

**THE BENEFIT OF AN EFFECTIVE SAFETY
PROGRAM IN THE AGRIBUSINESS
INDUSTRY**

by

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ABSTRACT

This thesis is the tool for moving companies to the next level in safety. I believe through this plan we can keep people safe in the agribusiness industry. This is very important, so that we can keep cost down and be able to stay in business; or avoid costly litigation / arbitration hearings because someone was injured on the job.

When I was hired my job was to develop procedures that meet Occupational Safety and Health Administration (OSHA) standards, reduced injuries, and would be a continuous improvement type of program.

The thesis will be introductory information in regards to safety followed by a sample safety manual that I have created by working with different safety professional in the safety industry.

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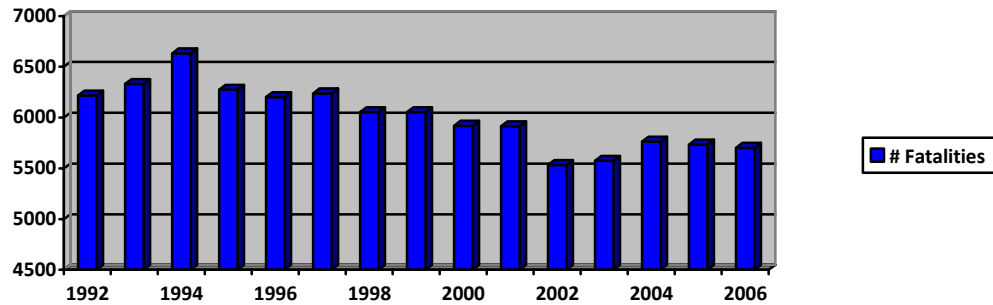
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CHAPTER I: INTRODUCTION

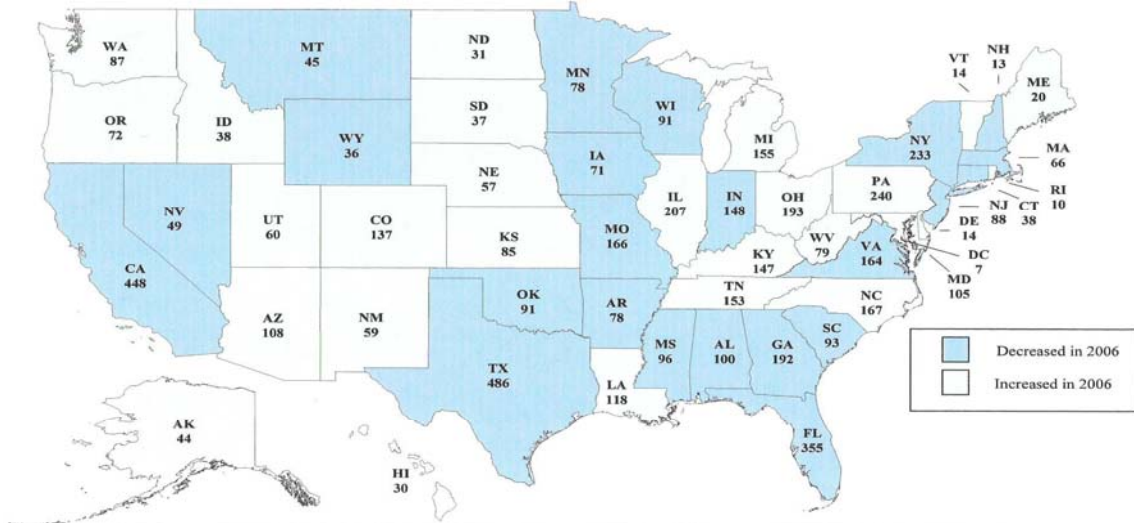
Every year, workers are killed on-the-job due to a safety hazard or not following policy. In 2006, 5,700 workers died in workplace accidents, which is a decrease of 500 in the number of workers killed in 1992. Figure 1.1 shows the number of fatal work injuries, 1992 to 2006. Figure 1.2 is a breakdown by state of the number of fatalities for 2006 and which states had an increase in fatalities.

Figure 1.1 Number of fatal work injuries, 1992-2006



U.S. Bureau of Labor Statistics, 2006

Figure 1.2 Number of fatal work injuries, by State, 2006



Twenty-three States and the District of Columbia had fewer fatal workplace injuries in 2006 compared to 2005. The remaining 27 States had a higher number of fatal injuries in 2006 than in 2005.

