers Born in US (n=9)		Workers Born Outside US (n=29)	
	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change
Comfortable Refusing Work *(n, %)*	33 (79%)	2%	4 (100%)	0%	5 (56%)	0%	24 (83%)	3%
Ever Refused Work *(n, %)*	15 (36%)	5%	3 (75%)	0%	2 (22%)	0%	10 (35%)	7%
JCQ: Psychological job demands* *(m, sd)*	2.8 (±0.6)	0.1	3.3 (±0.8)	-0.3	2.4 (±0.3)	0.6	2.9 (±0.5)	0
JCQ: Co-worker support* *(m, sd)*	4.2 (±0.7)	-0.3	4.4 (±0.5)	-0.5	4.1 (±0.9)	-0.6	4.1 (±0.8)	-0.1
JCQ: Supervisor support* *(m, sd)*	4.3 (±0.7)	-0.1	4.6 (±0.6)	-0.4	4.5 (±1.1)	-0.1	4.1 (±0.9)	0.04
Safety Climate* *(m, sd)*	3.6 (±0.7)	0.1	4.3 (±0.6)	-0.2	3.9 (±0.9)	0.3	3.4 (±0.5)	0.04

**Scale: 1-5*

Health and safety experiences and perceptions

Overall, as seen in Table 6, workers reported being comfortable refusing unsafe work (79%), although only about a third had ever done so (36%). The only change in these variables post-intervention was seen among foreign-born workers, with an increase of comfort post-intervention of 3% and an increase of unsafe work refusal of 7%. Employees assigned moderately high scores for safety climate, with a pre-intervention average of 3.6 out of 5, and little change post-intervention. Supervisors showed the highest pre-intervention safety climate score (4.2), followed by workers born in the US (3.9) and finally workers born outside the US (3.4). Little to no change in safety climate was seen among any groups from pre- to post-intervention. .Psychological job demands were moderate among all employees, and changed little from pre- to post-intervention. Pre-intervention survey co-worker support scores were high overall (4.2 out of 5), with little change at post-intervention. Similarly, pre-intervention supervisor support was high (4.3 out of 5), but showed little change post-intervention.

Perceptions of and interactions with the HSC

There was an increase in awareness of the health and safety committee among all workers with a change from 83% to 95% reported on the pre- and post-intervention surveys respectively (Table 7). The greatest change in awareness was among those born outside of the US: 79% were aware of the HSC on the pre-survey, while 93% were aware on the post-survey. The number of workers reporting a problem to the HSC also increased from 15 pre-intervention to 20 post-intervention. Again, the greatest change was among those born outside of the US with a change of 8 to 12 reporting, with essentially no change in reporting among US born workers. The proportion of those reporting a problem to the HSC and hearing back with an answer or solution roughly doubled from pre- to post-intervention among both US born workers and workers born outside the US. However, correction of problems was essentially identical (about two thirds) on the pre- and post-intervention surveys. Comfort reporting issues was high (4.2), but also remained unchanged, despite a 0.5 decrease in the degree to which language was a barrier to reporting problems. General confidence in the HSC pre-intervention was high among supervisors (4.8) and workers born in the US (4.1), but was moderately low among workers born outside the US (2.7). A substantial increase in confidence (0.7) was seen among worker born outside the US post-intervention. Overall, moderate improvements were seen in awareness and interaction with the committee.

Table 7: Perceptions of and interactions with the HSC

	All (n=42)		Supervisors (n=4)		Workers Born in US (n=9)		Workers Born Outside US (n=29)	
	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change
Aware of HSC *(n, %)*	35 (83%)	12%	4 (100%)	0%	8 (89%)	11%	23 (79%)	14%
Ever Reported problem *(n, %)*	15 (36%)	12%	4 (100%)	0%	3 (33%)	11%	8 (28%)	14%
Of those reporting a problem								
Heard back with solution *(n, %)*	10 (67%)	3%	4 (100%)	-25%	2 (67%)	33%	4 (50%)	8%
Problem Corrected *(n, %)*	10 (67%)	-2%	4 (100%)	-25%	2 (67%)	-17%	4 (50%)	17%
Confidence in HSC* *(m, sd)*	3.5 (±1.9)	0.1	4.8 (±0.5)	-0.3	4.1 (±1.4)	-0.6	2.7 (±1.9)	0.7
Comfortable raising HS Issues* *(m, sd)*	4.2 (±1.0)	-0.1	5 (±0)	0	4.1 (±1.4)	0.3	4.1 (±1.0)	-0.3
Language is a barrier in HS* *(m, sd)*	3.4 (±1.5)	-0.5	2.5 (±1.9)	-0.5	2.8 (1.8)	-0.9	3.7 (±1.3)	-0.6

**Scale: 1=strongly disagree, 5 = strongly agree*

HSC Committee Questionnaire

Thirteen committee members completed the HSC questionnaire pre-intervention, and ten committee members completed the HSC questionnaire post-intervention. However, only eight members completed both pre- and post-intervention questionnaires, as some members no longer worked for the company, were no longer serving on the committee, or were not available at the time of questionnaire administration. Overall, members reported moderately high pre-intervention effectiveness in accident prevention (3.6 out of five), problem identification (3.3), and problem correction (3.5), Interestingly, worker members tended to report decreased scores in these variables, while management members reported increases post-intervention. Effectiveness of communication to both workers and management increased post-intervention (1.6 and 1.0, respectively).Increases in management influence on committee activities were reported by both management (1.0) and worker members (2.0). Perceived worker awareness of the HSC increased by 1.3, and perceived worker confidence in the committee increased by 0.5 overall. The degree to which language was a barrier to HSC participation increased by 0.5 overall, and by 1.5 among worker members. Half of all members stated that management demonstrated its support for the HSC by providing resources and time to complete committee activities pre-intervention, which increased by 38% post-intervention.. Three quarters of all HSC members indicated that management implements their recommendations, which remained unchanged pre- to post-intervention. 63% of members also stated that management provided reasons for not implementing HSC recommendations pre-intervention, with an increase of 25% post-intervention.
In general, there were moderate positive changes in perceptions of HSC effectiveness, worker awareness, and management support from pre- to post-intervention.

Table 8: HSC member questionnaire results

	Total (n=8)		Managers (n=4)		Workers (n=4)	
*Mean (SD) scores**	Pre	Pre-Post Change	Pre	Pre-Post Change	Pre	Pre-Post Change
Effectiveness in accident prevention	3.6 (1.5)	0.4	3.5 (1.3)	1.0	3.8 (1.9)	-0.3
Effectiveness in problem identification	3.3 (1.7)	0.4	2.8 (1.5)	1.5	3.8 (1.9)	-0.8
Effectiveness in problem correction	3.5 (1.6)	0.3	3.3 (1.5)	0.5	3.8 (1.9)	-1.0
Effectiveness of communication to workers	2.5 (1.1)	1.6	3.0 (0.8)	0.8	2.0 (1.2)	2.5
Effectiveness of communication to management	2.6 (1.0)	1.0	2.5 (1.3)	1.3	2.7 (0.6)	0.7
Worker influence on HSC activities	3.6 (1.3)	0.4	4.0 (0.8)	0.8	3.3 (1.7)	0.0
Management influence on HSC activities	3.3 (1.0)	1.4	3.5 (1.3)	1.0	3.0 (0)	2.0
Worker awareness of HSC	3.8 (1.8)	1.3	3.8 (1.9)	1.3	3.8 (1.9)	1.3
Worker confidence in HSC	3.0 (1.2)	0.5	3.0 (0)	0.3	3.0 (1.8)	0.8
Worker comfort raising issues to HSC	2.9 (0.8)	0.5	3.3 (0.5)	0.3	2.5 (1.0)	0.8
Language barrier to HSC participation	3.9 (1.6)	0.5	3.8 (1.9)	0.3	4.0 (1.4)	0.8
Language barrier to raising issues to HSC	3.4 (1.7)	0.5	3.8 (1.9)	-0.5	3.0 (1.6)	1.5
N (%)						
Management demonstrates support	50%	38%	50%	50%	50%	25%
Management implements recommendations always or sometimes	75%	0%	100%	-25%	50%	25%
Management provides reasons for not implementing recommendations always or sometimes	63%	25%	100%	0%	25%	50%

**Scale: 1=strongly disagree, 5 = strongly agree*

HOT Observations

677 observations were made using the HOT pre-intervention, while 501 were completed post-intervention. No large changes were seen in use of basic required PPE, except for a 13% increase in use of high visibility vests and jackets. A general trend was seen of a decrease in exposurefor the majority of hazards assessed, including an 18% decrease in hazardous walking or working surfaces and a 14% decrease in the risk of being struck by objects. A variety of positive changes were also seen in the use of PPE and controls. These included a 76% increase in use of controls for hazardous energy (i.e. lock-out tag-out), a 42% increase in use of machine guarding, a 39% increase in PPE use for eye hazards, a 35% increase in use of controls for struck by hazards, a 16% increase in use of respiratory protection, and a 14% increase in use of hearing protection. Overall, observed exposures tended to decrease from pre- to post-intervention while observed PPE and control use increased.

Table 9: Use of basic required PPE

	n Pre/Post	**Pre # (%)**	**Pre-Post change**
Hard hat	674/497	558 (83)	-4%
Safety glasses	654/497	513 (78)	1%
High visibility clothing	674/497	142 (21)	13%
Work boots	583/496	582 (99.8)	0.2%

Table 10: Hazard presence and hazard-specific PPE and control use

	Hazard presence			**PPE/control use***		
	n Pre/Post	Pre # (%)	Pre-Post Change	n Pre/Post	Pre # (%)	Pre, Post Change
Falls	677/499	120 (18)	-7%	119/54	100 (84)	-3%
Noise	677/499	478 (71)	-4%	331/293	196 (59)	14%
Eye Hazards	677/500	198 (29)	1%	193/150	109 (56)	39%
Dust/fume	677/500	190 (28)	-4%	185/119	66 (36)	16%
Struck by objects	677/501	157 (23)	-14%	153/46	16 (10)	35%
Traffic/vehicles	677/501	239 (35)	-6%	230/145	16 (7)	3%
Hazardous energy	677/501	31 (5)	2%	9/33	0	76%
Machines	677/501	125 (19)	-1%	66/89	29 (44)	42%
Working surfaces	555/501	205 (37)	-18%	NA	NA	NA
Lacerations/abrasions	677/501	258 (38)	3%	251/203	222 (88)	6%
Repetitive motion	677/501	440 (65)	6%	NA	NA	NA
Lifting	677/501	153 (23)	0%	NA	NA	NA
Awkward postures	676/501	456 (68)	-1%	NA	NA	NA
Vibration	677/500	297 (44)	2%	82/181	21 (26)	-7%

**other than basic required PPE*

Industrial hygiene measurements

59 full shift personal noise measurements were made pre-intervention, and an additional 53 measurements were made post-intervention (Table 11). The mean pre-intervention noise exposure was 81.9 dBA, with 19% of samples being over the PEL-TWA of dBA. Post-intervention, mean exposure was 80.8 dBA, with 17% over the PEL. At post-intervention, 89% of individuals exposed over the PEL reported wearing hearing protection. There were 63 full shift personal samples collected for total particulate and metals concentrations pre-intervention, and 62 post-intervention. Geometric mean total particulate concentrations were0.38 mg/m^3 pre-intervention and 0.32 mg/m^3 post intervention. 2% of samples were over the PEL of 10 mg/m^3 pre-intervention, while 5% of samples were over the PEL post-intervention. All workers exposed at total particulate levels exceeding the PEL reported wearing respiratory protection. Most samples were well below the PELs, and even below limits of detection for the 13 metals analyzed. However, 5% of pre-intervention samples exceeded the lead PEL-TWA of 0.05 mg/m^3, while 2% of post-intervention samples exceeded the PEL (Table 12). The majority of lead overexposures occurred in the burn area where workers were torch cutting, although one sample in the shear area adjacent to the burn area was also over the PEL. Blood lead levels revealed overall low exposures as well. Reflective of the few months prior to the test, mean blood lead levels measured at 3.2 µg/dl in January 2010, 3.7 µg/dl in August of 2010, 4.3 µg/dl in January of 2011, and 3.9 µg/dl in October 2011. Individuals with the highest measurements had levels at 12 µg/dl and 7µg/dl, well below the state limit of 40 µg/dl, and worked in very close proximity to the shredder equipment. Carbon monoxide levels were found to be negligible compared to the 35 ppm PEL-TWA pre-intervention, and were thus not measured post-intervention. In summary, the industrial hygiene measurements generally showed small reductions in exposures to noise and air contaminants.

Table 11: Industrial hygiene measurements

	Pre-Intervention			Post-Intervention					Change	
	n	Mean (SD)*	% over PEL	n	Mean (SD)*	% over PEL	Post PPE use (total)	Post PPE use (over PEL)	Change in mean	Change in % over PEL
Noise *(dBA)*	59	81.9 (8.4)	19%	53	80.8 (9.8)	17%	77%	89%	-1.1	-2%
Tot. particulates *(mg/m^3)*	63	0.38 (3.6)	2%	62	0.32 (3.9)	5%	77%	100%	-0.1	3%
Carbon monoxide *(ppm)*	17	2.1 (1.9)	0%							

*Noise: arithmetic mean and standard deviation

Total particulates and carbon monoxide: geometric mean and standard deviation

Table 12: Lead exposures by work area

	Pre-Intervention				Post-Intervention			
	n	GM	GSD	% over PEL	n	GM	GSD	% over PEL
Burn	4	0.0065	20.9	2 (50%)	4	0.0195	4.6	1 (25%)
Crane	4	0.0001	2.9	0%	3	0.0001	1.9	0%
Maintenance	7	0.0005	2.2	0%	6	0.0007	3.0	0%
NF1	8	0.0012	2.4	0%	6	0.0005	4.0	0%
NF2	7	0.0004	1.9	0%	8	0.0005	6.4	0%
Night	4	0.0007	4.6	0%	4	0.0007	3.2	0%
Shear	6	0.0006	11.6	1 (17%)	4	0.0002	8.4	0%
Shredder	13	0.0006	3.1	0%	15	0.0003	3.7	0%
Yard	10	0.0003	3.7	0%	12	0.0002	2.9	0%
Total	63	0.0006	4.9	3 (5%)	62	0.0004	5.8	1 (2%)

Qualitative Observations

Health and safety committee

Following the training intervention, the committee focused on establishing policies and procedures common to effective HSC as recommended by the research team, and further defining and addressing the priorities identified in the training sessions. This included:

- **Identification of priority health and safety issues**: In the HSC meeting following the training, the UW research team presented the results of the baseline health and safety assessment (Appendix D). From these results, the research team and the committee identified three priority issues: noise levels and use of hearing protection throughout the worksite, traffic safety, and projectiles from the shredder machinery into work areas.
- **Authorization of a traffic safety study**: As described above, the HSC agreed to pursue a traffic safety study conducted by UW College of Engineering traffic specialists. This resulted in the committee's first submission of a formal written recommendation to management.
- **Creation of a hazard reporting system**: In February of 2011, the HSC developed a system for worker reporting of hazards and other health and safety issues. Reporting forms were available in both English and Spanish, and workers were given the option to remain anonymous. Several forms were received in the first month after implementation of the system, and most workers reported that the issues had been addressed and corrected. However, no forms were received after the initial implementation, and the system was rarely discussed.
- **HSC member inspection training:** In March 2011, the safety director designed and conducted hazard identification and inspection training for all HSC members. The study staff attended these trainings, and provided interpretation for the training of Spanish speaking HSC members. The safety director then began to carry out regular walkthrough inspections, with the aid of a committee member. After the first several weeks, inspections seemed to be taking place with increasing irregularity. However, this was a positive step in involving worker members of the committee in health and safety activities outside of meeting times.
- **Development of a mission statement and charter:** In the spring of 2011, the HSC developed and adopted a committee mission statement as well as a charter outlining roles and responsibilities of committee members.

- **Development of a toolbox training program**: As described above, the committee commissioned the research team to develop health and safety training topics to be delivered to the workforce at departmental safety meetings. HSC members reported that these meetings have contributed to an "increase of health and safety awareness" as well as "raising the level of confidence of the HSC" among the workforce, which was a previously a common concern of committee members. Some members also stated that leading these meetings has enabled them to "take more ownership" in their role as committee members.
- **Spanish language support**: At the request of the committee, the research team provided Spanish translation and interpretation for a variety of HSC and health and safety activities to promote involvement of the dual-lingual workforce. This consisted of interpretation at committee meetings and departmental safety meetings and translation of committee documents. In addition, study staff translated and distributed notices to employees from a third party contractor regarding the results of their state mandated hearing and blood lead tests.

Committee members also described changes in the general functions of the HSC. Supervisors expressed an increase in communication among team members; this is believed to have contributed to improving the HSC's effort for "finding more creative solutions" and a "more unified effort to improve overall safety in the facility" compared to one year ago. Both workers and supervisors see improvement in the group composition, the group is "more balanced" and members believed it has contributed to some positive changes in the HSC dynamics. Members also felt the committee function improved "tremendously" and their increased involvement contributed to a less of a "finger-pointing group dynamics," and were instead "working more as a team" through active participation during committee meetings. Compared to the previous year, meetings are "more formal," and the group has "issues to address and there is a work plan." The "increased communication, participation and interest among HSC members" has translated into HSC members being more willing to "express ideas." Members reported that the training intervention also helped the committee move to the "next level" and helped the team be "more focused" with a better sense of direction when addressing safety at work.

After the training intervention, committee activities continued to be primarily led by the safety director, including leading meetings, preparing agendas, and recording minutes. Segregation between workers and managers and Spanish and English speakers also continued, but, in part due to interpretation during meetings, there was considerably more interaction between members than before the training. HSC members also commented on the persistence of the language barrier, acknowledging that some members "are unable to fully express their opinions" except when an interpreter is available. Without the use of an interpreter, some committee members feel that "there is still not enough interaction among HSC members," and that there is still a divide because "the language barrier is hard."

Throughout the study duration, a genuine effort by HSC members, the union, and management to work together to improve the overall health and safety at the worksite was observed. However, some difficulties were encountered in maintaining HSC activity and progress throughout the study period. Time commitments of the committee during hours of operation were a constraint that conflicted with production, leading in several instances to the cancellation and or postponement of monthly meetings and scheduled trainings. Management attendance as well as union representation during these meetings was inconsistent. The implementation and follow-through of safety activities was a challenge, such as with the traffic safety recommendations and recommendations to amend the shredder projectile hazard. Some members expressed frustration that management had not taken a more active role in supporting the efforts of the HSC or "taking it more seriously and giving the HSC the importance that it deserves." Many voiced doubt that there was potential to have any influence on health and safety due to lack of support from upper management. One positive action taken, however, was the management's implementation of a new requirement for twice-monthly departmental safety meetings in January 2011. These meetings have been occurring fairly regularly, and have been a useful forum for the HSC to discuss their activities and to solicit input on health and safety from the workforce, as well as to deliver the toolbox trainings.

At the HSC meeting in October 2011, the safety director announced his departure from the company and the intention of the company to seek a replacement in the future. Following this announcement, some of the committee members expressed concerns regarding the continuation of HSC activities and worker representation on the committee. However, committee meetings have

continued under the leadership of the environmental engineer who is now also acting as the site's safety director. It also appears that the committee elections held in January 2012 were met with more enthusiasm than prior to the training intervention, as multiple workers volunteered resulting in a proper election of new HSC members.

General health and safety environment

Changes among the general workforce in relation to health and safety were also observed during the study period. For instance, awareness of the HSC and its work grew among SMR workers, as well as health and safety related interactions between committee members and workers. The increased visibility of the HSC throughout the worksite, particularly due to their involvement in departmental safety meetings, contributed to an "increasing the credibility of the HSC" among workers. In addition, some expressed that the training provided the "needed guidance" for linking "commitment to action" by influencing supervisors "to be more involved around safety issues." At the end of the study period, many had perceived an overall "increase on safety awareness among yard workers," including increased use of PPE such as hearing protection and reflective clothing.

Some challenges to health and safety at the worksite persisted, however, despite the accomplishments of the committee. One of the most commonly cited frustrations was the communication barrier due to the multi-lingual nature of the workforce. Some pointed out that "trying to get everybody on board to convey the importance of safety is always difficult," especially when "supervisors do not speak the language the majority of the workers speak." Furthermore, some workers stated they were hesitant to raise health and safety issues for fear of being treated as "difficult" by management and supervisors. Workers also frequently expressed that they perceived management to be more concerned with production than with safety. In addition, many discussions observed on site involved blaming individuals for health or safety incidents or problems. This was particularly interesting given that safety climate scores were moderately high among workers. It is unclear if this discord was a result of questionable validity of the survey instruments used to measure health and safety performance in that particular environment, or if the workers expressing such frustrations were not representative of the rest of the workforce.

Conclusions and Recommendations

Overall, several positive outcomes were observed following the implementation of the HSC training intervention. These included notable accomplishments of the committee, such as the development of a mission statement and charter, writing formal recommendations to management, and establishing an approach to regularly engage the workforce through the departmental safety meetings. Function within the HSC also improved, including dual-lingual communications enabling enhanced collaboration among members, more focused direction for health and safety actions, and higher levels of engagement and participation among worker members on the committee. Changes seen within the large workforce included trends of decreasing hazards and exposures and increased use of PPE, a decrease in self-reported injuries, an increase in awareness of and reporting to the HSC, and a decrease in the degree to which language was a barrier to raising health and safety issues. It was somewhat concerning that these changes were not apparent in the results of the questionnaires, particularly in safety climate, JCQ-derived indicators, and perceived effectiveness of and confidence in the HSC. However, the positive impacts observed and reported overshadow this lack of quantitative change.

The committee faced a variety of challenges throughout the study period, including the continuing language barrier and variable levels of observable management support for health and safety and HSC activities. Without the ongoing assistance of the UW team, it is unclear if the committee would have made the achievements it did with the intervention alone. There was worry that momentum from the training intervention and subsequent committee growth would be suppressed. Indeed, HSC meetings were frequently cancelled or rescheduled due to production pressures, and it was only with persistent pressure from the study staff that the committee continued to meet regularly and undertook many of the projects recommended. The study staff was also instrumental in promoting teamwork and participation after the training by providing interpretation and facilitating some meeting activities. It may be that the presence of an advocate (i.e. a safety director, upper management representative, or union representative) for the HSC may be particularly useful when developing and improving committee effectiveness.

Similar interventions for HSCs may provide benefits in health and safety for other worksites. Based on what was learned throughout the study period, the following is recommended for optimizing HSC function in addition to the current Washington State requirements:

- **Committee composition**: For effective committee functioning, it is vital that the committee is representative of the workforce. Ensure adequate representation of all work departments/areas on the committee. It is also helpful to have a committee that reflects the demographics of the worker population to facilitate any multi-lingual communications. In efforts to promote worker-member participation and to foster open expression of opinions without fear of repercussions, it may be useful to minimize upper management presence on the committee and to encourage union involvement with the committee (i.e. shop steward, members or other union representative).
- **Committee function:** In order to maximize group functioning and HSC effectiveness, it is important to establish clear expectations and procedures for committee work. Develop a written mission statement for the HSC, as well as a charter identifying member roles and responsibilities. In addition, consider utilizing work plans to outline timelines, necessary steps, and key personnel to accomplish HSC priorities and health and safety issues. Formal written communications to management are also useful tools for recommending health and safety improvements and establishing accountability for their completion.
- **Meetings and logistics:** Consistency is another important aspect for effective committee functioning. Conduct HSC meetings in a space where interruptions are unlikely. In addition, schedule meetings regularly and minimize rescheduling due to production pressures or other issues. It may also be necessary to allow for additional time outside of meetings for necessary committee activities (i.e. committee member trainings, walkthrough inspections, accident investigations). Also important is to ensure that all HSC meetings and communications are multi-lingual, as necessary
- **Workforce engagement:** As the goal of an HSC is to provide employees a voice in health and safety matters, committee activities should promote worker engagement. Make all HSC materials available to the workforce (i.e. agendas, minutes), and provide translated materials as appropriate. It may be effective to have committee members lead some health and safety activities such as departmental safety meetings or trainings. A method for workers to report hazards can also be a helpful way to connect the workforce to the HSC, and is also useful in calling attention to issues that the HSC can address.

In this particular worksite, the development of a model HSC was observed to give rise to a variety of positive effects throughout the company. This indicates that given some support and guidance, HSCs can facilitate worker involvement in health and safety and make a positive impact on health and safety conditions. However, it is unclear if the changes made will be sustainable without involvement by the research team, what level of effort would be needed to produce similar changes elsewhere, and if the magnitude of change was sufficient to have lasting and significant impact on overall health and safety.

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APPENDIX A: HSC training curriculum

Health and Safety Committee Training Curriculum

Presented to the health and safety committee at SMR by the University of Washington November 4, 2010 and November 18, 2010

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Introduction to Curriculum

This purpose of this curriculum is to improve health and safety committee functioning and effectiveness through a variety of group development and health and safety activities. The training is intended to span two different 4-hour sessions, with a "homework" assignment to be completed between sessions.

Considerations for multi-lingual committees

All materials were developed for a dual-lingual committee, with consideration of the variety of English and Spanish language literacy levels. We also suggest a bilingual facilitator, if appropriate. We found that with abilities in both languages spoken by committee members, the facilitator was able to engage and encourage participation of all individuals. A bilingual/bicultural facilitator can also be useful in bridging cultural differences and improve understanding and collaboration among committee members.

General materials

- Nametags (optional)
- Whiteboard or easel pad with markers
- Paper and pens for each participant
- Laptop with compatible projector and screen
- Session 1 and 2 PowerPoint files and site-specific photos for hazard recognition if desired
- Copies of handouts for each unit

Session 1

Unit 1 – Training Introduction

Purpose

- Introduce training staff and purpose
- Establish ground rules for training
- Review health and safety committee regulation and purpose

Resources

Time

- *30 minutes*

Materials

- *List of ground rules on large easel pad*

Handouts

- *Session 1 Agenda*

Detailed facilitator notes

Activity 1: Introduction of training (10 minutes)

- Distribute Session 1 Agenda
- Introduce training staff and facilitator
- Briefly summarize WA HSC regulation
    - HSC required if 11 or more employees on one shift at one location
    - At least half of members must be employee-elected (as opposed to management-appointed)
    - Recordkeeping required – attendance, meeting minutes
- Mention that regulation is just a starting point for health and safety committees, and that there are many other factors that affect how well the committee works
- Introduce training purpose
    - *To make health and safety committee more successful, which in turn can increase collaboration and worker involvement in health and safety and ultimately improve workplace safety and*
    - *Help the committee work better as a group*
    - *Help the committee to improve communication and collaboration with both workers and management*
    - *Help the committee learn and practice health and safety problem solving skills*
    - *Give ideas for things the committee can do to improve health and safety at SMR*

Activity 2: Ground rules (5 minutes)

- Post list of ground rules at the front of the room
- Discuss rules with group and ask for their input – add any additional rules to the list that the group feels are necessary

Activity 3: *Introductions (5 minutes)*

- Ask each committee member to introduce him/herself to the group with the following;
  - Name
  - Job
  - One thing that people probably don't know about you (i.e. interesting fact, hobby, something to be proud of)
- Or have each committee member introduce him/herself to someone next to them (providing same info as above), then call on a few members to tell the group what they learned about their partner

Activity 4: *Icebreaker game – Human knot (10 minutes)*

- Ask group to stand in a circle shoulder to shoulder and put their hands in the middle of the circle
- Have each person grab two different hands
- Explain to group that they must now untangle themselves and form a circle without letting go of hands
- Observe as group attempts task. Note the interactions, who's taking lead, etc.
- Debrief
  - Ask group how it felt to do the exercise
  - Prompt discussion on how the task was completed – who took what roles, what worked, what didn't etc.
  - Discuss connections between activity and working as a group - importance of working together, everyone with unique perspective/role/offerings, need a variety of individuals to come up with solution

Ground rules

- **Enjoy yourself** – relax and do not hesitate to laugh
- **Listen carefully** – understand others without interrupting
- **Fully participate** – participate actively and equally; ask questions and say what's on your mind
- **Respect others** – use inclusive and respectful language (i.e. non-racist, non-sexist); respect privacy if someone says something meant to be confidential
- **Value differences** – if you do not agree, challenge each other constructively
- **Be open-minded** – be open to learning new ideas and taking some risks
- **Challenge yourself** – and others with the use of "I" statements
- **Be on time** – please respect the work and time required to implement this agenda; everyone's promptness, cooperation and responsibility are needed
- **Reserve side conversations for breaks** – we will work to have breaks with respect to the timeline of the agenda

**To be written on a large easel pad and posted for all to see throughout training sessions*

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SMR

Health and Safety Committee Training

Agenda for Session #1

11/4/2010

2:00 Introduction
2:30 Accidents and their causes (*Accidentes y las causas*)
2:45 Break – snacks and refreshments (*Descanso*)
3:00 Group work – how to work better as a team (*Trabajo en grupo—como trabajar mejor en equipo*)
4:15 Break – snacks and refreshments (*Descanso*)
4:30 Health and safety hazard control process (*Salud y seguridad: Procesos y controles de peligros*)
5:45 Wrap-up (*Resumen final)*
6:00 End (*Final*)

Next training session Thursday Nov. 18th

Unit 2 – Accidents and their causes

Purpose

- Establish a common understanding and terminology for workplace health and safety incidents and their causes

Resources

Time

- *20 minutes*

Materials

- *Session 1 PowerPoint– slides 1 - 2*

Handouts

- *None*

Detailed facilitator notes

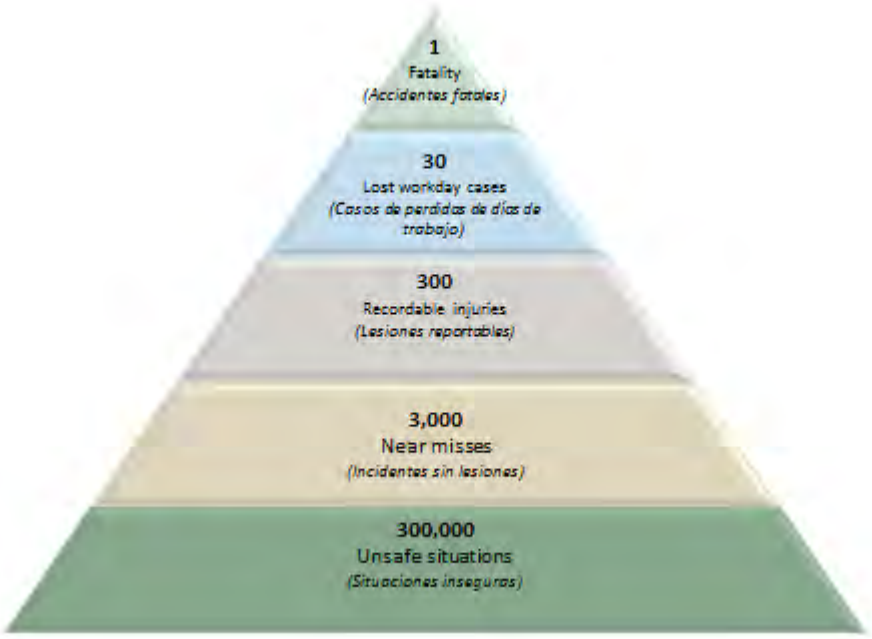
Activity 1: Accident pyramid (5 minutes)

- Display workplace incident pyramid (slide 1) on projector
- Briefly describe each level of the pyramid, then discuss overall relevance
    - For each fatality or major injury, there are many more "near misses" or unsafe conditions
    - To prevent these more serious incidents, there is significant work to be done in identifying, preventing, and addressing unsafe conditions
- Suggest that the term "accident" be avoided when discussing health or safety incidents. "Accident" implies that occurrence happened purely by chance, when in fact workplace illnesses and injuries are preventable. Incident tends to be a better term, and can refer to near misses or situations resulting in injury.

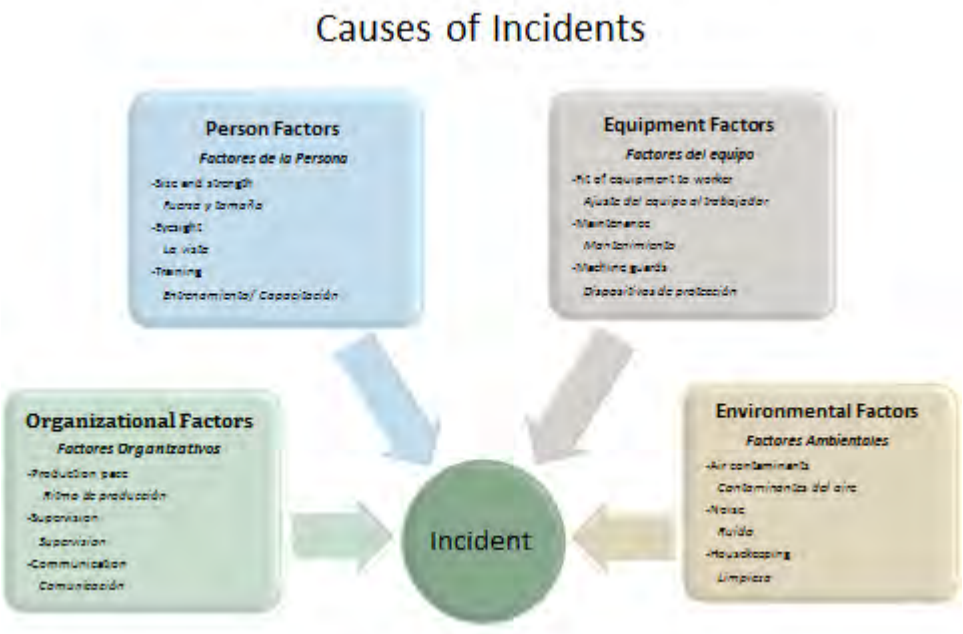
Activity 2: Discussion of health and safety Incident causes (15 minutes)

- Ask group to name some causes of workplace health and safety incidents
    - Write worker ideas on easel pad at front of room
- Display incident causation model (slide 2) on projector
- Describe model
    - Explain that there are a variety of different factors that can lead to a health or safety incident
    - Discuss each type of factors and the listed examples. Also note where the ideas listed earlier by the group fit into the model
- If time allows, ask for an example of a health or safety incident and have the group try and list the various factors involved using the model as a guide

Slide 1 – Workplace incident pyramid



Slide 2 – Causes of incidents



Unit 3 – Committee team building

Purpose

- Clarify goals of general health and safety program
- Increase understanding of the various roles and perspectives in health and safety on the worksite
- Promote group cohesion and collaboration between worker and management members

Resources

Time

- *75 minutes*

Materials

- *Role-play scenarios*

Handouts

- *None*

Detailed facilitator notes

Activity 1: Large group discussion of health and safety at worksite (15 minutes)

- Engage the group in a general discussion about health and safety at their worksite by asking the following questions
  - *Why do we have a health and safety program?*
  - *What are we trying to achieve with health and safety programs at the worksite?*
  - *What could be better about health and safety at the worksite?*
  - *What are some things that make it hard to improve health and safety at the worksite?*

Activity 2: Small group discussion of health and safety at worksite (30 minutes)

- Have the committee split into small groups - groups should have 3 or 4 people, with management-appointed members and employee-elected members in separate groups
- If possible, one trainer/facilitator should sit with each group to observe and prompt discussion on the following items. Ask a committee member to take notes.
  - *Feedback on all-group discussion*
    - *Do you agree with comments in large group discussion?*
    - *Anything to add/elaborate?*
    - *Anything you don't agree with or that needs to be revised?*
  - *Discussion of roles in health and safety*
    - *What is your role as a worker/supervisor/manager in health and safety?*
    - *What are some things you can do to improve health and safety? (think about incident pyramid, incident causation model)*
    - *How can the "other group" help you or how can you work together to improve health and safety at the worksite?*
- Ask the groups to report back on the questions and encourage discussion as a whole group on issues raised

Activity 3: Role-play (30 minutes)

- Provide a realistic scenario reflective of the issues in the workplace and ask participants to play various roles in addressing it
- Ask for volunteers to act out the scenario – if possible, try to get a mix of worker and management members
- Assign volunteers to roles outside of current job (i.e. have a worker-member play a supervisor role or vice versa)
- Describe the situation and ask the volunteers act out situation in front of group
- Begin discussion about the scenario by asking some of the following questions to the actors and the entire group;
    - *What were you feeling and thinking during the scenario?*
    - *What do you think the others in the scenario were feeling and thinking?*
    - *How did it feel to play a different role than you're used to?*
    - *What was positive about the interactions in the scenario?*
    - *What could have been improved?*

Unit 4 – Hazard control process

Purpose

- Introduce a model and tools to be used in identifying and addressing workplace hazards
- Increase comfort with hazard recognition and control techniques
- Encourage labor-management collaboration among committee members
- Encourage collaboration between committee members and their constituents

Resources

Time

- *75 minutes*

Materials

- *Session 1 PowerPoint– slides 3-4*
- *Hazard recognition photos from Session 1 PowerPoint slides 5-14*

Handouts

- *"Types of Health and Safety Hazards"*
- *"Homework"*

Detailed facilitator notes

Activity 1: Introduction of hazard control process (15 minutes)

- Display hazard control process diagram (slide 3)
- Explain that the model is one approach to deal with hazards at work
- Briefly describe each step in the process
- Explain that the first step of the hazard control process (See It), is often called hazard recognition or hazard identification
- Ask the group about different ways they may find out about a workplace hazard. If needed, supplement their ideas with the following methods for hazard identification;
  - Walkthroughs
  - Incident/hazard reporting by employees – formal or informal
  - Incident investigations
- Distribute "Types of Health and Safety Hazards" handout and display on projector (slide 4)
- Explain that thinking of hazards in categories is sometimes useful in identifying hazards
- Briefly describe each type of hazard on the handout

Activity 2: Hazard recognition and control exercise (20 minutes)

- Display hazard recognition photographs using the projector
- For each photo, ask the group to name potential health and safety hazards (using the handout as a guide if necessary) and discuss the probability of incident occurring as a result of the hazards, and the severity of the potential consequences
- For a few of the photos, identify one hazard and ask the group to come up with potential solutions for that hazard. Discuss if solutions are temporary or permanent, and if they lead to any other health or safety problems.

Activity 3: Small group practice (25 minutes)

- Divide committee into groups of 3 or 4, with a mix of worker and management members in each group. Ask one person to take notes.
- Display hazard recognition photo on slide 14 on the projector
- Ask each group to discuss the hazards seen in the photo, as well as potential solutions
- When finished, ask each group to name a few hazards they saw and to describe some of the potential solutions

Activity 4: "Homework" (15 minutes)

- Explain that for many successful health and safety committees, work outside of the regular meetings is needed. This includes taking time to interact with "constituents" (coworkers represented by committee member) to understand their concerns and ideas for health and safety
- Distribute homework handout and describe assignment
    - Worker members - go back to work area and collaborate with co-workers
        - Identify hazards in area
        - Brainstorm solutions
    - Management members - work with upper management/owners to identify priority health and safety issues
- Each member to turn in completed handout before next training session

Slide 3 – Hazard control process

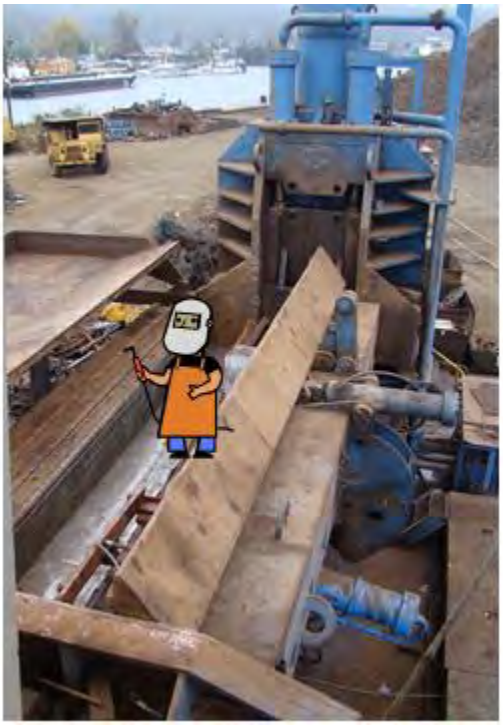
Slide 4 – Types of health and safety hazards

Slide 5 – Hazard recognition photo

Slide 6 – Hazard recognition photo

Slide 7 – Hazard recognition photo

Slide 8 – Hazard recognition photo



Slide 9 – Hazard recognition photo

Slide 10 – Hazard recognition photo

Slide 11 – Hazard recognition photo

Slide 12 – Hazard recognition photo

Slide 13 – Hazard recognition photo

Slide 14 – Hazard recognition photo for small group exercise

One way to make a health and safety committee more successful is to get input on health and safety issues from all workers.

Una manera para que un comité de salud y la seguridad tengan éxito es conseguir información acerca de los aspectos de seguridad y de salud por parte de todos los trabajadores.

Your "assignment" is to talk with the other workers in your area about health and safety issues in your work area.

Tu "misión" es hablar con tus compañeros de trabajo acerca de los temas de salud y seguridad en tu área.

- **Ask your coworkers about the health and safety issues they see in the work area, and possible solutions for those problems and concerns**.
  Pregúntale a tus compañeros de trabajo acerca de las situaciones de seguridad y las posibles preocupaciones y soluciones a estos problemas.

- **Then, write down the issues and ideas for solutions in the form**.
  Luego escribe los problemas y las ideas para solucionar los problemas en las columnas siguientes.