SOURCE: U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2007

Last year, 2006, I was given the opportunity to become the Safety Manager of a growing bakery in Abilene, Texas, my hometown. Previously I had worked in the agribusiness industry in several roles. I originally worked for Cargill after graduating from

Angelo State University where I received my B.S. in Animal Science. My first role with Cargill was with Excel Meats as a Procurement Agent where I advanced to Assistant Procurement Manager. Then I switched gears to Cargill Animal Nutrition (CAN) as a Plant Manager Associate. While there I discovered my greater purpose to be in the area of industrial safety. When I was at CAN I was constantly graded as a Safety Champion. What is a Safety Champion? Table 1.1 shows the guidelines for obtaining the classification of Safety Champion.

Table 1.1 Guidelines of a Safety Champion

Focus on safety – A 24/7 thought process	Communicate concern – near misses / supervisor	Provide positive feedback – Creates an open line of communication between management and hourly employees
Continually educate – attend safety trainings	Anticipate unforeseen dangers – mind on task	Document and address unsafe conditions – near miss reporting
Recognize others – positive reinforcement	Promote problem-solving – looks for answers to the problem	Ask for suggestions – communicate by asking for help
Make suggestions – safety suggestion process	Practice what they preach – lives safety and abides by safety policies	

My faith took me back to my hometown where I was hired by Fehr Foods, Inc as the Safety Manager. I was put in this role because of the safety knowledge I gained with Cargill. As this is my first full-time safety role I developed a great understanding for Safety in the Agribusiness Industry.

1.1 Purpose of the Thesis

The purpose of this thesis is to develop an effective written and employee driven safety program. The main purpose is to reduce the extent and severity of work related

injuries, improve employee morale and productivity, and reduce worker's compensation costs. The other reason is to set a standard on programs that meet OSHA requirements.

1.2 Occupational Safety and Health Administration (OSHA)

First, what is OSHA? OSHA is the main federal agency charged with the enforcement of safety and health legislation. It is under the Department of Labor. The agency was created in 1970 by President Richard Nixon, mainly due to the safety issues with the steel industry. Congress created the Occupational Safety and Health (OSH) Act of 1970 to form this agency.

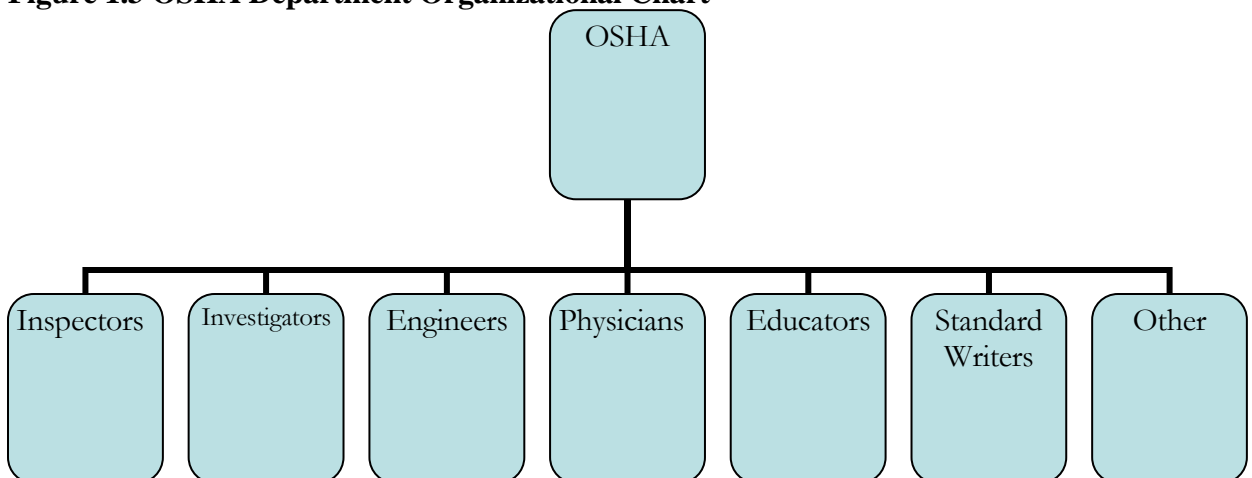
1.3 OSHA's Mission

OSHA's mission is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

OSHA has over 200 offices throughout the country, along with state OSHA agencies. There are 26 states that have state regulations along with federal regulations to set standards for employers. The other 24 states use the current Federal OSHA program as guidance for safety. Most state OSHA programs focus on stepping up or increasing awareness to the federal OSHA programs.