- **Hand in to safety director by <u>November 10, 2010</u>**.
  Entrégaselo al director de seguridad el día <u>Noviembre 10, 2011</u>

Health & Safety problem/concern

(Problemas y preocupaciones de salud y seguridad)

***Example** (Ejemplo) :*

- **A belt on a machine is exposed and could catch clothing or a body part**

  (Una faja en una máquina está expuesta y podría atrapar la ropa o una parte del cuerpo)

Ideas to fix the problem/concern

(Ideas para solucionar los problemas)

***Examples** (Ejemplos):*

- **Purchase guard to enclose belt**

  (Comprar y reemplazar la cobertura de proteccion para la faja)
- **Put up cones around area to prevent people from coming near belt**

  (Colocar conos de seguridad alrededor del área para evitar que la gente se acerque a la la maquina con la faja expuesta)

Unit 5 – Debrief/wrap up

Purpose

- Encourage participants' reflection and expression of thoughts and ideas learned in the session

Resources

Time

- *10-15 minutes*

Materials

- *None*

Handouts

- *None*

Detailed facilitator notes

- Debrief
  - Ask group how it felt to do the training activities and to interact with other committee members
  - Ask group what they learned during the session
- Introduce what will be covered in next session
  - Communication
  - Characteristics and activities of effective health and safety committees
  - Results from baseline health and safety assessment
  - Planning for future committee activities

Session 2
Unit 1 – Session 2 Introduction and Communication

Purpose

- Increase participants' awareness and understanding of individual and cultural differences in communication

Resources

Time

- *60 minutes*

Materials

- *Ground rules from Session 1*
- *Photo for icebreaker game*
- *Box of personal protective equipment props*
  - *New earplugs*
  - *Dust mask*
  - *Safety glasses*
  - *Safety boot*
  - *Other assorted safety gear or tools*

Handouts

- *"Session 2 Agenda"*

Detailed facilitator notes

Activity 1: Session 2 Introduction (15 minutes)

- Re-introduce facilitator and training staff
- Review ground rules list from Session 1 - Activity 1
- Ask group for thoughts on last training (i.e. memories, successes, challenges)
- Remind group of training purpose (from Session 1 - Activity 1)

Activity 2: Communication icebreaker game (15 min)

- Arrange a line of chairs facing the front of the room and have participants sit in them (they should be seated so that they can only see the participants in front of them)
- Explain that the purpose of the exercise is to communicate a message up the line, so that the person at the front can complete the task being communicated. However, the participants are not allowed to talk during the game – they must only convey the message through gestures.
- Show the photo to the person seated at the back of the line and ask them to act out what they see in the picture to the person in front of them. Then have that person gesture what they saw to the person in front of them, and so on.
- The person at the end of the line should then select from the box of props to act out the message that he/she received.
- Show the group the original photo and compare to what the last person in line did with the props.
- Debrief
  - Ask the group what they felt was challenging about the game
  - Ask how it felt not to be able to talk

Activity 3: Communication (30 minutes)

- Transition from discussion on icebreaker game
- Ask group to discuss experiences with "homework" assignment
    - *How did it feel to talk to coworkers?*
    - *Describe some of the language or communication barriers encountered*
    - *What were some of the techniques you used to communicate?*
- Discuss communication issues with language/cultural barriers
    - *How do you know if you're being understood?*
    - *How do you let others know you understand them?*
    - *Are these the same indicators for all people?*
    - *What are some universal ways to communicate a message?*
    - *What are some ways to facilitate communication with those who speak a different language?*

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SMR

Health and Safety Committee Training

Agenda for Session #2

11/18/2010

2:00 Improving communication (*Mejorando la comunicación*)
3:00 Break – snacks and refreshments (*Descanso*)
3:15 How to be a successful health and safety committee (*Como tener éxito en los comités de salud y seguridad*)
4:00 Health and safety at SMR (*Salud y seguridad en SMR*)
4:45 Break – snacks and refreshments (*Descanso*)
5:00 Planning for the future (*Planear para el futuro*)
5:45 Wrap-up (*Resumen final*)
6:00 End (*Final*)

Unit 2 – How to be an effective committee

Purpose

- Promote awareness and reflection for current committee functioning/effectiveness
- Increase participants' awareness and encourage adoption of characteristics and activities of successful health and safety committees

Resources

Time

- *45 minutes*

Materials

- *Session 2 PowerPoint- slides 1-10*

Handouts

- *"What the research tells us about successful health and safety committees"*

Detailed facilitator notes

Activity 1: Current committee functioning (30 minutes)

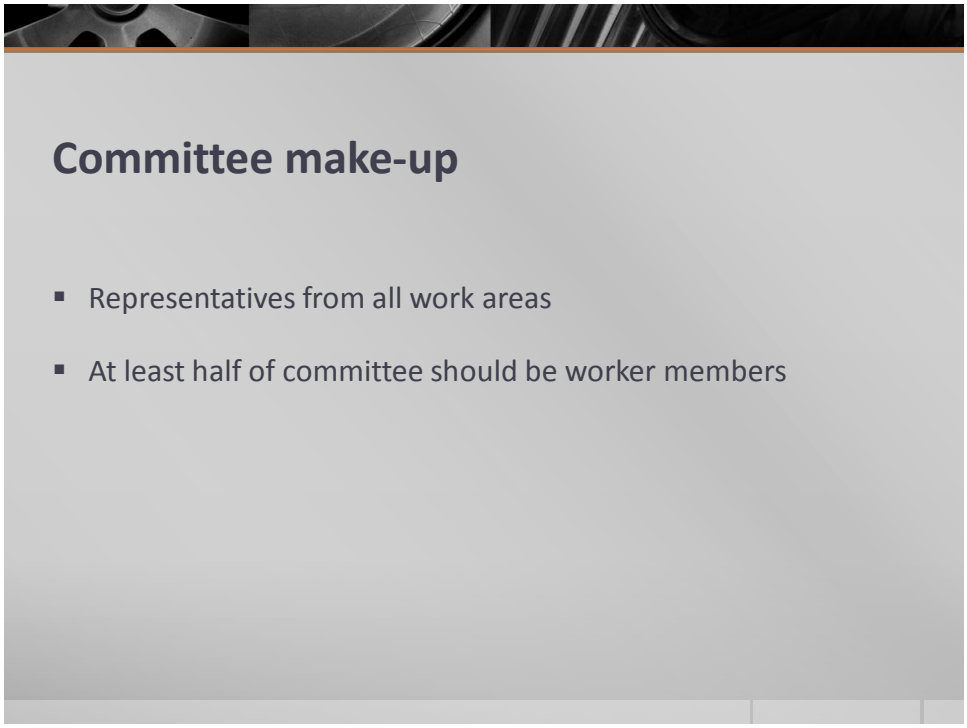
- Engage the group in a general discussion about their health and safety committee by asking the following questions;
    - *What are committee successes/accomplishments?*
    - *What has the committee been doing that is working well?*
    - *What has the committee been doing that hasn't been working?*
    - *Any ideas for being more successful?*
        - *New procedures/policies for how the committee works; how meetings are run?*
        - *New systems/activities?*
        - *Knowledge/skills needed?*

Activity 2: Successful health and safety committees (15 minutes)

- Distribute handout "What the research tells us about successful health and safety committees"
- Display Session 2 PowerPoint with projector
- Explain that research studies/best practices have found that there are a variety of characteristics and activities common to successful committees which will be summarized in presentation
- Present material on slides 1-10

Slide 1

Slide 2



Slide 3

Roles and responsibilities

- A charter describes…
  - Role of committee within health and safety program
    - Which health and safety activities will the committee participate in or oversee
  - Individual member roles
    - Declare chair of committee or worker/management co-chairs?
    - Participation in committee activities
      - Developing agendas
      - Taking minutes
  - Authority of committee (i.e. spend money, make changes, make recommendations)

Slide 4

Meeting format

- Allow enough time to address health and safety issues as they come up
  - Meet regularly – at least an hour monthly
  - Additional meetings and time as needed
- Agendas created and handed out before meeting
  - Members assigned to report on agenda items as appropriate, run portions of meetings
- Keep careful minutes
  - List members responsible for action items
  - Approve minutes at beginning of each meeting
- Have a decision-making process

Slide 5

Communication

- With management
  - Written recommendations
- With workers
  - Post list of members, meeting times
  - Post minutes in a timely manner
  - Suggestion box –worker reports of hazards, near misses – option to remain anonymous
  - Safety meetings

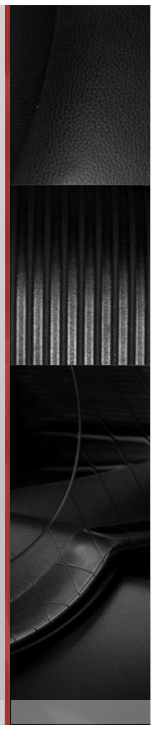
Slide 6

Checking to see if the committee is working well

- Identify goals for committee and health and safety
- Regular evaluation of committee effectiveness, progress on goals (i.e. yearly, every 6 months)
  - Checklists, forms, discussion questions

Slide 7

Health and safety activities

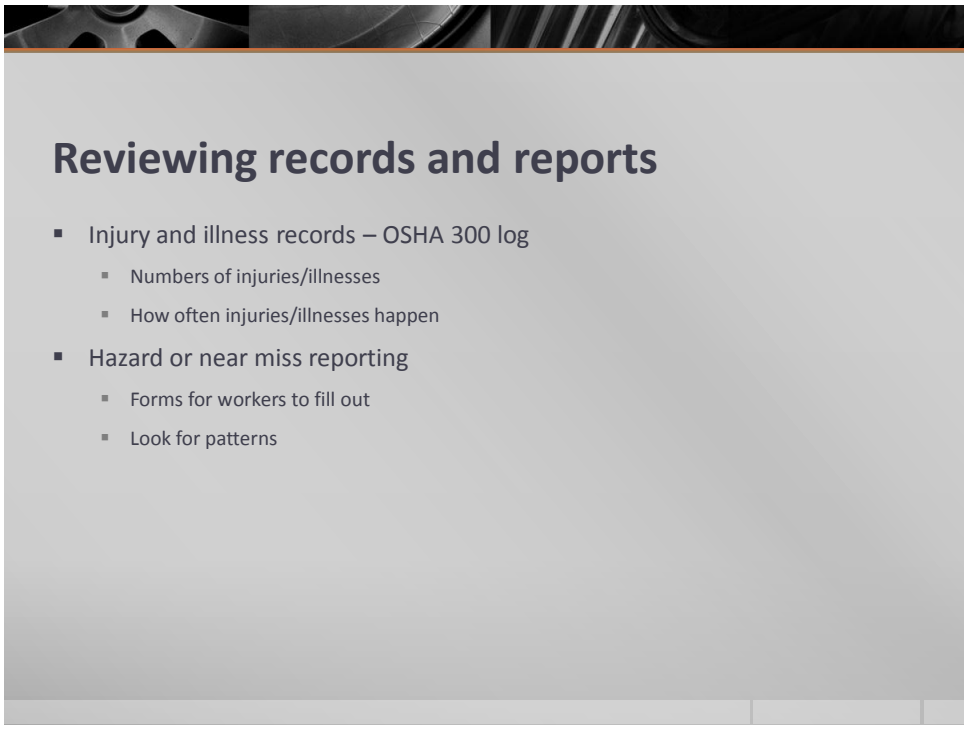


Slide 8

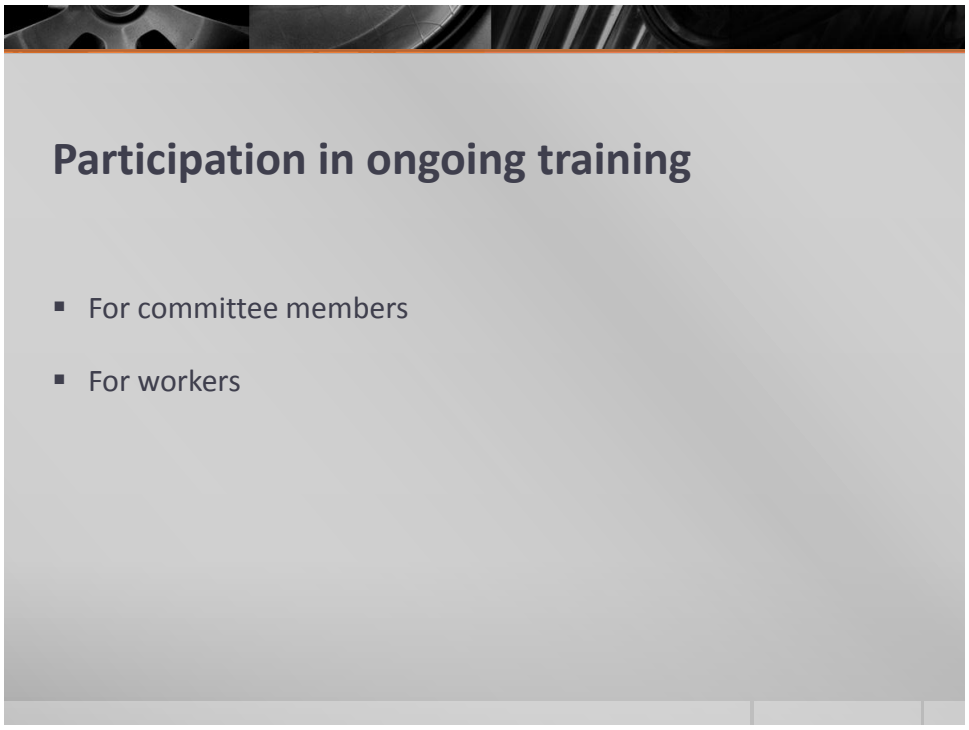
Inspections and investigations

- Participation in inspections/walkthroughs
  - Monthly inspections
    - Can use checklist
    - Consider pairing up labor and management committee members
  - Target inspections
    - For one type of health and safety issue (ie machine safety, noise)
- Participation in investigations
  - Follow up on fatalities, injuries, and near misses
    - Can use checklist, reporting form

Slide 9



Slide 10



What the research tells us about successful health and safety committees

Committee make-up

- Representatives from all work areas
- At least half of committee should be worker members

Roles and responsibilities

- Describe in a "charter" document
    - Role of committee within health and safety program
        - Which health and safety activities will the committee participate in or oversee
    - Individual member roles
        - Declare chair of committee or worker/management co-chairs?
        - Participation in committee activities
            - Developing agendas
            - Taking minutes
    - Authority of committee (i.e. spend money, make changes, make recommendations)

Meeting format

- Allow enough time to address health and safety issues as they come up
    - Meet regularly – at least an hour monthly
    - Additional meetings and time as needed
- Agendas created and handed out before meeting
    - Members assigned to report on agenda items as appropriate, run portions of meetings
- Keep careful minutes
    - List members responsible for action items
    - Approve minutes at beginning of each meeting
- Have a decision-making process

Communication

- With management
    - Written recommendations
- With workers
    - Post list of members, meeting times
    - Post minutes in a timely manner
    - Suggestion box –worker reports of hazards, near misses – option to remain anonymous
    - Safety meetings

Checking to see if the committee is working well

- Identify goals for committee and health and safety
- Regular evaluation of committee effectiveness, progress on goals (i.e. yearly, every 6 months)
    - Checklists, forms, discussion questions

Health and safety activities

- Participation in inspections/walkthroughs
    - Monthly inspections
        - Can use checklist
        - Consider pairing up labor and management committee members
    - Target inspections
        - For one type of health and safety issue (ie machine safety, noise)
- Participation in investigations
    - Follow up on fatalities, injuries, and near misses
        - Can use checklist, reporting form
- Reviewing records and reports
    - Injury and illness records – OSHA 300 log
        - Numbers of injuries/illnesses
        - How often injuries/illnesses happen
    - Hazard or near miss reporting
        - Forms for workers to fill out
        - Look for patterns
- Participation in ongoing training
    - For committee members
    - For workers

Que nos informan los estudios acerca de la efectividad de los Comités de salud y seguridad

Composición del comité

- Representantes de todas las áreas de trabajo
- Por lo menos la mitad del comité deben ser trabajadores

Funciones y responsabilidades

- Descrito en el documento que contiene los estatutos
    - El papel del comité dentro del programa de salud y seguridad
        - ¿En cuales actividades de salud y de seguridad el comité participará o supervisará?
    - El rol del miembro del comité
        - Seleccionar el presidente del comité o ¿co-presidencia por parte de la gerencia/trabajadores?
        - Participación en actividades del comité
            - Desarrollo de la agenda del comité
            - Tomando notas de las actas del comité
    - Autoridad del comité (ej., hacer cambios, presentar recomendaciones, utilización de fondos)

El formato de las reuniones

- Permitir tiempo suficiente para hacer frente a problemas de salud y la seguridad a medida que surgen
    - Reunirse regularmente—por lo menos una hora al mes
    - Reuniones y tiempo adicional cuando sea necesario
- Agendas son desarrolladas y distribuidas antes de la reunión del comité
    - Ciertos miembros son asignados a reportar partes de la agenda, dirigir partes de la reuniones
- Mantener en detalle las notas de las actas
    - Mantener un listado de los miembros del comité responsables por puntos de acción
    - Aprobar las actas de las reuniones previas antes de comenzar la nueva reunión
- Establecer un método para la toma de decisiones

Comunicación

- Con la gerencia
    - Recomendaciones por escrito
- Con los trabajadores
    - Publicar la lista de los miembros del comité, el horario de las reuniones
    - Publicar las actas de las reuniones en un tiempo adecuado
    - Caja de sugerencias—reporte por parte de los trabajadores acerca de riesgos, cuasi/casi accidentes—con la opción de mantener el anonimato
    - Reuniones periódicas de seguridad

Verificar la eficacia del comité (Que tan bien esta funcionando)

- identificar los objetivos del comité y de la salud y la seguridad
- Evaluación periódica de la efectividad y el progreso de los objetivos (ej., anualmente, cada seis meses)
    - Lista de controles, formularios, temas de discusión

Actividades de salud y seguridad

- Participación en inspecciones/rondas de seguridad
    - Inspecciones mensuales
        - Utilizando listas de control
        - Considere el emparejamiento de dos miembros del comité (gerencia/trabajador)
    - Fijar objetivos de las inspecciones
        - Para un tipo de problema de salud y seguridad (ej., seguridad de maquinaria, ruido)
- Participación en las investigaciones de accidentes
    - Dar seguimiento a la investigación de accidentes fatales, lesiones y casi-accidentes
        - Utilizar una lista de controles, hojas de reporte
- Revisar los registros y reportes
    - Registros de lesiones, heridas y enfermedades—OSHA 300
        - Numero de lesiones/heridas/enfermedades
        - Que tan seguido ocurren las lesiones/heridas/enfermedades
    - Peligros y reportes de casi-accidentes
        - Formularios para ser completados por los trabajadores
        - Observación de patrones
- Participación en entrenamientos en desarrollo
    - Para miembros del comité
    - Para los trabajadores

Unit 3 – Health and safety at your worksite

Purpose

- Promote communication of health and safety issues raised in members' respective departments
- Inform participants of UW health and safety assessment process

Resources

Time

- *45 minutes*

Materials

- *Session 2 PowerPoint – slides 11-15*
- *Completed "homework" forms from participants*

Handouts

- *None*

Detailed facilitator notes

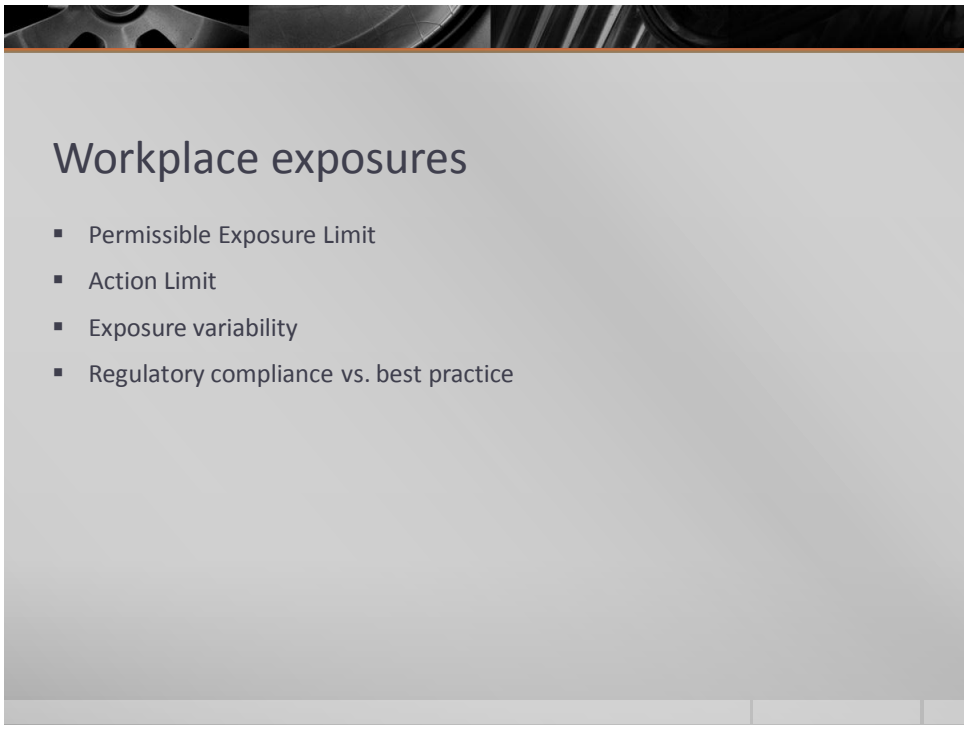
Activity 1: "Homework" reports (30 minutes)

- Ask participants to share some of the issues raised/discussed from their "Homework" exercise
- Discuss any commonalities, potential solutions etc
- Reiterate that interacting with "constituents" to learn about the health and safety issues they experience is a key function of the health and safety committee

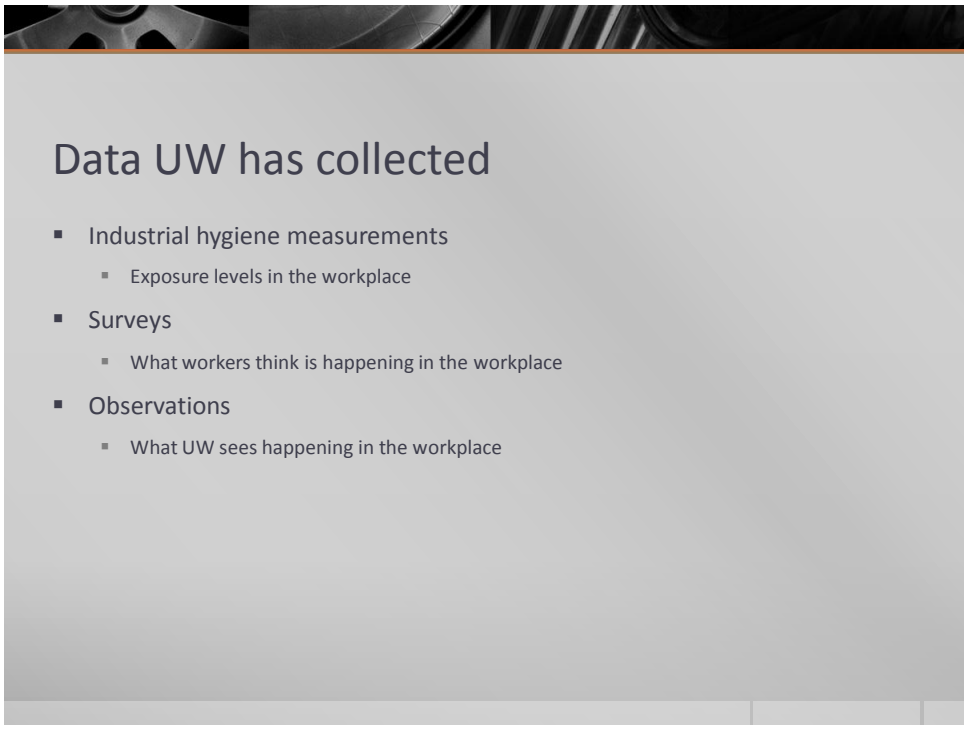
Activity 2: UW health and safety assessment (15 minutes)

- Display Session 2 PowerPoint with projector – starting on slide 11
    - Explain the exposure concepts on slide 11
    - Describe the data collection process as outline on slide 12
    - Show example of results from noise monitoring on slides 13-15
- Explain that comprehensive results will be presented at an upcoming health and safety committee meeting – all committee members will receive a detailed report in English/Spanish

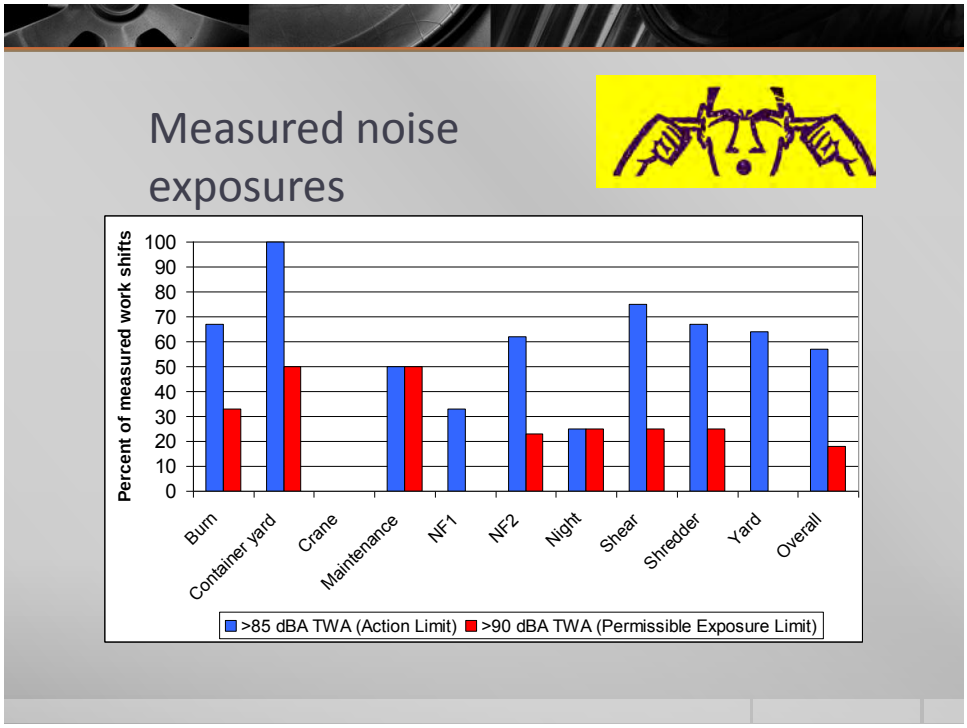
Slide 11



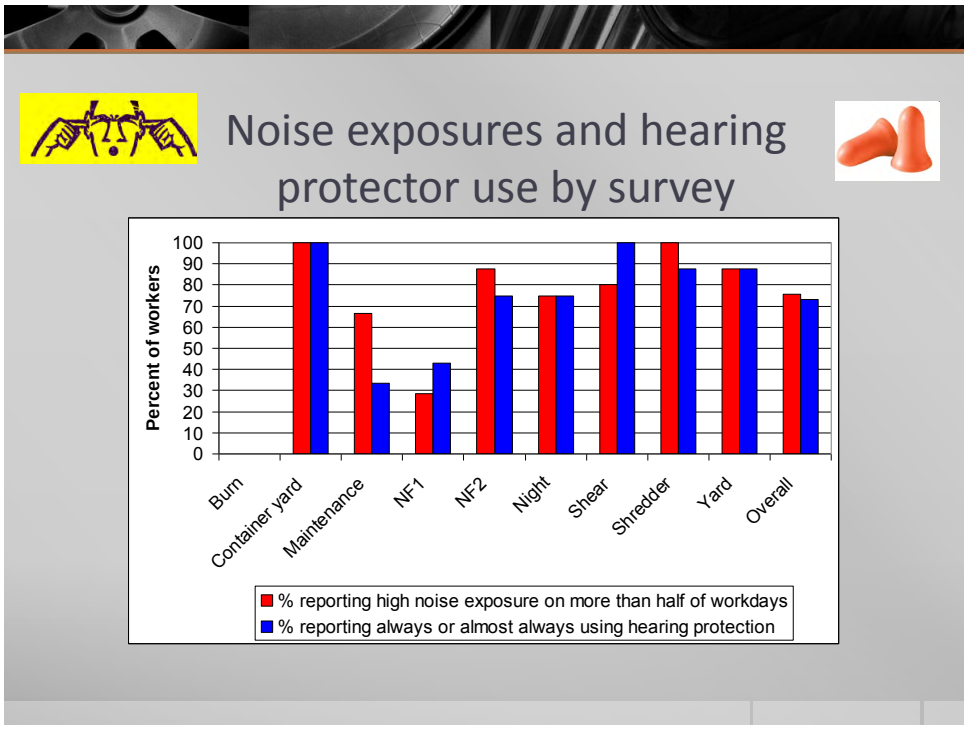
Slide 12



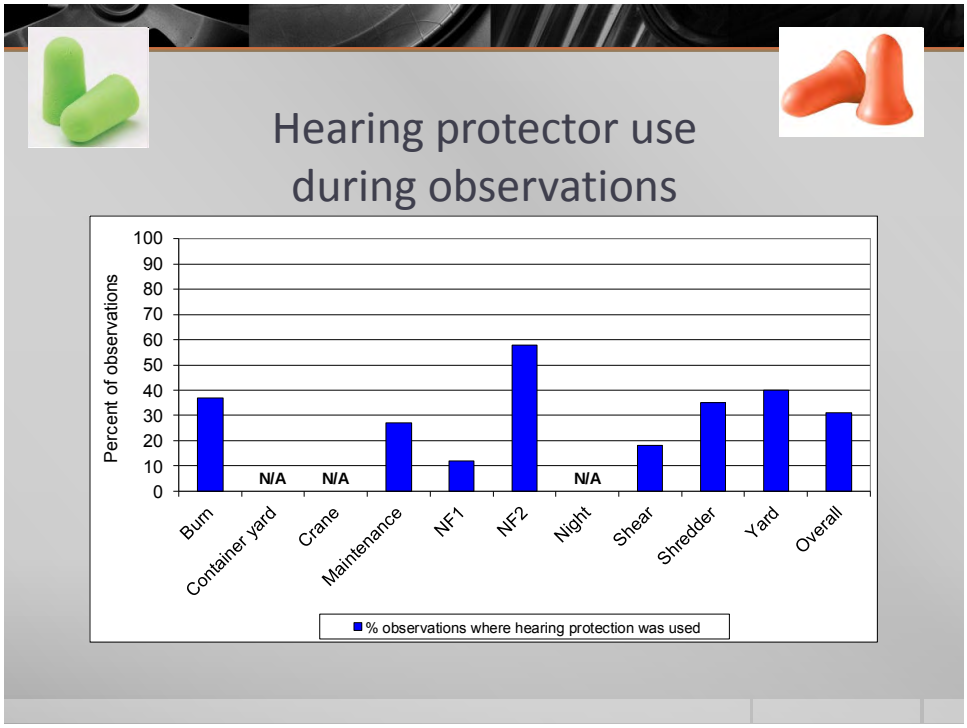
Slide 13



Slide 14



Slide 15


Hearing protector use during observations
Percent of observations
100
90
80
70
60
50
40
30
20
10
0
N/A
N/A
N/A
Bum
Container yard
Crane
Maintenance
NF1
NF2
Night
Shear
Shredder
Yard
Overall
% observations where hearing protection was used

Unit 4 – Next steps for the health and safety committee

Purpose

- Encourage discussion and planning of next steps to improve committee functioning and effectiveness

Resources

Time

- *50 minutes*

Materials

- *Small group discussion questions*

Handouts

- *None*

Detailed facilitator notes

Activity 1: Small group discussions of next steps (30 min)

- Have the committee split into 3 groups of 3-5 with a mix of management-appointed members and employee-elected members
- Each group will discuss a different topic – communication, committee structure and function, or health and safety activities. Provide each group with a different set of the provided discussion questions.
- If possible, one trainer/facilitator should sit with each group to observe and prompt discussion on the provided discussion questions. Ask a committee member to take notes.
- After about 25 minutes, ask each group to identify a few priorities resulting from the discussion

Activity 2: Large group activity/discussion of next steps (20 minutes)

- Ask one person from each group to share their selected priorities. Facilitator or other training staff should record these items on large easel pad at front of room.
- Discuss/clarify items listed as needed
- Once all items have been listed, ask each participant to choose 2 or 3 of the items from the list that see as the most important. Then, ask the participants to go to the front of the room and put a star/mark next to their priority items.
- Observe any trends and discuss with group

Communication

Within committee

- How will we make sure everyone is participating?
- How will we make sure everyone understands?
    - What about members who are more comfortable speaking Spanish?

With management

- How will we inform management of committee activities?
- How will we make recommendations to management?
    - Written or verbal?
    - How will we make sure management responds to recommendation?

With workers

- How will we inform workers of committee activities?
- How will we inform workers of health and safety issues?
- How will we make sure workers can inform the committee of health and safety issues?
- What about workers who are more comfortable speaking Spanish?

Comunicación

Dentro del comité

- ¿Cómo vamos a asegurarnos de que todos los miembros participan?
- ¿Cómo vamos a asegurarnos que todos los miembros entienden?
    - ¿Qué pasa con los miembros que se sienten más cómodos hablando Español?

Con la gerencia

- ¿Cómo vamos a informar a la gerencia de las actividades del comité?
- ¿Cómo vamos a proponer recomendaciones a la gerencia?
    - ¿Por escrito o en forma verbal?
    - ¿Cómo nos aseguraremos que la gerencia da respuesta a nuestras recomendaciones?

Con los trabajadores

- ¿Cómo vamos a informar a los trabajadores de las actividades del comité?
- ¿Cómo vamos a informar a los trabajadores acerca de las cuestiones de la salud y seguridad?
- ¿Cómo vamos a hacer que los trabajadores informen al Comité acerca de las cuestiones de salud y seguridad?

¿Qué pasa con los trabajadores que sienten más cómodos hablando en Español?

Committee structure and function

Roles and responsibilities

How does the committee fit into the rest of the health and safety program at SMR?

- How should the committee support the health and safety program?

What kind of authority will the committee have?

- Ability to manage own budget, spend money?
- Authority to make changes in the worksite?
- Advising/making recommendations to management?

Individual roles in the committee

- Who should lead the committee?
    - What about co-chairs – worker and management representatives
- Who will write up the agenda?
- Who will record minutes?
    - Same person or rotate?

Meeting format

What should meetings look like?

- How often should the committee meet?
- For how long?
- Who will run the meetings?
    - Chairperson(s)?
    - Individual members report on some agenda items?

How will decisions be made (for setting priorities, for disagreements)?

- Should any one individual be able to veto ideas?
- Voting or consensus (presenting arguments, debating)?

How will the committee make sure action items get dealt with?

- How will we keep track of action items?
- How will we track progress on action items?

Estructura y Función del Comité

Rol y Responsabilidades

¿Cómo encaja el comité en el resto del programa de salud y seguridad en el SMR?

- ¿Cómo debería el comité dar apoyo al programa de salud y seguridad?

¿Qué tipo de autoridad tendrá el comité?

- ¿Capacidad para gestionar un presupuesto propio, utilizar los fondos?
- ¿Autoridad para realizar cambios en el lugar de trabajo?
- ¿Asesoramiento/ formular recomendaciones a la gerencia?

Los roles indivi duales en el comité

- ¿Quién debe liderar el comité?
    - ¿Qué pasa con los co-presidentes - representantes de los trabajadores y la gerencia?
- ¿Quién va a redactar la agenda?
- ¿Quién va a anotar/redactar las actas o minutos de las reuniones?
    - Con rotaciones o el mismo miembro?

Formato de las reuniones

¿Cómo deberían llevarse a cabo las reuniones?

- ¿Con qué frecuencia se debería reunir el comité?
- ¿Por cuánto tiempo?
- ¿Quién va a dirigir las reuniones?
    - ¿Presidente(s)?
    - ¿Miembros reportan algunos de los temas de la agenda (programa)?

¿Cómo se tomaran las decisiones (para el establecimiento de prioridades, para resolver desacuerdos)?

- ¿Existe la posibilidad que un miembro sea capaz de vetar las ideas?
- ¿Votar o consenso (la presentación de argumentos, debate)?

¿Cómo verificara el comité que los puntos de acción son tratados y resueltos?

- ¿Cómo vamos a asegurar que se ha dado un seguimiento a los puntos de acción?
- ¿Cómo vamos a monitorizar el progreso de las acciones a tomar?

Health and safety activities

Current activities

- Is the committee already participating in any of the activities on the list?
    - How are they working?
- What types of information do these activities provide?
- Are the right people involved?
    - Should more workers be involved?
- Are the forms/checklists/tools used (if any) working?
- Could changes be made to the activities we do to make them work better?
    - Could they provide more information?
    - What resources would be needed?
        - Forms/checklists
        - Health and safety expertise
        - Time
        - Committee members to be involved

Potential new activities

- Are there any activities on the list that the committee does not do or participate in that might be helpful?
- What types of new information would the activities provide?
    - How will we use the information?
- Who would be involved in these activities?
- What resources would be needed?
    - Forms/checklists
    - Health and safety expertise
    - Time

Actividades de Salud y Seguridad

Actividades actuales

- ¿Está el comité participando en alguna de las actividades en la lista?
    - ¿Cómo están trabajando?
- ¿Qué tipo de información ofrecen estas actividades?
- Se encuentran involucradas las personas indicadas?
    - ¿Deberían ser incluidos mas trabajadores?
- ¿Son útiles los formularios y listas de control / herramientas utilizadas (si alguna)?
- ¿Se podrían hacer cambios en las actividades que llevamos a cabo para que funcionen mejor?
    - ¿Podrían proporcionar más información?
    - ¿Qué recursos serían necesarios?
        - Listas de acción, formularios
        - Experiencia en salud y seguridad
        - Tiempo
        - Miembros del comité que debería estar involucrados

Posibles nuevas actividades

- ¿Hay alguna actividad en la lista que el comité no participa en que podría ser útil?
- ¿Qué tipo de nueva información ofrecen las actividades?
    - ¿Cómo utilizaremos la información?
- ¿Quién participará en estas actividades?
- ¿Qué recursos serían necesarios?
    - Formularios, listas de acción
    - Experiencia en salud y seguridad
    - Tiempo

Unit 5 – Debrief/wrap up

Purpose

- Encourage participants' reflection and expression of thoughts and ideas learned in the session

Resources

Time

- *10-15 minutes*

Materials

- *None*

Handouts

- *None*

Detailed facilitator notes

- Debrief
  - Ask group how it felt to do the training activities and to interact with other committee members
  - Ask group what they learned during the session
  - Ask group what they hope the results will be from the training sessions/what they are looking forward to
- Describe next steps in UW study
  - Presentation of detailed health and safety assessment results at next committee meeting
  - Ongoing involvement and support in committee activities
    - Provide support and resources for priority activities as identified by committee
  - Re-check health and safety performance in about 1 year, followed by final report

APPENDIX B: Pre-training questionnaire

Questions 1-7 ask about your experience with the health and safety committee at SMR. Please tell us how much you agree or disagree with each statement. Marking 1 indicates that you "strongly disagree" with the statement, 3 means you "neither agree nor disagree," and 5 means you "strongly agree" with the statement.

	Strongly Disagree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
1. I am comfortable interacting with other committee members.	1	2	3	4	5	NA
2. I am comfortable speaking up in the committee setting.	1	2	3	4	5	NA
3. Worker and management committee members cooperate in the committee setting.	1	2	3	4	5	NA
4. My role and responsibilities as a committee member are clear.	1	2	3	4	5	NA
5. The role and responsibilities of the committee as a whole are clear.	1	2	3	4	5	NA
6. I am comfortable identifying health and safety problems in an organized way.	1	2	3	4	5	NA
7. I am comfortable coming up with multiple ways to solve a health and safety problem.	1	2	3	4	5	NA

APPENDIX C: Post-training questionnaire

Questions 1-14 ask about your experience with the training and with the health and safety committee in general at SMR. Please tell us how much you agree or disagree with each statement. Marking 1 indicates that you "strongly disagree" with the statement, 3 means you "neither agree nor disagree," and 5 means you "strongly agree" with the statement.

	Strongly Disagree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
1. I am comfortable interacting with other committee members.	1	2	3	4	5	NA
2. I am comfortable speaking up in the committee setting.	1	2	3	4	5	NA
3. Worker and management committee members cooperate in the committee setting.	1	2	3	4	5	NA
4. My role and responsibilities as a committee member are clear.	1	2	3	4	5	NA
5. The role and responsibilities of the committee as a whole are clear.	1	2	3	4	5	NA
6. I am comfortable identifying health and safety problems in an organized way.	1	2	3	4	5	NA
7. I am comfortable coming up with multiple ways to solve a health and safety problem.	1	2	3	4	5	NA
8. The facilitator encouraged participation.	1	2	3	4	5	NA
9. The facilitator was clear and easy to understand.	1	2	3	4	5	NA
10. The information presented in the training was easy to follow and understand.	1	2	3	4	5	NA
11. The worksheets and handouts used in the training were helpful.	1	2	3	4	5	NA
12. I will use the worksheets and handouts given out at the training.	1	2	3	4	5	NA
13. Overall, I am satisfied with the training.	1	2	3	4	5	NA

14. Which parts of the training were the **most** useful?
15. Which parts of the training were the **least** useful?
16. Are there other activities or information that would have been helpful to have at the training?
17. Is there anything else you would like to share with us about the training

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Baseline Results of Exposure Assessment of SMR

Resultados del Punto de Inicio de Evaluación de la Exposición en SMR

December 29, 2010

Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

The Department of Environmental and Occupational Health Sciences has partnered with SMR and Teamsters Local 117 to enhance the effectiveness of the Labor/Management Health and Safety Committee at SMR. The project, funded by the Washington State Department of Labor and Industries, Safety and Health Investment Projects, involves conducting an initial assessment of health and safety exposures at the facility, providing training to the Health and Safety Committee concerning committee effectiveness, and a reevaluation of conditions at the company one year later. This report, designed for delivery to the SMR joint labor management health and safety committee, provides the results of the initial assessment. The intent of this report is to provide basic findings to the SMR committee to assist with setting priorities for committee and program development over the coming year.

The information reported here is derived from three types of sources: questionnaires delivered to all employees at SMR, industrial hygiene measurements of specific exposures at the site, and observations of work practices and conditions made by UW staff. All data were collected in October and November, 2010 and compiled by UW staff.

Noah Seixas, Principal Investigator
Rick Neitzel, Research Scientist
Carlos Dominguez, Research Coordinator
Allison Crollard, Graduate Student
Bert Stover, Data Analyst

El Departamento de Ciencias Ambientales y Ocupacionales se ha asociado con la empresa SMR y el sindicato Teamsters Local 117 para aumentar la eficacia del Comité de Salud y Seguridad compuesto por trabajadores y empresarios de SMR. El proyecto fundado a través del Proyecto de Inversión en Salud y Seguridad por el Departamento de Labor e Industrias del Estado de Washington, implica la ejecución de una evaluación inicial de riesgos de salud y seguridad en las instalaciones, proporcionar capacitación al Comité de Salud y Seguridad en cuanto a efectividad del comité, y una reevaluación de las condiciones en la empresa un año después. Este informe presenta los resultados iniciales del asesoramiento al Comité de Salud y Seguridad de la empresa SMR. La intención de este informe es ofrecer los resultados básicos al Comité para ayudar a establecer prioridades, y contribuir en el desarrollo del programa durante el próximo año.

La información contenida en este reporte proviene de tres fuentes de información: los cuestionarios o encuestas proporcionadas a todos los trabajadores de la empresa SMR, las mediciones de los riesgos específicos de higiene industrial, y las observaciones de las condiciones y prácticas de trabajo realizadas por el personal de la Universidad de Washington (UW).

Noah Seixas, Investigador Principal
Rick Neitzel, Científico Investigador
Carlos Domínguez, Coordinador de Investigación
Allison Crollard, Estudiante de Posgrado
Bert Stover, Analista de Datos

NOISE/RUIDO

The problem

Exposure to high levels of noise can cause hearing loss over time. Noise is measured as a full-shift average. Noise is measured in decibels (dBA). The higher the decibel level, the greater the risk of hearing loss.

Washington state has a Permissible Exposure Limit that sets allowable noise exposure levels.
Average levels over 85 dBA mean that a hearing conservation program is needed. This program includes noise measurements, worker training, hearing testing, and use of hearing protectors.
Average levels over 90 dBA mean that noise controls must be attempted to reduce noise levels. Noise controls are changes to the workplace, changes to work practices, or changes to equipment.

SMR has an existing hearing conservation program that covers all workers onsite. The program includes noise measurements, worker training, hearing testing, and use of hearing protectors. All workers receive annual hearing testing and training. Hearing protection is provided to all exposed workers at no cost. We have not identified any previous efforts to develop noise controls.

What UW measured

Using noise meters (dosimeters), we measured full-shift average noise levels on workers over 60 shifts. The numbers in parentheses behind each area name are the number of measurements we made.

El problema

La exposición a altos niveles de ruido puede causar pérdida de audición a través del tiempo. El ruido se mide como un promedio durante un turno completo. El ruido se mide en decibelios (dBA). Cuanto mayor sea el nivel de decibelios, mayor será el riesgo de pérdida de audición.

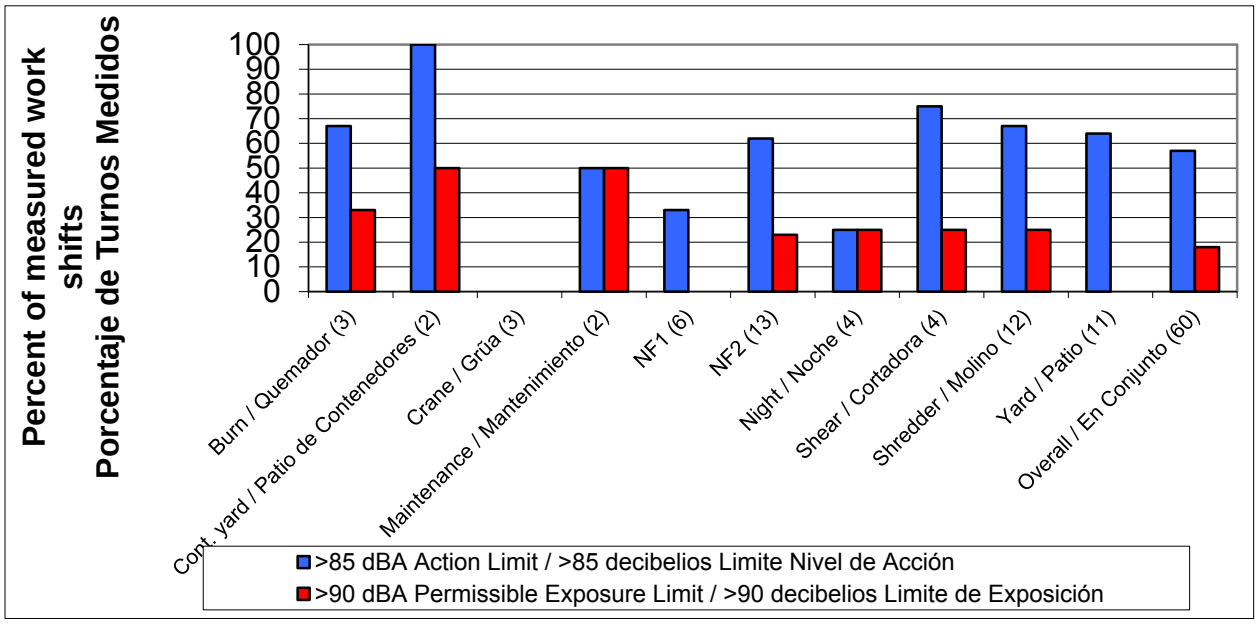
El Estado de Washington tiene Límites de Exposición Permisibles que establece los niveles permisibles de exposición al ruido
El promedio de niveles más altos de 85 (dBA) significa que es necesario un programa de conservación de la audición. El programa incluye medidas de ruido, capacitación de trabajadores, exámenes auditivos, y el uso de equipo de protección auditiva.
El promedio de niveles más altos de 90 (dBA) significa que para reducir los niveles de ruido controles de ruido deben de intentarse. Controles de ruido pueden ser cambios en el lugar de trabajo, cambios a las prácticas de trabajo, o cambios en la maquinaria.

La empresa SMR tiene un programa vigente de conservación de la audición que cubre todos los trabajadores expuestos al ruido. El programa incluye la capacitación de los trabajadores, las mediciones de ruido, los exámenes de audición, y el uso de protección auditiva. Todos los trabajadores reciben un examen y capacitación anualmente. Protectores auditivos son proporcionados a todos los trabajadores expuestos al ruido, sin costo alguno. No se han identificado ningún esfuerzo previo de desarrollo de controles de ruido.

Que midió la UW

Utilizando medidores de ruido (dosímetros), se midió el promedio de los niveles de ruido durante el turno completo en más de 60 turnos. Los números en paréntesis detrás de cada área es el número de mediciones que tomamos.

NOISE/RUIDO



Many work shifts were over the Action Limit and Permissible Exposure Limit. Only one area (cranes) had no noise problems. Noise levels in most areas were high enough that noise controls should be considered.

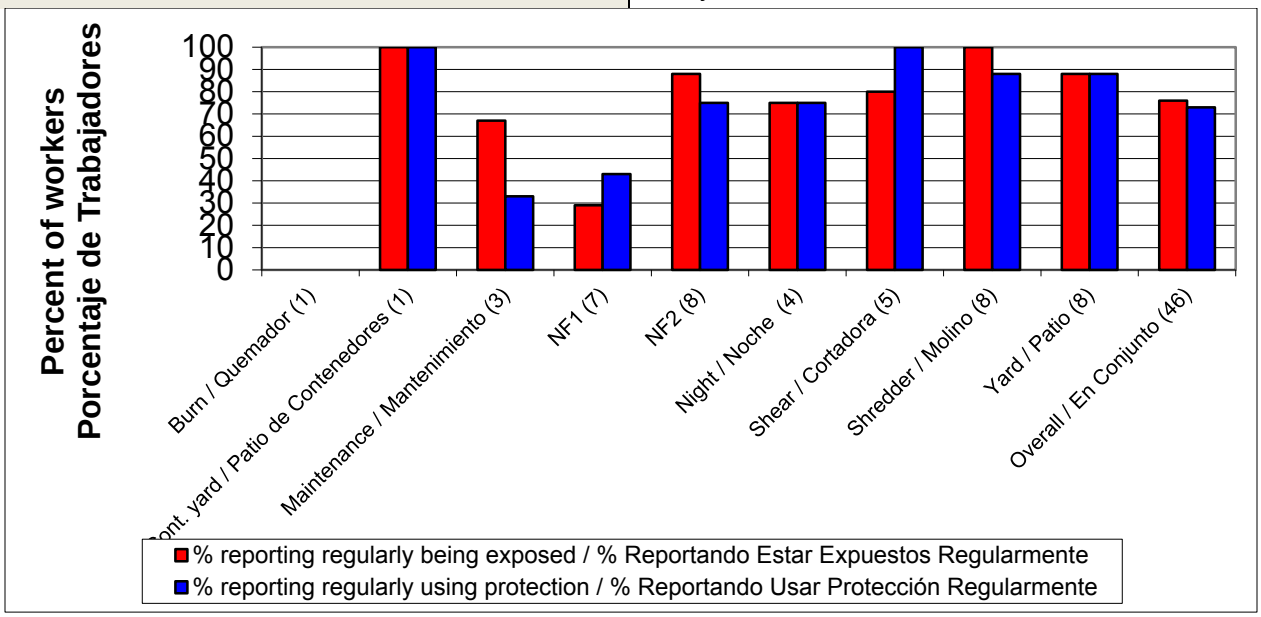
What workers told UW

We interviewed 46 workers and working supervisors, and asked them about their own noise exposures. The numbers in parentheses behind each area name are the number of workers we interviewed.