The organizational chart for OSHA is broken down into 7 departments depending on their specialty (Figure 1.3).

Figure 1.3 OSHA Department Organizational Chart



1.3.1. OSHA's Jurisdiction

Who is under OSHA's jurisdiction? Most of the employed men and women in the nation are subject to OSHA's jurisdiction with the exception of miners, transportation workers, many public employees, and the self employed. Many other individuals such as occupational safety and health professionals, academic community leaders, lawyers and journalists use OSHA services.

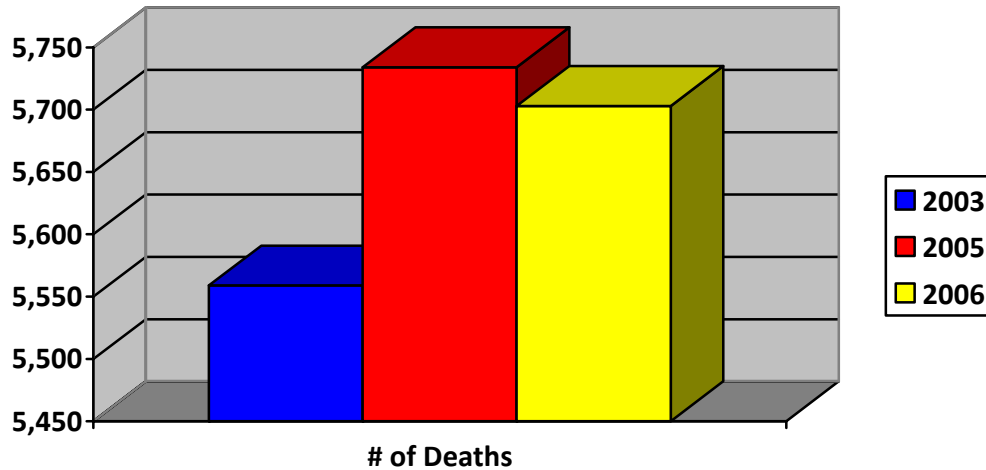
OSHA is determined to stimulate company management to promote active involvement and commitment from employees' participation in comprehensive workplace safety and health programs. Training of employees is one of OSHA's primary concerns.

OSHA provides many services to employers, including consultation visits and inspections and access to historical safety data through the Bureau of Labor Statistics (BLS) to help maintain continuous improvement. OSHCON (Occupational Safety and Health Consultation Program) visits are used to bring the location into compliance with OSHA regulations whether federal or state.

1.4 OSHA Statistics and Trends

OSHA and BLS are a great source of data to find information about trends in workplace injuries. In 2006, there were 5,703 employee deaths, less than 5,734 in 2005 (Figure 1.4). This trend has been decreasing over the past 15 years as shown in Figure 1.1. Majority of the decrease has been accounted for by addition of safety managers, training, and by enforcing safety policies and procedures.

Figure 1.4 # of Deaths in the United States



www.osha.gov

OSHA made 38,579 regulatory inspections in 2006. These inspections were made for a variety of reasons across different industries. Table 1.2 shows the breakdown over the past 5 years and the reason for the inspection.

Table 1.2 Inspection Results

OSHA Inspection Statistics	FY2002	FY2003	FY2004	FY2005	FY2006	% Change 2002-2006
Total Inspections	37,614	39,817	39,167	38,714	38,579	+2.6%
Total Programmed Inspections	20,539	22,436	21,576	21,404	21,506	+4.7%
Total Unprogrammed Inspections	17,075	17,381	17,590	17,310	17,073	0.0%
Fatality Investigations	1,134	1,021	1,060	1,114	1,081	-4.7%
Complaints	7,896	7,969	8,062	7,716	7,376	-6.6%
Referrals	4,447	4,472	4,585	4,787	5,019	+12.9%
Other	3,598	3,880	3,829	4,807	3,555	-1.2%

www.osha.gov

Programmed inspections are schedule worksite inspections based upon objective or neutral criteria. These inspections do not include imminent danger, fatality/catastrophe, and formal complaints. OSHA every year will select a certain industry to do scheduled inspections. In the state of Texas the target industry has been the oil and gas industry.

Unprogrammed inspections are unscheduled worksite inspections due to a fatality investigation and employee complaint (imminent danger and formal). These complaints are due to a safety hazard or an employee was killed on the job which requires a company to notify OSHA within 8 hours in the event of a fatality.

From the inspections in Table 1.3, OSHA identified the following violations (Table 1.3).

Table 1.3 Types of Violations

Violations	Percent	Type	Current Penalties
479	.5	Willful	\$16,009,045
61,337	73.1	Serious	\$54,139,361
2,551	3.0	Repeat	\$9,688,804
288	0.3	Failure to Abate	\$1,044,925
64,655	Total		\$80,882,135

www.osha.gov

Willful is the most serious of the types of violations. Willful means the employer knew of the hazard and did nothing to correct the hazard. Serious is a hazard that could cause severe injury. Repeat is obvious as it is a repeat violation, but does not have the weight of injury that willful and serious carry. Failure to abate is when a company fails to provide a correction for the violation for which the company was cited by OSHA.

1.5 Management Involvement in Safety

Management's commitment in safety should begin in every organization from the CEO / Owner / President all the way down to the hourly employees. If safety does not start from the top, then no one will take ownership in making sure safety policies and procedures are followed and employees are held accountable for safety violations. Upper

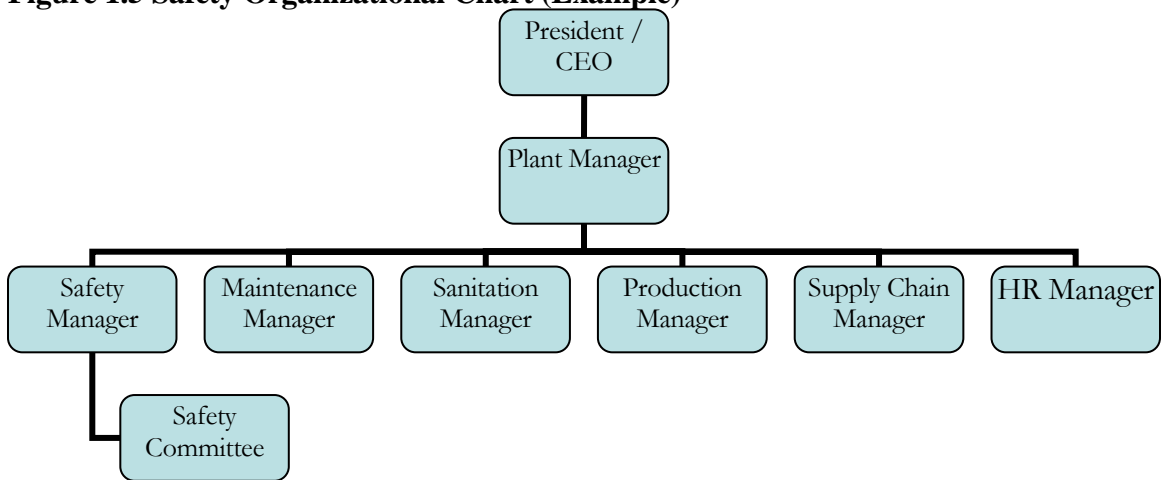
management can be held accountable for their actions by government agencies, such as the Department of Labor, and possibly the Department of Justice if a case goes to trial and finds that the employer committed a willful violation that in turn caused the employee injury.

Having a Safety Manager is a great way to establish collaboration between a company's departments to ensure that safety rules are being followed and if not followed, actions are being taken. Obviously building the management commitment in a proactive way versus a reactive way will promote acceptance and observance among employees.

1.6 Safety Organizational Chart

There are several ways to establish a safety program within any company. Safety begins with the President / CEO and this should not change with any company. The Safety Manager should be at the same level as other managers so that he/she maintains a similar level of authority and respect. The following is an example of a manufacturing company's safety organizational chart. (Figure 1.5)

Figure 1.5 Safety Organizational Chart (Example)



1.7 Safety Committee / Safety Meetings

A safety committee must be established to help review and create safety policy and procedure. The more sets of eyes that are looking at any facility the better off a company is in determining what needs to be fixed and what can be done to continually make the facility a safe working environment.

To establish the committee it is best to have a good mix of hourly and management employees. The hourly employees should volunteer or be selected by their peers. It is important to rotate employees out regularly to get a fresh set of eyes, so that complacency is not a factor in solving problems dealing with safety. It is best if the Safety Manager or individual responsible for safety is the chairperson of the safety committee. The chairperson is responsible for keeping order in the meetings to ensure full effectiveness and productivity. Meetings should be scheduled on a weekly basis in order to solve issues quickly.