Muchos de los turnos estuvieron más altos de los Límites de Acción y Límites Permisibles de Exposición. Solo en un área (grúas) no tuvieron problemas con el ruido. Los niveles de ruido en la mayor parte fueron lo suficientemente altos que los controles de ruido debe ser considerados.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores, y les preguntamos acerca de su exposición al ruido. Los números dentro de cada paréntesis es el número de trabajadores entrevistados.



NOISE/RUIDO

Workers in almost all areas felt they regularly have high noise exposures. Most workers also reported regularly using protection (either earplugs or earmuffs).
Although all workers receive training as part of the hearing conservation program, only 82% of workers said they have received training on how to protect their hearing from noise.

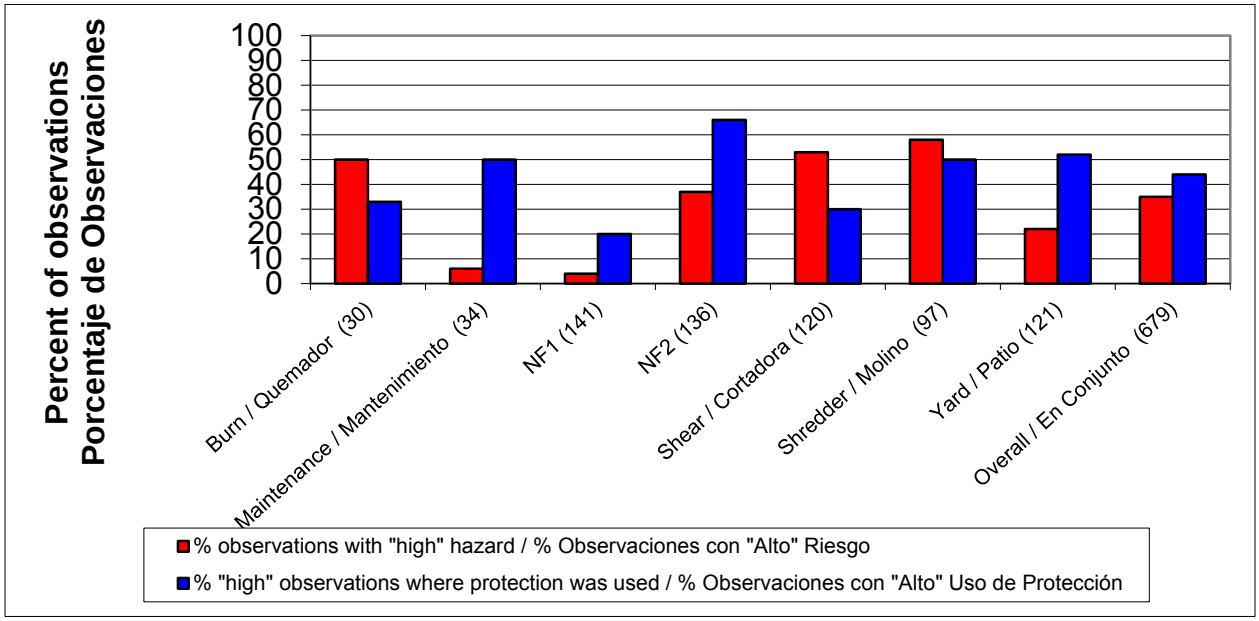
Los trabajadores de casi todas las áreas sienten que están expuestos regularmente a altos niveles de ruido. La mayoría de los trabajadores reportan utilizar protección regularmente (tapones u orejeras). Aunque todos los trabajadores reciben capacitación como parte del programa de conservación de la audición, solo el 82% de los trabajadores reportan que han recibido capacitación sobre cómo proteger su audición debido al ruido.

What UW observed

We observed the noise levels workers were exposed to over two months. We also observed the protective equipment (earplugs and earmuffs) they were using.
We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los niveles de ruido que los trabajadores están expuestos durante un período de más de dos meses. También observamos el equipo de protección utilizado (tapones y orejeras). Completamos 679 observaciones de trabajadores. No llevamos a cabo ninguna observación durante el turno de la noche. Los números entre paréntesis detrás de cada área de trabajo son el número de observaciones que completamos.



UW recommendations

All workers should be enrolled in a hearing conservation program.
Noise controls should be implemented to reduce noise levels.

Recomendaciones de la UW

Todos los trabajadores deben estar inscritos en el programa de la prevención de la audición.
Los controles de ruido deben implementarse para reducir los niveles de ruido.

CARBON MONOXIDE / MONOXIDO DE CARBONO

The problem

High exposures to carbon monoxide gas can cause headaches, nausea, vomiting, dizziness, and fatigue. Very high exposures to carbon monoxide can cause loss of consciousness and death. Carbon monoxide gas is measured as a full-shift average, and also as a short-term exposure over every 5-minute period during a measured workshift. Carbon monoxide is measured in parts per million (ppm).

Washington state has a Permissible Exposure Limit that sets allowable carbon monoxide exposure levels:
35 ppm full-shift average
200 ppm average over a 5-minute period

Workers exposed above these levels need to be enrolled in a respiratory protection program that includes training, use of respirators, fit-testing of respirators, and annual medical evaluations.

SMR has an existing respiratory protection program that covers some workers. All workers except those in the yard area receive annual training. Respirators are required for workers doing cutting or burning, welding, soldering or brazing, and painting. Respirators are provided to all exposed workers at no cost.

What UW measured

Using carbon monoxide meters, we measured full-shift average carbon monoxide levels and 5-minute average levels on workers during 17 shifts. The numbers in parentheses behind each area name are the number of measurements we made.

El problema

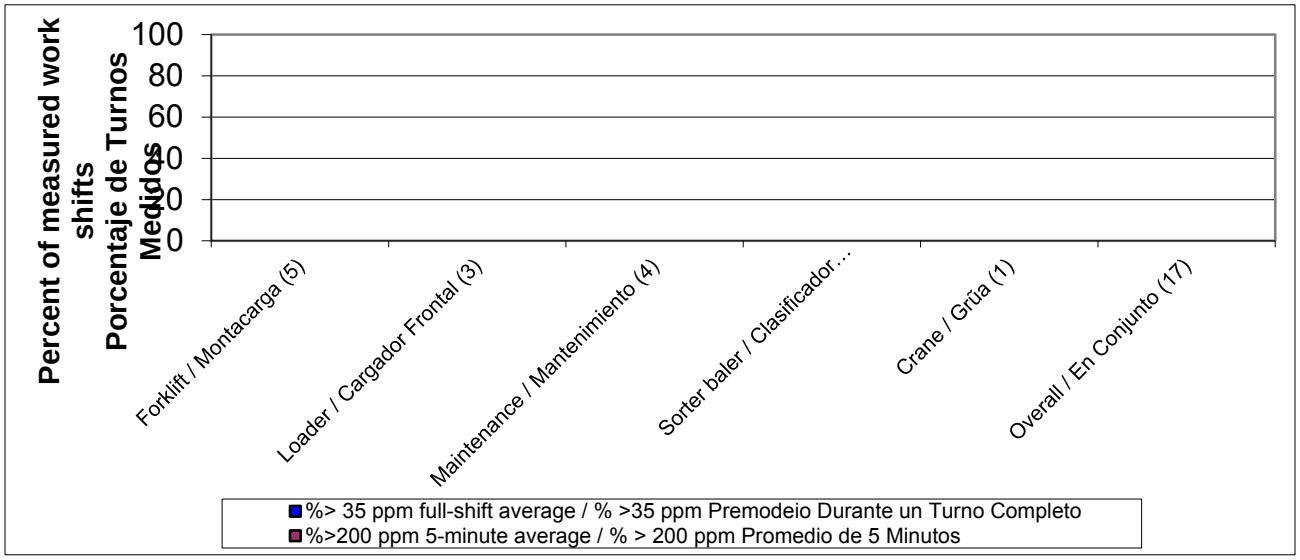
La exposición elevada a altos niveles de monóxido de carbono puede causar dolores de cabeza, náuseas, mareos, y fatiga. Muy alta exposición al monóxido de carbono puede causar la pérdida del conocimiento y la muerte. El monóxido de carbono se mide como un promedio durante un turno completo, y también como un promedio de exposición de corto plazo durante un periodo de 5 minutos. El monóxido de carbono se mide en partes por millón (ppm).

El estado de Washington determina los siguientes Límites de Exposición Permisibles para el monóxido de carbono:
35 ppm el promedio durante un turno completo
200 ppm el promedio durante un periodo de 5 minutos
Los trabajadores expuestos por encima de estos niveles deberán estar inscritos en un programa de protección respiratoria que incluya la capacitación, el uso de respiradores, pruebas de ajuste de los respiradores, y evaluaciones médicas anuales
La empresa SMR tiene un programa vigente de protección respiratoria que cubre algunos trabajadores. Todos los trabajadores, excepto los de la zona del patio reciben capacitación anualmente. Los respiradores son necesarios para los trabajadores que realizan el corte o la quema con equipo de soldadura, soldadura o soldadura dura, y pintura. Los respiradores son proporcionados a todos los trabajadores expuestos, sin costo alguno.

Lo que midió la UW

Utilizando el equipo de medición de monóxido de carbono, medimos el promedio de monóxido durante un turno completo y el promedio de los niveles de los trabajadores durante 5 minutos en 17 turnos. Los números entre paréntesis en cada área de trabajo son el número de mediciones que completamos.

CARBON MONOXIDE / MONOXIDO DE CARBONO



We did not find any overexposures to carbon monoxide over full shifts or 5 minute intervals.

UW recommendations

Workers driving bobcats should be trained on the potential for high carbon monoxide exposures when operating the vehicles inside enclosed spaces like containers.

Other workers do not need to be enrolled in a respiratory protection program specific to carbon monoxide exposures.

Durante los turnos completos o durante los intervalos de 5 minutos no encontramos ninguna sobre exposición al monóxido de carbono,

Recomendaciones de la UW

Los trabajadores que manejan montacargas deben de ser capacitados en los posibles peligros a la alta exposición al monóxido de carbono dentro de los contenedores.

No es necesario que otros trabajadores estén inscritos en el programa de protección respiratoria especifico a las exposiciones al monóxido de carbono

PARTICULATE MATTER (DUST)/MATERIAL PARTICULADO (POLVO)

The problem

Exposure to high levels of particulate matter in the air, such as dust and welding smoke, can cause lung disease.

Airborne particulate matter is measured as weight of particulate matter (in milligrams, mg) per cubic meter of air, or mg/m^3. Total particulate is measured as a full-shift average.

Washington state has a Permissible Exposure Limit that sets allowable total particulate exposure levels:
10 mg/m^3 full-shift average

Workers exposed above these levels need to be enrolled in a respiratory protection program that includes training, use of respirators, fit-testing of respirators,

SMR has an existing respiratory protection program that covers some workers. Respirators are required for workers doing cutting or burning, welding, soldering or brazing, and painting. Respirators are provided to all exposed workers at no cost. Workers in the respiratory protection program receive annual training.

What UW measured

Total particulate

Using air sampling pumps. We measured full-shift average particulate matter exposure levels during 72 shifts. The numbers in parentheses behind each area name are the number of measurements we made.

El problema

La exposición a altos niveles de partículas en el aire, como el polvo y el humo de la soldadura, puede causar enfermedades pulmonares.

El material particulado en el aire se mide como el peso de las partículas (en miligramos) por centímetro cubico de aire, o mg/m3. El total de material particulado es medido como promedio durante un turno completo.
El estado de Washington tiene un Límite de Exposición Permisible que establece los totales admisibles de partículas en los niveles de exposición:
10 mg/m3 promedio turno completo

Los trabajadores expuestos por encima de estos niveles deberán estar inscritos en un programa de protección respiratoria que incluya la capacitación, el uso de respiradores, y pruebas de ajuste de los respiradores

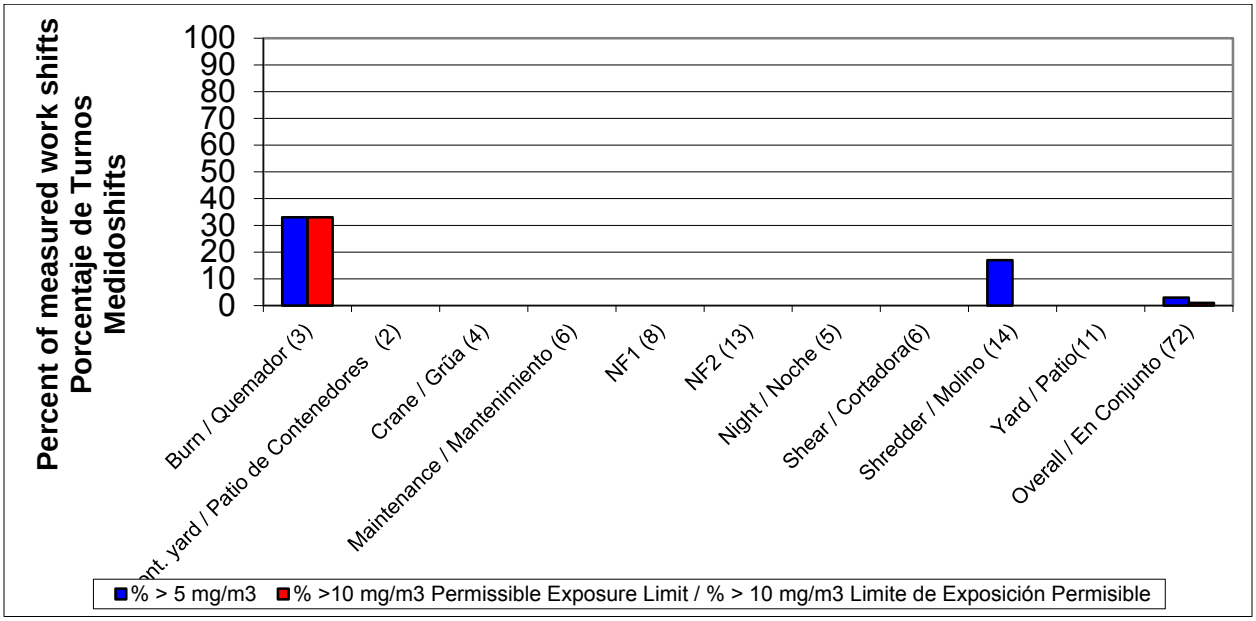
La empresa SMR tiene un programa existente de protección respiratoria que cubre algunos trabajadores. Los respiradores son requeridos para los trabajadores que realizan el corte o la quema con quipo de soldar, soldadura, y la pintura. Los respiradores son proporcionados a todos los trabajadores expuestos, sin costo alguno. Los trabajadores en el programa de protección respiratoria reciben capacitación anualmente.

Lo que midió la UW

Particulado Total

Utilizando de bombas de muestreo de aire medimos el promedio de exposición al material particulado durante 72 turnos completos. Los números entre paréntesis en cada área son el número de mediciones que tomamos.

PARTICULATE MATTER (DUST)/MATERIAL PARTICULADO (POLVO)



Nearly all workers had particulate matter exposures that were well below 5 mg/m^3, or one-half of the Washington state Permissible Exposure Limit. Only workers in the burn and shredder areas ever exceeded one-half of the Permissible Exposure Limit, and only workers in the burn area ever exceeded the Permissible Exposure Limit.

Specific metals

We also examined all 72 air samples for each of the following metals: antimony, beryllium, cadmium, chromium, cobalt, copper, iron, manganese, molybdenum, nickel, vanadium, and zinc.

Each of these metals has a Permissible Exposure Limit set by Washington State. None of the air samples reached more than ½ of the Permissible Exposure Limits.

What workers told UW

We interviewed 46 workers and working supervisors, and asked them about their own particulate matter exposures. The numbers in parentheses behind each area name are the number of workers we interviewed.

Casi todos los trabajadores tienen exposición a material particulado que estuvo muy por debajo de 5 mg / m3, o la mitad del Límite de Exposición Permisible del estado de Washington.

Los trabajadores en el área de quema y la trituradora (molino) nunca superaron la mitad del Límite de Exposición Permisible, y solamente los trabajadores en el área de quema superaron los Límites de Exposición Permisibles en algunas ocasiones.

Metales Específicos

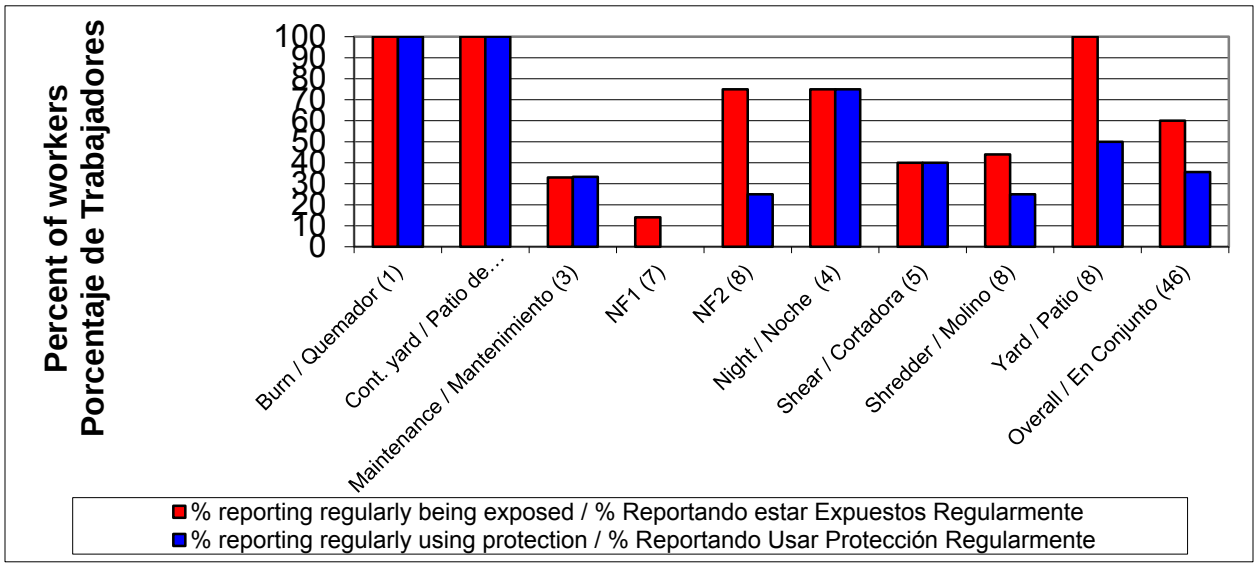
También se examinaron las 72 muestras de aire para cada uno de los siguientes metales: antimonio, berilio, cadmio, cromo, cobalto, cobre, hierro, manganeso, molibdeno, níquel, vanadio y zinc.

Cada uno de estos metales tiene un Límite de Exposición Permisible fijado por el estado de Washington. Ninguna de las muestras de aire ha llegado a más de la mitad de los Límites de Exposición Permisibles.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores, y les preguntamos acerca de sus exposiciones a material particulado. Los números entre paréntesis en cada área son el número de trabajadores entrevistados.

PARTICULATE MATTER (DUST)/MATERIAL PARTICULADO (POLVO)



Workers in most areas reported regularly exposure to particulate matter. Many, but not all workers reported regularly using protection (respirators) when they were exposed to particulate matter. Fifty-seven percent of workers reported having received training on respiratory protection.

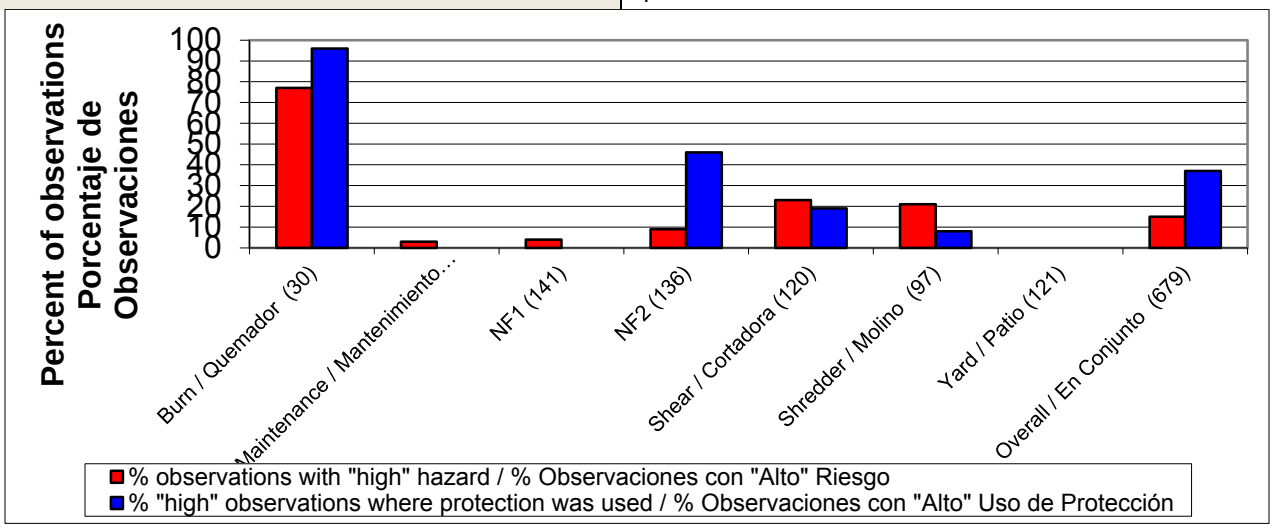
What UW observed

We observed the particulate matter exposures workers had over two months. We also observed the protective equipment (respirators) they were using. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Trabajadores en muchas de las áreas han reportado que están regularmente expuestos a material particulado. Muchos, pero no todos los trabajadores informaron que utilizan protección regularmente (respiradores) cuando están expuestos al material particulado. Cincuenta y siete por ciento de los trabajadores informaron que han recibido capacitación en materia de protección respiratoria

Lo que observó la UW

Se observó la exposición a material particulado que los trabajadores tuvieron durante más de dos meses. También se observó el equipo de protección (respiradores) que estaban utilizando. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis en cada área son el número de observaciones que llevamos a cabo.



PARTICULATE MATTER (DUST)/MATERIAL PARTICULADO (POLVO)

Workers in the shredder area almost never wore protection (respirators) when they were judged to have a high exposure. However, based on the results of our air sampling measurements, workers in this area do not need to use respirators. Workers in the burn area wore protection nearly all of the time, which is appropriate given their potential for high exposures.

Los trabajadores del área de la trituradora (molino) casi nunca usaban protección (respiradores) cuando se consideraba que tenían una alta exposición. Sin embargo, con base en los resultados de las mediciones de muestreo de aire, los trabajadores de esta área no necesitan usar respiradores. Trabajadores en el área de quema usan protección casi todo el tiempo, que es apropiado dado sus posibilidades a altas exposiciones.

UW recommendations

Burners should continue to be enrolled in a respiratory protection program

Workers in other work areas do not need to be enrolled in a respiratory protection program.

Recomendaciones de la UW

Quemadores deben continuar estar inscritos en un programa de protección respiratoria

Trabajadores en otras áreas no necesitan inscribirse en un programa de protección respiratoria.

ERGONOMICS / ERGONOMIA

The problem

Repetitive motion, awkward postures, and lifting heavy objects can lead to musculoskeletal problems, sprains, strains, and other injuries.

SMR has an existing ergonomics policy and training program, which applies only to office staff ergonomics issues.

What workers told UW

We interviewed 46 workers and working supervisors, and asked them about their own ergonomics exposures, including how often they performed repetitive tasks with their hands, how often they worked in awkward postures, and how often they lifted objects.

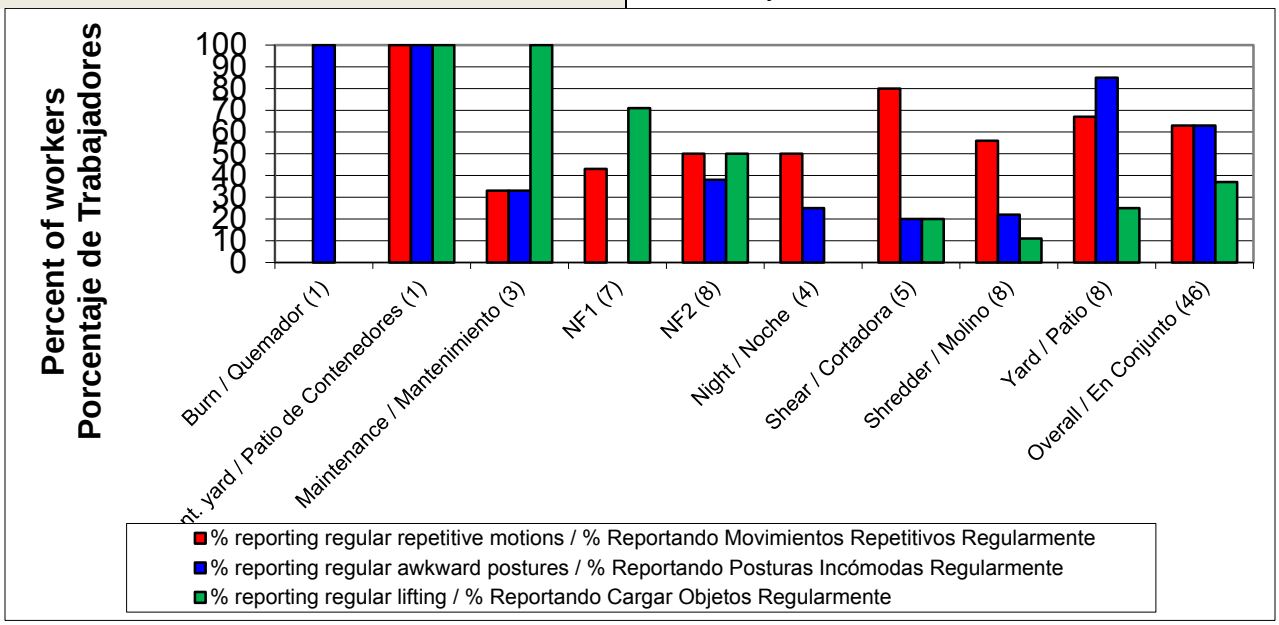
El Problema

Los movimientos repetitivos, las posturas incómodas, y el levantamiento de objetos pesados pueden contribuir a problemas músculo-esqueléticos, desgarres, torceduras y otras lesiones.

La empresa SMR tiene una política vigente y un programa de capacitación de ergonomía para el personal de oficina.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores, y les preguntamos acerca de sus exposiciones ergonómicas, incluyendo la frecuencia con que realizan tareas repetitivas con las manos, la frecuencia con que trabajan en posturas incómodas, y con qué frecuencia levantan objetos.



Workers in all areas reported regular exposure to at least one type of ergonomic hazards. Repetitive motions were most commonly reported in the container yard, shear, yard, and shredder areas. Awkward postures were most commonly reported in the burn, container yard, and yard areas. Regular lifting was most commonly reported in the container yard, maintenance, and NF1 areas. Forty-seven percent of workers said they have received training on ergonomics.

Los trabajadores de todas las áreas reportan estar expuestos regularmente al menos a un tipo de los riesgos ergonómicos. Los movimientos repetitivos fueron reportados con mayor frecuencia en las áreas del patio de contenedores, cortadora, patio, y la trituradora (molino). Las posturas incómodas fueron reportadas con mayor frecuencia en las áreas de quema, el patio de contenedores y el patio. El levantar regularmente objetos fue más común en el patio de contenedores, mantenimiento, y las áreas NF1. Cuarenta y siete por ciento de los trabajadores reportan haber recibido capacitación sobre la ergonomía.

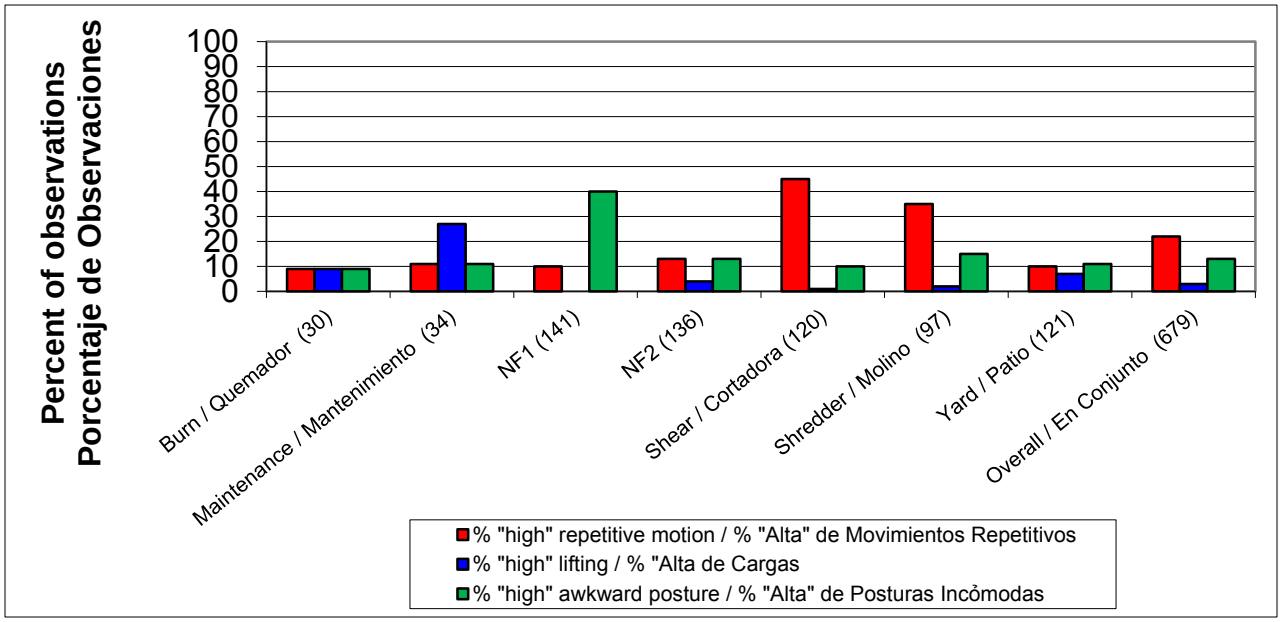
ERGONOMICS / ERGONOMIA

What UW observed

We observed the ergonomics hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los riesgos ergonómicos a que los trabajadores estuvieron expuestos durante más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis en cada área son el número de observaciones que fueron completadas.



Ergonomic exposures were found in all areas. Repetitive motion exposures were observed most often in the shear and shredder areas. Awkward postures were observed most often in NF1. Lifting exposures were most common in the maintenance area.

Se encontraron exposiciones ergonómicas en todas las áreas. Se observaron exposiciones a movimientos repetitivos con mayor frecuencia en el área de corte y la trituradora (molino). Las posturas incómodas se observaron con mayor frecuencia en la NF1. Las exposiciones de levantamiento fueron más comunes en el área de mantenimiento.

UW recommendations

The ergonomics training program should be expanded to include all workers, not just office workers.

Recomendaciones de la UW

El programa de capacitación en ergonomía se debería expandir para incluir a todos los trabajadores, no sólo los trabajadores de oficina.

LEAD EXPOSURES IN AIR AND BLOOD / EXPOSICIONES AL PLOMO EN EL AIRE Y LA SANGRE

The problem

Inhalation of airborne lead, and accumulation of high levels of lead in blood, can cause a variety of serious health problems.

Workplace airborne lead exposure is measured as weight of particulate matter (in milligrams, mg) per cubic meter of air, or mg/m^3. Airborne lead exposure is measured as a full-shift average. Washington state has set a Permissible Exposure Limit for airborne lead of 0.05 mg/m^3 for a full-shift average.

In addition, Washington state requires that workers with exposures to airborne lead which exceed the Permissible Exposure Limit to be enrolled in a blood lead level testing program. Blood lead is measured as weight of lead (in micrograms, µg) per volume of blood (in deciliters, dL). Blood lead levels greater than 25 µg/dL are considered harmful.

SMR has an existing lead awareness training program, All workers receive this training. SMR also has an existing blood lead level testing program which tests workers twice a year. Workers from the following work areas are currently enrolled in the program: burn, shredder, and shear. In addition, workers doing the following types of work are also enrolled in the program: welder, night shift, maintenance. It is not clear whether all workers in these areas and doing these types of work are enrolled in the program.

What UW measured

Airborne lead

Using air sampling pumps, we measured full-shift average airborne lead exposure levels during 72 shifts. The numbers in parentheses behind each area name are the number of measurements we made.

El problema

La inhalación de plomo en el aire, y la acumulación de altos niveles de plomo en la sangre, pueden causar una variedad de problemas graves de salud.

Exposición al plomo en el aire en el lugar de trabajo se mide como el peso de las partículas (en miligramos, mg) por metro cúbico de aire, o mg/m3. La exposición al plomo en el aire es medida como un promedio durante un turno completo. El estado de Washington ha establecido un Límite de Exposición Permisible de plomo en el aire de 0.05 mg / m3 como un promedio total durante un turno completo.

Además, el estado de Washington requiere que los trabajadores expuestos al plomo en el aire que superen el Límite de Exposición Permisible deben estar inscritos en un programa de pruebas de nivel de plomo en la sangre. El plomo en la sangre se mide como el peso de plomo (en microgramos, µg) por el volumen de sangre (en decilitros, dl). Niveles de plomo en sangre superiores a 25 µg / dL se consideran perjudiciales.

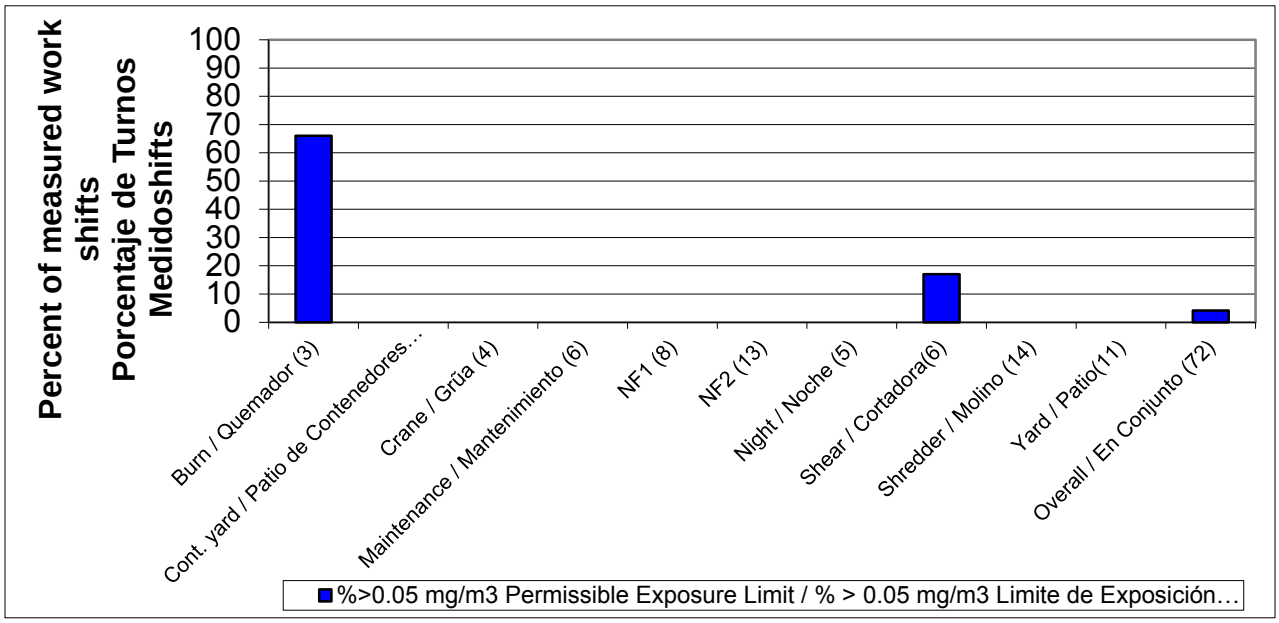
La empresa SMR tiene un programa vigente de conocimiento y capacitación acerca del plomo. Todos los trabajadores reciben capacitación. La empresa también tiene un programa vigente que mide los niveles de plomo en la sangre que incluye las pruebas de sangre de los trabajadores dos veces por año. Los trabajadores de las siguientes áreas de trabajo están actualmente inscritos en el programa: quema, trituradora (molino), y el área de corte. Además, los trabajadores que realizan los siguientes tipos de trabajo también están inscritos en el programa: soldadura, turno de noche, y mantenimiento. No está claro si todos los trabajadores de estas áreas de trabajo o que realizan estos tipos de trabajo están inscritos en el programa.

Lo que midió la UW

Plomo en el aire

Utilizando bombas de muestreo de aire, medimos el promedio de la exposición al plomo durante 72 turnos completos. Los números entre paréntesis en cada área son el número de mediciones que se llevaron a cabo.

LEAD EXPOSURES IN AIR AND BLOOD / EXPOSICIONES AL PLOMO EN EL AIRE Y LA SANGRE



Blood lead levels

With workers' consent, we also obtained from SMR the results of each worker's last two blood lead level tests. No workers had blood lead levels which exceeded the 25 µg/dL, although one worker (a picker) had a blood lead level of one-half this level (12 µg/dL).

UW recommendations

Continued inclusion of burners and workers in the shear area in the existing blood lead level testing program.

The majority of workers do not appear to be at risk of overexposure to lead. However, the workers enrolled in the blood lead level testing program do not appear to represent all workers who are potentially exposed to lead. For example, it appears that not all pickers are enrolled in the testing program, even though the highest blood lead levels in workers in the program were in a picker working at the shredder outlet. (This picker also works as a burner one-third of the time). SMR should ensure that all workers in the shear and burn areas, as well as all pickers in the shredder area, are enrolled in the program.

Niveles de Plomo en la sangre

Con el consentimiento de los trabajadores, también obtuvimos los resultados de sus dos últimas pruebas de plomo en la sangre. Ningún trabajador muestra niveles de plomo en la sangre que sobrepasan los 25 µg / dl, aunque uno de los trabajadores (recolector) muestra un nivel de plomo en sangre a menos de la mitad de este nivel (12 µg / dl).

Recomendaciones de la UW

Continuar la inclusión de los quemadores y los trabajadores en el área de corte en el programa vigente de niveles de plomo en la sangre.

La mayoría de los trabajadores no parecen estar en riesgo de sobre-exposición al plomo. Sin embargo, los trabajadores inscritos en el programa de pruebas de nivel de plomo en la sangre no representan todos los trabajadores que posiblemente están expuestos al plomo. Por ejemplo, a pesar que los más altos niveles de plomo en la sangre aparece en uno de los trabajadores del área de la trituradora (este trabajador también trabaja como quemador una tercera parte del tiempo), parece que no todos están inscritos en el programa. SMR debe garantizar que todos los trabajadores en el área de corte y las zonas de quema, así como todos los recolectores en el área de la trituradora estén inscritos en el programa.

FALLS FROM HEIGHT / CAIDAS DESDE ALTURAS

The problem

Working at height presents a risk of falls that can result in injury or death.

Washington state law requires that a fall protection program be in place when workers can fall 4 feet or more.

SMR has an existing fall protection policy and training program. Workers in all areas receive basic fall protection training as part of their orientation training. Workers in the shear and shredder areas and maintenance workers receive additional fall protection training.

What workers told UW

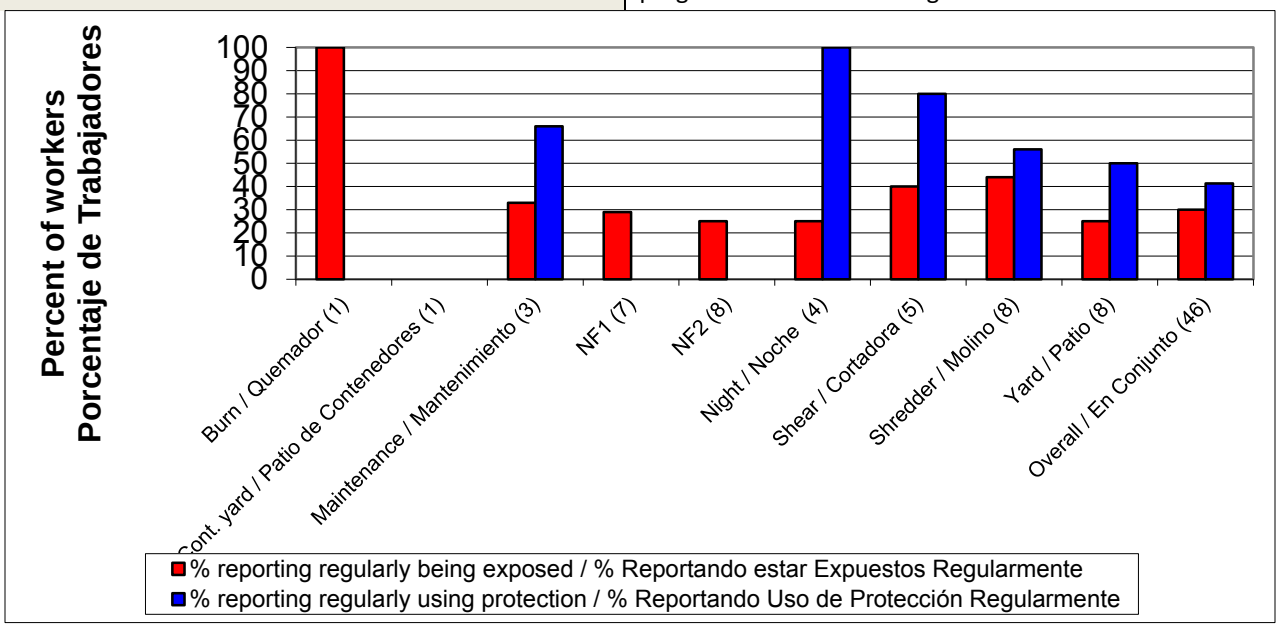
We interviewed 46 workers and working supervisors, and asked them about their own potential for falls from height.

El Problema

Los trabajos en altura representan un riesgo de caídas que pueden causar serias lesiones o la muerte.
La ley del estado de Washington requiere que un programa de protección contra caídas debe estar en función cuando los trabajadores pueden caer de 4 pies o más de altura.
La empresa SMR tiene una política vigente de protección y capacitación contra las caídas. Los trabajadores de todas las áreas reciben entrenamiento básico en protección contra caídas. Trabajadores en la área de corte, la trituradora, y de mantenimiento reciben capacitación adicional en protección contra las caídas.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores, y les preguntamos sobre su riesgo de caídas desde alturas.



Workers in the burn, shredder, maintenance, and shear areas were the most likely to report high exposures to falls from height. Many workers in the shear, shredder, and maintenance areas reported using fall protection regularly. However, no workers in the burn, NF1, and NF2 areas reported using fall protection, even though some workers reported regular exposure to falls from height – likely as a result of working on loading docks, which represent a potential fall hazard of nearly four feet. Fifty-two percent of workers said they have received training on fall protection.

Los trabajadores en las áreas de quema, trituradora (molino), mantenimiento, y el área de corte reportaron más a menudo una alta exposición a las caídas desde alturas. Muchos de los trabajadores en las áreas de corte, la trituradora (molino), y mantenimiento reportan usar con regularidad el equipo de protección contra caídas. Sin embargo, a pesar de que algunos trabajadores reportan estar expuestos regularmente a las caídas desde alturas, ni los quemadores, o las áreas NF1 y NF2 reportan el uso de protección contra caídas, es probable que se deba al trabajo en la zona de carga, que representan un riesgo de caída desde casi cuatro pies. Cincuenta y dos por ciento de los trabajadores reportan que han recibido capacitación sobre la protección contra caídas.

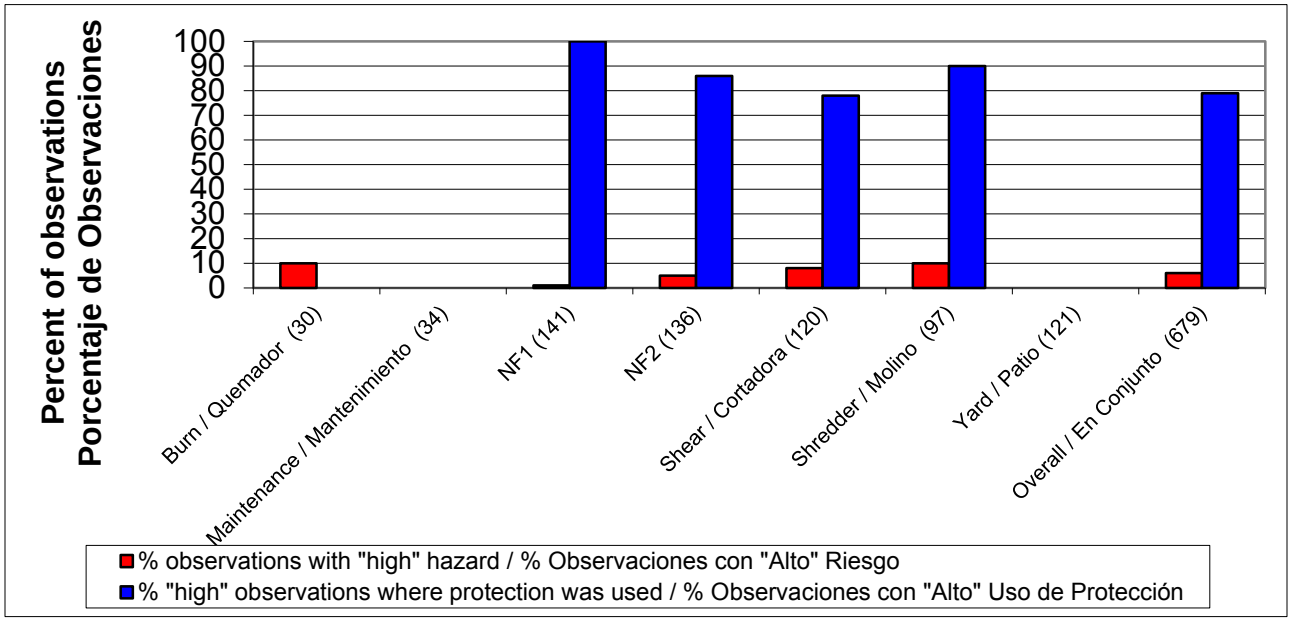
FALLS FROM HEIGHT / CAIDAS DESDE ALTURAS

What UW observed

We observed the fall hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los riesgos de caídas a que los trabajadores estuvieron expuestos durante más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis en cada área son el número de observaciones realizadas.



The areas with the most observed high fall hazard situations were the shredder, burn, and shear areas. Uncontrolled fall hazards were most often observed in the burn area; use of fall protection was generally quite high in other areas.

Las áreas con situaciones de alto riesgo de caídas fueron la trituradora (molino), quema, y el área de corte. Los riesgos de caídas no controlados fueron observados más a menudo en el área de quema; en general, el uso de protección contra caídas fue bastante alto en otras áreas.

UW recommendations

A fall protection program should be in place in the following areas: burn, shear, maintenance, and shredder. This program should include the existing training program, as well as enforced use of fall protection devices in these areas.

Fall protection equipment (for example, guardrails and handrails) should be permanently installed where possible.

Recomendaciones de la UW

Un programa de protección contra las caídas debe incorporarse en las siguientes áreas: de quema, mantenimiento, cortadora y trituradora (molino). Este programa debe incluir la capacitación existente, así como el uso obligatorio en estas áreas de dispositivos de protección contra caídas.

Equipo de protección contra las caídas (por ejemplo: barandillas y pasamanos) deben de instalarse donde sea posible.

TRAFFIC HAZARDS / PELIGROS DEL TRAFICO

The problem

Areas of high vehicle traffic can result in vehicle-vehicle or vehicle pedestrian collisions that cause injuries or death.

SMR does not appear to have a formal traffic safety policy or training program. Traffic safety is addressed in the new hire training that all employees receive.

What workers told us

We interviewed 46 workers and working supervisors, and asked them about their own traffic hazard exposures.

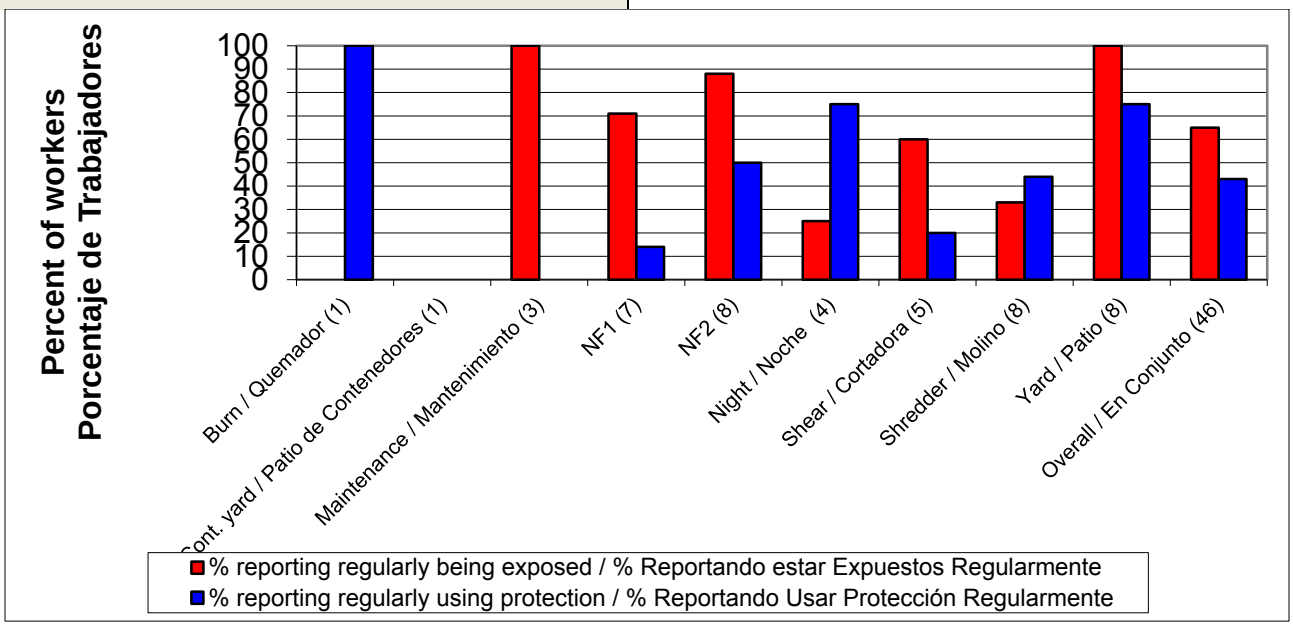
El Problema

Las áreas de alto tráfico de vehículos pueden resultar en colisión de vehículo contra vehículo o colisión de vehículos contra peatones que pueden a su vez causar lesiones o la muerte.

La empresa SMR no parece tener una política de seguridad vial formal o un programa de capacitación. El tema de la seguridad vial se trata durante la orientación que reciben todos los nuevos empleados.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores de trabajo, y les preguntó sobre sus exposiciones de peligro con el tráfico.



Workers in all areas except burn and the container yard reported regularly being exposed to traffic hazards. All workers in the maintenance and yard areas reported regular exposure, and many workers in NF1, NF2, and the shear areas reported regular exposure. Very few workers reported using protection (high visibility clothing) in the maintenance, shear and NF1 areas. Use was higher, though not high enough, in the NF2 and yard areas. Sixty-two percent of workers said that have received training on traffic safety.

Los trabajadores de todas las áreas, excepto el área de quema y el patio de contenedores, informaron estar expuestos regularmente a los peligros del tráfico. Todos los trabajadores en las áreas de mantenimiento y el patio informaron exposición rutinaria, como también muchos de los trabajadores en la NF1 y NF2, y el área de corte. Muy pocos trabajadores reportaron el uso de protección (ropa de alta visibilidad) en el área de mantenimiento, corte y las zonas NF1. El uso fue mayor, aunque no lo suficientemente alto, en la NF-2 y las áreas del patio. Sesenta y dos por ciento de los trabajadores reportan que han recibido capacitación sobre la seguridad del tráfico.

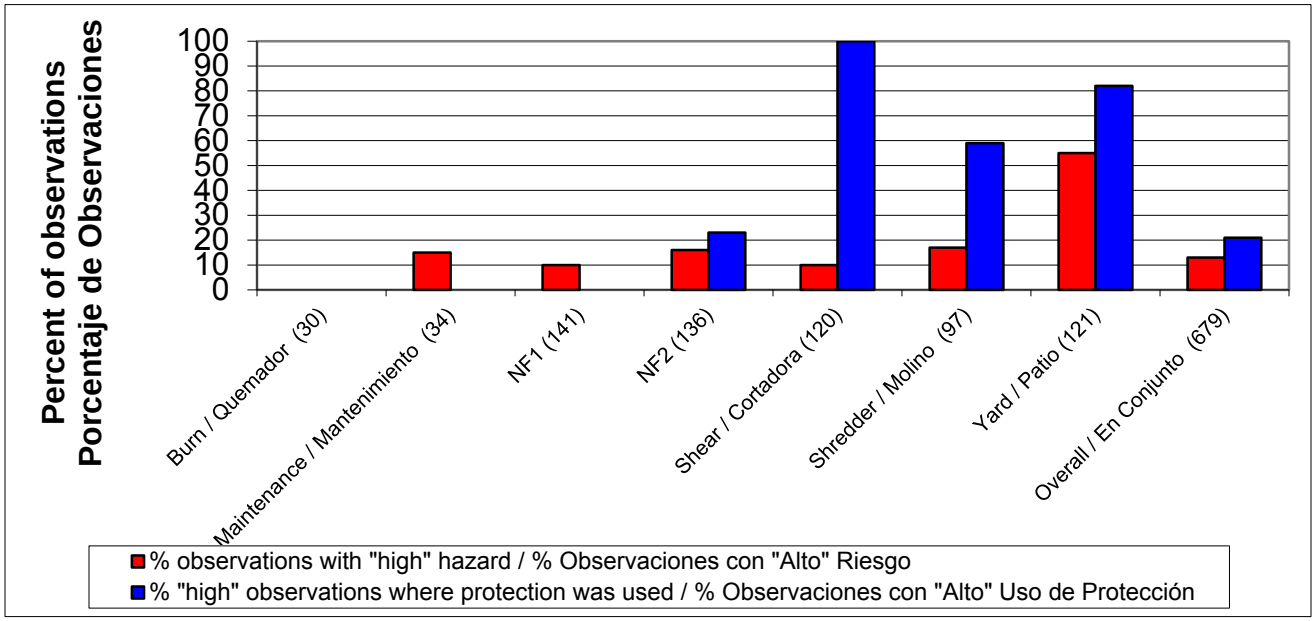
TRAFFIC HAZARDS / PELIGROS DEL TRAFICO

What UW observed

We observed the traffic hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los peligros del tráfico a que los trabajadores estuvieron expuestos por más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que llevamos a cabo.



Workers in the yard, shredder, NF1, and maintenance areas were most likely to have observed exposures to traffic hazards. Workers in many areas were observed wearing protection (high visibility clothing), but workers in the maintenance and NF1 areas need to wear protection more regularly.

Los trabajadores en el patio, la trituradora (molino), NF1 y mantenimiento fueron las más propensos a tener exposición a los peligros del tráfico. Trabajadores de muchas zonas fueron observados usando protección (ropa de alta visibilidad), pero los trabajadores en el área de mantenimiento y NF1 necesitan usar protección con más regularidad.

UW recommendations

We observed adequate use of traffic protections (high visibility clothing) in most areas. However, workers in the maintenance and NF1 areas had lower use. Increased use of traffic protection is needed in these areas. Additionally, all workers should receive specific traffic safety training.

Recomendaciones de la UW

En la mayoría de las áreas se observó un uso adecuado de ropa de alta visibilidad (chaleco reflectante) para la protección del tráfico. Sin embargo, este tipo de protección se usa menos en las áreas de mantenimiento y NF1. Es necesario aumentar la protección del tráfico en estas áreas. Además, todos los trabajadores deberían recibir formación específica de seguridad vial.

EYE HAZARDS / PELIGRO PARA LOS OJOS

The problem

Airborne dust and metal fragments, as well as scrap pieces sticking out from scrap piles, can potentially cause eye injuries.

SMR has an existing policy that requires safety glasses for all workers. Additional eye protection is required for all workers doing heavy chipping or grinding, or who work with chemicals. Eye safety is addressed in the new hire training that all employees receive. Eye protection is provided to all exposed workers at no cost.

El Problema

Potencialmente, el polvo y los fragmentos de metal, así como piezas de chatarra que saltan de las pilas de desechos pueden causar lesiones a los ojos.

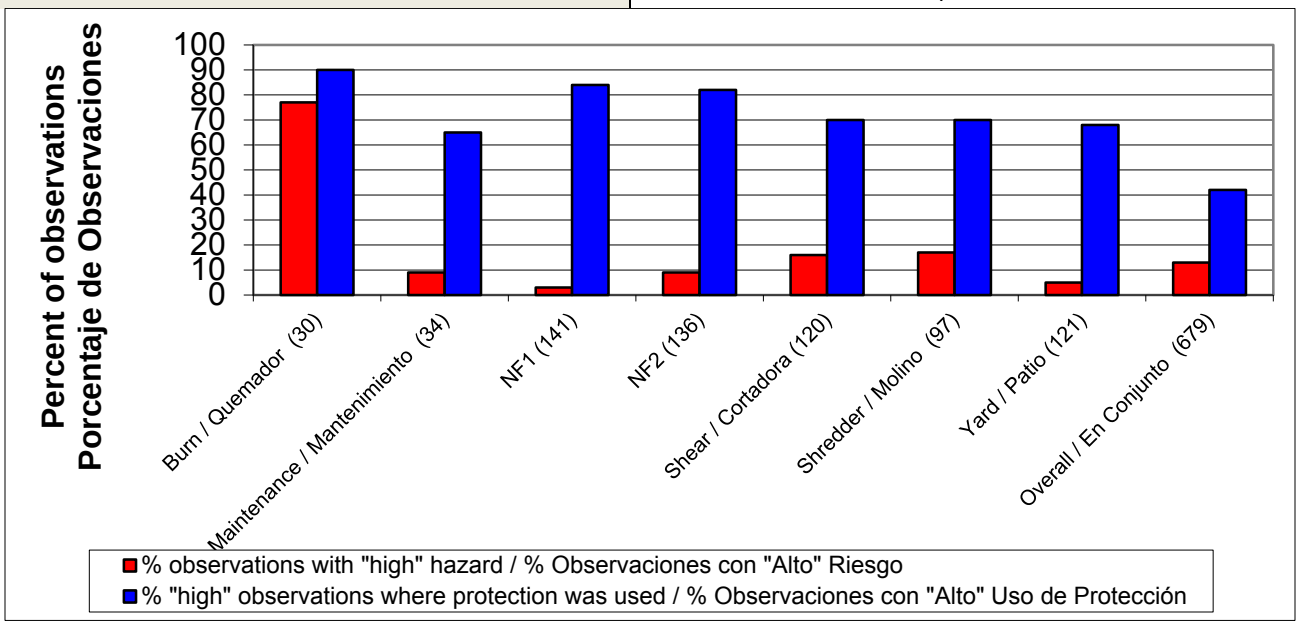
La empresa SMR tiene una política vigente que requiere el uso de lentes de seguridad por parte de todos los trabajadores. Protección adicional para los ojos se requiere para todos los trabajadores que realizan trabajo pesado rompiendo o desgastando pedazos de metal, o que trabajan con químicos. El tema de la seguridad para los ojos se aborda durante la orientación y capacitación que reciben todos los nuevos empleados. La protección de los ojos es provista a todos los trabajadores expuestos, sin costo alguno.

What UW observed

We observed the eye hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos el riesgo para los ojos que los trabajadores estuvieron expuestos por más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que llevamos a cabo.



We observed eye hazards to be common only in the burn area. Use of safety glasses was high in all areas, including the burn area, but safety glasses were not observed to be used 100% of the time.

Observamos que el peligro para los ojos es común sólo en el área de quema. En todas las áreas el uso de lentes de seguridad fue alto, incluyendo el área de quema, pero no se observó el uso consistente de lentes de seguridad el 100% del tiempo.

EYE HAZARDS / PELIGRO PARA LOS OJOS

UW recommendations

The majority of workers appear to be protected against eye injuries. However, some workers were observed not using safety glasses, which are a requirement for entry into the worksite. Greater enforcement of safety glass use is needed.

Recomendaciones de la UW

La mayoría de los trabajadores parecen estar protegidos contra lesiones a los ojos. Sin embargo, se observó que algunos trabajadores no utilizan los lentes de seguridad, aun siendo un requisito para la entrada al área de trabajo. Es necesario un mayor esfuerzo para hacer cumplir los reglamentos para el uso de lentes de seguridad.

STRUCK-BY HAZARDS / PELIGRO DE GOLPES

The problem

Collapsing piles of scrap or materials ejected from machinery have the potential to strike and injure or kill workers.

SMR has an existing policy that requires head protection (hard hats) for all workers in situations where head injuries are possible. Head protection is addressed in the new hire training that all employees receive. Head protection is provided to all exposed workers at no cost.

What UW observed

We observed the struck-by hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

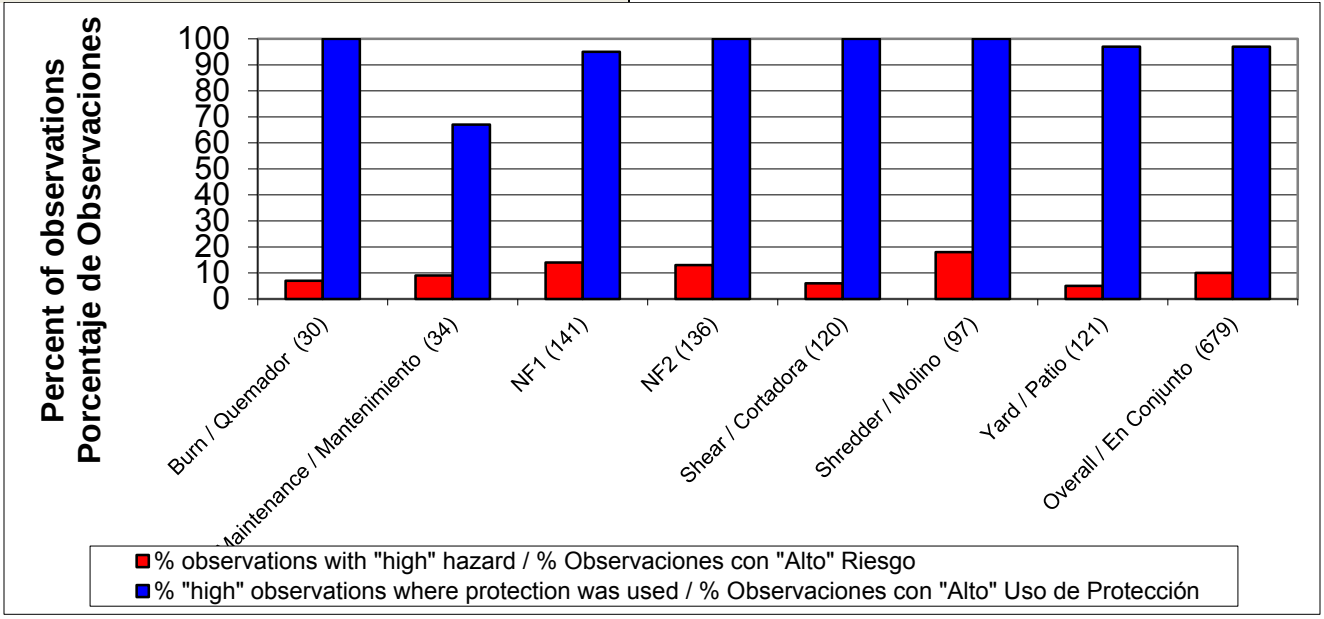
El Problema

El desmorono de los montones de chatarra o material eyectado de la maquinaria tienen el potencial de golpear y lesionar o matar a los trabajadores.

La empresa SMR tiene una política vigente que requiere la protección de la cabeza (cascos) para todos los trabajadores en situaciones donde heridas o lesiones a la cabeza son posibles. La protección de la cabeza se incluye durante la orientación inicial que reciben todos los nuevos empleados. Los cascos son provistos sin costo a los trabajadores.

Lo que observó la UW

Por más de dos meses observamos los riesgos de golpes a que los trabajadores están expuestos. Se llevaron a cabo 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que llevamos a cabo.



The greatest number of observed exposure to struck-by hazards occurred in the shredder area, followed by the NF1 and NF2 areas. Nearly all workers in most areas were using protection (hard hats); however, workers in the shear and shredder areas were observed to use hard hats less often.

UW recommendations

While most workers were wearing protection (hard hats) against struck-by hazards, workers in the shear and shredder areas were observed using hard hats less often than in other areas. Additional enforcement of hard hat use is needed in these areas.

La mayor exposición a golpes observada ocurre en el área de trituración (molino), seguida por las áreas de la NF1 y la NF2. Se observó que casi todos los trabajadores en la mayoría de las áreas usaban protección (casco), sin embargo, se observó que los cascos se usan con menos frecuencia en el área de la trituradora (molino) y de corte.

Recomendaciones de la UW

Aunque la mayoría de los trabajadores utilizan protección (cascos) contra los peligros de golpes, pero los trabajadores de la trituradora (molino) y el área de corte y las zonas utilizan los cascos de seguridad con menos frecuencia que en otras áreas. Es necesario hacer cumplir las políticas del uso de cascos en estas áreas.

CUT HAZARDS / RIEGOS DE CORTADURAS

The problem

Working around scrap with sharp edges can result in cuts and possibly infections.

SMR has an existing policy that requires the use of gloves whenever workers are exposed to hazards like harmful substances, severe cuts, abrasions or lacerations, punctures, or chemical, electrical, or thermal burns. Cut hazards are addressed in the new hire training that all employees are to receive. Hand protection is provided to all exposed workers at no cost. SMR also has a hand and power tool training program. All workers except those in office areas receive this training.

What UW observed

We observed the laceration hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

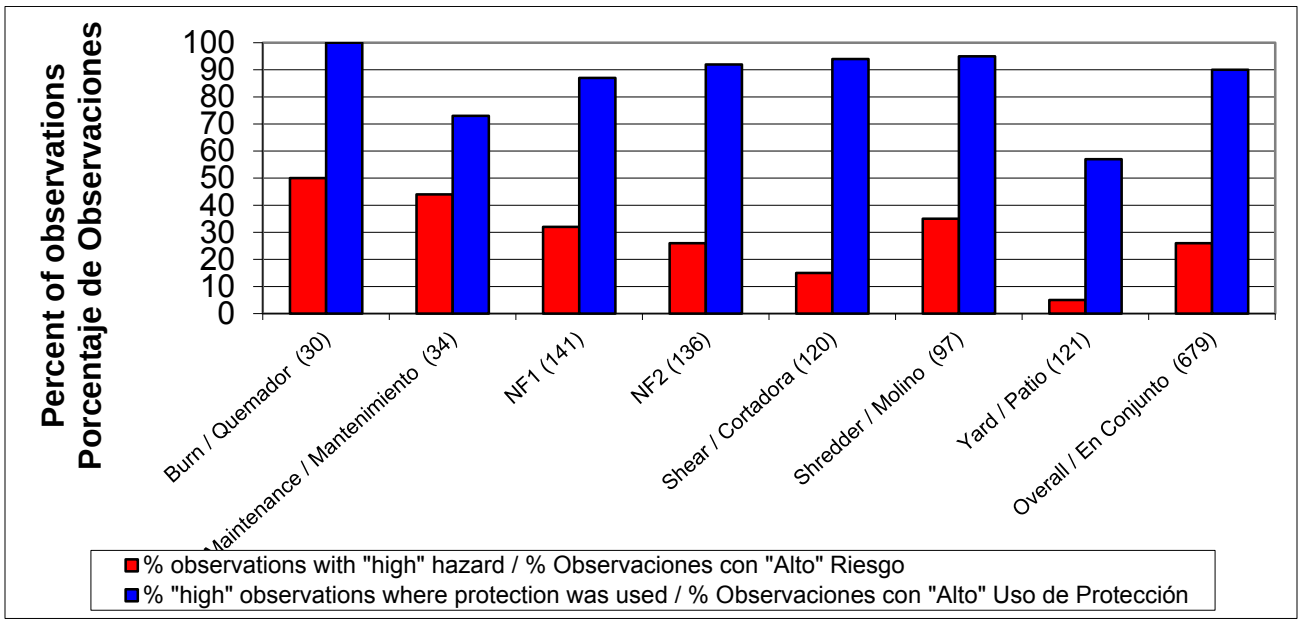
El Problema

Cuando se trabaja cerca de la chatarra con bordes filudos, estos podrían causar cortaduras y posiblemente infecciones.

Existe en la empresa SMR una política vigente que requiere el uso de guantes cada vez que los trabajadores están expuestos a peligros como las sustancias nocivas, cortes severos, abrasiones, laceraciones o cortaduras, pinchazos, quemaduras producidas por químicos, electricidad, o altas temperaturas. Los peligros de cortaduras se abordan durante la orientación y capacitación inicial recibida por todos los nuevos empleados. La protección de las manos es provista a todos los trabajadores expuestos sin costo alguno. La empresa SMR también tiene un programa de capacitación para el uso de herramientas eléctricas de mano. A excepción de los trabajadores de oficina, todos reciben esta capacitación.

Lo que observó la UW

Observamos los peligros de cortaduras a que los trabajadores estuvieron expuestos durante más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que hemos llevado a cabo.



CUT HAZARDS / RIEGOS DE CORTADURAS

Laceration hazards were observed in all work areas. The greatest percentages of high hazard observations were seen in the burn, maintenance, and shredder areas. However, use of protective equipment (gloves) was also high in all areas. Workers in the burn, NF1, NF2, and yard areas were observed using gloves most often. Gloves were observed to be worn least often in the maintenance and yard areas.

UW recommendations

Glove use appears to be sufficient in all areas except the maintenance shop. Additional training, and possibly a different selection of gloves suitable to maintenance work, should be provided to workers in the maintenance shop to further reduce the risk of laceration hazards.

Se observó que los peligros de cortaduras están presentes en todas las áreas de trabajo. Los mayores porcentajes de observaciones de alto riesgo fueron en las áreas de mantenimiento, de quema, y la trituradora (molino). Sin embargo, el uso de equipo de protección (guantes) también fue alto en todas las áreas. Los trabajadores en el área de la quema, la NF1, la NF2, y las áreas del patio fueron observados usando guantes más a menudo. Se observó que en las áreas de mantenimiento y el patio los guantes se usan con menos frecuencia.

Recomendaciones de la UW

El uso de guantes parece ser suficiente en todas las áreas, excepto el taller de mantenimiento. Capacitación adicional y, posiblemente, una selección diferente de los guantes apropiados para trabajos de mantenimiento, debe ser suministrada a los trabajadores en el taller de mantenimiento para reducir aún más el riesgo de cortaduras.

SLIP, TRIP, AND FALL HAZARDS / RESBALONES, TROPEZONES Y CAIDAS

The problem

Walking on uneven, slippery, or cluttered surfaces can cause slips, trips, and falls, which can result in injuries.

SMR has an existing policy on walking and working surfaces, as well as a policy on housekeeping. SMR also has a walking and working surface training program. All workers except those in the office receive this training.

El Problema

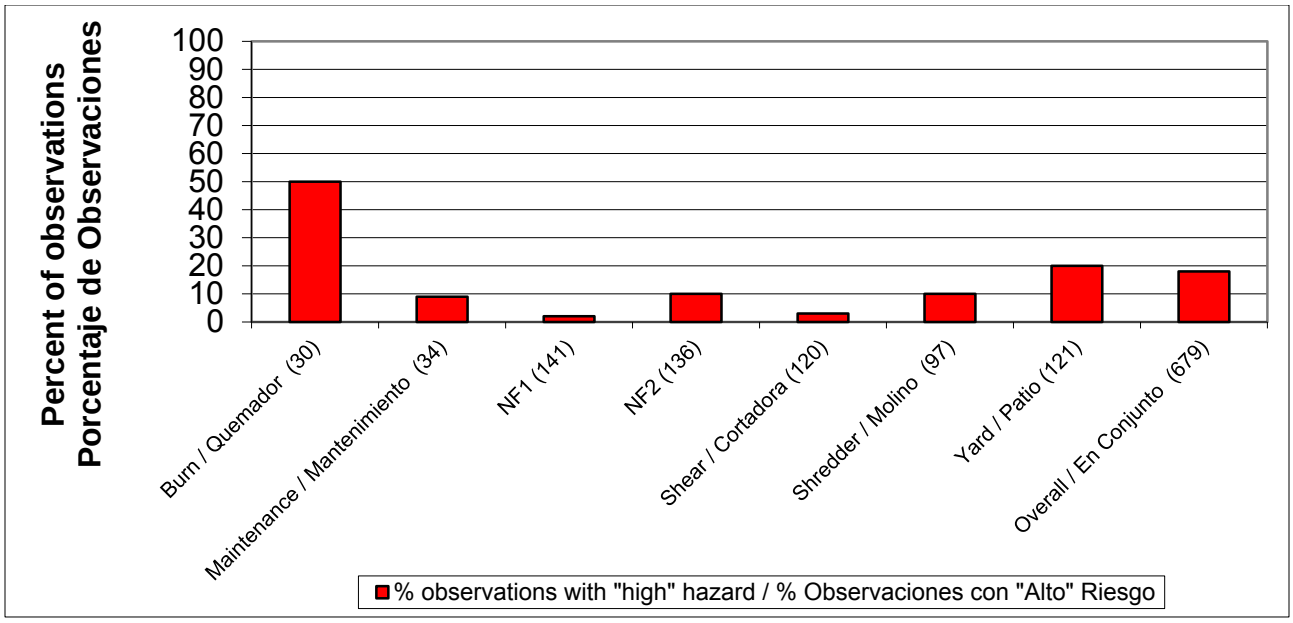
El caminar en superficies resbaladizas, desniveladas o superficies abarrotadas puede causar resbalones, tropezones y caídas, lo cual puede resultar en lesiones. La empresa SMR tiene una política existente referente a las superficies de camino y de trabajo, también como una política de limpieza. La empresa también tiene un programa de capacitación para la prevención de accidentes en superficies de trabajo y de camino. Todos los trabajadores excepto los de oficina reciben esta capacitación.

What UW observed

We observed the slip, trip, and fall hazards workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los riegos de resbalones, tropezones, y caídas a que los trabajadores estuvieron expuestos durante más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que llevamos a cabo.



The highest percentage of observations with high hazard (slippery or uneven walking surfaces, or surfaces cluttered with scrap or other materials) were seen in the burn and yard areas.

El mayor porcentaje de observaciones con alto riesgo (superficies resbaladizas o el caminar en superficies irregulares, o superficies llenas de materiales de desecho o de otro tipo) se observaron en las áreas de quema y el patio.

SLIP, TRIP, AND FALL HAZARDS / RESBALONES, TROPEZONES Y CAIDAS

UW recommendations

To reduce the risk of slips, trips, and falls, walking surfaces should be kept free from clutter. Also, uneven and slippery walking surfaces, found commonly in the burn and yard areas, should be replaced when possible with uniform surfaces. In particular, metal plates present a tripping hazard in the dock areas, as these plates are very slippery when wet.

Recomendaciones de la UW

Para reducir el riesgo de resbalones, tropezones y caídas, las superficies de tránsito deben mantenerse libres de obstáculos. Además, las superficies de tránsito irregulares y resbaladizas, que se encuentran comúnmente en el área de quema y el patio, deben ser reemplazadas cuando sea posible con unas superficies uniformes o planas. En particular, las placas de metal presentan un peligro de tropiezo en las áreas del muelle, ya que estas placas son muy resbaladizas cuando están mojadas.

MACHINE HAZARDS / PELIGROS DE MAQUINARIA

The problem

Working around machinery can result in cuts from sharp edges or blades. Workers can also be caught by moving machinery parts, or trapped by large machinery.

SMR has an existing policy on machine guarding and machine safety. SMR also has a machine guarding training program. All workers except those in the office receive this training.

What workers told UW

We interviewed 46 workers and working supervisors, and asked them about their own machinery hazard exposures.

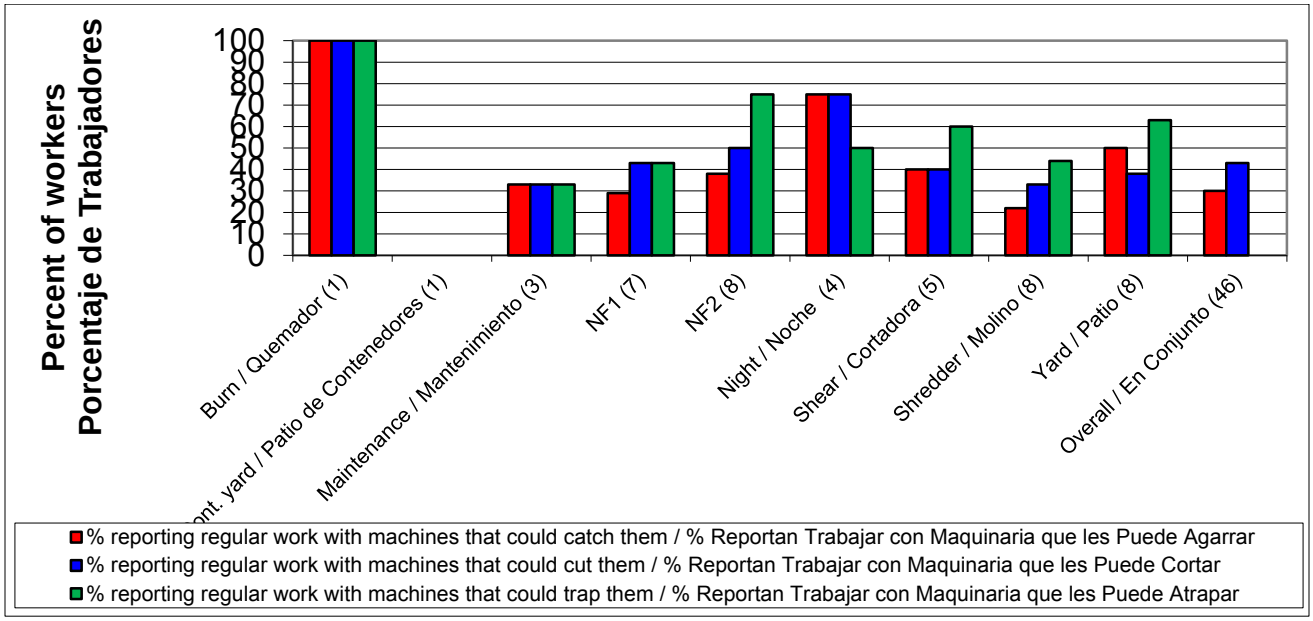
El Problema

El trabajo alrededor de la maquinaria puede dar lugar a cortaduras con los bordes afilados o las cuchillas. Los trabajadores también pueden quedar atrapados por las piezas de maquinaria en movimiento, o atrapados por la maquinaria de gran tamaño.

La empresa SMR tiene una política existente de seguridad y de guardias de protección de maquinaria. La empresa también tiene un programa de capacitación de protección y guardia de maquinaria. Todos los trabajadores excepto los de oficina reciben esta capacitación.

Lo que los trabajadores reportaron a la UW

Entrevistamos a 46 trabajadores y supervisores de trabajo, y les preguntamos sobre sus exposiciones a los peligros con la maquinaria.



Workers in all areas except the container yard reported exposures to machinery hazards. Reported exposures to machines that could catch clothing or body parts were highest on the night shift and working in the yard and shear areas. Reported exposures to machines that could cause cuts were highest on the night shift and in NF1 and NF2. Reported exposures to machines that could trap workers were highest in NF2, the yard, and the shear areas. Sixty percent of workers said they have received training on machine guarding and lockout/tagout.

Los trabajadores de todas las áreas, excepto el patio de contenedores informaron la exposición a peligros de la maquinaria. Las exposiciones cerca de las máquinas que pueden enganchar la ropa o partes del cuerpo fueron las más altas en el turno de noche, los trabajadores en el patio, y la zona de corte. Las exposiciones cerca de las máquinas que podrían causar cortaduras fueron más altas en el turno de noche, en la NF1 y la NF2. Las exposiciones cerca de las máquinas que podrían atrapar a los trabajadores fueron reportadas mayormente en el área NF2, el patio, y las zonas de corte. Sesenta por ciento de los trabajadores reportan haber recibido capacitación en el etiquetado y bloqueo de maquinaria

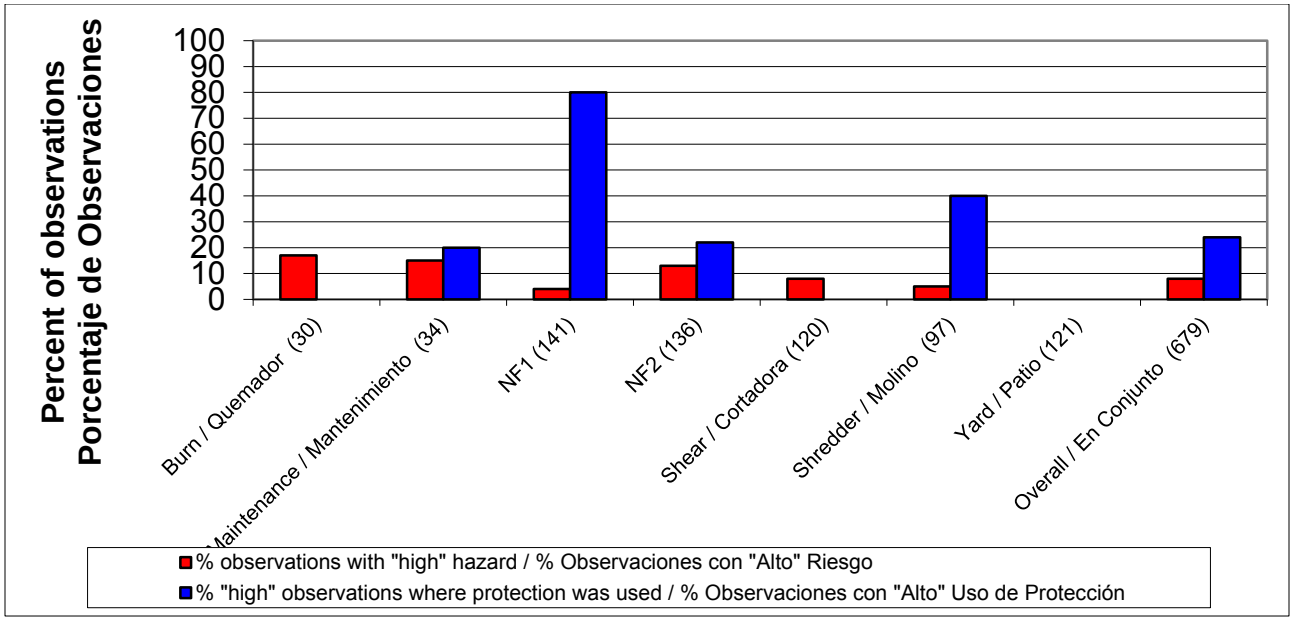
MACHINE HAZARDS / PELIGROS DE MAQUINARIA

What UW observed

We observed the machinery-related hazards that workers were exposed to over two months. We made 679 observations of workers. The numbers in parentheses behind each area name are the number of observations we made.

Lo que observó la UW

Observamos los peligros relacionados a la maquinaria que los trabajadores estuvieron expuestos durante más de dos meses. Se realizaron 679 observaciones de los trabajadores. Los números entre paréntesis detrás de cada área son el número de observaciones que llevamos a cabo.



We observed machinery hazards most often in the burn, maintenance, and NF2 areas. Machine guards were generally in place in most areas, but we observed uncontrolled machine hazards in the burn and shear areas.

Observamos peligros de la maquinaria con más frecuencia en el área de quema, mantenimiento, y la NF2. Las guardias, o mecanismos de protección, de las máquinas están generalmente en su lugar en la mayoría de las áreas de trabajo, pero observamos maquinarias con riesgos y sin controles en las áreas de corte y quema.

UW recommendations

Machinery hazards are present in all work areas. The existing machine guarding and lockout/tagout programs should be continued to prevent injuries.

Recomendaciones de la UW

Los peligros de maquinaria están presentes en todas las áreas de trabajo. Los programas existentes del bloqueo y de etiquetado para seguridad con las maquinas deben continuar para evitar lesiones.

OTHER HAZARDS / OTROS RIESGOS

SHREDDER EJECTIONS

Many workers commented that large chunks of scrap are sometimes ejected from the shredder and land in the yard or strike the maintenance shop building. We did not see this happen in any of our observations. However, the potential for ejected scrap to cause injury or death is quite high, given that a hard hat would provide little protection if the scrap struck a worker. We recommend that additional work be done to insure that all scrap is contained within the shredder.

EYECCIONES DE LA TRITURADORA(MOLINO)

Muchos de los trabajadores han comentado que grandes trozos de chatarra a veces salen de la trituradora (molino) y caen en el patio o chocan contra las paredes del taller de mantenimiento. Durante nuestras observaciones no vimos que esto ocurrió. Sin embargo, el potencial de lesiones o muerte por el material de la chatarra expulsada es bastante alto, teniendo en cuenta que un casco ofrece poca protección si la chatarra golpea la cabeza de un trabajador. Se recomienda atención adicional para asegurar que todos los desechos de chatarra se contengan dentro de la trituradora (molino).

HEARING LOSS

There was a very high incidence of noise-induced hearing loss claims in 2010, despite the presence of a hearing conservation program. This, combined with the relatively low use of hearing protectors we observed, suggests that further efforts to control noise exposures are needed at SMR.

PÉRDIDA DE AUDICIÓN

A pesar de la presencia de un programa de conservación de la audición, en el 2010 hubo una incidencia muy alta de reclamos por la pérdida auditiva inducida por el ruido. Esto, combinado con el relativamente bajo uso de los protectores auditivos observado, sugiere que se necesita aumentar los esfuerzos para controlar las exposiciones al ruido en SMR.

NEAR MISSES

Most workers and working supervisors we interviewed also reported regularly experiencing near misses with vehicles in the yard. These near misses were either between two vehicles, or between a vehicle and pedestrians. The potential for injuries or death from vehicle/pedestrian collisions is high, given the size, speed, and number of vehicles traveling through the yard. We recommend further analysis and revision of the traffic patterns at SMR, greater emphasis on traffic control, and physical separation of workers and vehicles wherever possible.

CASI-ACCIDENTES

La mayoría de los trabajadores y supervisores entrevistados informaron que han estado expuestos regularmente casi-accidentes con vehículos en el patio. Estos “casi” accidentes fueron entre dos vehículos, o entre un vehículo y los peatones. El peligro de lesiones o muerte por vehículos y las colisiones con peatones es alto, dado el tamaño, la velocidad y el número de vehículos que circulan por el patio. Se recomienda un nuevo análisis y revisión de los patrones de tráfico en SMR, mayor énfasis en el control de tráfico, y la separación física de los trabajadores y los vehículos donde sea posible.

REVIEW OF UW RECOMMENDATIONS / RESUMEN DE LAS RECOMENDACIONES

NOISE

Continuation and improvement of the existing hearing conservation program for all workers onsite, including noise measurements, worker training, noise controls where feasible, use of hearing protectors, and annual hearing testing. Given the number of reported hearing loss cases in 2010, review existing training, consider additional hearing protector enforcement policies, and explore possible noise control solutions.

RUIDO

La continuación y la mejora del programa de protección auditiva para todos los trabajadores, incluyendo las mediciones del ruido, la capacitación de los trabajadores, los controles del ruido cuando sea posible, el uso de protectores auditivos, y exámenes de audición anual. Dado el número de casos de pérdida de la audición en el 2010, es necesario la reevaluación de programas de capacitación existente, considerar las políticas del cumplimiento del programa de protección de la audición, y explorar posibles soluciones para el control del ruido.

STRUCK-BY HAZARDS

Improve the existing physical containment barrier on the shredder to prevent scrap metal from being ejected at high speed.

RIESGOS DE GOLPES

Mejorar la contención física o barreras existentes cerca de la trituradora para evitar que partes de chatarra sean expulsadas a alta velocidad de la trituradora (molino).

TRAFFIC HAZARDS

Vehicle traffic evaluation and redesign, and physical separation of pedestrians from vehicles wherever possible. Deliver training program specific to traffic safety.

RIESGOS DE TRÁFICO

Una re-evaluación y diseño del tráfico de vehículos, y siempre que sea posible, una separación física entre los peatones y los vehículos. Ofrecer un programa de capacitación d seguridad con el tráfico de vehículos.

FALLS FROM HEIGHT

Continuation and enforcement of the fall protection program for the following areas: burn, shear, shredder, and maintenance.

CAÍDAS DE ALTURA

Continuar con el programa de protección contra las caídas y hacer cumplir los reglamentos en las siguientes áreas: quema, corte, mantenimiento, y la trituradora (molino).

RESPIRATORY HAZARDS

Continued inclusion of burners in respiratory protection program

Continued inclusion of burners and workers in the shear area in blood lead level testing program.

Evaluation of workers enrolled in the existing blood lead level testing program to insure that all potentially exposed workers are included. Current enrollment does not appear to cover all pickers, for example.

PELIGROS RESPIRATORIOS

Continuar incluyendo los quemadores en el programa de protección respiratoria

Continuar incluyendo a los quemadores y los trabajadores en el área de corte en el programa de pruebas de nivel de plomo en la sangre.

Evaluación de los trabajadores inscritos en el programa existente de pruebas de nivel de plomo en sangre para asegurar que todos los trabajadores potencialmente expuestos están incluidos. Por ejemplo, la lista actual no parece incluir a todos los recolectores,

APPENDIX E: Traffic safety report

UNIVERSITY OF WASHINGTON

SMR

Traffic Analysis and Safety Recommendations Proposal

"Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects"

Anne Goodchild, PhD, Assistant Professor, Civil and Environmental Engineering Felipe Sandoval, MSc, Civil & Environmental Engineering

3/29/2011

Executive Summary

This study identifies the three main traffic features that affect pedestrian safety at the SMR facility and proposes recommendations to increase pedestrian safety.

The three main traffic features in the facility are as follows: potential crashes from intersecting vehicular flows, unknown variability on truck arrival rates, and circulation of internal vehicles close to pedestrian.

Two types of recommendations are proposed: operational improvements and facility-level improvements.

Operational improvements are inexpensive measures that cause minimal disruption on the company's daily operations. They seek to reduce unexpected conditions on the facility's roads. These recommendations are as follows:

- **Marking and signaling:**
  - Isolate pedestrians from vehicular traffic by marking where pedestrians can circulate.
  - Mark the locations of unloading areas.
  - Identify areas where vehicles can make U-turns.
  - Mark parking areas for vehicles.
- **Employees Clothing**
  - Provide reflective clothing to employees working at the main facility and ensure its use.
  - Provide reflective police-like gloves and whistles to increase the visibility of traffic controllers and their ability to guide traffic and ensure their use.
- **Traffic Management**
  - Hold vehicles by the main entrance to avoid congestion in the facility.
  - Increase the coordination among the traffic controllers.
  - Review the area where internal vehicles work.

Facility-level improvements require more investment and coordination. These types of recommendations address the source of the problematic traffic patterns observed at the facility. These recommendations are as follows:

- **Management**
  - Reduce incoming-material flow variability by evenly distributing the incoming flow of materials during the day.
  - Reduce the arrival time variability by a partial appointment system.
  - Certify traffic controllers.
- **Road Size**
  - Decrease the piles' diameter by increasing throughput.
  - Eliminate bidirectional traffic flows.
  - Change configuration or location of the scrap machine in zone #6 to allow relocation of piles.

About this Document

This document presents the effects of vehicular traffic on pedestrian safety at the SMR's facility. Main traffic characteristics in the facility are identified as well as their impact on people circulating in it. Recommendations are proposed to increase pedestrian safety.

The document is organized as follows. First, a description of the site visit, interviews, and main observations is presented. Second, the most used pedestrian routes in the facility are identified. Thirdly, three consecutive sections describing the three main traffic features respectively are described: internal vehicular routes and location of potential crashes, sources of traffic flow variability, and internal vehicles' service areas. Finally, operational recommendations are presented based on the previous features and observations.

Sources of Observation

The authors of this study have obtained the necessary observations from two sources: a site visit and interviews.

The site visit to the facility took place on January the 4th, 2011. During this visit, it was possible to obtain information about on-site operations, equipment, customers, and traffic behavior.

The interviews were done on February the 25th, 2011. Seven people participated in this activity: a front loader driver, a forklift driver, a crane operator, main gate's traffic controller, zone #6's traffic controller, zone #2's traffic controller, and the company's director of health and safety. This array of people covers key functions for the daily operations. Their answers provided a first-hand opinion of the effects of traffic on people's safety in the facility.

i. Description of the observations from the on-site visit

SMR is a company that scraps and recycles ferrous and non-ferrous materials. The input materials arrive mainly by truck every week day. These trucks are run by both the company and independent owners. The trucks freely arrive to the facility during business hours.

The facility has a unique entrance where vehicles are weighed both when entering and leaving. Also, documentation checking is done at this location. Vehicles can be held immediately after the entrance or on the local roads to avoid an increase in internal congestion. It is important to note there is no clear internal coordination or policy to decide when vehicles need to be held. If there is enough space in the facility, vehicles can enter and drive to the area where they need to unload.

There are three supervisors directing traffic: one at the main gate and two on the south part of the facility. These last two supervisors wear proper safety clothes and work in the same space where vehicles circulate. Their visibility is reduced by traffic itself and noise level is high. These two constraints can affect the supervisors' knowledge of the vehicles surrounding them. They communicate by radio and they share instructions regarding traffic.

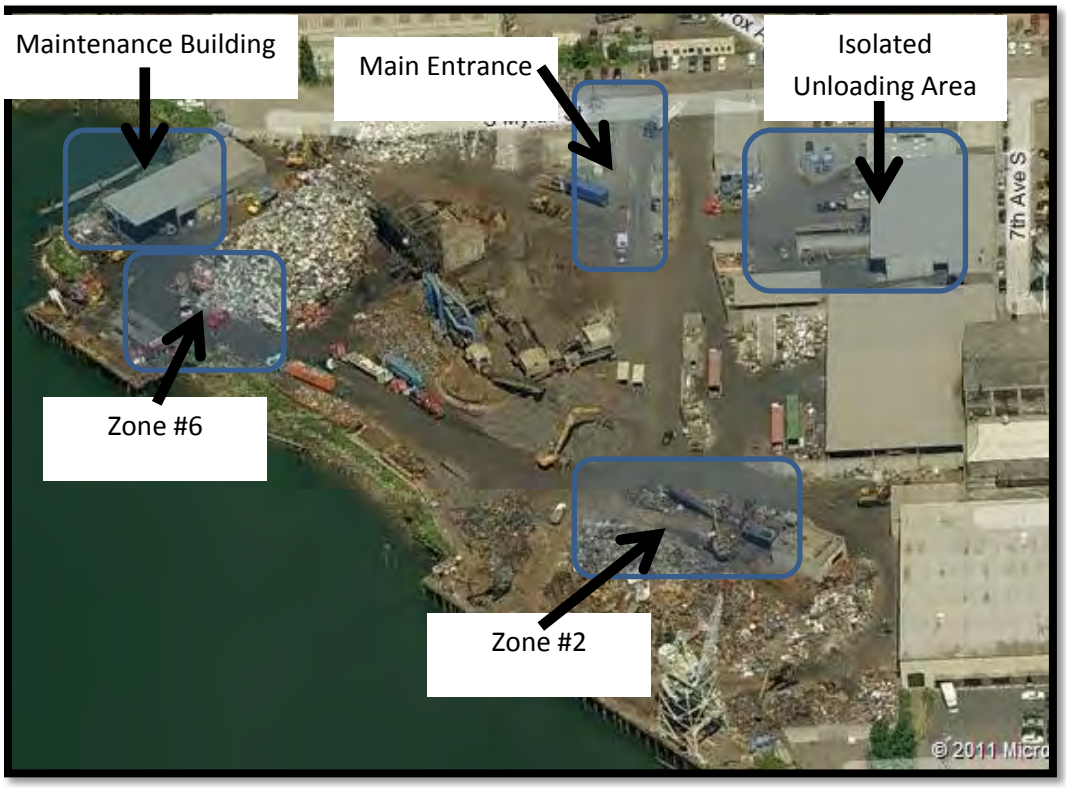
The main areas to unload products are located in what are called zone #2 and zone #6. In these places, customers unload the incoming products and internal vehicles pile them up. A crane takes these products and feeds scrap machines, one in each zone.

Additionally, there is a separate building east of the main gate where incoming nonferrous materials are unloaded and processed. All the related activities happen isolated from the main traffic area. This isolation increases safety for the customers and staff working in this area.

On the southwest corner of the facility, there is a maintenance building. Staff frequently walks in this area and company-owned vehicles enter and leave this building. Sometimes, these vehicles cannot access this area immediately surrounding this building because high volumes block its access.

An image presenting the areas described above is shown in Figure 1.

Figure 1: SMR Facility



Source: Image provided by Microsoft Bing

ii. Description of observations from the interviews

Seven employees from SMR were interviewed. They perform a wide range of daily activities in the facility. These people are: a front loader driver, a forklift driver, a "crane" operator, main gate's traffic controller, zone#6's traffic controller, zone #2's traffic controller, and the company's director of health and safety. They were asked questions about their perceptions about safety in regards to vehicular movement in the facility and improvements opportunities.

The common answers to this interview are summarized below:

- Roads are narrow providing little space to drivers to maneuver. This increases accident risks to pedestrian circulating near these vehicles;
- Sizeable vehicles operating in this constrained space reduce visibility to other drivers, pedestrian and internal operators;
- Objects can fall from the piles in zone #2 and #6 potentially injuring people and reducing even more the road space;
- Internal roads' conditions affect drivers' behavior and vehicular movement. Customers are sometimes afraid to cross potholes with water because metal scraps in them can damage their vehicles' tires;
- Non-defined procedures to manage incoming and internal traffic. Traffic controllers have developed some guidelines to improve mobility but these are only based on their experience;
- Employees connected by radio sometimes talk in languages different than English. This can reduce the effectiveness of future communication strategy;
- Opportunity to systematically learn from daily experiences regarding safety. There are periodic safety meetings (almost monthly) that can be used for that purpose.
- Opportunity to increase safety by implementing small changes. Providing whistles to some traffic controllers have increased their ability to guide vehicles. Newly-painted walkways have helped to guide pedestrian and isolated them from traffic;
- Opportunity to prioritize efforts and resources by developing comparative analysis between cost of accidents (production disruptions and personnel health costs) and the cost of implementing safety measures (from operational to strategic changes)

Pedestrian Corridors

Employees and customers walk in the facility. Pedestrians do not have isolated sidewalks and they share the same space with vehicles. A portion of the road connecting the main entrance with zone #2 has been painted to clearly separate pedestrian and vehicular flows. Sizeable vehicles are driving in the facility so these simple visual measures provide information to drivers regarding where to expect pedestrian. An image with the main pedestrian corridors in the facility is shown in Figure 2.

Figure 2: Main pedestrian corridors in the facility

Source: Image provided by Microsoft Bing

Traffic Features at the Facility

Three traffic features were identified in the facility. These features relates to how vehicles move and interact. Identifying main traffic features helps focusing the analysis of vehicle-pedestrian interactions.

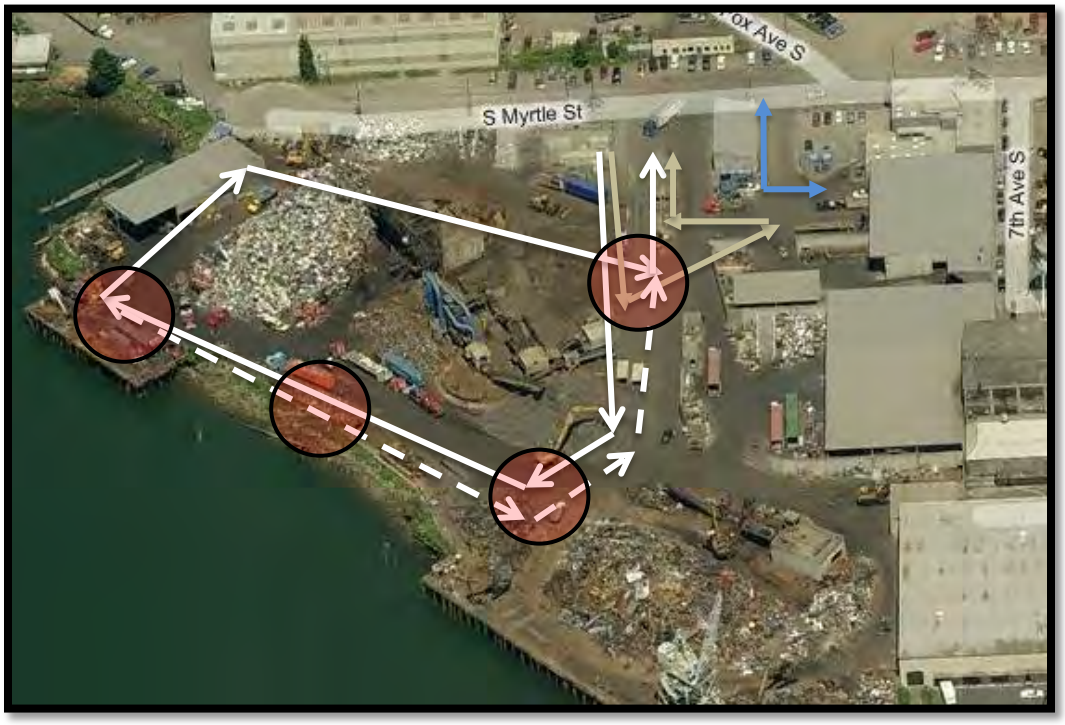
i. Main Routes and Potential Spots for Crashes

The main routes vehicles follow and conflicting spots are shown in Figure 3. Places where routes intersect are potential spots for crashes in addition to the areas where vehicles do U-turns.

The continuous blue line represents the route customers normally follow to go to zone #2 and zone #6. Vehicles come directly from the entrance and leave the facility by doing a U-turn and following the discontinuous blue line. Vehicles at zone #6 can return to the main entrance by going around the pile but this road is frequently too narrow because of excess of material. The purple line represents the route customers follow when they unload directly to the company's facilities. Finally, the four red circles show potential areas where vehicles can crash because of intersecting routes or vehicles driving in opposite directions.

It is worth noticing that pedestrian walk next to vehicles on these routes. In addition to this danger, narrow road space, U-Turns maneuvers, and bidirectional flow increase the likelihood of accidents for both drivers and pedestrians.

Figure 3: Frequent vehicle routes in the facility and spots of crossing routes



Source: Image provided by Microsoft Bing

ii. Variability

In this study, variability is understood as the range of vehicle flows visiting the facility and volumes loaded/unloaded during a period of time. This variability has negative consequences on pedestrian safety because it creates an uncertainty in the number of vehicles circulating in the facility during the day as well as the routes these vehicles follow.

At SMR, variability has not been formally studied. Therefore, the company does not have key information to create comprehensive plans to manage changing traffic flows patterns. The variable number of customers coming to the facility creates congestion which blocks internal roads and changes the internal routing in the facility. This uncertainty is unsafe for pedestrians because vehicles can come from different directions during the day.

We found seven areas in the facility facing important degrees of variability. These areas are shown in Figure 4. The details of the variability occurring in these areas are listed below:

1. Number of vehicles entering the facility
2. Number of vehicles using unloading area
3. Vehicles unloading immediately after the entrance
4. Vehicle unloading area
5. Vehicle unloading area
6. Maintenance area. Vehicles entering and leaving facilities
7. Vehicle unloading area

Figure 4: Location of processes that present variability during a day

Source: Image provided by Microsoft Bing

iii. Internal Vehicles

The company operates vehicles to help unloading trucks and to place the input materials on the piles. Their movement is shown in Figure 5. Some of these vehicles work in the same areas where customers are circulating (two red lines on the left) and some of them work in isolated areas from the customers (two green lines on the right). The company can add or reduce the number of vehicles doing such activities during the day, which allows it to adapt to the demand.

Additionally, it appears that the only crane operator at zone #6 has constant access to a radio and regularly communicates with the traffic controller in this zone. The traffic controller indicates to him when vehicles and pedestrian are far enough to make it safe to operate. However, some material can fall from the crane and the rotation of the crane is a constant safety risk for internal vehicles and pedestrians in the surrounding area.

Figure 5: Movement of internal vehicles

Source: Image provided by Microsoft Bing

Proposed Recommendations

Pedestrians and vehicles share narrow unmarked roads. Traffic patterns change during the day because of variability in the arrival rates, demand volumes, internal routing, and U-turn frequency. These conditions create an uncertain environment for people walking in the main facility in terms of where to expect vehicles and what maneuvers drivers are allowed to make. Additionally, the number of traffic controllers is not sufficient and they cannot assist all vehicles when demand is high. This leaves some drivers with no instructions or unmarked areas where pedestrian can be hit.

In order to increase safety for pedestrians in the facility two types of recommendations are proposed: operational improvements and facility-level improvements. The former are inexpensive measures that do not or minimally disrupt normal day-to-day operations. The latter require more investment and coordination. These safety recommendations are based on the observed pedestrians' patterns, traffic features and answers from the interview. These two groups of recommendations are not exclusive and they can be combined.

i. Operations improvements

Reducing uncertainty in vehicular flows and drivers' maneuvers increases safety because pedestrians can expect where vehicles will be coming and what maneuvers drivers will perform. The following recommendations seek to reduce unexpected conditions on the facility's roads by reducing pedestrian-vehicle interactions, variability, and the risks from the internal vehicles' flows:

- **Marking and signaling:**
  - **Isolate** pedestrians from vehicular traffic by marking where pedestrians can circulate and safely move. The use of physical separation such as fences should also be considered.
  - **Mark** the locations of unloading areas. These signs can aid navigation especially to new customers.
  - **Identif**y areas where vehicles can make U-turns. These areas can be marked on the pavement or by using other visual signs.
  - **Mark** parking areas for vehicles. These areas need to be located at a safe distance from the traffic and objects potentially falling from the scrap piles. These parking areas can also provide isolation for pedestrians.
- **Employees Clothing**
  - **Provide** reflective clothing to employees working at the main facility and ensure its use.
  - **Provide** reflective police-like gloves and whistles to increase the visibility of traffic controllers and their ability to guide traffic and ensure their use.
- **Traffic Management**
  - **Hold** vehicles by the main entrance to avoid congestion in the facility. Heavy traffic in the facility reduces the available space for drivers to maneuver. Limited space can increase the risk of accidents and reduces the ability to serve customers fast.
  - **Increase** the coordination among the traffic controllers. Communication has to be bidirectional among them. They need to inform of unexpected circumstances to avoid accidents. Coordination between controllers is a key component of a holding policy.

- **Review** the area where internal vehicles work. The internal vehicles (front loaders and forklifts) carry materials from the customers to the scrap piles. These drivers have reduced visibility because of the material carried in front in front of them. This is a hazard for pedestrians especially in the proximity of the maintenance building where there is a high-volume of pedestrian (staff and customers).

ii. Facility-Level Improvements

The facility-level improvements address the source of the problematic traffic patterns observed at the facility. These improvements reduce traffic variability, internal vehicular routing uncertainty, and the pedestrian-vehicle interactions. This is done by demand-management techniques and operational improvements. The recommendations below may require further analyses of the current operations and financial commitment. It is worth considering that a national average cost per injury or illness of an employee is US$85,848[1].The facility-level improvements are as follow:

- **Management:** the below recommendations seek to spread incoming material volumes, arrivals rates more evenly during the day as well as improve traffic management in the facility.
  - Reduce incoming-material flow variability. Despite the dynamic nature of the business, it is worth looking for opportunities to increase certainty in the incoming material flows. Based on the workers' interview answers, several customers are frequent visitors. Identifying those who bring the major percentage of material and allocating them during off-peak periods is an effective way flatten out the incoming demand.
  - Reduce the arrival time variability. Both trucks operated by SMR and external customers arrive at the facility without early notice. A partial appointment system would help to spread the arrivals during the day and reduce congestion. This system can be first implemented with those trucks operated by SMR and service providers as waste collection.
  - Certify traffic controllers. The average two-day certification program for traffic controllers can increase their ability to manage the internal traffic and reduce accident risks for pedestrians.
- **Road Size:** the limited roads space can be increased by reducing the piles' diameter or relocating them.
  - Increase throughput to decrease the piles' diameter. Throughput can be increased in three ways: improving the coordination between the existing equipment, reducing the equipment' failure rates, and acquiring additional equipment.
  - Eliminate bidirectional flows. The restoration of the previous northwest exit or the creation of a permanent loop around the piles at zone #6 would allow vehicles to continue moving in the same directions and reduce U-turns at zone #2 and #6. The above recommendation is a good complement to this one because smaller piles can provide the require road space.
  - Change configuration or location of the scrap machine in zone #6. Such a change can allow relocating piles and provide additional adjacent surface. This additional surface can be used as additional road space and extra buffer area for when the pile diameter increases. This alternative requires an understanding of demand history, service rates, and related costs.

[1] Jeffery L. Campbell, (2005) "Significantly reducing facility maintenance costs through innovative custodial safety", Journal of Facilities Management, Vol. 3 Iss: 3, pp.203 - 214

EXPOSURES FROM BURNING METALS

Burning metals is an everyday activity in the scrap metal recycling industry. However, it's also a hazardous activity – there are many toxic substances in metal that are released into the air when the metal is burned. Some of the more common toxic metals include lead and hexavalent chromium. If you're exposed to either of these metals your employer is required to take steps to protect your health. Here's some information to keep you safe when burning metals. For more information visit http://www.afscme.org/news/publications/workplace-health-and-safety/fact-sheets/welding.

MANY METALS CONTAIN LEAD

Breathing in too much lead causes many serious health problems. Lead is usually found on the coatings of scrap metal.

SOME METALS CONTAIN HEXAVALENT CHROMIUM

Breathing in too much hexavalent chromium over time can cause lung cancer. Hexavalent chromium is found in stainless steel scrap metal.

YOUR EMPLOYER MUST MEASURE YOUR EXPOSURE

Your employer is required to determine how much lead you are exposed to at work by making measurements in your work area and give a copy of your results.

YOUR EMPLOYER MAY MONITOR YOUR BLOOD OR URINE

If you are exposed to lead, or cadmium, your employer must measure these metals in your body regularly, and give a copy of your results.

USE A RESPIRATOR

Respirators can help reduce your exposure when burning metals. Your employer will train you on the type of respirator you need, test the fit and teach you how to use it correctly.

AVOID EXPOSURE TO YOURSELF AND YOUR LOVED ONES

Be sure you change clothes and wash thoroughly after burning metals so you don't take toxic metals home with you and expose your loved ones.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

EXPOSURES FROM BURNING METALS

Supplemental information

Scrap metal recycling involves cutting and burning pieces of metal. There are **safety hazards** associated with using a torch to burn metal. There are also **health hazards** associated with **breathing substances** that are released into the air when metal is burned. The substances released during burning vary depending on the composition of the metal and any coatings on the surface of the metal. **Lead** and **hexavalent chromium** are two hazardous substances that are commonly released when burning metal.

Many metals contain lead

- Lead exposure occurs when metals are burned which are **coated with paint that contains lead**. When the paint is burned it releases lead into the air. Lead may also be found in recycled **cable coverings** and **construction materials**.
- **Early signs of lead poisoning** include tiredness, headache, a metallic taste in your mouth, and a poor appetite. **Later signs of lead poisoning** include aches or pains in your stomach, constipation, muscle and joint pains, and memory problems.
- **Employers must identify** when and where you might be exposed to lead at work, and **insure that you are protected** against exposures.

Some metals contain hexavalent chromium

- Exposure to hexavalent chromium occurs when **metals which contain chromium** are burned. These metals include chromium alloys such as **stainless steel** or metals with a **chromium protective coating.**
- Hexavalent chromium exposure is known to cause **lung cancer**. It can also irritate and **damage your nose, throat, eyes, and skin**. **Employers must identify** when and where you might be exposed to lead at work, and **insure that you are protected** against exposures.

Your employer must measure your exposure

- If there is a chance you might be exposed to lead or hexavalent chromium, your **employer must regularly measure your exposures** to these substances. This is done by having you **wear a small pump** that measures the amount of these substances in your work area.

Your employer may monitor your blood or urine

- If you are exposed to high levels of lead or hexavalent chromium in your work area, your employer will **monitor your blood or urine regularly**. This monitoring is done to insure that the **amount of these substances getting into your body is low**.

Use a respirator

- If you are exposed to lead or hexavalent chromium, your **employer must enroll you in a respiratory protection program.** This program will insure that you **receive a respirator at no cost and are trained** on how and when to use the respirator.

Avoid exposure to yourself and your loved ones

Lead and hexavalent chromium can get on your skin, clothes and boots at work. To **avoid exposing your family and loved ones** to lead and hexavalent chromium, be sure to **shower, wash your hands, and do not take your work clothes or boots home**.

EXPOSICIONES A METALES ARDIENTES

La quema de metales es una actividad cotidiana en la industria del reciclaje de chatarra. Sin embargo, también es una actividad peligrosa-muchas sustancias tóxicas se liberan al aire cuando el metal se quema. Algunos de los metales más comunes incluyen el plomo y el cromo hexavalente. Si usted se expone a cualquiera de estas sustancias su empleador está obligado a tomar medidas para proteger su salud. He aquí alguna información para mantenerse a salvo cuando quema metales. Para más información visite: http://www.afscme.org/news/publications/workplace-health-and-safety/fact-sheets/welding.

MUCHOS METALES CONTIENEN PLOMO

Respirar demasiado plomo causa graves problemas de salud. El plomo se encuentra generalmente en los recubrimientos del metal de desecho.

ALGUNOS METALES CONTINENEN CROMO HEXAVALENTE

Respirar demasiado cromo hexavalente durante largo tiempo puede causar cáncer de pulmón. El cromo hexavalente se encuentra en el metal de chatarra de acero inoxidable.

SU EMPLEADOR DEBE MEDIR SU EXPOSICIÓN

Su empleador tiene la obligación de determinar la cantidad de plomo que está expuesto en el trabajo haciendo mediciones en el área de trabajo, y proveer una copia de sus resultados.

SU EMPLEADOR PUEDE MONITORIZAR SU SANGRE U ORINA

Si usted está expuesto al plomo, cromo o cadmio, el empleador debe medir estos metales en su cuerpo regularmente y proveer una copia de sus resultados.

UTILIZAR UN RESPIRADOR

Los respiradores pueden ayudar a reducir su exposición al quemar metales. Su empleador debe proveer el respirador que necesita, probar el ajuste y capacitarlo en cómo usarlo correctamente.

EVITAR EXPONERSE Y A SUS SERES QUERIDOS

Asegúrese de cambiarse la ropa y lávese bien después de la quema de metales para que no lleve los metales tóxicos a su casa y exponer a sus seres queridos.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Financiamiento y apoyo para este proyecto ha sido proporcionada por el Estado de Washington, el Departamento de Labor e Industrias, Proyectos de Inversión Seguridad y Salud

Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

EXPOSICIONES A METALES ARDIENTES

Información Suplementaria

El reciclaje de chatarra consiste en cortar y quemar pedazos de metal. Hay **riesgos de seguridad** asociados con el uso de un soplete para quemar metal. También hay **riesgos para la salud** asociados a la **respiración de sustancias** toxicas que se liberan en el aire cuando el metal se quema. Las sustancias liberadas durante la combustión varían dependiendo de la composición del metal y los revestimientos en la superficie del metal. El **plomo** y el **Cromo hexavalente**, son dos de las sustancias peligrosas que se liberan comúnmente cuando se queman metales.

Muchos metales contienen plomo

• La exposición de plomo se produce cuando se queman los metales que están **recubiertos con pintura que contiene plomo**. Cuando la pintura se quema libera plomo al aire. El plomo también se puede encontrar en el **revestimiento de cables** y **materiales de construcción** reciclados.
• **Los primeros indicios de envenenamiento por plomo** incluyen cansancio, dolor de cabeza, un sabor metálico en la boca, y falta de apetito. Los **síntomas tardíos** de envenenamiento por plomo incluyen dolores en el estómago, estreñimiento, dolores musculares y articulares y problemas de memoria.
• **Los empleadores deben identificar** cuándo y dónde usted puede estar expuesto al plomo en el trabajo, y **asegurar que está protegido** contra la exposición.

Algunos metales contienen cromo hexavalente

• La exposición al cromo hexavalente se produce cuando los **metales que contienen cromo** se queman. Estos metales son aleaciones de cromo como el **acero inoxidable** o metales con una **capa protectora de cromo**.
• La exposición al cromo hexavalente se sabe que causa **cáncer de pulmón**. También puede **irritar y dañar su nariz, la garganta, los ojos y la piel**.
• **Los empleadores deben identificar** cuando y donde usted puede estar expuesto al plomo en el trabajo, y **asegurar que está protegido** contra la exposición.

Su empleador debe medir su exposición

• Si hay alguna posibilidad de que pudiera estar expuesto al plomo o cromo hexavalente, **su empleador debe medir regularmente su exposición** a estas sustancias. Esto se hace llevando un pequeño aparato que mide la cantidad de estas sustancias en su área de trabajo.

Su empleador puede monitorizar la sangre o la orina

• Si usted está expuesto a altos niveles de plomo o cromo hexavalente en su área de trabajo, su empleador tomará **muestras de sangre u orina con regularidad**. Esta vigilancia se lleva a cabo para asegurar que la **cantidad de estas sustancias que entran en su cuerpo es baja**.

Utilizar un respirador

• Si usted está expuesto al plomo o al cromo hexavalente, su empleador **debe inscribirlo en un programa de protección respiratoria**. Este programa asegurará de que usted **reciba un respirador sin costo alguno y capacitación en cómo y cuándo usar el respirador**.

Evite exponerse y a sus seres queridos

• El plomo y el cromo hexavalente puede entrar en la piel, la ropa y las botas en el trabajo. Para **evitar exponer a su familia y seres queridos** al plomo y cromo hexavalente, asegúrese de ducharse, lavarse las manos, y no llevar su ropa de trabajo o botas al hogar.

WORKING SAFELY AROUND MOVING VEHICLES

Working in the scrap metal recycling industry often means working very close to moving vehicles. These vehicles may be large semi-trucks, forklifts, or private automobiles. Regardless of their type, all of these vehicles have one thing in common: they can hurt or even kill workers in an accident. That's why working safely around moving vehicles is so important. For more information visit http://www.selective.com/WebApplications/EDS/PublicSite/Document.aspx?filename=/psClient/PDF/LossControl/ConstructionSafety_english/2290_057.pdf.

NEVER ASSUME A VEHICLE OPERATOR CAN SEE YOU

All vehicles have blind spots. If you can't see the driver, they can't see you, either! By establishing eye contact, the driver can signal to you that they know you are there.

STAY CLEAR OF LOADS THAT COULD BE UNSTABLE

It can be hard to tell if a load of scrap metal is well secured. Stay away from the sides of loaded trucks and forklifts.

DON'T GO WHERE YOU DON'T BELONG

Stay in marked pedestrian walkways, since vehicles may not expect to encounter pedestrians outside of those walkways.

WEAR TRAFFIC SAFETY CLOTHING

Visibility is one of your best tools for preventing accident. Wear high visibility clothing and safety gear.

TALK WITH YOUR HANDS

By communicating with hand signals, you can insure that vehicle operators understand your intentions, even when you can't talk to them directly.

PUT SOMETHING BETWEEN YOU AND VEHICLES

Pedestrian walkways are good – but physical barriers between you and moving vehicles are even better. Your employer should separate your work area from moving vehicles whenever possible.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

WORKING SAFELY AROUND MOVING VEHICLES

Supplemental information

The scrap metal recycling industry depends on vehicle traffic to deliver scrap metal. This traffic includes trains, trucks of all sizes, forklifts, bobcats, and personal automobiles. All of these vehicles can injure or kill workers in the event of a collision. Scrap metal recycling employers need to develop a good traffic safety plan which minimizes the possibility of accidents between vehicles and workers. Workers need to work with their employers to implement the traffic safety plan, and to identify and correct any situations which could result in accidents, injuries, or deaths.

Never assume a vehicle operator can see you

- **Every vehicle**, no matter how big or small, **has blind spots**. If you are in one of these blind spots, **there is no way the driver can see you**.
- The only way to be sure a driver sees you is to **establish eye contact with the driver and signal to them visually**. When the driver responds, you can be sure that he or she sees you. If the **driver doesn't respond**, he or she **probably does not see you**.
- **Verbal communications** with drivers are good for exchanging information, but they **do not mean that the driver can see you**.

Stay clear of loads that could be unstable

- Scrap metal loads are **inherently unstable** due to the different shapes of pieces of scrap metal. An unstable load could **topple unexpectedly** and **injure or crush** nearby workers.
- To minimize your risk of an accident, **stay clear of all scrap metal loads** – even if they appear to be secured – unless you are assisting with loading or unloading. In particular, **stay clear of the sides of trucks and train cars** loaded with scrap metal.
- If possible, secure **scrap metal loads from a position where you are protected** – for example, underneath an overhang that would protect you from falling metal.

Don't go where you don't belong

Scrap metal recycling yards **should have clearly marked pedestrian walkways**, and workers should stay within these walkways whenever possible. Drivers won't expect to encounter workers outside of the walkways, so workers should be **extra vigilant when walking outside of marked walkways**.

Wear traffic safety clothing

- **Employers should provide workers with high-visibility traffic safety clothing**. Examples include **brightly colored or reflective vests, hard hats, and gloves.**

Talk with your hands

- **Employers and employees should identify a set of common hand signals** for use in communicating with vehicles. These hand signals can **help insure that drivers and workers clearly understand one another**, even when they cannot communicate verbally.

Put something between you and vehicles

- Wherever possible, **employers should put barriers in place which physically separate workers from vehicles**. These barriers can help eliminate accidents.

TRABAJANDO CON SEGURIDAD ALREDEDOR DE VEHICULOS EN MARCHA

El trabajo en la industria de reciclaje de chatarra a menudo significa trabajar muy cerca de vehículos en movimiento. Estos vehículos pueden ser grandes camiones, montacargas, o automóviles privados. Independientemente del tipo, todos estos vehículos tienen algo en común: pueden lesionar o matar a los trabajadores en un accidente. Es por eso que trabajar con seguridad cerca de los vehículos en movimiento es tan importante. Para más información visite http://www.selective.com/WebApplications/EDS/PublicSite/Document.aspx?filename=/psClient/PDF/LossControl/ConstructionSafety_english/2290_057.pdf.

NUNCA ASUMA QUE EL OPERADOR DEL VEHICULO PUEDE VERLE

Todos los vehículos tienen puntos ciegos. Si no puede ver al conductor, ellos itampoco le pueden ver! Al establecer contacto visual, el conductor le puede indicar que sabe dónde Ud. se encuentra.

MANTENGASE ALEJADO DE CARGAS QUE PUEDEN SER INESTABLES

Puede ser difícil determinar si una carga de chatarra está bien asegurada. Manténgase alejado de los lados de los camiones y los montacargas con carga.

NO CAMINE DONDE NO ES PERMITIDO

Permanezca en caminos peatonales marcados, ya que los vehículos no esperan encontrarse con peatones fuera de los caminos peatonales.

USAR ROPA DE SEGURIDAD VIAL

La visibilidad es uno de sus mejores herramientas para la prevención de accidentes. Use ropa de alta visibilidad y equipos de seguridad.

HABLE CON SUS MANOS

Al comunicarse con señales de mano, usted puede asegurar que los operadores de vehículos entienden sus intenciones, incluso cuando no se puede hablar con ellos directamente.

PONER ALGO ENTRE USTED Y VEHÍCULOS

Caminos peatonales son buenos - pero las barreras físicas entre usted y los vehículos en movimiento son aún mejores. Su empleador debe separar su área de trabajo de los vehículos en movimiento siempre que sea posible.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Financiamiento y apoyo para este proyecto ha sido proporcionada por el Estado de Washington, el Departamento de Labor e Industrias, Proyectos de Inversión Seguridad y Salud

Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

TRABAJANDO CON SEGURIDAD ALREDEDOR DE VEHICULOS EN MARCHA

Información Suplementaria

La industria de reciclaje de chatarra depende de la circulación de vehículos para entregar chatarra. Este tráfico incluye trenes, camiones de todos los tamaños, montacargas, cargadores, y vehículos privados. En caso de colisión, todos estos vehículos pueden lesionar o matar a los trabajadores. Los empleadores de reciclaje chatarra tienen que desarrollar un buen plan de seguridad vial que minimiza la posibilidad de accidentes entre vehículos y trabajadores. Los trabajadores tienen que trabajar con sus empleadores para implementar el plan de seguridad vial, e identificar y corregir cualquier situación que pudiera dar lugar a accidentes, lesiones o muertes.

Nunca debe asumir que el operador del vehículo puede verle

• **Todo vehículo**, no importando cuán grande o pequeño, **tiene puntos ciegos**. Si usted está en uno de estos puntos ciegos, **no hay forma en que el conductor lo pueda ver**.
• La única manera de estar seguro de que un conductor le ve es el de **establecer contacto visual con el conductor y con señas con la mano**. Cuando el conductor responde, puede estar seguro de que él o ella le ve. Si el **conductor no reacciona**, él o ella **probablemente no le ha visto**.
• Las comunicaciones verbales con los conductores son buenas para el intercambio de información, pero **no significa que el conductor le puede ver**.

Manténgase alejado de las cargas que pueden ser inestables

• Las cargas de chatarra son **virtualmente inestables**, debido a las diferentes formas de las piezas de chatarra. Una carga inestable podría **caerse inesperadamente** y **herir o aplastar** a los trabajadores cercanos.
• Para minimizar el riesgo de un accidente**, manténgase alejado de todas las cargas de chatarra** - aunque parezcan estar seguras − a no sea que está ayudando con la carga o descarga. En particular, **mantenerse alejados de los costados de los camiones y vagones de tren** cargados con chatarra.
• Si es posible asegure **las cargas de chatarra a partir de una posición en la que está protegido** - por ejemplo, debajo de un alero que lo protegería de la caída del metal.

No camine donde no es permitido

Las áreas de reciclaje de chatarra **deben tener el paso de peatones claramente demarcados**, y los trabajadores deben mantenerse dentro de los pasos peatonales siempre que sea posible. Los conductores no esperan encontrarse con los trabajadores fuera de estas áreas, por lo que los trabajadores deben ser **más vigilantes al caminar fuera de senderos marcados**.

Use ropa de seguridad vial

• **Los empleadores deben proporcionar a los trabajadores con prendas de alta visibilidad de seguridad vial**. Ejemplos incluyen **cascos, guantes y chalecos de colores brillantes o reflectantes.**

Hable con sus manos

• **Los empleadores y los empleados deben identificar un conjunto de señales de mano comunes** para su uso en la comunicación con los vehículos. Estas señales con las manos **pueden ayudar a asegurar que los conductores y los trabajadores se entienden claramente unos a otros**, incluso cuando no pueden comunicarse verbalmente.

Poner algo entre usted y los vehículos

• Siempre que sea posible**, los empleadores deben poner barreras en el lugar que los trabajadores físicamente separados de los vehículos**. Estas barreras pueden ayudar a eliminar los accidentes.

ERGONOMICS: PREVENTING STRAINS AND SPRAINS

Many workers will experience sprained and strains muscles during their work careers. However, it doesn't have to be that way. You can prevent these injuries by working with your employer to find safer, more efficient ways to do the job, and by paying attention to how your body feels when you're working and not pushing yourself too hard. For more information visit http://www.lni.wa.gov/Safety/Topics/Ergonomics/default.asp.

USE TOOLS

Wherever possible, use tools like forklifts and hand carts to move heavy loads, rather than trying to lift them yourself.

DON'T DO IT ALONE

If you have to lift an object that weighs more than 50 pounds, don't do it alone – find a second person or use a lifting aid.

DON'T BEND OR EXTEND

Bending while lifting places enormous strain on your back – even if you're lifting something light. Also, when lifting an object, keep it as close to your body as possible

DON'T REPEAT IT

Motions you make repeatedly can wear you out. Make sure you take breaks to let your arms and hands rest and recover.

DON'T BE A JERK

Sharp, jerky lifts or pulls are especially hard on your body. Use smooth gentle motions.

TALK TO YOUR SUPERVISOR OR SAFETY MANAGER

If you have an idea about how your work can be made easier and more efficient, tell someone!

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

ERGONOMICS: PREVENTING STRAINS AND SPRAINS

Supplemental information

Scrap metal recycling involves difficult, physically demanding work. Some work tasks may require workers to work in awkward positions, lift heavy loads, or perform the same tasks over and over. All of these activities can result in muscle sprains and strains, which are one of the most common injuries in US workplaces. Fortunately, the ergonomic challenges presented by some tasks can often be reduced or eliminated through a variety of different strategies.

Use tools

- It can be tempting to move or lift heavy loads or do very difficult physical tasks using your own strength. However, these **tasks will almost always be easier and safer to do with the help of a mechanical tool**. Below are some examples of tools you can use to make your tasks easier and safer:
    - Use of a **forklift** or **hand cart** to **carry a heavy object**.
- Use of a **lift** or **hoist** to **raise a heavy object.** If you need a tool to help you do a difficult task, **ask your employer** for one.

Don't do it alone

Avoid lifting objects that weigh **more than forty pounds or are awkward or difficult to handle** by yourself. Instead, **find another person to help** you with the lift, or use a mechanical tool.

Don't bend or extend

- Bending while lifting places great stress on your back, because it's holding up whatever you are trying to lift plus your upper body. **Always lift with a straight back.** If you have to get low to the ground to make the lift, **bend at your knees, not at your back**.
  Keep the object you're lifting as close to your body as possible. This greatly reduces the stress on your back.

Don't repeat it

- Some tasks require you to repeat a single movement or a series of movements. Over time, these **repetitive movements can cause sprains, strains, and other injuries**.
- If your work tasks require repeated motions, **take regular breaks and stretch to help your muscles recover**.

Don't be a jerk

- Sharp or jerky movements are more likely to cause sprains and strains. When you are **lifting or doing a physically difficult task, use smooth, fluid motions**, which are much easier on your body

Talk to your supervisor or safety manager

- Talk to your supervisor, safety manager, or health and safety committee member if:
    - You feel that **a task is too physically difficult**

  You feel that **a task has already caused a sprain, strain, or other injury.** You have an **idea that could make a task easier or more efficient**

ERGONOMÍA: PREVENCIÓN DE TORCEDURAS Y DESGARRES

Muchos trabajadores sufrirán torceduras y desgarres en los músculos durante sus años de trabajo. Sin embargo, no tiene por qué ser así. Usted puede evitar estas lesiones al trabajar con su empleador buscando maneras más eficientes y seguras de hacer el trabajo, y prestando atención a cómo se siente su cuerpo cuando trabaja y no se esfuerza demasiado. Para más información visite http://www.lni.wa.gov/Safety/Topics/Ergonomics/default.asp.

UTILICE HERRAMIENTAS

Siempre que sea posible, utilice herramientas como montacargas y carretillas para mover cargas pesadas, en lugar de tratar de levantarlas usted mismo.

NO LO HAGA SOLO

Si tiene que levantar un objeto que pesa más de 50 libras, no lo haga solo - busque una segunda persona o utilice una herramienta de levante.

NO SE DOBLE O EXTIENDA

Doblar la espalda al levantar cosas pesadas causa un gran esfuerzo- incluso cuando se levanta algo liviano. Mantenga los objetos lo más cerca del cuerpo posible

NO LO REPITA

Movimientos repetitivos le pueden agotar. Asegúrese de tomar descansos para permitir que los brazos y las manos descansen y se recuperen.

PROTEJA SU ESPALDA

El levante de carga de una manera brusca o con tirones, es especialmente duro en su espalda. Hágalo con más suavidad y más lentamente.

HABLE CON SU SUPERVISOR O ENCARGADO DE SEGURIDAD

Si usted tiene una idea acerca de cómo su trabajo puede ser más fácil y más eficiente, ¡hable con su supervisor!

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

ERGONOMIA: PREVENCION DE TORCEDURAS Y DESGARRES

Información Suplementaria

Reciclaje de chatarra implica un trabajo difícil y físicamente exigente. Algunas tareas pueden exigir a los trabajadores de trabajar en posiciones incómodas, levantar cargas pesadas o realizar las mismas tareas una y otra vez. Todas estas actividades pueden dar lugar a torceduras y desgarres, que son una de las lesiones más comunes en los lugares de trabajo en los EE.UU. Afortunadamente, los problemas ergonómicos presentados por algunas de las tareas a menudo pueden ser reducidos o eliminados a través de una variedad de estrategias diferentes.

Utilice herramientas

• Puede ser tentador el mover o levantar cargas pesadas o hacer tareas físicas difíciles usando su propia fuerza. Sin embargo, **estas tareas serán casi siempre más fáciles y más seguras hacerlas con la ayuda de una herramienta mecánica**. A continuación se presentan algunos ejemplos de herramientas que puede utilizar para realizar sus tareas más fácilmente y con seguridad:

- El uso de un **montacargas o una carretilla de mano** para **cargar objetos pesados**.
- El uso de un **montacargas para levantar objetos pesados**.
- Si necesita una herramienta para ayudarle a hacer una tarea difícil, **pídale una a su empleador**.

No lo haga solo

Evite levantar objetos que pesen **más de cuarenta libras o son incómodos o** sin ayuda **son difíciles de manipular**. En cambio, **encontrar a otra persona que le ayude** con la carga, o utilice una herramienta mecánica.

No se doble o extienda

• Doblar al levantar pone gran énfasis en la espalda, ya que está sosteniendo lo que usted está tratando de levantar con la parte superior del cuerpo. **Levante siempre con la espalda recta**. Si usted tiene que recoger algo en el piso, **doble las rodillas, no su espalda**.
Mantenga el objeto que se está levantando lo más cerca del cuerpo posible. Esto reduce considerablemente la presión sobre su espalda.

No lo repita

• Algunas tareas requieren que se repita un movimiento o una serie de movimientos. Con el tiempo, **estos movimientos repetitivos pueden causar torceduras, desgarres y otras lesiones**.
• Si sus tareas de trabajo requieren movimientos repetitivos, **tomar descansos regulares y el estiramiento para ayudar a sus músculos a recuperarse.**

Proteja su espalda

• Los movimientos bruscos o sacudidas son más propensos a causar desgarres y torceduras. Cuando **usted está levantando o hace una tarea físicamente difícil**, **use movimientos suaves y fluidos**, que son mucho más cómodos para su cuerpo

Hable con su supervisor o el encargado de seguridad

• Hable con su supervisor, encargado de seguridad o un miembro del comité de seguridad en caso de:
o Cree que **una tarea es físicamente demasiada difícil**
o Siente que **la tarea ya ha causado un desgarre, torcedura o lesión**. Tiene una **idea que podría hacer una tarea más fácil o más eficiente.**

OVERVIEW OF PERSONAL PROTECTIVE EQUIPMENT

Your employer is responsible for eliminating hazards from the workplace whenever possible. When hazards can't be eliminated, though, you need to wear personal protective equipment. Here are different types of personal protective equipment that are commonly required in scrap metal recycling facilities. For more information visit http://www.osha.gov/OshDoc/data_General_Facts/ppe-factsheet.pdf.

COMMONLY-REQUIRED PROTECTIVE EQUIPMENT

Most scrap metal recycling facilities require workers to wear a hard hat, safety glasses, study work boots, work gloves, and high visibility clothing. Some workers may also be required to wear a respirator and fall protection equipment.

IF YOU'RE EXPOSED, PROTECT YOURSELF

Remember that protective equipment only works to protect you if you actually wear it – so wear it all the time when you're exposed!

MAKE SURE IT FITS

Make sure all the types of protective equipment you use are compatible with one another. For example, some earmuffs and safety glasses interfere with each other.

MAINTAIN IT

Protective equipment requires regular care to make sure it continues to function properly. Take care of your equipment so it can take care of you when you need it.

MAKE SURE IT IS SPECIFIC TO YOUR EXPOSURE

Make sure that the equipment you are using is rated to protect you from the specific type of exposure you have at your workplace exposures – including electricity, chemicals, and other hazards.

WHO SHOULD PROVIDE PROTECTIVE EQUIPMENT?

Your employer is responsible for keeping you safe from all workplace hazards. To keep you safe, your employer will provide you with necessary protective equipment at no cost to you.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

OVERVIEW OF PERSONAL PROTECTIVE EQUIPMENT

Supplemental information

Scrap metal recycling employers are required to eliminate hazards from their workplaces wherever possible. However, there are times when hazards cannot be eliminated. In those cases, employers must ensure that workers have personal protective equipment that will protect them from the hazard. Employers must provide this personal protective equipment, train workers on how to use it, and make sure that workers use it when it is needed.

Commonly-required protective equipment

- There are a **wide variety of hazards** in scrap metal recycling facilities.
- **Each hazard has a corresponding piece of personal protective equipment**:

Hazard	Protective equipment
Noise	Hearing protection (earplugs or earmuffs)
Dust, metal fume, and air contaminants	Half-face or full-face respirator
Ergonomic hazards	Lifting and moving equipment
Vehicle traffic	High-visibility clothing
Falls from height	Fall protection harnesses and guard rails
Eye hazards	Safety glasses
Cut hazards	Cut-resistant gloves, coveralls, chaps

If you're exposed, protect yourself

- Your **employer is required to provide personal protective equipment** to you. **You are required to wear it** when and where it is needed. Only by **working together** can you and your employer insure that you are safe at work.

Make sure it fits

- **Not all types of personal protective equipment work when worn together.** For example, some types of safety glasses cannot be worn with earmuffs, and not all respirators are compatible with a hard hat. **If you have difficulties** wearing your personal protective equipment, tell your supervisor, safety manager, or health and safety committee representative.

Maintain it

- All personal protective equipment requires **regular care and maintenance**. Your employer will show you on how to care for your equipment. Make sure you do so it is in good working order when you need it

Make sure it is specific to your exposure

- **All protective equipment has limitations**. For example, some gloves may guard against cuts but not chemicals. Make sure the equipment you have is appropriate for your exposures. The label on the equipment will show what exposures the equipment can protect you against.

Who should provide protective equipment

With few exceptions, your **employer must provide you** with personal protective equipment at no cost to you.

RESUMEN DEL EQUIPO DE PROTECCIÓN PERSONAL

Su empleador es responsable en la eliminación de los riesgos en los lugares de trabajo siempre que sea posible. Cuando los peligros no se pueden eliminar totalmente, es necesario utilizar equipo de protección personal. Aquí se presentan los diferentes tipos de equipo de protección personal que se requieren normalmente en las instalaciones de reciclaje de chatarra. Para más información visite http://www.osha.gov/OshDoc/data_General_Facts/ppe-factsheet.pdf.

EQUIPO DE PROTECCION COMUNMENTE REQUERIDO

La mayoría de las empresas de reciclaje de metales requieren que los trabajadores usen cascos, anteojos de seguridad, botas de trabajo, guantes y ropa de alta visibilidad. Para algunos trabajadores también puede ser necesario usar un respirador y equipos de protección contra caídas.

SI ESTA EXPUESTO, !PROTEJASE!

Recuerde que el equipo de protección sólo lo protege si usted lo usa - cuando está expuesto ¡utilícelo todo el tiempo!

ASEGURAR EL AJUSTE

Asegúrese de que todos los tipos de equipo de protección que utiliza son compatibles entre sí. Por ejemplo, algunas orejeras y gafas de seguridad interfieren entre sí.

CONSERVAR EN BUEN ESTADO

El equipo de protección requiere un cuidado para asegurarse de que continúe funcionando correctamente. Cuide de su equipo para que este pueda cuidar de usted cuando lo necesite.

ASEGURAR QUE ES ESPECIFICO PARA SU EXPOSICION

Asegúrese de que el equipo que está utilizando está clasificado para protegerle de su exposición en el trabajo - incluyendo la electricidad, productos químicos y otros peligros.

¿QUIEN DEBE PROPORCIONAR EL EQUIPO DE PROTECCION?

Su empleador es responsable de mantener a salvo de todos los riesgos en el trabajo. Para mantenerse a salvo, su empleador le proporcionará equipos de protección necesarios sin costo alguno al trabajador.

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UNIVERSITY of WASHINGTON

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

RESUMEN DEL EQUIPO DE PROTECCION PERSONAL

Información Suplementaria

Los empleadores en la industria de reciclaje de chatarra tienen la obligación de eliminar los riesgos de sus lugares de trabajo siempre que sea posible. Sin embargo, hay ocasiones en que los riesgos no pueden eliminarse. En estos casos, los empleadores deben garantizar a los trabajadores equipos de protección personal que les proteja del peligro. Los empleadores deben proporcionar el equipo de protección personal, capacitar a los trabajadores sobre la manera de usarlo, y asegurar que los trabajadores lo utilizan cuando es necesario.

Equipos de protección comúnmente requerido

- Hay una **amplia variedad de riesgos** en las instalaciones de reciclaje de chatarra.
- **Cada riesgo tiene una pieza correspondiente del equipo de protección personal:**

Riesgos	Equipo de Protección
Ruido	Protección auditiva (tapones u orejeras)
Polvo, humos metálicos, y los contaminantes del aire	Respiradores de media o cara completa
Riesgos Ergonómicos	Equipo de levantamiento o carga
Tráfico de vehículos	Ropa de alta visibilidad
Caídas de altura	Protección de caídas (arnés y pasamanos)
Peligro a los ojos	Lentes de protección
Peligro de cortaduras	Guantes resistentes a cortaduras, overoles, zamarras (chaparrera)

Si usted está expuesto, ¡protéjase!

- Su empleador **está obligado a proporcionarle equipo de protección personal**. **Usted está obligado a usarlo** cuando y donde sea necesario. Sólo **trabajando juntos** podemos asegurar que usted y su empleador están seguros en su trabajo.

Asegurarse de que ajusta o encaja

- **No todos los tipos de equipo de protección personal encajan cuando se usan en combinación**. Por ejemplo, algunos tipos de lentes de seguridad no se puede usar con orejeras, y no todos los respiradores son compatibles con un casco. **Si tiene dificultades** para usar el equipo de protección personal, informe a su supervisor, encargado de seguridad o al representante del comité de salud y seguridad.

Conservar en buen estado

- Todo el equipo de protección personal **requiere un cuidado y mantenimiento**. Su empleador le mostrará cómo cuidar de su equipo. Asegúrese de hacerlo para que esté en buenas condiciones cuando lo necesite.

Asegurar que es específico para su exposición

- **Todos los equipos de protección tiene sus limitaciones.** Por ejemplo, algunos guantes puede proteger contra las cortaduras, pero no de los productos químicos. Asegúrese de que el equipo que tiene es adecuado para su exposición. La etiqueta en el equipo mostrará a qué tipo de exposiciones le puede proteger.

¿Quién debe proporcionar el equipo de protección?

- Con pocas excepciones, **su empleador tiene que proporcionarle** equipo de protección personal sin costo alguno para usted.

PREVENTING SLIPS, TRIPS AND FALLS

Scrap metal recycling facilities have piles of scrap and many rough and uneven working surfaces. These surfaces may also often be wet or icy. These conditions can lead to slips, trips, and falls. Slips happen when you have too little traction on the surface you are walking on. Trips happen when your foot hits an object in your way or the surface you are walking on drops to a lower level unexpectedly. Falls happen when you are too far off balance. Below are some tips to help prevent slips, trips, and falls. For more information visit http://www.uwsp.edu/ehs/Slips,%20Trips%20&%20Falls.htm.

PRACTICE GOOD HOUSEKEEPING

Keep your work area as clean, dry and organized as possible, and maintain clear walking paths.

WEAR GOOD FOOTWEAR

Wear a sturdy work boot with good traction, take care of it, and get it replaced when it wears out.

BE CAREFUL WHEN WORKING AT HEIGHTS

Some form of fall protection is required any time you could fall 6 feet or more. Your employer should train you on how to work safely at heights.

IF YOU DO WORK AT HEIGHTS

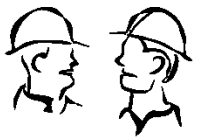
Working safely at heights, even for brief periods, requires a fully enclosed guardrail and/or use of a fall protection harness system. Make sure you have been trained before using a harness.

LADDER SAFETY

When working on a ladder, be sure to use a ladder of the proper height. Also, secure it so it can't move while you're on it and always maintain at least three points of contact.

TALK TO YOUR SUPERVISOR OR SAFETY MANAGER

If you know of an area at your worksite that has unsafe walking or working surfaces, or a work platform without railings, tell someone so the problem can be fixed.



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Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

PREVENTING SLIPS, TRIPS AND FALLS

Supplemental information

Most scrap metal recycling facilities have rough patches of ground and uneven piles of scrap. During winter months, the ground in these facilities may also be wet, icy, or covered with snow. All of these conditions can cause workers to slip, trip or fall. Slips happen when workers have too little traction on the surface you are walking on. Trips happen when a worker's foot hits an object in your way or the surface you are walking on drops to a lower level unexpectedly. Falls happen when a worker is too far off balance

Practice good housekeeping

- Your **employer should work to ensure that scrap piles are well-contained**, and to insure that working surfaces are as even as possible.
- You can help prevent slips, trips, and falls by **maintaining clear walking paths through your work area** and by keeping your area:
    - As **organized as possible**
    - As **free of debris and clutter** as possible.

Wear good footwear

- Your employer may or may not provide you with work boots. Regardless of who provides your boots, be sure:
    - They have **good traction** for walking on slippery surfaces
    - You **take good care of them**
    - They are **replaced when they become worn out**.

Be careful when working at heights

- Any time you are working in an area where you **could fall six feet or more**, **your employer must provide you with some type of fall protectio**n. This protection could include a fall protection harness or guard rails.
  Your employer must train you on how to prevent falls if the work you do places you in situations where you could fall more than six feet.

If you do work at heights

- You are at risk of a fall and injury or even death every time you work at height – **even if the work you do will only last for a few moments**. Your **employer must insure that you are protected by guard rails or a fall protection harness** whenever you could fall six feet or more.

Ladder safety

- Ladders are a common cause of falls. When you **work on a ladder**, make sure:
    - The ladder is **not too tall or too short** for the job
    - The ladder is **secured so that it cannot move** while you are working on it

  You always **maintain three points of contact** while working on the ladder (in other words, two hands and one foot, or two feet and one hand).

Talk to your supervisor or safety manager

- If you know of an area where a fall could occur, talk to your supervisor, safety manager, or health and safety committee member so that they can **work to fix the problem**. Only by **working together** can you insure that your work area is as safe as possible.

PREVENCIÓN CONTRA RESBALONES, TROPEZONES Y CAÍDAS

En las instalaciones de reciclaje de metal se acumulan montones de chatarra y existen muchas superficies de trabajo ásperas y desniveladas. Estas superficies pueden a menudo estar mojadas o cubiertas con hielo. Estas condiciones pueden conducir a resbalones, tropezones y caídas. Los resbalones ocurren cuando uno tiene muy poca tracción en la superficie que camina. Los tropezones ocurren cuando el pie toca un objeto en su camino o cuando hay cambios en las superficies en las que camina. Las caídas ocurren cuando pierde el equilibrio. A continuación se presentan algunos consejos para ayudar a prevenir los resbalones, tropezones y caídas. Para más información visite http://www.uwsp.edu/ehs/Slips,%20Trips%20&%20Falls.htm.

MANTENGA UN AREA DE TRABAJO LIMPIA

Mantenga su área de trabajo lo más limpia, organizada y seca posible, y también las áreas de camino.

USE BUENAS BOTAS de TRABAJO

Use botas de trabajo resistentes con buena tracción, cuídelas, y remplácelas cuando están desgastadas.

TENGA CUIDADO CUANDO TRABAJA EN ALTURAS

Alguna forma de protección contra caídas se requiere en cualquier momento que podría caer 6 pies o más de altura. Su empleador debe capacitarlo sobre cómo trabajar con seguridad en alturas.

SI TRABAJA EN ALTURAS

Trabajar con seguridad en alturas, incluso durante corto tiempo, requiere una barandilla de protección y/o el uso de un arnés de protección contra caídas. Asegúrese de que haya sido capacitado antes de usar un arnés.

SEGURIDAD CON LAS ESCALERAS

Cuando trabaja con escaleras asegure que la escalera tiene la altura apropiada. También, asegure que la escalera que no se mueva cuando esta subido y siempre mantenga tres puntos de contacto.

HABLE CON SU SUPERVISOR O EL ENCARGADO DE SEGURIDAD

Si usted sabe de una superficie de trabajo que representa un peligro al caminar o al trabajar, o una plataforma sin barandillas, infórmele a alguien, para que corrijan el problema

Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

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Financiamiento y apoyo para este proyecto ha sido proporcionada por el Estado de Washington, el Departamento de Labor e Industrias, Proyectos de Inversión Seguridad y Salud

PREVENCIÓN DE RESBALONES, TROPEZONES Y CAÍDAS

Información Suplementaria

Las instalaciones de reciclaje de chatarra comúnmente tienen suelos ásperos y desnivelados. Durante los meses de invierno, el suelo en estas instalaciones también puede estar mojados, con hielo, o cubiertos de nieve. Todas estas condiciones pueden contribuir a resbalar, tropezar o caídas. Los resbalones ocurren cuando los trabajadores tienen muy poca tracción en la superficie que caminan. Las caídas ocurren cuando el pie tropieza contra un objeto en su camino o la superficie en que camina tiene un desnivel de forma inesperada. Las caídas ocurren cuando un trabajador pierde el balance. A continuación se presentan algunos consejos para ayudar a prevenir los resbalones, tropezones y caídas. Para más información visite http://www.uwsp.edu/ehs/Slips,%20Trips%20&%20Falls.htm.

Practique la Buena Limpieza

• Su **empleador debe trabajar para asegurar que las pilas de chatarra están bien contenidas**, y para asegurar que las superficies de trabajo son lo más uniforme posible.
• Puede ayudar a prevenir los resbalones, tropezones y caídas, manteniendo despejados los senderos a través de su área de trabajo y manteniendo su área:
  - o **lo más organizada posible**
  - o **lo más libre de desechos y chatarra como sea posible**.

Llevar buen calzado

• Su empleador puede o no puede proporcionarle botas de trabajo. Independientemente de quién proporcione las botas, asegúrese de:
  - o tienen una **buena tracción** para caminar sobre superficies resbaladizas
  - o **las mantiene en buen estado**
  - o **son reemplazadas cuando se desgastan**.

Tenga cuidado al trabajar en alturas

• En cualquier momento que se encuentra trabajando en un área en la que **podría caer desde seis pies o más de altura, su empleador tiene que proporcionarle algún tipo de protección contra caídas.** Esta protección podría incluir barandillas o un arnés de protección contra caídas.
Si el trabajo a que está asignado lo expone a situaciones en que podría caer de más de seis pies de altura **su empleador tiene que darle capacitación sobre cómo prevenir las caídas**.

Si trabaja en alturas

• Cada vez que trabaja en alturas usted corre el riesgo de una caída y lesionarse incluyendo la muerte - **incluso si el trabajo que hace sólo dura unos minutos**. Siempre que pueda caerse de seis pies o más de altura, su **empleador debe asegurarse de que están protegidos con barandillas o un arnés** de protección contra caídas.

Seguridad con las escaleras

• Las escaleras son una causa común de caídas. Cuando **trabaja en una escalera**, asegúrese de que:
  - o La escalera **no es demasiado alta o demasiado baja para el trabajo**
  - o La escalera **está asegurada para que no se pueda mover** mientras está trabajando en ella
  - o **Mantenga siempre tres puntos de contacto** mientras se trabaja en la escalera (en otras palabras, dos manos y un pie, o dos pies y una mano).

Hable con su supervisor o el encargado de seguridad

• Si usted sabe de un área en la que una caída puede ocurrir, hable con su supervisor, encargado de seguridad o un miembro del comité de seguridad para que puedan **trabajar para solucionar el problema**. Sólo **trabajando juntos** podemos asegurar que su área de trabajo es tan segura como sea posible.

HEAT STRESS

Workers in scrap metal recycling facilities often have to work in hot environments. Exposure to extreme heat can cause heat-related illnesses and injuries. Here are some ways to work safely when temperatures are high. For more information, visit http://www.cdc.gov/niosh/docs/2010-114/pdfs/2010-114.pdf.

KNOW THE SYMPTOMS OF HEAT-RELATED ILLNESS

Signs of heat-related illness include heavy sweating, cramps, fatigue, irritability, dizziness, confusion, and headaches.

KEEP AN EYE ON YOURSELF AND OTHERS

Watch yourself and your coworkers for signs of heat-related illness. Get medical attention if you or someone else appears ill.

DRINK WATER

Drink water frequently, and drink enough that you never become thirsty. You should drink one quart per hour. Your employer must provide you with water.

REST

Take more breaks when working in high heat and humidity. Take breaks in the shade or a cool area.

TIME IT RIGHT

Whenever possible, do the hottest and heaviest work during the coolest parts of day.

WEAR THE RIGHT CLOTHES

Wear light-colored, loose-fitting, breathable clothing like cotton – not synthetic fabrics.

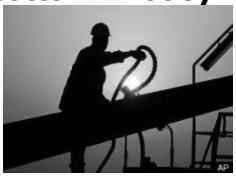

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Image source: Worldwide web, Google Search

HEAT STRESS

Supplemental information

Work in scrap metal recycling facilities usually takes place outdoors. During the hot summer months, workers can be exposed to very high temperatures which can result in heat-related illnesses and injuries. Risk factors for heat-related illness include: high or unusually hot temperature and humidity, work in the sun, and work in waterproof or non-breathable fabrics. Heat-related illness can result in death, and unfortunately several workers in Washington state die every year as a result of heat-related illness.

Know the symptoms of heat-related illness

- Heat **exhaustion**:
  - Headache, dizziness, or fainting
  - Weakness and wet skin
  - Irritability or confusion
  - Thirst, nausea, or vomiting
- Heat **stroke**:
  - Confusion, unable to think clearly, fainting or passing out
  - Collapsing or having seizures
  - May stop sweating

- **Keep an eye on yourself and others**
- You should **monitor yourself and your coworkers** for signs of heat-related illness.
- If you or a coworker begins to show symptoms of heat-related illness, **seek medical attention immediately**.

Drink water

- Your **employer must provide you with water** during your work shift.
- **Drink water often** during your work shift, and **drink enough** that you never become thirsty.
- You should **drink one quart of water per hour**.
- **Energy drinks and caffeinated drinks will not prevent heat-related illness**.

Rest

- Your **employer should arrange more regular breaks** for you when you are working in high temperatures.
- When you do take breaks, **move to a cool, shady area if possible** to allow your body to recover.

Time it right

- Sometimes work schedules cannot be changed. But if the **work schedule is flexible**, your employer should arrange to have you do your **most physically demanding activities during cooler parts of the day**.

Wear the right clothes

- Certain types of clothing are better for work in high temperatures. These include:
  - **Light-colored** clothing
  - **Loose-fitting** clothing
  - B**reathable , non-waterproof** clothing

Clothing made out **of natural fabrics like cotton**. **Do not wear synthetic fabrics** like nylon.

AGOTAMIENTO POR EL CALOR

Los trabajadores de las instalaciones de reciclaje de metal a menudo tienen que trabajar en ambientes calientes. La exposición al calor extremo puede causar enfermedades y lesiones relacionadas al calor. He aquí algunas maneras de trabajar con seguridad, cuando las temperaturas son altas o calurosas. Para más información, visite http://www.cdc.gov/niosh/docs/2010-114/pdfs/2010-114.pdf.

CONOZCA LOS SINTOMAS DE ENFERMEDADES RELACIONADOS AL CALOR

Los síntomas de las enfermedades relacionadas al calor incluyen el sudor excesivo, calambres, fatiga, irritabilidad, mareos, confusión y dolores de cabeza.

PONER ATENCION A SUS SINTOMAS Y EL DE SUS COMPAÑEROS

Reconozca sus síntomas y los de sus compañeros para detectar síntomas de enfermedades relacionadas al calor. Busque atención médica si usted o alguien más pareciera estar enfermo.

BEBER AGUA

Beber agua con frecuencia, y beber lo suficiente para evitar la sed. Usted debe beber un litro por hora. Su empleador tiene que proporcionarle agua.

DESCANSOS

Tome más descansos cuando se trabaja en el calor y la humedad. Tome descansos a la sombra o en un lugar fresco.

PLANIFIQUE EL TRABAJO

Siempre que sea posible, hacer el trabajo más pesado y caliente durante las horas más frescas del día.

USE LA ROPA ADECUADA

Use ropa de colores claros, holgada, ropa transpirable como el algodón - no tejidos sintéticos.

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

AGOTAMIENTO POR EL CALOR

Información Suplementaria

El trabajo en las instalaciones de reciclaje de chatarra generalmente toma lugar al aire libre. Durante los meses de verano, los trabajadores pueden estar expuestos a temperaturas muy altas que pueden resultar en enfermedades relacionadas al calor. Factores de riesgo de enfermedades relacionadas al calor incluyen: temperatura ambiental alta o clima extraordinariamente caliente y húmedo, trabajar bajo el sol, y el trabajo usando ropa con tejidos impermeables o que no permiten la transpiración. Enfermedades relacionadas al calor puede causar la muerte, y lamentablemente varios trabajadores en el estado de Washington mueren cada año como resultado de enfermedades relacionadas al calor.

Conozca los síntomas de enfermedades relacionadas al calor

- **Agotamiento** por calor:
  - o Dolor de cabeza, mareos, o desmayos
  - o Debilidad y piel húmeda
  - o irritabilidad o confusión
  - o Sed, náuseas, o vómitos
- **Insolación:**
  - o Confusión, dificultad de pensar con claridad, desfallecimiento o desmayo
  - o Colapso o tener convulsiones
  - o Puede dejar de sudar

Ponga atención a sus síntomas y el de sus compañeros

•Usted debe **poner atención a sus síntomas y al de sus compañeros** de trabajo para detectar signos de enfermedades relacionadas al calor.

• Si usted o un compañero de trabajo comienzan a mostrar síntomas de enfermedades relacionadas al calor, **busque atención médica inmediatamente**.

Beber agua

• Su **empleador tiene que proporcionarle agua durante su jornada de trabajo**.

• **Beba agua con frecuencia** durante su jornada de trabajo, y beber suficiente como para no tener sed.

• Se recomienda **beber un litro de agua por hora.**

• **Las bebidas energéticas y bebidas con cafeína no previenen enfermedades relacionadas al calor.**

Descansos

• Su **empleador debe organizar descansos más regularmente** cuando se trabaja a altas temperaturas.

• Cuando se toman descansos, para permitir que su cuerpo se recupere, **diríjase a un área sombreada y fresca si es posible**.

Planificar las tareas de trabajo

• A veces los horarios de trabajo no se puede cambiar. Pero si **el horario de trabajo es flexible**, su empleador debe hacer arreglos para que usted pueda realizar las **actividades físicamente más agotadoras durante las horas más frescas del día.**

Use la ropa adecuada

• Ciertos tipos de ropa son mejores para trabajar en altas temperaturas. Estas incluyen:
  - o Ropa **de color claro**
  - o Ropa **holgada**
  - o Use ropa transpirable, ropa hecha de **fibras naturales como el algodón**. No use **telas sintéticas como el nylon.**

WORKING AROUND SCRAP METAL

Scrap metal recycling facilities are busy places that constantly change over time. Some of the materials in scrap metal recycling facilities contain toxic substances, and all scrap metal sites have hazards like moving vehicles and scrap piles. Here are a few things to help you stay safe when working around scrap metal. For more information visit www.osha.gov/Publications/OSHA3348-metal-scrap-recycling.pdf.

KEEP YOUR HEAD SAFE

There are plenty of things that can hit your head at a scrap metal recycling facility; wearing a hard hat helps prevent head injuries.

PROTECT YOUR HANDS

Wear gloves any time you are near or handling scrap metal to prevent cuts and burns.

WORK SAFELY AT HEIGHT

If you are in a situation where you can fall more than 6 feet, your employer must provide you with fall protection equipment like ladders and handrails.

WATCH FOR TRAFFIC

Vehicle accidents can result in worker injuries or even deaths. Stay clear of traffic, and always make sure vehicle operators can see you.

WATCH FOR FALLING METAL

Unsecured loads can fall off trucks unexpectedly. Also, scrap piles can shift or collapse and equipment may eject or throw chunks of metal.

DON'T HANDLE METAL IF YOU DON'T HAVE TO

Touching metal can cause cuts or expose you to lead or other toxic substances. Don't touch it if you don't have to.

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Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Worldwide web, Google Search

WORKING AROUND SCRAP METAL

Supplemental information

Scrap metal recycling involves work conditions that change constantly. There are a variety of hazards associated with working in scrap metal recycling facilities. These include health hazards associated with breathing toxic substances and safety hazards that result from working around heavy machinery, vehicle traffic, and metal scrap. Scrap metal recycling employers must have an accident prevention plan that identifies hazards and ways to keep workers safe on the job. Workers need to ensure that they understand and comply with the accident prevention plan. Only by working together can injuries and accidents be prevented.

Keep your head safe

- There are **many objects that can hit your head and injure or even kill you** when working at a scrap metal recycling facility, including pieces of metal, items ejected from shredding machines, tools and equipment, and vehicles.
- **Wearing a hard hat is essential** to protect your head from these objects.

Protect your hands

- Most pieces of scrap metal have sharp edges that can easily **cut through skin and cause a severe injury to your hands.**
- To avoid cuts, **avoid handling scrap metal unless it is absolutely necessary**.
- **Always wear gloves when handling scrap metal** is unavoidable.

Work safely at height

- Falls from height are a **leading cause of injuries and deaths** among workers.
- When you work in an area or situation where you could **fall more than 6 feet**, **your employer must provide you with fall protection equipment** such as guard rails or a fall protection harness.
- **Always use fall protection when working at height** – even if the work will only last a short time.

Watch for traffic

- Scrap metal recycling work often requires **working very close to moving vehicles** and heavy equipment. A **collision with a vehicle can hurt or kill you**.
- Always **establish eye contact with vehicle drivers** before moving towards a vehicle.
- **Wear high-visibility clothing** such as brightly-colored vests, hard hats, and gloves any time you are working near vehicles. Your employer should provide this equipment to you.

Watch for falling metal

- Unsecured or unstable loads on trucks and trains, and piles of scrap metal, **can collapse with no warning.**
- To avoid being injured, **keep your distance** from unsecured loads and scrap metal piles whenever possible.

Don't handle metal if you don't have to

- Almost all scrap metal has **sharp edges**, and some types of scrap metal **are coated with toxic substances. Never touch scrap metal with your bare hand**s. Also, **do not take any scrap metal home with you**, as you could expose your family and loved ones to toxic substances.

TRABAJANDO ALREDEDOR DE CHATARRA

Las instalaciones de reciclaje de chatarra son lugares de mucho movimiento que cambian constantemente día con día. Algunos de los materiales en las instalaciones de reciclaje de chatarra contienen sustancias tóxicas, y todos estos tipos de empresas tienen riesgos; como los vehículos en movimiento y los montones de chatarra. Aquí se presenta alguna información para ayudar a mantener su seguridad al trabajar cerca de la chatarra. Para más información visite www.osha.gov/Publications/OSHA3348-metal-scrap-recycling.pdf.

PROTEJA SU CABEZA

Hay muchas cosas que pueden golpear su cabeza en una empresa de reciclaje de chatarra. Ponerse un casco de seguridad ayuda a prevenir lesiones en la cabeza.

PROTEJA SUS MANOS

Usar guantes para evitar cortes y quemaduras cada vez que están cerca o de manipulación de metales de desecho.

TRABAJE CON SEGURIDAD EN ALTURAS

Si usted está en una situación en la que pueden caer de más de 6 pies, su empleador debe proporcionarle equipos de protección contra caídas, como escaleras, arnés y pasamanos.

ESTAR ATENTO AL TRANSITO

Los accidentes con vehículos pueden resultar en lesiones de los trabajadores o incluso muertes. Manténgase alejado del tráfico, y siempre asegurarse de que los operadores de vehículos le pueden ver.

ATENTO CON EL METAL QUE CAE

Cargas que no están aseguradas pueden caer de los camiones de forma inesperada. Además, las pilas de desechos pueden desplazarse o desplomarse, y el equipo puede expulsar o lanzar trozos de metal.

NO TOQUE PIEZAS DE METAL SI NO NECESITA

Contacto con el metal puede causar cortes o exponerle al plomo u otras sustancias tóxicas. No lo toque si no tiene que hacerlo.

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

TRABAJANDO ALREDEDOR DE CHATARRA

Información Suplementaria

Las condiciones del trabajo en la industria de reciclaje de chatarra cambian constantemente. Hay una variedad de riesgos asociados al trabajo en las instalaciones de reciclaje de chatarra. Estos incluyen riesgos para la salud asociados con la respiración y sustancias tóxicas y los riesgos de seguridad que se derivan de trabajar con maquinaria pesada, el tráfico de vehículos, y los desechos de metales. Los empleadores en la industria del reciclaje de chatarra deben tener un programa de prevención de accidentes que identifica los riesgos y las maneras de mantener la seguridad de los trabajadores en el trabajo. Los trabajadores necesitan asegurarse de que comprendan y cumplan con el plan de prevención de accidentes. Sólo trabajando juntos se pueden prevenir los accidentes y lesiones.

Proteger su cabeza

- Hay muchos objetos que pueden golpear su cabeza, lesionar e incluso causar la muerte cuando se trabaja en una empresa de reciclaje de chatarra, incluyendo piezas de metal, piezas expulsadas de máquinas de trituración, herramientas y equipos, y vehículos.
- **Usar el casco es esencial** para proteger la cabeza de estos objetos.

Proteger sus manos

- La mayoría de piezas de chatarra tienen los bordes afilados que pueden **cortar la piel y causar una lesión grave en sus manos.**
- Para evitar cortes, hay que **evitar la manipulación de chatarra, a menos que sea absolutamente necesario.**
- Siempre use guantes cuando es inevitable el manipular o tocar la chatarra.

Trabajar con seguridad en alturas

- Las caídas de altura son **la principal causa de lesiones y muertes entre los trabajadores.**
- Cuando trabaje en un área o situación en la que podría caer **más de 6 pies, su empleador tiene que proporcionarle el equipo de protección contra caídas**, tales como barandillas o un arnés de protección contra caídas.
- **Siempre use protección contra caídas cuando se trabaja en altura** – aun cuando el trabajo sólo toma poco tiempo.

Estar atento al tránsito

- El trabajo en la industria de reciclaje de chatarra a menudo **requiere trabajar muy cerca de equipo pesado y vehículos en movimiento**. **Una colisión con un vehículo puede lesionarlo o matarlo.**
- Siempre **establezca contacto visual con los conductores de vehículos** antes de avanzar hacia un vehículo.
- **Use prendas de alta visibilidad**, chalecos de colores brillantes, cascos y guantes cada vez que están trabajando cerca de vehículos. Su empleador debe ofrecerle o proporcionarle este equipo.

Esté atento a la caída de metales

- Las cargas no aseguradas o inestables en los camiones y trenes, y los montones de chatarra, **pueden colapsar sin previo aviso.**
- Para evitar lesiones, mantenga su distancia de las cargas no aseguradas, las pilas de desechos de metal siempre que sea posible.

No tocar el metal, si no es necesario

- Casi todos los metales de desecho tienen **bordes filosos**, y algunos tipos de chatarra **están recubiertas con sustancias tóxicas**. **Nunca toque la chatarra con las manos**. Además, no lleve ningún tipo de chatarra a su casa, ya que podría exponer a su familia y seres queridos a sustancias tóxicas.

WHY WORKING SAFELY NEEDS TO BE A PRIORITY

Getting injured on the job is bad for you, your coworkers, and your company. Every employee has to be part of a team to make the workplace safe.

SAFETY IS EVERYONE'S JOB

It's your employer's responsibility to keep you safe on the job. You need to help to make that happen.

AVOID HURTING YOURSELF

Unsafe activities and actions can lend to injuries and even deaths in the job

AVOID HURTING OTHERS WORK AS A TEAM

Work as a team and make the workplace safe for everyone

PROTECT YOURSELF, PROTECT YOUR LOVED ONES

The people who depend on you depend on your work being safe

WORK MORE EFFICIENTLY

Safe work often also takes less energy and is more efficient

REDUCE COSTS

Safe worksites have lower workers' compensation costs – which means reduced costs to the company and

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Image source: Worldwide web, Google Search

WHY WORKING SAFELY NEEDS TO BE A PRIORITY

Supplemental information

Safety needs to be the **highest priority** in every workplace. In many workplaces, there is an **incorrect perception** that production is more important than safety. But that just doesn't make sense. Unsafe activities at work can result in injuries, illnesses, and even death, and the costs of these events far outweigh any questionable financial benefits of unsafe work.

When communicating why safety needs to be a priority, it's important to **make the message positive**, rather than negative.

BAD: *"You need to work safely."*
Sends the negative message that workplace safety is the job of individuals, not the employer.
GOOD: *"We all need to work together to make the workplace safe."*
Send the positive message that safety is everyone's responsibility

Safety is everyone's job

- **Employers** have a responsibility to **maintain a safe workplace** and correct unsafe conditions.
- **Workers** have a responsibility to **follow safe work practices** and help identify unsafe conditions.

Avoid unsafe activities

- Unsafe activities and conditions can lead to **injury, illness, or even death**.
- If you believe **conditions are unsafe, don't do the work**. Instead, tell your supervisor so the unsafe conditions can be corrected.

Make sure your coworkers are safe

- If you see a coworker engaged in unsafe activities, stop them and identify the problem.
- Remember that if you work under unsafe conditions, you may not only be putting yourself at risk of injury or worse. You may be **endangering your coworkers**, too.

Protect yourself, protect your loved ones

- Think **about how many people would be affected** if you were hurt or killed at work.
- By avoiding unsafe work conditions and actions, you avoid hurting the ones you love.
- Injuries and illnesses can result in:
    - Having to take **time off** work to recover
    - Having to **change jobs**
    - Becoming **permanently disabled**

Work more efficiently

- Oftentimes unsafe working conditions make work activities harder to accomplish.
- By working safely, you may actually **save time and energy** in addition to avoiding injury.

Reduce costs

- Employers with more injuries, illnesses, and death have much **higher workers' compensation costs**.
- By insuring that work is done safely, you and your employer can reduce workers' compensation costs. This can increase profit, which can in turn increase your paycheck.

POR QUÉ TRABAJAR CON SEGURIDAD DEBE SER UNA PRIORIDAD

Sufrir lesiones en el trabajo no es bueno para usted, sus compañeros y la empresa. Cada empleado tiene que ser parte de un equipo para hacer el lugar de trabajo seguro

SEGURIDAD ES TRABAJO DE TODOS

Es la responsabilidad de su empleador de mantener un lugar de trabajo seguro. Pero usted tiene que ayudar para hacer que esto suceda.

EVITE SER UNA VICTIMA

Las Actividades y las acciones peligrosas y pueden causar lesiones e incluso muertes en el trabajo

EVITE LESIONAR A OTROS: TRABAJE EN EQUIPO

Trabaje en equipo y contribuya a un lugar de trabajo seguro para todos

PROTEJA SU VIDA, PROTEJA A SUS SERES QUERIDOS

Su familia depende que trabaje con seguridad

TRABAJAR MAS EFICIENTEMENTE

Mantener seguridad en el trabajo a menudo toma menos energía y hace el trabajo más eficiente

REDUZCA LOS COSTOS

Lugares de trabajo seguros tienen menos costos de compensación - lo que significa reducción de costos para Usted y la empresa

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Financiamiento y apoyo para este proyecto ha sido proporcionada por el Estado de Washington, el Departamento de Labor e Industrias, Proyectos de Inversión Seguridad y Salud

Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

POR QUE TRABAJAR CON SEGURIDAD ES UNA PRIORIDAD

Información Adicional

La seguridad debe ser la **prioridad máxima** en todos los lugares de trabajo. En muchos lugares de trabajo, hay una **percepción incorrecta** de que la producción es más importante que la seguridad. Pero eso no tiene sentido. Actividades peligrosas en el trabajo puede dar lugar a lesiones, enfermedades e incluso la muerte, y los costos de estos eventos son muy superiores a los cuestionables beneficios financieros de un trabajo peligroso.

Cuando se comunica por qué la seguridad tiene que ser una prioridad, es importante **cerciorarse que el mensaje sea positivo**, no negativo.

MALO: *"Hay que trabajar de forma segura."*
Envía el mensaje negativo que la seguridad laboral es la tarea de las personas, no del empleador.
BUENO: *"Todos tenemos que trabajar juntos para hacer que el lugar de trabajo sea seguro."*
Envía el mensaje positivo de que la seguridad es responsabilidad de todos

La seguridad es tarea de todos

• **Los empleadores** tienen la responsabilidad de **mantener un lugar de trabajo seguro** y corregir las condiciones inseguras.
• **Los trabajadores** tienen la responsabilidad de **seguir las prácticas de trabajo seguras** y ayudar a identificar las condiciones inseguras.

Evite las actividades peligrosas

• Las actividades y condiciones inseguras pueden conducir a **lesiones, enfermedades o incluso la muerte**.
• Si usted cree que las **condiciones no son seguras, no haga el trabajo**. En cambio, infórmele a su supervisor, para que las condiciones inseguras puedan ser corregidas.

Asegúrese de que sus compañeros de trabajo están seguros

• Si usted ve un compañero de trabajo que participa en alguna actividad peligrosa, deténgalo e identifique el problema.
• Recuerde que si usted trabaja en condiciones inseguras, no sólo puede ponerse en riesgo de lesiones o algo peor, pero también usted **puede poner en peligro a sus compañeros de trabajo.**

Protéjase y proteja a sus seres queridos

• Piense en **cuántas personas se verían afectadas** si se lesiona o muere en el trabajo.
• Al evitar las acciones y condiciones inseguras de trabajo, usted evita herir a sus seres queridos.
• Las lesiones y enfermedades puede resultar en:
Tener que **ausentarse** del trabajo para recuperarse
Tener que **cambiar de trabajo**
Estar **discapacitado permanentemente**

Trabajar con mayor eficiencia

• Muchas veces las condiciones de trabajo inseguras hacen las actividades de trabajo más difíciles.
• Al trabajar con seguridad, usted puede realmente **ahorrar tiempo y energía**, además de evitar las lesiones.

Reducir los costos

• Los empleadores que tienen más accidentes, enfermedades y muertes pagan mucho **más altos costos de compensación de los trabajadores**.
• Asegurando que el trabajo se realiza de forma segura, usted y su empleador pueden reducir los costos de compensación al trabajador. Esto puede aumentar las ganancias, que a su vez pueden aumentar su sueldo.

WHAT TO DO IF YOU SEE A HAZARD

Worksites have many hazards. Some are obvious, some are harder to spot – but all of them can cause an accident or injury. If you see a hazard, there are many ways you can help to fix it and avoid injuries and accidents. Here are some of the things you can do if you see a hazard.

STOP THE WORK

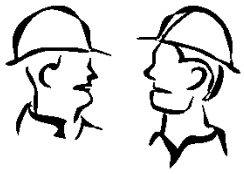
If you see a coworker in danger, tell them so they can stop the work until it's safe

FIX THE HAZARD YOURSELF

If the problem is simple and you can safely fix it, do so – but don't put yourself in danger

TALK TO YOUR SUPERVISOR OR SAFETY OFFICER

Your supervisor or safety officer should have the resources and knowledge to fix the hazard

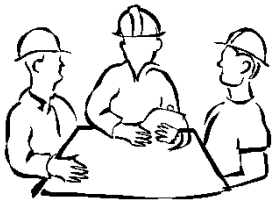


TALK TO A MEMBER OF YOUR HEALTH AND SAFETY COMMITTEE

Committee members can help solve the problem

TALK TO YOUR UNION

Your union representative may have useful information about the hazard from similar worksites



FILL OUT A HAZARD REPORT FORM

Forms are often anonymous, so you don't have to identify yourself if you'd prefer not to

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Image source: Worldwide web, Google Search

WHAT TO DO IF YOU SEE A HAZARD

Supplemental information

Injuries often happen because workers and employers **aren't aware of a hazard**. Fortunately, if you do see a hazard at work, there are many different steps you can take to make sure that the **hazard is corrected before someone gets hurt** – or worse. Keep in mind that if you have ideas about how the hazard can be corrected, you should share them. **It may be your idea that actually fixes the problem**, and even if it is not, your suggestions may be very helpful in fixing other, similar problems.

Talk to your supervisor or safety officer

- Your supervisor and safety officer should both have **authority to stop work** immediately if the work conditions are unsafe.
- Your supervisor and safety officer should also be able to make sure that the **problem is corrected promptly**.

Talk to a member of your Health and Safety Committee

- The Health and Safety Committee at your worksite should be able to **identify a solution** to the problem.
- The Health and Safety Committee at your worksite should also be able to **follow up on the problem** to insure that it is corrected.

Talk to your union

- Your union representative may have talked with workers at similar work sites who have faced similar hazards.
- The representative may also know of a solution that been effective at other work sites.

Stop the work

- If you see a coworker in unsafe conditions, **notify them immediately** and have them stop working until the problem is corrected.
- Your coworkers may not realize when they do things that put them in danger. **Help them stay safe** by speaking up.

Fill out a hazard report form

- Many work sites use hazard report forms to **encourage** workers and supervisors to **report hazards**.
- Hazard report forms are often anonymous, so you don't have to identify yourself.
- Be sure to **provide as much detail as possible** about the hazard.

Fix the problem yourself

- Some hazards can be fixed quickly and easily.
- **Never attempt to correct a hazard if there's a chance you could get hurt doing so**. Instead, report the problem to your supervisor or safety officer so it can be corrected safely.

QUÉ HACER SI USTED VE UN PELIGRO

Los lugares de trabajo tienen muchos peligros. Algunos son obvios, otros son más difíciles de ver - pero todos estos pueden causar un accidente o lesión. Si ve un peligro, hay muchas maneras que usted puede ayudar a solucionarlo y así evitar lesiones y accidentes. Estas son algunas de las cosas que puede hacer si usted ve un peligro.

PARE EL TRABAJO

Si ve a un compañero en peligro, avísele para que pare el trabajo hasta que todo esté seguro

HAGA LAS REPARACIONES USTED MISMO

Si el problema es sencillo y lo puede arreglar con seguridad, hágalo - pero no se ponga en peligro

HABLE CON SU SUPERVISOR O SU DIRECTOR DE SEGURIDAD

Su supervisor o el encargado de seguridad deben tener los <u>recursos y conocimientos para solucionar el peligro</u>

HABLE CON SU MIEMBRO DEL COMITE DE SEGURIDAD

Los miembros del comité pueden ayudar a resolver el problema

HABLE CON SU SINDICATO

El representante del sindicato puedan tener información útil sobre el peligro en los lugares de trabajo similares

COMPLETE UN FORMULARIO DE REPORTE DE RIESGOS

Estos formularios se pueden completar anónimamente, si usted prefiere no dar su nombre

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

QUÉ HACER SI USTED VE UN PELIGRO

Información Adicional

Las lesiones en el trabajo ocurren porque los trabajadores y los empleadores **no están conscientes del peligro**. Afortunadamente, si usted ve un peligro en el trabajo, hay muchos pasos que puede tomar para asegurarse de que el peligro se corrija antes de que alguien se lesione - o le suceda algo peor. Tenga en cuenta que si usted tiene ideas sobre cómo el peligro puede ser corregido, debe compartirlas. Puede ser que su idea de realmente solución al problema, e incluso de no ser así, sus sugerencias pueden ser muy útiles en la corrección de otros problemas similares.

Hable con su supervisor o el encargado de la seguridad

- Su supervisor y el encargado de la seguridad ambos tienen la **autoridad para detener el trabajo** inmediatamente, cuando las condiciones de trabajo son inseguras.
- Su supervisor y el encargado de la seguridad también debe ser capaces de asegurarse de que el **problema sea corregido inmediatamente**.

Hable con un miembro de su Comité de Salud y Seguridad

- El Comité de Salud y Seguridad en su lugar de trabajo debe ser capaz de **encontrar una solución** al problema.
- El Comité de Salud y Seguridad en su lugar de trabajo también debe ser capaz de **dar seguimiento** a este problema para asegurar que el problema sea corregido.

Hable con su sindicato

- Su representante sindical puede haber hablado con otros trabajadores que hayan enfrentado similares peligros en trabajos similares.
- El representante también puede saber de alguna solución **que ha sido eficaz** en otros lugares de trabajo.

Detener el trabajo

- Si usted ve un compañero de trabajo en condiciones inseguras, **avísele inmediatamente** y haga que deje de trabajar hasta que el problema haya sido resuelto o solucionado.
- Puede que sus compañeros de trabajo no se dan cuenta cuando hacen cosas que los ponen en peligro. **Hay que hablar** para ayudarles a mantenerse a salvo.

Llenar un formulario de informe de riesgos

- Muchos sitios de trabajo utilizan formularios de **notificación de riesgos** para alentar o incentivar a los trabajadores y supervisores para que reporten los peligros en el trabajo.
- Los formularios de notificación de riesgos a menudo son anónimos, por lo que no tiene que identificarse.
- Asegúrese de **proporcionar el mayor detalle posible** sobre el peligro.

Corregir el problema

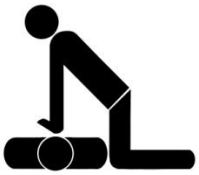
- Algunos riesgos se pueden corregir o resolver rápidamente y fácilmente.
- **Nunca intente corregir un peligro si existe la posibilidad de que Usted corra peligro al hacerlo**. En cambio, informe del problema a su supervisor o el encargado de seguridad para que el problema se pueda corregir de forma segura.

WHAT TO DO WHEN THERE'S AN INJURY

When someone is injured on a worksite, it's critical to insure that the injured person receives help and treatment immediately.

ASSIST THE INJURED PERSON

Don't leave the injured person unless there's no other way to get help



DON'T BECOME A VICTIM

Make sure you don't get hurt by whatever caused the first injury and avoid any remaining dangers

TELL YOUR SUPERVISOR OR SAFETY MANAGER

This insures that the injured person can get the help and treatment they need and problem hazard can be removed

GET FIRST AID SUPPLIES

Even if you don't know how to administer first aid, you can still help by getting supplies

CONTACT EMERGENCY MEDICAL SERVICES

Different worksites have different ways to contact help – know the way for your worksite

KNOW YOUR RIGHTS UNDER THE LAW

If you are hurt on the job may be eligible to receive workers' compensation. Ask your union or visit the Washington Department of Labor and Industries website: http://www.lni.wa.gov/ClaimsIns/Claims/Guide/phase1.asp

Washington State Department of Labor & Industries

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Image source: Worldwide web, Google Search

WHAT TO DO WHEN THERE'S AN INJURY

Supplemental information

When someone is injured on a worksite, it's critical to insure that the injured person receives **help and treatment** immediately.

Assist the injured worker

- Insure that the worker is **not going to be injured further.**
- Do not attempt to treat the injury unless you have been trained on how to administer first aid
- **Do not leave the injured worker** unless there is someone else who can stay with them

Don't become a victim yourself

- Make sure the safety problem that caused the injury **will not injure anyone else.**
- If the safety problem is still present, **secure the area** around it so that you and other workers will not also be injured

Tell your supervisor or safety manager

- Your employer **needs to know about the injury** to insure that the safety problem is corrected.
- Notify your supervisor or safety manager as soon **as you can safely do so**.
- Provide your supervisor or safety manager **as many details as you can** about how the injury happened.

Know where first aid supplies are

- Not all workers are trained on how to administer first aid.
- Even if you do not know how to give first aid, you can still help the injured worker by getting first aid supplies and any other needed equipment.
- Know where these supplies are located **on your worksite**.

Know how to reach emergency medical services

- Different worksites have different procedures for contacting emergency medical services.
- Be sure you know how to contact emergency help at your site.
    - It may be as simple as **dialing 911**, but it may be a different number, or even a radio call.

Know your rights under the law

- If you are hurt on the job **may be eligible to receive workers' compensation**.
- In Washington state, workers' compensation is managed by the **Department of Labor and Industries** (L&I).
- Information on worker's compensation is available from two sources:
    - The L&I website, http://www.lni.wa.gov/ClaimsIns/Claims/Guide/phase1.asp
    - The L&I hotline, 1-800-LISTENS
- L&I can provide you with information on how injured workers can:
    - Get medical treatment
    - Work with their employer
    - File a claim

Get help if they are injured by a third party (someone other than your employer or a co-worker)

QUÉ HACER CUANDO HAY ALGUIEN LESIONADO/HERIDO

Cuando alguien se lesiona en un lugar de trabajo, es fundamental asegurar que la persona lesionada reciba ayuda y tratamiento de inmediato.

AYUDAR A LA PERSONA LESIONADA

No deje sola a la persona lesionada a menos que no hay otra manera de obtener ayuda

NO SE CONVIERTA EN UNA VICTIMA

Asegúrese de no lastimarse por lo que causó la lesión en primer lugar y evite cualquier otros peligros restantes

INFORME A SU SUPERVISOR O AL DIRECTOR DE SEGURIDAD

Esto asegura que la persona lesionada puede obtener la ayuda y el tratamiento necesario y el peligro pueda ser eliminado

CONOZCA DÓNDE ESTÁN LOS SUMINISTROS DE PRIMEROS AUXILIOS

Aun si usted no sabe cómo administrar los primeros auxilios, usted puede ayudar obteniendo los suministros

SABER COMO CONTACTAR LOS SERVICIOS DE EMERGENCIAS

Lugares de trabajo tienen diferentes formas de contacto para ayuda - conozca cual es la forma en su lugar de trabajo

CONOZCA SUS DERECHOS BAJO LA LEY

Si usted se lesiona en el trabajo puede ser elegible para recibir compensación para los trabajadores. Pregúntele a su sindicato o visite el sitio web del Departamento de Labor e Industrias del estado de Washington: http://www.lni.wa.gov/ClaimsIns/Claims/Guide/phase1.asp

Washington State Department of Labor & Industries

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Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

QUÉ HACER CUANDO HAY ALGUIEN LESIONADO/HERIDO

Información Adicional

Cuando alguien se lesiona en un lugar de trabajo, es fundamental asegurar que la persona lesionada reciba la ayuda y el tratamiento necesario de inmediato.

Ayudar al trabajador lesionado

• Asegúrese de que el trabajador no va a **sufrir más lesiones o heridas**.
• No intente dar tratamiento a la persona lesionada, a menos que haya recibido capacitación sobre cómo administrar los primeros auxilios
• **No abandone al trabajador lesionado** a menos que haya otra persona que pueda quedarse con él.

No se convierta en una víctima más

• Asegúrese de que el problema de seguridad que causó la lesión **no perjudique a nadie más**.
• Si el problema de seguridad sigue presente, hay que **asegurar el área alrededor** del accidente para que usted y otros trabajadores no vayan a ser lesionados o heridos.

Informe a su supervisor o gerente de seguridad

• Su empleador **tiene que saber acerca de la lesión o accidente** para asegurarse de que el problema de seguridad se corrija
• Informe a su supervisor o gerente de seguridad **los más pronto posible siempre que sea seguro hacerlo**.
• Proporcione a su supervisor o gerente de seguridad **todos los detalles que pueda** acerca de cómo ocurrió la lesión o accidente.

Sepa dónde están localizados los suministros de primeros auxilios

• No todos los trabajadores reciben capacitación sobre cómo administrar los primeros auxilios.
• Si usted no sabe cómo dar los primeros auxilios, usted puede ayudar al trabajador lesionado al conseguir suministros de primeros auxilios y cualquier otro equipo necesario.
• Sepa donde estos suministros se encuentran en su lugar de trabajo.

Saber cómo llamar a los servicios de emergencia médica

• Diferentes lugares de trabajo tienen diferentes procedimientos para ponerse en contacto con servicios de emergencia médica.
• Asegúrese de saber cómo solicitar ayuda de emergencia en su sitio de trabajo.
• Puede ser tan simple como llamar al 911, pero puede ser un número diferente, o incluso una llamada utilizando el radio portátil.

Conozca sus derechos bajo la ley

• Si se lesiona en el trabajo puede ser elegible para recibir compensación de trabajadores.
• En el estado de Washington, la remuneración de los trabajadores es administrado por el Departamento de Labor e Industrias (L & I).
• La información sobre la compensación del trabajador está disponible a partir de dos fuentes:
  ○ El sitio web de L & I, http://www.lni.wa.gov/ClaimsIns/Claims/Guide/phase1.asp
  ○ La línea directa de L & I, 1-800-LISTENS
• L & I le puede proporcionar información sobre cómo los trabajadores lesionados pueden:
  ○ Obtener tratamiento médico
  ○ Negociar con su empleador
  ○ Presentar un reclamo
  ○ Pedir ayuda si han sido lesionado/herido por una tercera fuente (alguien que no sea su empleador o un compañero de trabajo)

LANGUAGE BARRIERS AND EFFECTIVE COMMUNICATION

Your workplace may include workers who speak various languages, and some workers may not speak English at all. Language barriers can lead to accidents and injuries. Effective use of language is critical to communicating safe work practices. Below are some ways to overcome language barriers and insure effective communication.

DON'T JUST AGREE WHEN YOU DON'T UNDERSTAND

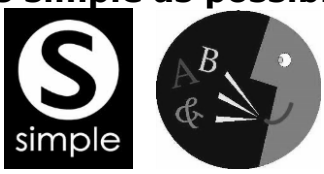
Nodding your head signals that you understand. Make sure you really understand a message before indicating that you do.

USE HAND SIGNALS OR PICTURES WHENEVER POSSIBLE

Using <u>standard hand signals</u> makes it harder to misunderstand a message

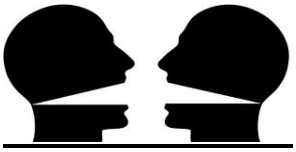
KEEP YOUR MESSAGE SIMPLE

The more complex a message, the harder it is to understand, so keep it as simple as possible



HAVE OTHERS REPEAT YOUR MESSAGE BACK TO YOU

One way to be sure someone understands your message is to have them repeat it to you



YOUR BILINGUAL COWORKERS ARE RESOURCES. USE THEM!

Coworkers who speak two languages can help interpret messages to avoid confusion. Ask for help

ASK QUESTIONS

Communication is a two-way activity. Don't just announce your message - talk through it to make sure everyone understands.

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LANGUAGE BARRIERS AND EFFECTIVE COMMUNICATION

Supplemental information

Your workplace may include workers who speak **various languages**, and some workers **may not speak English** at all. It's important to understand that language barriers can lead to accidents and injuries. Effective use of language is critical to communicating safe work practices. Below are some ways to overcome language barriers and insure effective communication.

Don't just agree when you don't understand

- No one wants to seem like they don't understand what's happening around them. But it's important that you **avoid indicating that you understand a message if you don't really understand it.**
- Some ways people indicate that they understand include:
  - Nodding your head up and down
  - Saying that you understand the message

Use hand signals or pictures whenever possible

- Nonverbal communications though hand signals and pictures can be very effective and efficient.
- Hand signals are **only effective if they are understood by everyone**. For example, a raised palm almost universally means "STOP"

 means 

Keep your message simple

- The **more complicated** the message, the **more likely it is to be misunderstood**.
- Keep your message as **simple as possible**. If necessary, break it up into smaller, individual ideas.

Have others repeat your message back to you

- Even when people indicate to you that they understand you, it's still possible that they have misunderstood some or all of your message
- One way to be absolutely sure that your message was communicated effectively is to **have people repeat your message back to you**.
- This will help you insure that they understand all, and not just parts, of your message.

Your bilingual coworkers are resources. Use them!

- In most workplaces, there are at least a few workers who **speak more than one language**.
- If you are having trouble communicating with someone who speaks a different language, try to find a coworker who speaks both languages and have them **translate your message**
  - **Be sure your bilingual coworker understands** your message correctly before they translate it!

Ask questions

- It's important for everyone involved to ask questions to make sure a message is understood
- If you're **giving the message**, ask questions about any parts of the message you think are difficult
- If you're **receiving the message**, ask questions about any parts of the message that are unclear

LAS BARRERAS DEL IDIOMA Y LA COMUNICACIÓN EFECTIVA

Su lugar de trabajo puede incluir a trabajadores que hablan varios idiomas, y algunos trabajadores puede que no hablen inglés en lo absoluto. Las barreras del idioma pueden contribuir a accidentes y lesiones. El uso eficaz del idioma es fundamental para la comunicación de prácticas de trabajo seguras. A continuación se presentan algunas formas de superar las barreras lingüísticas y asegurar la comunicación efectiva.

NO ESTÉ DE ACUERDO, SI NO ENTIENDE

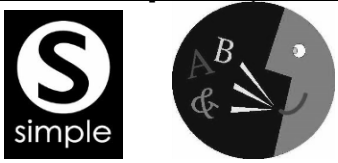
Asentir con la cabeza señala que usted entiende. Asegúrese de que realmente entiende el mensaje antes de indicar que sí.

HAGA SEÑALES DE MANO O UTILICE DIBUJOS CUANDO SEA POSIBLE

El uso de <u>señales estándares de mano</u> hacen que sea más difícil de malinterpretar un mensaje

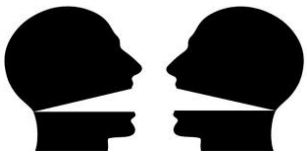
COMUNIQUE MENSAJES SENCILLOS

Cuanto más complicado es un mensaje, más difícil es de entender, hágalo <u>lo más simple posible</u>



HAGA QUE LE REPITAN EL MENSAJE

Una manera de estar seguro de que alguien entiende su mensaje es que ellos se lo repitan



COMPAÑEROS BILINGUES SON UN RECURSO, ¡PÍDALES AYUDA!

Compañeros de trabajo que hablan dos idiomas puede ayudar a interpretar los mensajes para evitar confusiones.

HAGA PREGUNTAS

La comunicación es una actividad de dos vías. No solo de su mensaje – discuta su punto para asegurarse de que todos lo entienden.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Financiamiento y apoyo para este proyecto ha sido proporcionada por el Estado de Washington, el Departamento de Labor e Industrias, Proyectos de Inversión Seguridad y Salud

Fuente de Imágenes: La Red Mundial (sitio web), Búsqueda Google

LAS BARRERAS DEL IDIOMA Y LA COMUNICACIÓN EFECTIVA

Información Adicional

Su lugar de trabajo puede incluir a trabajadores que hablan varios idiomas, y puede que algunos trabajadores no pueden hablar nada o hablan poco de inglés. Es importante entender que las barreras del idioma pueden conducir a accidentes y lesiones. El uso eficaz del idioma es fundamental para la comunicación de prácticas de trabajo seguras. A continuación se presentan algunas formas de superar las barreras lingüísticas y asegurar la comunicación efectiva.

No este de acuerdo cuando "no entiende"

• Nadie quiere parecer como que no entienden lo que está sucediendo a su alrededor. Pero es importante que **evite indicar que usted entiende el mensaje, si usted realmente no lo entiende**.
• Algunas formas en que se indica que entiende son:
  o Asintiendo con la cabeza de arriba y abajo, como indicando "Si"
  o Diciendo que usted entienda el mensaje

Haga señales de mano o dibujos siempre que sea posible

• La comunicación no verbal utilizando señales de mano y dibujos pueden ser muy eficaces y eficientes.
• Las señales de mano **sólo son eficaces si todos las entienden**. Por ejemplo, casi todo el mundo sabe que con una palma de la mano levantada quiere decir "STOP/ALTO"

 significa 

Mantenga su mensaje simple

• Cuanto **más complicado** es el mensaje, lo más probable es que puede ser malinterpretado.
• Mantenga su mensaje **lo más simple posible**. Si es necesario, divida su mensaje en pequeñas y cortas ideas.

Que otros le repitan el mensaje

• Incluso cuando la gente le indica que si entienden, es posible que hayan malinterpretado parte o todo su mensaje
• Una manera de estar absolutamente seguro de que su mensaje fue comunicado de manera efectiva es **que la gente le repita su mensaje**.
• Esto le ayudará a asegurarse de que entienden todo, y no sólo parte de su mensaje.

Sus compañeros de trabajo bilingües son buenos recursos. ¡Úselos!

• En la mayoría de lugares de trabajo, hay al menos unos trabajadores que **hablan más de un idioma.**
• Si tiene problemas para comunicarse con alguien que habla un idioma diferente, hay que tratar de encontrar un compañero de trabajo que habla los dos idiomas y pedirles ayuda para que **traduzcan su mensaje**
  ○**Asegúrese de que su compañero de trabajo bilingüe entiende** su mensaje correctamente antes de que ¡lo traduzca!

Haga preguntas

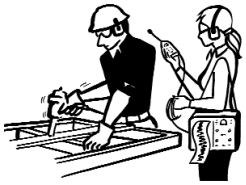
• Es importante para todos los participantes hacer preguntas para asegurarse de que un mensaje se entiende
• Si usted está **dando el mensaje**, haga preguntas acerca de cualquier parte del mensaje que cree que son difíciles
• **Si recibe el mensaje**, haga preguntas acerca de cualquier parte del mensaje que no está claro.

HOW TO PROTECT YOURSELF AGAINST HEARING LOSS

Scrap metal recycling is **noisy**. Noise levels are often over the Washington state limit of 85 decibels (dBA). Some common noise sources include auto shredders, metal shears, heavy equipment and power tools. Exposure to high noise can cause you to **lose your hearing**. That's why scrap metal recycling workers need to be enrolled in a Hearing Loss Prevention Program. For more information visit www.osha.gov/Publications/osha3074.pdf.

NOISE MEASUREMENTS

Help identify high noise areas. Ask your employer where high noise occurs on your work site!

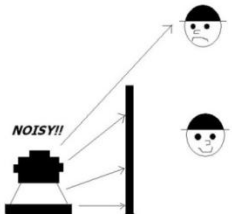


TRAINING

All workers exposed to high noise must be trained on how to prevent hearing loss every year.

NOISE CONTROLS

High noise can be reduced through changes to equipment, activities, or facilities.



HEARING PROTECTORS

Always wear earplugs or earmuffs in high noise, even for short exposures.

HEARING TESTING

Testing every year helps insure the hearing loss prevention program is protecting your hearing.

Hearing loss from noise is **permanent** and **irreversible**. The good news is that it is also completely **preventable**! Protect your hearing from noise both on and off the job and your ears will last a lifetime.

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Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects

Image source: Queensland Government Department of Industrial Relations

HOW TO PROTECT YOURSELF AGAINST HEARING LOSS

Supplemental information

Washington state law requires that workers with work shift average noise exposures of 85 decibels or more be enrolled in a hearing loss prevention program. 85 decibels is about as loud as a gas lawnmower.

Hearing loss from noise

- Can make it **difficult or impossible to understand** coworkers, family, and friends
- Is **permanent and irreversible**
- Is completely **preventable**
- Happens gradually, and most people don't realize it's happening until it's **too late**
- High noise at home or during leisure activities is **just as bad for your hearing** as high noise at work

Noise measurements

- May be made on particular equipment, specific areas, or individual workers
- May be **very short** or last for an **entire work shift**
- Results determine need for hearing loss prevention program, noise controls, and hearing protection

Training

- Must happen **before** first high noise exposure and **every year** afterwards
- Helps you understand the **risks of noise** and **why and how to protect your hearing**

Noise controls

- Changes to equipment, facilities, or work activities to **reduce** noise
- Include:
  - Using barriers to keep noise away from workers
  - Changing equipment to reduce noise
  - Changing work patterns or moving work locations to reduce noise
  - Eliminating some types of work to reduce noise
- Are **much more effective than hearing protectors**

Hearing protectors

Earmuffs

Easiest to fit

Foam earplugs

Hardest to fit

Premolded earplugs

Come in many sizes

Custom-molded earplugs

Only fit one person

Banded ear caps

Good for intermittent noise

- Only provide adequate noise reduction **when worn properly**
- **When worn wrong, they may not protect you at all.** That's why training is so important
- Employers must provide at least **two different types at no cost to workers**
- Try different kinds until you find a pair that is **comfortable** and that you **will wear**
- Keep them with you so you always have them when you need them
- Available from: safety director; lunchroom; individual work areas

Hearing testing

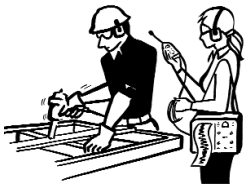
- Takes place **every year** in a test booth in a clinic or on a mobile truck
- Evaluates how **well workers hear different sounds**
- Doesn't protect your hearing at all – it only tells you if it's been hurt by noise.

CÓMO PROTEGERSE CONTRA LA SORDERA

El reciclaje de chatarra es **ruidoso**. Los niveles de ruido a menudo por encima del límite del estado de Washington de 85 decibelios. Algunas fuentes de ruido más comunes incluyen trituradoras de automóviles, cizallas para metales, maquinaria pesada y herramientas eléctricas. La exposición al alto ruido puede hacer que usted **pierda su capacidad auditiva**. Es por eso que los trabajadores de reciclaje de chatarra necesitan estar inscritos en un Programa de Prevención de Pérdida de la audición. Para más información visite la página en la red: www.osha.gov/Publications/osha3074.pdf.

MEDICIONES DE RUIDO

¡Ayudar a identificar las zonas de alto ruido. Pregunte a su empleador donde el alto ruido se produce en su lugar de trabajo!

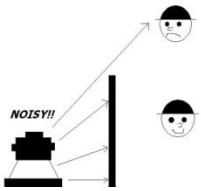


CAPACITACION

Entender por qué y cómo su empleador está trabajando para proteger su audición.

CONTROL DEL RUIDO

El alto ruido se puede reducir a través de cambios de equipo, actividades o instalaciones.



PROTECTORES AUDITIVOS

Siempre use tapones para los oídos u orejeras en alto ruido, incluso durante exposiciones cortas

PRUEBAS DE AUDICION

Los resultados ayudan a asegurar que el programa de prevención de la pérdida de audición le está protegiendo su audición.

La pérdida de audición por el ruido es **permanente** e **irreversible**. La buena noticia es que también es completamente ¡**prevenible**! Proteja su audición debido al ruido, tanto dentro como fuera del trabajo y sus oídos durarán toda la vida.

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Fuente de la imagen: Gobierno de Queensland Departamento de Relaciones Industriales

CÓMO PROTEGERSE CONTRA LA SORDERA

Información suplementaria

La ley del estado de Washington requiere que los trabajadores con exposición del trabajo por turnos con promedio de ruido de 85 decibeles o más deben estar inscritos en un programa de prevención de pérdida de la audición. 85 decibeles es casi tan fuerte como una cortadora de césped de gasolina

La pérdida de audición por el ruido

- Puede hacer que sea **difícil o imposible de entender** compañeros de trabajo, familiares y amigos
- Es **permanente e irreversible**
- Es totalmente **prevenible**
- Sucede gradualmente, y la mayoría de las personas no se dan cuenta de lo que está pasando hasta que es **demasiado tarde**
- El alto ruido en el hogar o durante actividades durante el tiempo libre es tan malo como el alto ruido en el trabajo

Mediciones de ruido

- Pueden ser tomadas en maquinaria en particular, áreas específicas, o individualmente a los trabajadores
- Puede ser **muy breve** o durar **un turno completo de trabajo**
- Los resultados determinan la necesidad de un programa de prevención de pérdida de audición, controles de ruido y protección auditiva

Capacitación

- Debe hacerse **antes** de la primera exposición al ruido y **cada año** después
- Le ayuda a entender los **riesgos del ruido** y **por qué y cómo proteger su audición**

Controles del Ruido

- Cambios de equipo, instalaciones o actividades en el trabajo para **reducir** el ruido
- Incluyendo:
  - Utilizando barreras para mantener el ruido lejos de los trabajadores
  - Cambiando el equipo para reducir el ruido
  - Cambios en los patrones de trabajo o re-ubicación de áreas de trabajo para reducir el ruido
  - Eliminación de algunos tipos de trabajo para reducir el ruido
- Son **mucho más eficaces que los protectores auditivos**

Protectores Auditivos

Orejeras

Fácil de ajustar

Tapones de espuma

Difíciles de ajustar

Tapones pre-moldeados

Vienen en muchos tamaños

Moldeado a la medida

Solo se ajustan a una persona

Tapones con banda

Buenos para ruido intermitente

- Sólo proporcionan reducción de ruido adecuado cuando **se usan correctamente**
- **Cuando se usan incorrectamente, puede que no protejan en absoluto**. Es por eso que la capacitación es tan importante
- Los empleadores deben proporcionar por lo menos **dos tipos diferentes sin costo alguno a los trabajadores**
- Pruebe distintos tipos hasta que encuentre una tipo que sea **cómodo** y **que usted usará**
- Llévelos consigo para que siempre los tenga cuando los necesite
- Disponibles: director de seguridad, comedor, áreas de trabajo

Pruebas auditivas

- Toman lugar **cada año** en una cabina en una clínica o en un camión móvil
- Evalúa **lo bien que los trabajadores escuchan diferentes sonidos**
- o protege su audición en lo absoluto - sólo le informa si es lastimado por el ruido.

APPENDIX G: Worker questionnaire

Scrap Metal Recyclers: Worker Assessment

SCHOOL OF PUBLIC HEALTH

UNIVERSITY of WASHINGTON

Department of Environmental and Occupational Health Sciences

Please answer the following questions to the best of your ability. Your answers are confidential and will not be shared with your coworkers or supervisor. You can choose not to answer specific questions. For questions about your work activities and behavior, please tell us what you actually do, not what you are supposed to do.

Please tell us your name:

First:	Last:

Today's Date: / /

Job Title:

Questions 1-44 ask about exposures you might have at work, and injuries you might have had.

Dust and/or welding fumes at work

1. How often do you work near dust or welding fumes?

- ☐ Never or almost never → ***Skip to question 5***
- ☐ Less than half of your work days
- ☐ About half of your work days
- ☐ More than half of your work days
- ☐ Every work day or almost every work day

2. What type of protective equipment does the company provide to protect you against dust or welding fumes at work?

Check all that apply

- ☐ None
- ☐ Half-face or full-face respirator
- ☐ Dust mask
- ☐ Other_____

3. How often do you use a respirator or dust mask when you work near dust or welding fumes?

- ☐ Never or almost never
- ☐ Less than half the time
- ☐ About half the time
- ☐ More than half the time
- ☐ Always or almost always

4. Have you received training from the company on how to work safely around dust or welding fumes?

- ☐ Yes
- ☐ No
- ☐ Don't know

Chemicals at work

5. How often do you work with or near chemicals, acids, caustics, or solvents that you could breathe in or get on your skin?

- ☐ Never or almost never → ***Skip to question 9***
- ☐ Less than half of your work days
- ☐ About half of your work days
- ☐ More than half of your work days
- ☐ Every work day or almost every work day

6. What type of protective equipment does the company provide to protect you from chemicals, acids, caustics, or solvents at work?

Check all that apply

- ☐ None
- ☐ Half-face or full-face respirator
- ☐ Dust mask
- ☐ Gloves
- ☐ Safety glasses or goggles
- ☐ Coveralls
- ☐ Apron
- ☐ Other_____

7.	**How often do you use protective equipment when you work with or near chemicals, acids, caustics, or solvents at work?**	☐ Never or almost never ☐ Less than half the time ☐ About half the time ☐ More than half the time ☐ Always or almost always
8.	**Have you received training from the company on how to work safely around chemicals, acids, caustics, or solvents?**	☐ Yes ☐ No ☐ Don't know

Traffic and moving vehicles at work

9.	**How often are you near moving trucks, vehicles, fork lifts, railroad cars or street traffic at work?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
10.	**Does the company provide you with high visibility or reflective clothing, such as gloves and vests, to use at work?**	☐ Yes ☐ No ☐ Don't know
11.	**How often do you use high visibility or reflective clothing when you work near moving trucks, vehicles, fork lifts, railroad cars or street traffic?**	☐ Never or almost never ☐ Less than half the time ☐ About half the time ☐ More than half the time ☐ Always or almost always
12.	**Have you received training from the company on how to work safely around moving trucks, vehicles, fork lifts, railroad cars or street traffic?**	☐ Yes ☐ No ☐ Don't know

Working at heights

13.	**How often do you work in locations where you could fall <u>more than 4 feet (1.2 meters)</u>?**	☐ Never or almost never → ***Skip to question 17*** ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day

14.	**What types of fall protection equipment does the company provide to protect you from falls <u>more than 4 feet (1.2 meters)</u>?** ***Check all that apply***	☐ None ☐ Fall protection harness ☐ Safety railing ☐ Other_____
15.	**How often do you use fall protection equipment when you are working in locations where you could fall more <u>than 4 feet (1.2 meters)</u>?**	☐ Never or almost never ☐ Less than half the time ☐ About half the time ☐ More than half the time ☐ Always or almost always
16.	**Have you received training from the company on how to make sure you do not fall <u>more than 4 feet (1.2 meters)</u> at work?**	☐ Yes ☐ No ☐ Don't know

Use of machinery at work

17.	**How often do you work with or near machines or equipment which could <u>catch you or your clothing</u> in their moving parts?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
18.	**How often do you work with or near objects or equipment which could <u>stab or cut</u> you?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
19.	**How often do you work with or near objects or equipment which could <u>trap, squeeze or crush</u> you?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day

20.	**Do the machines and equipment you work with have <u>protective guards or other mechanisms</u> designed to prevent you from being injured?**	☐ Yes, all machines do ☐ Some machines do, some don't ☐ No ☐ Don't work with machines or equipment ☐ Don't know
21.	**Does the company have a "Lock-out/Tag-out" safety program in place for doing <u>maintenance and repairs</u> on the machines and equipment you work with?**	☐ Yes ☐ No → ***Skip to question 24*** ☐ Don't know
22.	**Have you ever received training on "Lock-out/Tag-out" safety procedures?**	☐ Yes ☐ No ☐ Don't know
23.	**How often do you follow "Lock-out/Tag-out" safety procedures when working on machinery or equipment?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day ☐ I don't work on machinery or equipment

Ergonomics at work

24.	**How often do you work with your hands or elbows <u>above your shoulders</u> for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day

25.	**How often do you work with your neck or back <u>bent and unsupported</u> for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
26.	**How often do you work while <u>kneeling</u> for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
27.	**How often do you work <u>repeating the same motion</u> with your neck, shoulders, elbows, wrists, or hands for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
28.	**How often do you lift objects weighing <u>more than 75 pounds (34 kilos)</u> once or more per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
29.	**How often do you lift objects weighing <u>more than 10 pounds (4.5 kilos)</u> for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
30.	**How often do you use grinders, sanders, or other <u>vibrating</u> hand tools for more than 2 hours total per day?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
31.	**Have you ever received training from the company on how to prevent ergonomic problems like sprains, strains, or back injuries?**	☐ Yes ☐ No ☐ Don't know

Noise at work

32.	**How often are you exposed to high noise at work?** ***"High noise" means louder than a noisy bar or restaurant, or loud enough that a person has to raise their voice to talk to someone 3 feet or less away.***	☐ Never or almost never → ***Skip to question 36*** ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
33.	**What type of protective equipment does the company provide to protect you from noise at work?** ***Check all that apply***	☐ None ☐ Ear plugs ☐ Ear muffs
34.	**How often do you use ear plugs or ear muffs when you are exposed to high noise at work?**	☐ Never or almost never ☐ Less than half the time ☐ About half the time ☐ More than half the time ☐ Always or almost always
35.	**Have you received training from the company on how to prevent hearing loss from noise at work?**	☐ Yes ☐ No ☐ Don't know

Injuries at work

36.	**How many times have you been injured at work <u>in the past year</u>?**	_____times → ***If 0, skip to question 41***
37.	**For your <u>worst injury at work in the past year</u>, what type of medical care did you receive?**	☐ No medical care ☐ First aid at work ☐ Treatment from a doctor or other healthcare professional in a clinic or office ☐ Treatment at emergency room ☐ Other:_____
38.	**How much work did you miss due to your <u>worst injury in the past year</u>?**	☐ Did not miss any work and worked regular job ☐ Did not miss any work but was assigned to modified or light duty ☐ Missed work: _____ days

39.	**What <u>type of object or material</u> caused your worst injury at work in the past year?**	☐ Chemicals ☐ Containers ☐ Furniture or fixtures ☐ Machinery ☐ Parts or materials ☐ Persons, plants or animals ☐ Structures or surfaces ☐ Tools ☐ Instruments and equipment ☐ Vehicles ☐ Other:_____
40.	**How did your worst injury at work in the past year <u>occur</u>?**	☐ Contact with objects or equipment ☐ Fall ☐ Bodily reaction or exertion ☐ Exposure to harmful substance or environment ☐ Transportation accident ☐ Fire or explosion ☐ Assault or violent act ☐ Other:_____
41.	**How often were you <u>almost in an accident</u> at work in the past year?**	☐ Never or almost never ☐ Less than half of your work days ☐ About half of your work days ☐ More than half of your work days ☐ Every work day or almost every work day
42.	**Are you required to report injuries and accidents at work to the company?**	☐ Yes ☐ No ☐ Don't know
43.	**Would you feel comfortable refusing to do work because of unsafe working conditions?**	☐ Yes ☐ No
44.	**Have you ever refused to do any work because of safety concerns?**	☐ Yes ☐ No

Questions 45-55 ask about the Health and Safety Committee (HSC) at SMR.

45.	**Are you aware of the existence of a Health and Safety Committee at your company?**	☐ Yes ☐ No → ***Skip to question 59***
46.	**Do you know who represents you on the Health and Safety Committee?**	☐ Yes ☐ No → ***Skip to question 48***
47.	**What is your representative's name?**	Name: _____
48.	**Do you know how to report a problem to the Health and Safety Committee?**	☐ Yes ☐ No
49.	**Have you ever reported a problem or a safety hazard to the Health and Safety Committee?**	☐ Yes ☐ No → ***Skip to question 52***
50.	**Did you hear back with an answer or solution?**	☐ Yes ☐ No
51.	**Was the problem corrected?**	☐ Yes ☐ No ☐ Don't know
52.	**How does the Health and Safety Committee communicate with you and other workers?** ***Check all that apply***	☐ Through your supervisor ☐ Through the Health & Safety Director ☐ Safety or union meetings ☐ Bulletin board ☐ Newsletter or email ☐ Other:_____ ☐ Don't know
53.	**How do you become a member of the Health and Safety Committee?**	☐ Don't know ☐ Elected by other workers ☐ Selected by management ☐ Volunteer ☐ Other:_____
54.	**Have you ever participated in the Health and Safety Committee?**	☐ Yes ☐ No

55.	**Do you think service in the Health and Safety Committee is…**	☐ An honor or a privilege ☐ A punishment ☐ A way to get out of work ☐ A responsibility or a duty ☐ Other:_____

Questions 56-60 ask about your perceptions of the HSC at SMR. Please tell us how much you agree or disagree with each statement. Marking 1 indicates that you "strongly disagree" with the statement, 3 means you "neither agree nor disagree," and 5 means you "strongly agree" with the statement.

		Strongly Disagree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
56.	**You are <u>confident</u> in the Health and Safety Committee's ability to resolve or correct issues and problems.**	1	2	3	4	5	NA
57.	**The Health and Safety Committee is <u>effective</u> in making your workplace safer.**	1	2	3	4	5	NA
58.	**You feel that workers are adequately represented on the Health and Safety Committee.**	1	2	3	4	5	NA
59.	**You feel comfortable bringing safety issues and/or concerns to the Health and Safety Committee or your supervisor.**	1	2	3	4	5	NA
60.	**Language is a <u>barrier</u> when you need to communicate safety issues and concerns to the Health and Safety Committee or your supervisor.**	1	2	3	4	5	NA

Questions 61-86 ask about your working conditions. Please tell us how much you agree or disagree with each statement. Marking 1 indicates that you "strongly disagree" with the statement, 3 means you "neither agree nor disagree," and 5 means you "strongly agree" with the statement.

<u>Your work</u>

		Strongly <u>Dis</u>agree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
61.	**Your job requires working very fast.**	**1**	**2**	**3**	**4**	**5**	**NA**
62.	**Your job requires working very hard.**	**1**	**2**	**3**	**4**	**5**	**NA**
63.	**You are not asked to do an excessive amount of work.**	**1**	**2**	**3**	**4**	**5**	**NA**

		Strongly Disagree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
64.	**You have enough time to get the job done.**	**1**	**2**	**3**	**4**	**5**	**NA**
65.	**You are free from conflicting demands others make.**	**1**	**2**	**3**	**4**	**5**	**NA**
66.	**People you work with are competent in doing their jobs.**	**1**	**2**	**3**	**4**	**5**	**NA**
67.	**People you work with take a personal interest in you.**	**1**	**2**	**3**	**4**	**5**	**NA**
68.	**People you work with are friendly.**	**1**	**2**	**3**	**4**	**5**	**NA**
69.	**People you work with are helpful in getting the job done.**	**1**	**2**	**3**	**4**	**5**	**NA**
70.	**Your race/ethnicity is a factor in how you are treated at work.**	**1**	**2**	**3**	**4**	**5**	**NA**
71.	**The language you speak is a factor in how you are treated at work.**	**1**	**2**	**3**	**4**	**5**	**NA**
72.	**The most recent safety and health training you received from the company was effective.**	1	2	3	4	5	NA
73.	**Your supervisor is concerned about the welfare of those under him.**	**1**	**2**	**3**	**4**	**5**	**NA**
74.	**Your supervisor pays attention to what you are saying.**	**1**	**2**	**3**	**4**	**5**	**NA**
75.	**Your supervisor is helpful in getting the job done.**	**1**	**2**	**3**	**4**	**5**	**NA**
76.	**Your supervisor is successful in getting people to work together.**	**1**	**2**	**3**	**4**	**5**	**NA**
77.	**Your supervisor says a good word whenever he sees a job done according to the safety rules.**	**1**	**2**	**3**	**4**	**5**	**NA**
78.	**Your supervisor seriously considers any worker's suggestions for improving safety.**	**1**	**2**	**3**	**4**	**5**	**NA**
79.	**Your supervisor approaches workers during work to discuss safety issues.**	**1**	**2**	**3**	**4**	**5**	**NA**
80.	**Your supervisor gets annoyed with any worker ignoring safety rules, even minor rules.**	**1**	**2**	**3**	**4**	**5**	**NA**
81.	**Your supervisor watches more often when a worker has violated some safety rule.**	**1**	**2**	**3**	**4**	**5**	**NA**
82.	**As long as there is no accident, your supervisor doesn't care how the work is done.**	**1**	**2**	**3**	**4**	**5**	**NA**
83.	**Whenever pressure builds up, your supervisor wants you to work faster, rather than by the rules.**	**1**	**2**	**3**	**4**	**5**	**NA**
84.	**Your supervisor pays less attention to safety problems than most other supervisors in this company.**	**1**	**2**	**3**	**4**	**5**	**NA**
85.	**Your supervisor only keeps track of major safety problems and overlooks routine problems.**	**1**	**2**	**3**	**4**	**5**	**NA**

		Strongly Disagree ↓		Neither agree nor disagree ↓		Strongly Agree ↓	Don't Know ↓
86.	**As long as work remains on schedule, your supervisor doesn't care how this has been achieved.**	**1**	**2**	**3**	**4**	**5**	**NA**

Please tell us a little bit about yourself in questions 87-96.

87.	**In what year were you born?**	Year: _____
88.	**In what country were you born?**	_____ → ***If United States, skip to question 90***
89.	**How many years have you lived in the United States?**	_____ years
90.	**What is the highest level of formal schooling you have completed?**	☐ Less than high school ☐ Finished high school or GED ☐ Some college ☐ Finished college ☐ Trade/vocational school
91.	**How many years have you worked in the scrap metal and recycling business?**	_____Years
92.	**How many years have you worked for SMR?**	_____Years
93.	**How many hours a week do you usually work at SMR?**	_____ Hours/week
94.	**What language do you usually speak at home?**	☐ English ☐ Spanish ☐ Other_____
95.	**How comfortable are you <u>speaking</u> English?**	☐ Well ☐ Get By ☐ A little ☐ Not at all
96.	**How comfortable are you <u>reading</u> English?**	☐ Well ☐ Get By ☐ A little ☐ Not at all

THANK YOU FOR COMPLETING THIS SURVEY!

APPENDIX H: HSC member questionnaire

Scrap Metal Recyclers: HSC Assessment

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Department of Environmental and Occupational Health Sciences

Please answer the following questions to the best of your ability. Your answers are confidential and will not be shared with your coworkers, supervisor, or other Health and Safety Committee members. You can choose not to answer specific questions.

Please tell us your name:

First:	Last:

Today's Date:
/ /

Job Title:

Please tell us about how you became a part of the Health and Safety Committee, and your thoughts about the Committee's organization, in questions 1 through 10.

1.	**What year did you become a member of the Health and Safety Committee at SMR?**	Year: _____
2.	**How did you become a member of the Health and Safety Committee?**	☐ I was elected by my coworkers ☐ I was selected by management ☐ I volunteered ☐ Other, please explain_____
3.	**Does the Health and Safety Committee have a chairperson?**	☐ Yes ☐ No→ ***Skip to question 5*** ☐ Don't know→ ***Skip to question 5***
4.	**How is the Health and Safety Committee chairperson selected?**	☐ Elected by Health and Safety Committee ☐ Selected by management ☐ Volunteer ☐ Other, please explain_____ ☐ Don't know
5.	**How long does a term on the Health and Safety Committee last?**	☐ 1 year or less ☐ More than 1 year ☐ Don't know
6.	**Does the Health and Safety Committee have <u>authority to spend money</u> to make the workplace safer?**	☐ Yes ☐ No ☐ Don't know
7.	**Has the Health and Safety Committee structure been <u>reviewed or revised</u> in the past two years?**	☐ Yes ☐ No ☐ Don't know
8.	**How often does the Health and Safety Committee <u>actually meet</u>?**	☐ Less than once a quarter ☐ Once a quarter ☐ Once a month ☐ More than once a month ☐ Only as needed ☐ Don't Know
9.	**How long do Health and Safety Committee meetings usually last?**	☐ Less than an hour ☐ About an hour ☐ More than an hour

10.	**How often <u>do you actually attend</u> Health and Safety Committee meetings?**	☐ Never or almost never ☐ Less than half of meetings ☐ About half of meetings ☐ More than half of meetings ☐ Always or almost always

Please tell us your thoughts about the roles and responsibilities of the Health and Safety Committee in questions 11 through 22.

11.	**What is the role of the Health and Safety Committee?** ***Check all that apply***	☐ Perform health & safety inspections ☐ Make health & safety rules ☐ Enforce health & safety rules ☐ Make health & safety recommendations ☐ Conduct health and safety training ☐ Other, please explain_____
12.	**As a Health and Safety Committee member, do you represent a specific group of workers or work area?**	☐ Yes ☐ No → ***Skip to question 14*** ☐ Don't Know → ***Skip to question 14***
13.	**What is the group of workers or work area you represent?**	Please explain_____
14.	**Does the Health and Safety Committee regularly <u>review records or reports</u> on work-related injury and illnesses?**	☐ Yes ☐ No ☐ Don't Know
15.	**Does management demonstrate its support to the Health and Safety Committee by <u>providing resources, training, and time</u> for committee activities?**	☐ Yes ☐ No ☐ Don't Know
16.	**How often does management usually <u>implement</u> recommendations made by the Health and Safety Committee?**	☐ Almost always ☐ Sometimes ☐ Rarely ☐ Never ☐ Don't know

17.	**How often does management provide reasons when Health and Safety Committee recommendations <u>are not implemented</u>?**	☐ Almost always ☐ Sometimes ☐ Rarely ☐ Never ☐ Don't know
18.	**When was the last time the Health and Safety Committee received any safety training?**	☐ More than 1 year ago ☐ Less than 1 year ago ☐ Don't know
19.	**Who provides <u>technical support and advice</u> on health and safety to the Health and Safety Committee?** ***Check all that apply.***	☐ Health & Safety Director ☐ Private external consultant ☐ Labor & Industries ☐ No support available ☐ Other, Please explain _____ ☐ Don't know
20.	**Does the Health and Safety Committee review safety issues before new machinery or new work processes are introduced into the workplace?**	☐ Yes ☐ No ☐ Don't Know
21.	**How often does the Health and Safety Committee participate in health and safety inspections?**	☐ Weekly or more often ☐ Monthly ☐ Quarterly ☐ Yearly or less often ☐ As needed ☐ Don't know
22.	**Which of these activities does the Health and Safety Committee participate in?** ***Check all that apply.***	☐ Health & safety inspections ☐ Accident or near-miss investigations ☐ Review of injury reports/OSHA logs ☐ Other, Please explain_____ ☐ Don't know

Please tell us your thoughts about how the Health and Safety Committee operates in questions 23 through 32.

23.	**Is a written agenda developed before each Health and Safety Committee meeting?**	☐ Yes ☐ No → ***Skip to question 25*** ☐ Don't know → ***Skip to question 25***
24.	**If yes, who selects the agenda items before the Health and Safety Committee meeting?** ***Check all that apply.***	☐ Management representatives on the HSC ☐ Workers on the HSC ☐ All members of the HSC ☐ Health & Safety Director ☐ Other_____ ☐ Don't know
25.	**How does the Health and Safety Committee select issues to discuss at committee meetings?** ***Check all that apply.***	☐ Worker suggestions ☐ Management suggestions ☐ Health & Safety Director suggestions ☐ Accident reports ☐ Near miss reports ☐ Regular health and safety inspections ☐ Informal communications from workers or supervisors ☐ Other_____ ☐ Don't know
26.	**Is there a formal process in the Health and Safety Committee for <u>prioritizing</u> health and safety issues?**	☐ Yes ☐ No ☐ Don't know
27.	**How often does the Health and Safety Committee record <u>minutes</u> at meetings?**	☐ Always ☐ Sometimes ☐ Rarely or never ☐ Don't know
28.	**Does the Health and Safety Committee approve previous minutes at the beginning of every meeting?**	☐ Yes ☐ No ☐ Don't know
29.	**Do Health and Safety Committee meetings take place <u>on paid work time</u>?**	☐ Yes ☐ No ☐ Don't know

30.	**How many Health and Safety Committee members <u>actively participate</u> during the meetings?**	☐ All or almost all members ☐ Most members ☐ A few members ☐ Only 1 or 2 members ☐ Don't know
31.	**Do individual Health and Safety Committee members have the authority to call a committee meeting when needed?**	☐ No ☐ Only some members have this authority ☐ All members have this authority ☐ Don't know
32.	**How does the Health and Safety Committee <u>evaluate and/or assess</u> health and safety problems?** ***Check all that apply.***	☐ Worksite inspections ☐ Worker interviews ☐ Supervisor interviews ☐ Other, please write_____ ☐ Don't know

Please tell us your thoughts about how the Health and Safety Committee communicates with management and workers in questions 33 through 37.

33.	**How does the Health and Safety Committee communicate to the <u>workers</u>?** ***Check all that apply*.**	☐ Formal meetings ☐ Informal meetings ☐ Bulletin board ☐ Newsletter or email ☐ Word of mouth ☐ Other, please write_____ ☐ Don't know
34.	**How does the Health and Safety Committee communicate with <u>management</u>?** ***Check all that apply.***	☐ Formal meetings ☐ Informal meetings ☐ Bulletin board ☐ Newsletter or email ☐ Other, please write_____ ☐ Doesn't communicate with workers ☐ Don't know

35.	**Is there written communication from the Health and Safety Committee to management?**	☐ Yes ☐ No ☐ Don't know
36.	**How does <u>management</u> communicate with the Health and Safety Committee?** ***Check all that apply.***	☐ Management representative on committee ☐ Memos ☐ Formal meetings ☐ Informal discussion with committee members ☐ Other, please write_____ ☐ Don't know
37.	**How do <u>workers</u> communicate health and safety issues/problems to the Health and Safety Committee?** ***Check all that apply.***	☐ Suggestion box ☐ Through supervisor ☐ Through Health & Safety Director ☐ Through hazards reporting box ☐ Other, please write_____ ☐ Don't know

Please tell us about your perceptions of the Health and Safety Committee in questions 38 through 49. For these questions, please tell us how much you agree or disagree with each statement. Marking 1 indicates that you "strongly disagree" with the statement, 3 means you "neither agree nor disagree," and 5 means you "strongly agree" with the statement.

		Strongly disagree ↓		Neither agree nor disagree ↓		Strongly agree ↓	Don't know ↓
38.	**<u>Workers</u> influence the activities of the Health and Safety Committee.**	1	2	3	4	5	NA
39.	**<u>Management</u> influences the activities of the Health and Safety Committee.**	1	2	3	4	5	NA
40.	**The Health and Safety Committee is effective in <u>helping prevent</u> accidents, illnesses, and injuries.**	1	2	3	4	5	NA
41.	**The Health and Safety Committee is effective in <u>identifying</u> significant hazards and problems.**	1	2	3	4	5	NA
42.	**The Health and Safety Committee is effective in <u>correcting or resolving</u> safety issues.**	1	2	3	4	5	NA

43.	**Workers are aware of the Health and Safety Committee.**	1	2	3	4	5	NA
44.	**Workers have confidence in the ability of the Health and Safety Committee to make the workplace safe.**	1	2	3	4	5	NA
45.	**Communication from the Health and Safety Committee to the workers is effective.**	1	2	3	4	5	NA
46.	**Communication from the Health and Safety Committee to management is effective.**	1	2	3	4	5	NA
47.	**Workers are comfortable bringing safety issues to the Health and Safety Committee.**	1	2	3	4	5	NA
48.	**Language barriers prevent some workers from participating in the Health and Safety Committee.**	1	2	3	4	5	NA
49.	**Language barriers prevent some workers from bringing safety issues or problems to the Health and Safety Committee.**	1	2	3	4	5	NA

THANK YOU FOR COMPLETING THIS SURVEY!

APPENDIX I: Hazard Observation Tool

ONSITE RESEARCHER OBSERVATION FORM

Researcher: ☐ RN ☐ CD ☐ AC ☐ VR ☐ MB ☐ MC

Date of observation: _____/_____/_____ **Time of observation: _____:_____** ☐ **AM** ☐ **PM**

PPE: What PPE is worker using?

	Not used	Used	Uncertain
Hard hat	☐	☐	☐
Safety glasses	☐	☐	☐
Hi-vis	☐	☐	☐
Work boots	☐	☐	☐

Work area:

☐ Burn ☐ Dock ☐ Loading dock ☐ Maintenance ☐ Non-ferrous/bailer (NF2)

☐ Scalehouse ☐ Shear ☐ Shredder **inlet** ☐ Shredder **outlet** ☐ Warehouse (NF1)

☐ Water treatment

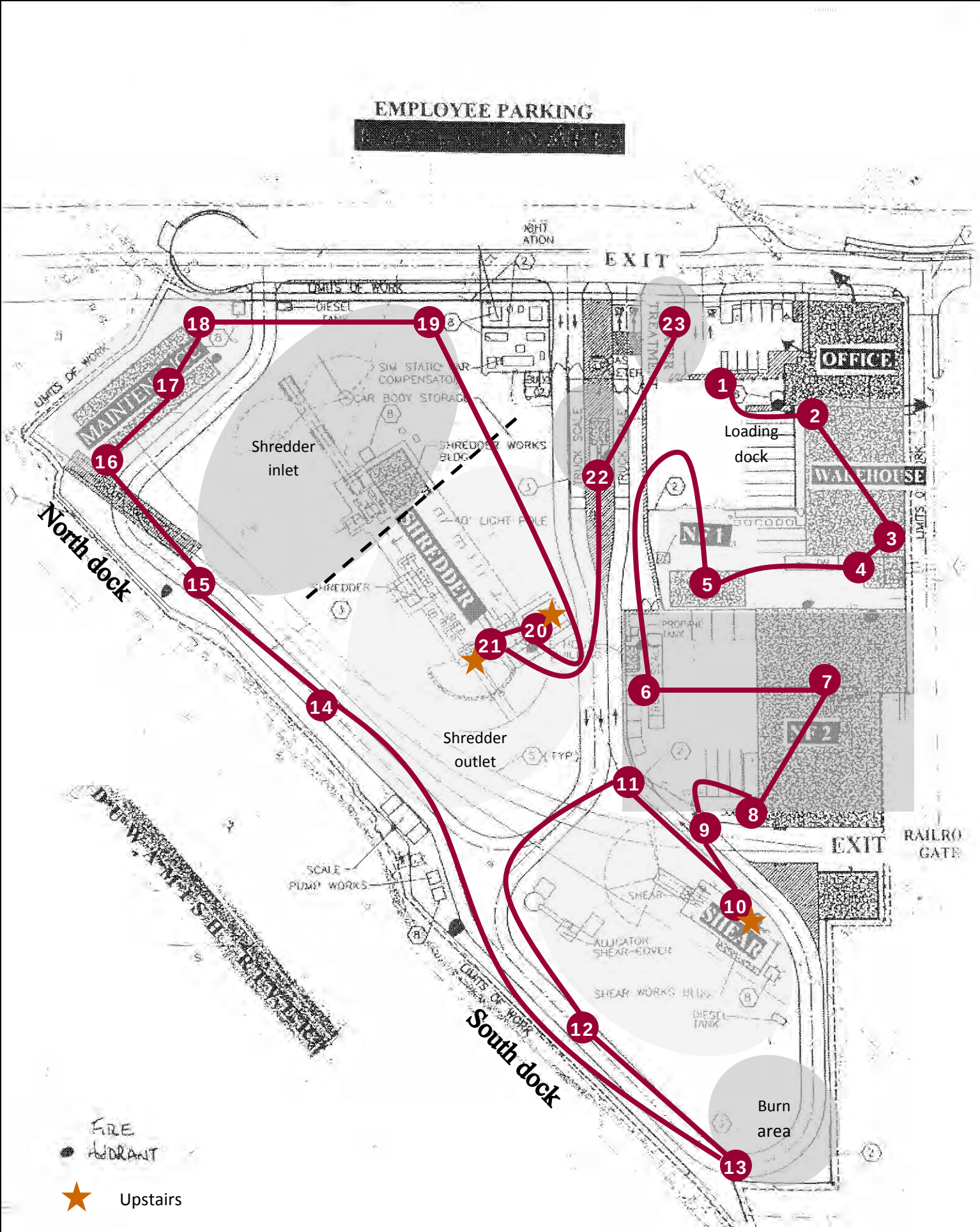
Work Activity:

☐ Burn/cut/weld ☐ Inspect/supervise ☐ Load/unload/move material ☐ Maintenance ☐ Operate bobcat/loader/other vehicle

☐ Operate crane ☐ Operate forklift ☐ Picking/sorting ☐ Stand ☐ Traffic control

☐ Walking ☐ Weighing ☐ Work with large machinery/equip ☐ Work with small tools/equip ☐ Other

Exposure:		**Exposure magnitude**		**Protective equipment**
Fall hazards		☐ Not present ☐ Low ☐ High		*(e.g., fall protection harness, railing, etc)* ☐ Not used ☐ Used ☐ Uncertain
Noise		☐ Not present ☐ Low ☐ High		*(e.g., earplugs or earmuffs)* ☐ Not used ☐ Used ☐ Uncertain
Eye hazard		☐ Not present ☐ Low ☐ High		*(e.g. faceshield, other than safety goggles/glasses)* ☐ Not used ☐ Used ☐ Uncertain
Dust/fume		☐ Not present ☐ Low ☐ High		*(e.g., dust mask or respirator)* ☐ Not used ☐ Used ☐ Uncertain
Struck by objects (not vehicles)		☐ Not present ☐ Low ☐ High		*(e.g. other than hardhat or helmet)* ☐ Not used ☐ Used ☐ Uncertain
Traffic/vehicle safety		☐ Not present ☐ Low ☐ High		*(e.g. other than high-visibility vest)* ☐ Not used ☐ Used ☐ Uncertain
Work with machines/equipment		☐ Not present ☐ Low ☐ High		*(e.g., machine guards)* ☐ Not used ☐ Used ☐ Uncertain
Maintenance/energy control		☐ Not present ☐ Low ☐ High		*(e..g., lock or tag)* ☐ Not used ☐ Used ☐ Uncertain
Working surfaces		☐ Not present ☐ Low ☐ High ☐ Uncertain		
Lacerations/abrasions		☐ Not present ☐ Low ☐ High		*(e.g., gloves, using tools – not hands)* ☐ Not used ☐ Used ☐ Uncertain
Repetitive motion		☐ Not present ☐ Low ☐ High		N/A
Lifting		☐ Not present ☐ Low ☐ High		N/A
Awkward postures		☐ Not present ☐ Low ☐ High		N/A
Vibration		☐ Not present ☐ Low ☐ High		*(e.g., anti-vibration gloves)* ☐ Not used ☐ Used ☐ Uncertain


EMPLOYEE PARKING
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OFFICE
WAREHOUSE
SHREDDER
SHEAR
SCALE
PUMP WORKS
Shredder inlet
Shredder outlet
Loading dock
Burn area
North dock
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FIRE HYDRANT
Upstairs

APPENDIX J: Study timeline

June 2010

- 6-2 Kickoff meeting
    - Employees at SMR
        - 60-65 total
        - 10 drivers – local 174
        - 4 crane operators – local 302
        - 39 local 117 members, yard workers
        - 5 night maintenance employees
        - 60-70% Spanish language only
    - Participating in L&I consultations – closing conference scheduled for 6/17/2010
    - Biannual blood-lead levels for most "exposed" employees
    - Four accidents in 2010
        - Two 1-2nd degree burns
        - One laceration and one hernia.
            - Only one accident resulted in a time off.
- 6-21 SMR safety orientation for UW staff (walkthrough facility)
- 6-24 HSC meeting**.**
    - Initial meeting took place in the lunchroom.
        - UW presented the description and goals of the project (translation available). Meeting conducted in English only.
        - Local 117 represented
    - Group dynamics were limited to going around the table and ask people if they have some safety issue to discuss.
        - "Ongoing issues/difficulties with changing attitudes – safety "shrugged off" by coworkers, employees." Supervisor
        - "some places you have to retrain the worker every day" - one conversation not enough to change behavior – needs reiteration." Supervisor
    - Owner and operations manager were part of the group but did not contribute to the discussion, manager spent time taking notes-not included in minutes.
    - Meeting was led by safety director, agenda included past items as part of the continuous discussion during the meeting.
        - Safety issues remain in agenda for many months
        - Typically up to 9 accidents this time of year–
            - 3 of those serious/with time loss
            - Only 3 injuries so far this year
            - Burn in shop – miscommunication
            - Burner burned by metal piece - flew up, hit neck
            - Worker in warehouse was disassembling garage door frame- bending by hand – was cut

- July – annual LOTO review (planned but not completed)
    - Safety committee will be visiting various operations (shearer, bailer, shredder) – will investigate for proper LOTO procedures, document findings
    - Safety director often rechecking LOTO procedures on shredder – is being done correctly
  - L&I Consultation
    - Initial consult - 62 items to be addressed, only 1 or 2 remaining
    - Closing meeting early July
  - HSC elections before next month
    - More opportunities, somewhat more of a commitment for members
    - Monday – will post a notice on the board for nominations for HSC

July 2010

- 7-21 HSC pre-Training (10-11:30)
    - Local 117 represented
- 7-26 Blood lead testing begins.
    - Letters with results expected to reach workers-
        - Not all workers tested received results-letters (results in English).

August 2010

- 8-5 Start of observation trial-runs
- 8-15 Death of SMR VP
- 8-26 HSC meeting canceled

September 2010

- 9-2 HSC meeting –
  - HSC member recruitment and consent
  - HSC member surveys
  - Local 117 represented
  - New elected/selected members attending
  - Review of roles/responsibilities of HSC
  - Safety director states that each member represents work area and their health and safety issues/concerns
  - Reminder that focus needs to be on safety issues rather than personal/personnel issues
    - "what happens in here, stays in here" – open forum, focused on safety – confidentiality
    - Drop in accidents/incidents–
        - 16 accidents this time last year
            - 4 time-losses
            - 4 this year and one time-loss
    - LNI consultation completed, report received – will share after management review
    - Importance of attendance, bringing issues from workers/work area to committee meetings

        - Suggestion box will be set up in worker's lunch room
        - After discussion between operations manager and the owners
            - VP will no longer sit on the committee – operations manager will be the management's representative

- 9-8 Worker recruitment.
    - Groups throughout the facility were gathered to receive information from UW staff about "inform-consent" (English and Spanish) forms were signed.
- 9-13 Baseline assessment
    - Noise & Air sampling,
    - Worker surveys
- 9-17 First meeting with Facilitator

October 2010

- 10-5 Observations data collection begins
- 10-7 HSC meeting **– setting dates for training**
    - Training Sessions agreement:
        - Two 4-hour sessions on consecutive Thursdays,
        - Beginning at 2 PM and ending at 6 PM.
    - Operations manager confirmed that this activity could take place during work hours on Thursdays at the end of October or early- to mid- November
    - Group was very interactive overall,
        - Spanish speaking workers were generally silent
        - More solutions/suggestions were proposed – by workers and management
    - Safety director was writing down new concerns
        - unclear what the plan was to follow-up with items
- 10-18 Sampling, worker surveys completed
- 10-20 Shredder projectile – hit maintenance building.

November 2010

- **11-4 First HSC training**
- 11-14 Near miss incident with front-loader and customer
- 11-15 Front-loader operator confirmed Shop Steward for Local 117
- **11-18 Second HSC training**
- 11-27 Crane operator out with back injury (HSC member) -
    - unclear whether work-related
    - unable returned back to work as 12/2011
- 11-29 Worker injured by forklift –
    - EMS call: emergency room for broken foot–
    - investigation by Safety Director & HSC member

December 2010

- 12-2 HSC meeting –
    - UW presentation of results, priorities handout.
    - The meeting attended by all members, the list of priorities is the tally of what members' voted to be priorities based on the list created during the HSC training.
        - 1) Regular meetings;
        - 2) HSC participation in inspections and walkthroughs;
        - 3) Meetings with management;
        - 4) Newsletter;
        - 5) Arrange for translation;
        - 6) Meetings should be longer;
        - 7) Agenda should be handed in advance.
    - Baseline results of exposure assessment of SMR
        - Printed report handed to all HSC's members containing the results of the exposure assessment (English/Spanish)
    - Report on accident and injury involving forklift in Bailer area (11/29)
        - One worker/fractured ankle.
        - Accident was the result of leaving the forklift unattended without engagement of the parking brake.
        - 911 was activated, ambulance took worker to ER.
        - Operator who left the vehicle is on suspension
- 12-5 Meeting with UW engineering about traffic assessment project
- 12-15 Meeting with Safety Director at UW – manager's asking for revised report
    - Proposed dates for HSC meeting (12/21,22,23)
    - Weekly safety inspections started
    - Tentative agenda items
        - HSC: Roles and Responsibilities
        - HSC Ground rules
        - HSC: Charter
- 12-29 **HSC meeting - cancelled**
- 12-24 Owners release internal/private memo requiring **biweekly safety meetings—**
    - Conversation at the Managers meeting and recorded in the meeting minutes, but is not a policy nor we have access to the meeting minutes

January 2011

- 1-5 Traffic assessment at SMR – initial walk-through
- 1-5 Templates: Agenda/Minutes provided to Safety Director
- 1-5 Templates: Roles and Responsibilities to Safety Director
- 1-5 initiated regular scheduled meetings with Safety Director (at UW e/2 weeks)
- 1-12 Met with Safety Director and discussed implementation of new agenda format & support strategy

- 1-14 Meeting with Safety Director: Charter and Roles and Responsibilities
- 1-20 **HSC meeting - cancelled**
- 1-25 Meeting with Local 117 at Local 117 – copy of report to Local 117 representatives
- 1-26 Meeting with Safety Director at SMR-Review training priorities/toolbox
- 1-27 Initial assessment report to Safety Director
- 1-27 HSC meeting canceled–
    - updated reports handed out
    - Plan for 2 meetings in Feb.

February 2011

- 2-2 **Meeting with Safety Director – cancelled**
- 2-7 Blood lead results still pending
- 2-8 Roles and Responsibilities Spanish to safety director
- 2-10 **Meeting with Safety Director – cancelled**
- 2-10 Meeting with Local 117, UW and SMR workers at local establishment
- 2-16 Meeting with Safety Director at UW—
    - Traffic recommendations
    - Walkthrough inspection to take place with HSC member (Maintenance area)
    - Accident investigation training—TBD (April 2011)
- 2-21 Shredder projectiles –
    - Hit and broke front loader right side windshield
        - One month without glass replacement.
- 2-22 UW Email to union and Safety Director pushing HSC progress
    - negative reaction of SMR owners
- 2-24 **HSC meeting – cancelled**
- 2-24 Blue Card (hazards) to Safety Director (Spanish)
- 2-25 Hazard ID cards/box placed in lunch area
- 2-24 Safety Director hazard inspection with HSC member in maintenance area
    - <u>prior to official training</u>
- 2-25 Panels in Shredder identified missing (2 months) due to maintenance
- 2-25 Traffic assessment at SMR
    - worker/management surveys/interviews
- 2-25 Blood lead testing results pending
    - Workers have not received information on results
- 2-25 Meeting at Local 117 with Brenda-go over the report and future involvement

March 2011

- 3-03 HSC meeting at SMR—attended by Local 117
    - Introduction of incident report form
        - Will report back – list corrective actions
        - Will be implemented on 3/7
        - Will train workers during biweekly safety meetings

- Priority issues
  - Blood lead level results
  - Workers have not received BLL results in last couple years
  - Safety Director thought results would be sent from contractor
  - Safety Director will make sure workers get copies and help workers understand results – Spanish letters if needed
  - Shredder guarding
    - Earlier there were missing panels from shredder curtain
    - Shredder panels missing mid-January – working on plan to inspect regularly
    - Front-loader operator: broken window from ejected material (2/21)
    - Operations Manager asked if more guarding was needed – Safety Director "to look into it."

- 3-07 Pilot observations continue
- 3-08 New staff hired
  - welder, laborer (night), maintenance
- 3-10 Meeting with Safety Director at UW-
  - Minutes posted glass case
  - Walkthrough NF2 inspection with HSC member, final report pending.
  - Hazard inspection training sessions (3/15 English and 3/22 Spanish)
    - Presentation to be translated into Spanish.
  - Ongoing challenges:
    - Management commitment to time for training.
    - Safety Director's ability to pursue safety agenda with management support.
    - Language and cultural barriers for communication.
    - Local 117: involvement/participation: agreed in positive contribution by increased involvement, although a distinction between "safety" and "labor" issues are needed to be clear.
    - Needed a P/t bi-lingual safety coordinator
- 3-14 Blue cards: "There is no eye wash station in the shredder area for the last 10 months."
- 3-15 <u>Inspection training at SMR – English speakers</u>
  - Identify hazardous and unsafe conditions
  - Corrective actions (Person responsible/date for completion)
- 3-17 New workers (pickers) assigned to sorting area outside shredder –ASR front loader
- 3-21 Final translation Inspection Training -Spanish
- 3-22 <u>Inspection training at SMR – Spanish speakers</u>
- 3-24 **HSC meeting – cancelled**
- 3-18 Meeting with Safety Director at SMR
  - Blood lead results letter-Spanish-
  - Accident investigation training-postponed (April 2011)

- 3-19 Blue Cards: "bobcat in the shredder area requires regular window cleaning maintenance. "
- 3-29 Revised Assessment report handed to HSC members
- 3-31 HSC meeting
    - Mission Statement for the H&S Committee
        - Complete mission statement
        - Discuss how to proceed with roles/responsibilities
        - Breakout session for charter development

April 2011

- 4-1 Blue Cards: "Potholes in the truck yard loading area-these potholes are a hazard when loading/unloading with the forklift."
- 4-4 Mobile Hearing test scheduled
- 4-5 Pilot observations continue
- 4-21 Translations completed:
    - Blue cards,
    - Traffic summary
    - Blood-lead
    - Hearing protection
- 4-26 **Meeting with Safety Director at UW—cancelled**
- 4-27 Finalized Mission statement
- 4-28 **HSC at SMR-adoption of Mission statement**
    - Local 117 present
    - Back strain in warehouse (NF1) – trying to move something too heavy
    - Toolbox Training materials:
        - Supervisor concerned about being specific to area – good to have all workers on same page, but still needs to be applicable
    - load of cars fell off trailer, no injuries –
        - Safety Director wants to know ASAP about accidents – injury or not.
- 4-28 Translation Hearing results letter/Spanish
- 4-28 Accident investigation training-postponed (May 2011)

May 2011

- 5-3 Traffic report to Safety Director
- 5-9 Roles & Responsibilities final translation-Spanish
- 5-09 Meeting with Safety Director at SMR
- 5-12 **Traffic Study presentation at SMR with HSC.**
    - **HSC agreed to move forward in the formal process of approval and Safety Director to move forward to management.**
    - **HSC approval of basic traffic recommendations next. (6/27)**
- 5-16 Blood lead results letter/Spanish
- 5-17 Accident Investigation training presentation/translation Spanish

- 5-19 Meeting with Safety Director at SMR-finalize Roles & Responsibilities/English/Spanish
- 5-26 Meeting with Safety Director at SMR-
    - Toolbox training content, process and evaluation
        - 13 Topics
        - Train/trainer sessions
        - Evaluation/observations
    - Accident Investigation training postponed (June 16 & 22, 2011)
- 5-31 Meeting with Safety Director-Photos, toolbox training materials (ISIS)

June 2011

- 6-14 Meeting with Safety Director at SMR-present toolbox training materials (hearing protection)
- 6-16 **Training Accident Investigation canceled-English**
- 6-22 **Training Accident Investigation canceled-Spanish**
- 6-24 Meeting with Safety Director at SMR-review toolbox training materials
- 6-30 HSC meeting-
    - UW Presentation: Traffic Assessment at SMR
    - HSC opportunity to make decision to approve "Traffic Study" findings and develop written recommendations to management.
        - Certification for traffic controllers,
        - Reflective clothing,
        - Road markings
        - Management/HSC/Safety Director– will discuss writing recommendations to management at next meeting
    - Traffic recommendations approval from HSC
    - intro to Toolbox Safety training
    - Accident investigation training postponed (7/2011)

July 2011

- 7-01 Workers 4th July lunch at SMR-UW invited.
    - T-shirts: "safety starts with you"
- 7-01 **Safety Director submits list of Traffic Recommendations to management**
- 7-12 Meeting with Safety Director at UW-
    - Scheduling/coordinating toolbox training/train/trainer schedule
- 7-15 Ejected projectile metal piece from shredder to unloading zone
    - Hit one worker in the rib cage, no medical attention required
- 7-18 HSC rep from Maintenance resigned-new job offer(last day 7/21)
- 7-19 Meeting with Safety Director
    - Take pictures of Traffic Revision project (before/after documentation)
    - Established the date for the upcoming "train/trainer" toolbox training (7/21)
    - Tentative HSC elections
        - Areas not currently represented: maintenance, night-shift, and NF1

- 7-25 Local 117 site visit (anonymous request)
    - Assessing the current location of the main propane tank that serves as a pump station for forklifts that is located 25.5 feet away from the stainless steel "cutting" area.
        - The previous week a forklift damaged the hose that is used for filling the gas and causes a leak that let gas scape near the "stainless steel" cutting area.
        - One of the supervisors was near and alerted the cutter and one of the workers in the bailer area shut off the valve.
- 7/28 HSC meeting
    - Reiteration on behalf of the owners bi-weekly meetings "important" to continue as scheduled.
    - Accident investigation training postponed (8/2011).
    - Traffic training (Evergreen Council) pending.
    - Pavement/concrete to fix the roads to be done during the summer (not completed).
    - HSC discussed replacing missing HSC members
    - Operations Manager announced that the shielding for the shredder will be installed in the next few days…worker hit by projectile in the prior week.
    - Workers request availability of drinking water during the hot days.
    - New workers assigned to shredder outlet-no safety assessment performed, procedures pending.
    - LP tank issue: re-locate LP tank outside NF2 due to danger near stainless steel burner-owner to make a decision
        - No changes, no decision was made,
        - Operations manager reported that there no violations and re-location would be costly).
        - Traffic recommendations officially approved, provisionally but not in writing.

August 2011

- 8/1 Meeting with Safety Director at UW to go over the toolbox-"train/trainer" schedule.
    - Spanish will take place on 8/4 (11-12)
    - English 8/11 (11-12)
- 8-04 Train/trainer session (Spanish) "Toolbox Materials"
- 8-15 Shared "toolbox" materials with Local 117
- 8-18 Scheduled train/trainer session "Toolbox Materials" for HSC members (English)
- 8-19 NF1 & NF2
    - Initiated training by presenting "What to do if you see a hazard."
        - No evaluations were conducted.
        - Positive feedback from both presenters,
        - Workers were enthusiastic to hear the information in new format.
        - Opportunity for workers to share safety issues in their area
- 8-23 Weekly meeting with Safety Director.

- Agenda for HSC meeting
- Schedule toolbox training for all areas
- New Local 117 representative invited to attend HSC meetings

- 8-25 HSC meeting:
  - Schedule bi-weekly area safety meetings: "toolbox training."
  - Assign supervisors to deliver and support each of the trainings staring in September 1st
    - Calendar to be sent by Safety Director.
  - Burner asks that we talk to all forklift drivers and let them know they need to signal him before they fuel their forklifts, so that he may stop torching before they start fueling their equipment.
  - NF2 Lead states that employees in his area are telling him the baler pit has a very bad odor and it seems to be getting worse.
  - Truck driver states that drivers have complained on several occasions about the poor condition of several roll-off containers.
    - They would like some system or protocol for inspecting boxes and have corrective actions to be prompt.
  - NF2 employees want to know if and when we may be moving the LP fuel tank?
  - Several complaints on the ACP surface conditions, specifically at the RR tracks.
    - These areas have gotten worse and are unsafe to travel across with a loaded forklift.
  - When will we start carrying out the approved items in the committee recommendations to management?
    - Specifically the pavement markings, traffic control training, and signs?
  - Safety Director designated NF1 supervisor to take minutes
    - Minutes not published
  - Accident investigation training postponed (9/2011)

September 2011

- 9-1 "Toolbox Training #1" ("Why working safely needs to be a priority")
  - 32 participants in the facility (NF1, NF2, Shredder, and Yard).
- 9-9 Weekly meeting with Safety Director
  - "Lessons-learned" from first toolbox training sessions.
  - Ideas for breakdown groups,
  - feedback to presenters,
  - availability of materials,
  - schedule times
- 9-15 "Toolbox Training #2" ("What to do if you see a hazard")
- 9-20 Weekly meeting with Safety Director at SMR,
  - Evaluations from last training,
  - Develop feedback process for presenters.
  - Schedule "Accident Investigation" training (English/Spanish)

- 9-26 Weekly meeting with Safety Director at UW
    - Agenda and the minutes for the HSC (9/29).
    - Notify Local 117 of the upcoming HSC at SMR
    - Coordination of the post-project activities for the next 2 months (air sampling, observations, and surveys/interviews).
    - Reviewed "tool box safety talks" experience so far and plans to continue e/2 weeks.
    - Traffic
        - On-site classes for traffic controllers by Evergreen Safety Council-approved but pending implementation
        - Asphalt resurfacing postponed to 2012
        - Traffic signs purchased but not installed
- 9-28 HSC meeting.
    - Reviewed "toolbox safety talk" feedback to presenters.
    - Introduced new shredder supervisor as a new member representing Area 6.
    - Reviewed "pending" safety issues (i.e. LP gas, Baler, Containers, ACP maintenance).
    - Next topic departmental meeting:
        - Issues regarding communication (updates) of process and safety issues to the workforce.
        - Operations manager commented that some of the fixes take time and people do not know the process, cost and effort needed to correct hazards.
        - Accident investigation training pending-possibly October.
        - Blood lead testing took place earlier this week.
- 9-29 "Toolbox Training #3" ("What to do when there is an injury")

October 2011

- 10-05 Meeting with Local 117 representative at UW.
    - Debrief new Local 117 representative assigned to SMR about the collaborative project between UW/117/SMR.
    - Meeting with Safety Director @ SMR
        - Coordination of post survey activities, initiation of observations and
        - Coordination with supervisors for the second survey.
- 10-5 Second round of worker's interviews and observations begins.
    - The goal is to complete the second survey with all the workers by the end of the month.
    - The goal is to complete 500 observations throughout the month of October and November.
- 10-6 "Toolbox Training #4" ("Language barriers and effective communication")
- 10-7 **Safety Director gives notice to SMR management of his departure.**
    - **Safety Director last day is 10/21.**
- 10-13 Safety meetings continue to take place in all areas using the "toolbox training" materials developed by the UW.
    - Next worker safety meeting to take place on 10/27.

- 10-14 Maintenance staff suffers injury to finger while attempting to test piston function inside crane's grapple.
    - Suffered laceration requiring medical attention in the emergency room.
- 10-20 **The** HSC meeting **normally scheduled on the last Thursday of the month was moved a week earlier in order to have Safety Director present** and leading the meeting for the last time.
    - The agenda :
        - 1) feedback from "safety toolbox" meetings from each of the presenters;
        - 2) Discussion about the next round of topics for the safety meetings;
        - 3) UW summary of status of data collection and project closure;
        - 4) Safety Director's replacement.
            - Operations manager self-designated chair of the HSC,
            - SMR looking for Safety Director
                - Operations manager and water treatment plant engineer to serve as interim safety contacts.
        - Issues raised by committee members:
            - 1) Levels of engagement vary, there is the consistent perception that not all areas are represented in the committee (e.g. Maintenance, NF1, Night shift);
            - 2) Need to develop specific safety topics for drivers;
            - 3) Credible corrective actions not being implemented and "it hurts" not only the committee's credibility, but also the overall perception on how SMR safety program effort and commitment.
            - 4) Good multi-lingual efforts, good content for the safety topics, but follow through has been poor and needs to improve before efforts will gain credibility among the workers.
            - 5) Management response: "many unseen efforts going on behind the scenes with regards to other pressing concerns-no concern goes ignored."
- 10-27 "Toolbox Training #5" ("How to protect yourself against hearing loss")
    - <u>Safety meetings take place in all areas</u>,
        - Materials delivered by the UW and presented by HSC members in their respective areas.
        - Met with Local 117 representative at SMR,
            - Walkthrough the facility while collecting observations data
- 10-31 Completed 56 interviews (second round of worker interviews-post assessment survey/questionnaire).
    - Post HSC member survey questionnaire distributed to all current members.

November 2011

- 11-8 Completed 525 worker observations.
  - Safety Toolbox materials delivered to Operations Manager to be distributed prior to safety talk to take place 11/10.
  - Collected 5 of the possible 8 HSC member survey/questionnaire.
- 11-10 "Toolbox Training #6" ("Working safely around moving vehicles")
  - Bi-weekly scheduled safety meetings (working safely around vehicles). (5th of 13 topics)
    - Assisted in the Shear-Yard presentation (12). NF1 (8).
    - Area 6 and shredder delivered by supervisor with the assistance of Spanish-speaking HSC's member.
- 11-14 In-person exit interviews with HSC members begin. Completed: NF1 supervisor.
- 11-21 Sent request to Operations Manager regarding OSHA logs for 2011, lead test results and injury rates for the last three quarters of 2011.
  - No response.
- 11-23 HSC interview with HSC member.
- Approached by acting safety contact,
  - Discussed about the responsibilities of the former safety director regarding:
    - "safety talks" material, scheduling safety meetings,
    - External resources for safety training.
- 11-24 **HSC Meeting-cancelled** –postponed to 12/1/11.
- 11-27 E-mail reminders sent to acting safety director
  - OSHA logs
  - Blood lead testing results
  - Response: we are looking; do not know where to find it.

December 2011

- 12-1 HSC meeting-cancelled to 12/8
- 12-1 "Toolbox Training #7" ("Ergonomics: preventing strains and sprains")
  - UW present at "yard" area safety meeting—UW staff conducted presentation (12 workers)
- 12-7 "Toolbox Training #6" ("Working safely around moving vehicles")
- 12-8 HSC meeting postponed to 12/15 -due to conflict with SMR customer lunch.
- 12-10 Second request to obtain the blood-lead testing results
  - Operations manager: need to find file
- 12-15 "Toolbox Training #8" ("Preventing slips, trips and falls")

- 12-15 **HSC meeting.**
    - Acting safety staff and operations manager leading the meeting.
    - Review "toolbox" safety talks—taking place consistently, although scheduled meetings moved due to holidays.
        - "Safety talks" with specific topic reinforces HSC work.
        - Two-sided handout very useful.
        - New topics need to be developed –need ideas from each department around the specific safety issues that need to be reinforced.
        - Delivery of the safety talks needs to be more "conversational" and less "lecturing."
        - Minimum 20 minutes for "safety meetings."
        - Need to rely more in translation it helps to engage workers.
    - Issues: stacking up boxes in NF2-too high, no fixes until materials are sold.
    - DOT: new form to inspect containers and to keep track of container damage and repair requests.
    - HSC elections: to take place in 2012. OM open discussion for suggestions for the recruiting of new HSC members.
    - Forklift safety: review training materials and update schedules for refresher courses.
        - Visual test plus observations during work.
        - There is no formal training for bobcat operators. Need to develop "own" written and visual testing methods.
    - OM: "experience rating" improvement from 17-19 "recordable" in 2010 to 8 in 2011.
    - Injury: back injury-medical visit and 2 days loss. Worker attempted to lift and move heavy object without assistance.

APPENDIX K: HOT and industrial hygiene measurement results by work area

Table K-1: Use of basic required PPE

	n Pre/Post	Pre # (%)	Pre-Post change
Hard hat	674/497	558 (83)	-4%
Safety glasses	654/497	513 (78)	1%
High visibility clothing	674/497	142 (21)	13%
Work boots	583/496	582 (99.8)	0.2%

Table K-2: Use of basic required PPE by work area

	Hard hat		Safety glasses		High visibility clothing		Work boots	
	Pre #(%)	Pre-Post change	Pre # (%)	Pre-Post change	Pre # (%)	Pre-Post change	Pre # (%)	Pre-Post change
Burn	26 (87)	3%	27 (96)	4%	0 (0)	10%	28 (100)	0%
Maintenance	28 (82)	-10%	22 (65)	26%	0 (0)	14%	34 (100)	0%
NF Warehouse	145 (95)	5%	129 (85)	5%	11 (7)	0%	139 (100)	0%
NF Baler	125 (92)	-2%	112 (84)	-11%	36 (27)	9%	128 (99)	1%
Shear	82 (69)	-8%	83 (74)	0%	24 (20)	15%	96 (100)	0%
Shredder Inlet	50 (58)	5%	61 (73)	7%	45 (52)	-2%	68 (100)	0%
Shredder Outlet	80 (86)	-2%	67 (76)	10%	4 (4)	34%	66 (100)	0%
Yard	22 (96)	4%	12 (52)	-44%	22 (96)	4%	23 (100)	0%

Table K-3: Hazard presence and hazard-specific PPE and control use

	Hazard presence			PPE/control use*		
	n Pre/Post	Pre # (%)	Pre-Post Change	n Pre/Post	Pre # (%)	Pre, Post Change
Falls	677/499	120 (18)	-7%	119/54	100 (84)	-3%
Noise	677/499	478 (71)	-4%	331/293	196 (59)	14%
Eye Hazards	677/500	198 (29)	1%	193/150	109 (56)	39%
Dust/fume	677/500	190 (28)	-4%	185/119	66 (36)	16%
Struck by objects	677/501	157 (23)	-14%	153/46	16 (10)	35%
Traffic/vehicles	677/501	239 (35)	-6%	230/145	16 (7)	3%
Hazardous energy	677/501	31 (5)	2%	9/33	0	76%
Machines	677/501	125 (19)	-1%	66/89	29 (44)	42%
Working surfaces	555/501	205 (37)	-18%	NA	NA	NA
Lacerations/abrasions	677/501	258 (38)	3%	251/203	222 (88)	6%
Repetitive motion	677/501	440 (65)	6%	NA	NA	NA
Lifting	677/501	153 (23)	0%	NA	NA	NA
Awkward postures	676/501	456 (68)	-1%	NA	NA	NA
Vibration	677/500	297 (44)	2%	82/181	21 (26)	-7%

**other than basic required PPE*

Table K-4: Fall hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	120 (18)	-7%	100 (84)	-3%
Burn	5 (17)	-5%	0	0%
Maintenance	1 (3)	-3%	0	0%
NF Warehouse	10 (7)	-5%	7 (70)	-70%
NF Baler	25 (18)	-0%	20 (80)	-8%
Shear	33 (28)	-17%	29 (88)	-13%
Shredder Inlet	6 (7)	-6%	6 (100)	0%
Shredder Outlet	40 (42)	-19%	38 (95)	1%
Yard	0	0%	NA	NA

Table K-5: Noise hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	478 (71)	-4%	196 (59)	14%
Burn	25 (83)	17%	9 (90)	10%
Maintenance	26 (77)	5%	9 (39)	44%
NF Warehouse	83 (55)	-11%	19 (29)	-29%
NF Baler	111 (82)	-12%	75 (86)	-3%
Shear	84 (71)	-11%	21 (42)	35%
Shredder Inlet	52 (60)	8%	31 (86)	-10%
Shredder Outlet	84 (88)	-2%	29 (63)	6%
Yard	13 (57)	-40%	3 (23)	-23%

Table K-6: Eye hazards by work area

	Hazard presence		PPE/control use*	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	198 (29)	1%	109 (56)	39%
Burn	25 (83)	17%	23 (92)	8%
Maintenance	7 (21)	29%	2 (33)	67%
NF Warehouse	22 (15)	-9%	12 (57)	43%
NF Baler	46 (34)	-3%	28 (61)	39%
Shear	37 (31)	-7%	19 (51)	45%
Shredder Inlet	12 (14)	3%	7 (58)	27%
Shredder Outlet	49 (51)	-5%	18 (39)	52%
Yard	0	0%	NA	NA

*other than safety glasses

Table K-7: Dust/fume hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	190 (28)	-4%	66 (36)	16%
Burn	25 (83)	17%	22 (88)	12%
Maintenance	4 (12)	29%	0	89%
NF Warehouse	15 (10)	-9%	13 (87)	-87%
NF Baler	36 (27)	-12%	13 (37)	36%
Shear	46 (39)	-15%	13 (29)	17%
Shredder Inlet	14 (16)	15%	0	85%
Shredder Outlet	50 (52)	-26%	5 (11)	5%
Yard	0	0%	NA	NA

Table K-8: Struck by hazards by work area

	Hazard presence		PPE/control use*	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	157 (23)	-14%	16 (10)	35%
Burn	10 (33)	-18%	0	0%
Maintenance	8 (24)	-24%	0	0%
NF Warehouse	16 (11)	-11%	2 (13)	NA
NF Baler	37 (27)	-13%	1 (3)	33%
Shear	28 (24)	-11%	10 (37)	63%
Shredder Inlet	30 (35)	-19%	0	8%
Shredder Outlet	28 (29)	-26%	3 (11)	23%
Yard	0	0%	NA	NA

*other than hard hat

Table K-9: Traffic/vehicle hazards by work area

	Hazard presence		PPE/control use*	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	239 (35)	-6%	16 (7)	3%
Burn	3 (10)	-5%	0	100%
Maintenance	5 (15)	-11%	0	0%
NF Warehouse	54 (36)	-14%	5 (9)	-9%
NF Baler	72 (53)	-20%	4 (6)	-6%
Shear	34 (29)	-1%	5 (15)	2%
Shredder Inlet	43 (49)	-1%	0	11%
Shredder Outlet	9 (9)	10%	1 (17)	0%
Yard	19 (83)	0%	1 (6)	4%

*other than high visibility vest/jacket

Table K-10: Machinery hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	125 (19)	-1%	29 (44)	42%
Burn	5 (17)	-17%	0	0%
Maintenance	6 (18)	-9%	1 (20)	-20%
NF Warehouse	8 (5)	-2%	6 (100)	0%
NF Baler	34 (25)	-1%	9 (45)	23%
Shear	20 (17)	-2%	4 (50)	50%
Shredder Inlet	1 (1)	-1%	0	0%
Shredder Outlet	51 (53)	-7%	9 (35)	59%
Yard	0	0%	NA	NA

Table K-11: Hazardous energy by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	31 (5)	2%	9/33	0%
Burn	0	0%	0	0%
Maintenance	20 (59)	-18%	0	44%
NF Warehouse	0	0%	0	0%
NF Baler	1 (0.7)	4%	0	100%
Shear	7 (6)	6.2%	0	92%
Shredder Inlet	1 (1)	-1%	0	0%
Shredder Outlet	2 (2)	3%	0	60%
Yard	0	0%	NA	NA

Table K-12: Working surface hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	205 (37)	-18%	NA	NA
Burn	24 (83)	7%	NA	NA
Maintenance	19 (59)	-55%	NA	NA
NF Warehouse	38 (29)	-20%	NA	NA
NF Baler	41 (35)	-11%	NA	NA
Shear	25 (29)	-18%	NA	NA
Shredder Inlet	32 (44)	-29%	NA	NA
Shredder Outlet	22 (32)	-6%	NA	NA
Yard	5 (22)	-22%	NA	NA

Table K-13: Laceration/abrasion hazards by work area

	Hazard presence		PPE/control use	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	258 (38)	3%	222 (88)	6%
Burn	20 (67)	33%	20 (100)	0%
Maintenance	18 (53)	-3%	11 (65)	26%
NF Warehouse	74 (49)	9%	57 (78)	2%
NF Baler	53 (39)	0%	48 (94)	3%
Shear	28 (24)	2%	27 (100)	-4%
Shredder Inlet	10 (12)	-5%	6 (67)	33%
Shredder Outlet	55 (57)	7%	53 (98)	2%
Yard	0	0%	NA	NA

Table K-14: Ergonomic risks by work area

	Repetition		Lifting		Awkward Postures		Vibration	
	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change	Pre # (%)	Pre-Post Change
Overall	440 (65)	6%	153 (23)	0%	456 (68)	-1%	297 (44)	2%
Burn	14 (48)	-13%	8 (27)	-22%	23 (78)	-13%	5 (17)	-17%
Maintenance	6 (18)	23%	4 (12)	-2.7%	15 (44)	20%	6 (18)	-14%
NF Warehouse	104 (68)	9%	50 (33)	11%	99 (65)	-4%	49 (32)	9%
NF Baler	96 (71)	-4%	36 (27)	-7%	104 (76)	-8%	55 (40)	-2%
Shear	85 (71)	5%	22 (18)	-4%	85 (72)	0%	63 (53)	5%
Shredder Inlet	48 (55)	12%	3 (3.4)	-2%	52 (60)	5%	48 (55)	8%
Shredder Outlet	84 (88)	5%	29 (30)	17%	75 (78)	-1%	69 (72)	-15%
Yard	3 (13)	-13%	1 (4)	-4%	3 (13)	-13%	2 (9)	-9%

Table K-15: Industrial hygiene measurements

	Pre-Intervention				Post-Intervention							
	n	GM	GSD	% over PEL	n	GM	GSD	% over PEL	Post PPE use (total)	Post PPE use (over PEL)	Change in mean	Change in % over PEL
Noise *(dBA)**	59	81.9	8.4	19%	53	80.8	9.8	17%	77%	89%	-1.1	-2%
Tot. particulates *(mg/m^3)*	63	0.38	3.6	2%	62	0.32	3.9	5%	77%	100%	-0.1	3%
Carbon monoxide *(ppm)*	17	2.1	1.9	0%								

*arithmetic mean reported

Table K-16: Noise by work area (PEL-TWA 90 dBA)

	Pre-Intervention			Post –Intervention						
	n	Mean (SD)	% over PEL	n	Mean (SD)	% over PEL	PPE use (total)	PPE use (over PEL)	Change in mean	Change in % over PEL
Burn	2	90.3 (1.2)	50%	1	91 (0)	100%	100%	100%	0.7	50%
Crane	3	68.0 (9.4)	0	3	66.9 (0.71)	0	100%	100%	-1.1	0%
Maintenance	4	87.3 (6.3)	50%	5	81.6 (8.8)	20%	80%	100%	-5.7	-30%
NF1	6	81.6 (4.2)	0	5	82.2 (3.1)	0	60%	100%	0.6	0%
NF2	13	83.4 (8.1)	23%	13	84.5 (8.3)	23%	92%	100%	1.1	0%
Night	4	81.4 (8.7)	25%	4	83.0 (4.7)	0	100%	100%	1.6	-25%
Shear	4	79.8 (13.4)	25%	2	78.0 (23.5)	50%	50%	100%	-1.8	25%
Shredder	12	82.3 (10.2)	25%	12	78.0 (11.2)	8%	67%	100%	-4.3	-17%
Yard	11	81.3 (3.8)	0	8	81.5 (10.9)	25%	63%	50%	0.2	25%
Total	59	81.9 (8.4)	19%	53	80.8 (9.8)	17%	77%	89%	-1.1	-2%

Table K-17: Total particulates by work area (PEL-TWA 10 mg/m3)

	Pre-Intervention				Post-Intervention							
	n	GM	GSD	% over PEL	n	GM	GSD	% over PEL	PPE use (total)	PPE use (over PEL)	Change in GM	Change in % over PEL
Burn	4	3.45	4.69	1 (25%)	4	7.85	2.23	2 (50%)	100%	100%	4.40	25%
Crane	4	0.09	1.70	0	3	0.06	1.87	0	33%		-0.03	0%
Maintenance	7	0.92	2.68	0	5	1.52	4.14	1 (17%)	60%	100%	0.60	17%
NF1	8	0.24	1.59	0	5	0.22	1.67	0	0%		-0.02	0%
NF2	7	0.26	1.57	0	8	0.19	2.12	0	63%		-0.07	0%
Night	4	0.52	3.73	0	4	0.33	2.31	0	25%		-0.19	0%
Shear	6	0.31	8.92	0	4	0.28	2.52	0	50%		-0.03	0%
Shredder	13	0.35	2.13	0	14	0.24	2.06	0	43%		-0.11	0%
Yard	10	0.29	2.96	0	9	0.18	2.19	0	56%		-0.11	0%
Total	63	0.38	3.57	1 (2%)	56	0.32	3.86	3 (5%)	77%	100%	-0.06	3%

Table K-19: Lead by work area (PEL 0.05 mg/m3)

	Pre-Intervention				Post-Intervention			
	n	GM	GSD	% over PEL	n	GM	GSD	% over PEL
Burn	4	0.0065	20.9	2 (50%)	4	0.0195	4.6	1 (25%)
Crane	4	0.0001	2.9	0%	3	0.0001	1.9	0%
Maintenance	7	0.0005	2.2	0%	6	0.0007	3.0	0%
NF1	8	0.0012	2.4	0%	6	0.0005	4.0	0%
NF2	7	0.0004	1.9	0%	8	0.0005	6.4	0%
Night	4	0.0007	4.6	0%	4	0.0007	3.2	0%
Shear	6	0.0006	11.6	1 (17%)	4	0.0002	8.4	0%
Shredder	13	0.0006	3.1	0%	15	0.0003	3.7	0%
Yard	10	0.0003	3.7	0%	12	0.0002	2.9	0%
Total	63	0.0006	4.9	3 (5%)	62	0.0004	5.8	1 (2%)