During these meetings, the committee should review safety inspection reports to help identify and correct hazards. They should also review past accident investigations to determine if the cause or causes of the unsafe situation have been identified and corrected. The committee also evaluates the safety programs and determines if there are any recommendations for improvement. In addition, attendance should be noted and minutes taken so that the subjects discussed during these meeting is recorded and kept on file for at least a year (OSHA suggests that records be kept for 5 years).

1.8 Safety Plan

It is also important to have a plan for where the safety program is headed within a company. Great business ideas have plans, and as such a safety plan should be created. The safety plan should be specific to the industry of the enterprise so that it aligns with the focus of that business.

1.8.1 Safety Plan Example

The following is an example of a safety plan created for the industry I am associated with:

Fehr Foods, Inc Safety Plan 2007

Safety Statement:

The team members of Fehr Foods are committed to creating a ZERO IS POSSIBLE work environment through training, team member empowerment, information sharing and continuous safety improvements. Fehr Foods recognizes:

- All incidents and accidents are preventable.
- Safety is everyone's responsibility.
- Nothing we do is so important that we can disregard safety.
- To be excellent in all we do, we must first be excellent in safety.

Safety Goals:

1. Ensure that safety is implemented with a full commitment to Fehr Foods' principle line of management responsibility; namely that each manager, working with his or her employees, is responsible for the safety of workers and coworkers.
2. Ensure the involvement of everyone in safety; instill individual responsibility and accountability, firmly embed safety values in the organizational culture, and build further on safety awareness.
3. To keep measureable IFE (Injury Frequency Rate), DFR (Disabling Frequency Rate), SR (Severity Rate) and SI (Safety Index) below the national standard for SIC 2052 – Cookie and Cracker Industry.
4. To become a SHARP recognized facility by meeting the qualifications of the program.
5. Have ZERO lost time accidents.
6. Ensure compliance with applicable Federal and State regulations as well as mandatory company safety programs.

7. Ensure weekly safety committee meetings are held and that safety is emphasized in every team meeting.
8. Seek continuous improvement in our safety programs and ensure our approach remains fresh, innovative, and successful.

Safety Committee Objectives:

1. Both salaried and hourly committee members must ensure the safety committee is an active, effective, and results-oriented team. Promote safety leadership, assume responsibilities for safety, and devote time, effort and financial resources, as necessary, in the safety area.
2. Maintain a proactive safety committee, which meets weekly and as necessary, in 2007.
3. Maintain and establish programs and conditions consistent with OSHA SHARP requirements.
4. Safety committee to assure safety compliance for all team members.
5. Self – improvement.

2007 Special Incentives:

Injury Management Program:

In September 2006 Fehr Foods teamed with Abilene Sports Medicine (ASMO), Dr. Munton, and West Texas Rehab to have a medical provider that is available 24 hours a day, 7 days a week. The team's responsibility is to handle any needs regarding to an accident and help reduce accidents by analyzing each case or injury and making corrective action suggestions.

Hazardous Energy Control Procedures:

Continuous strengthening of this program increased the effectiveness of the Lockout / Tagout program by including machine specific lockout / tagout procedures. These procedures are used in the training of new employees so they have a full understanding of where to lockout the equipment in the event it needs to be serviced or cleaned.

Confined Space Entry (CSE) Program:

Fehr Foods implemented a Confined Space Entry program. Within this program the Safety Committee identified all permit and non permit required confined spaces. Confined Space Team Leader training has been conducted by an outside safety consultant. Additionally, Fehr Foods purchased a 4 gas operating monitor in the event a confined space entry is necessary. The guidelines of the program mandate that all persons involved in a confined space entry team are properly trained prior to the confined space permit being issued.

First Responder Training:

As part of OSHA Reg. 1910.151, 1910.151 Appendix A & 1910.1030, Fehr Foods received Medic First Aid / CPR training presented by Canada & Associates Safety Training. Individuals were selected across all 3 shifts to ensure a properly trained first responder is present at the facility 24 hours a day in the event of an injury.

Safety Training Grant:

To help strengthen the safety program and training initiative at an accelerated pace, Fehr Foods applied for and received a \$7,500.00 grant from the Texas Manufacturing Assistance Center at Texas Tech University. The organization utilized the grant to employ the services of Canada & Associates. Darrel Canada, the President of Canada & Associates has served as a mentor / advisor to the Safety Manager. Darrel has made a significant impact to the safety program by collaborating with Fehr Foods, Inc. on safety related items as well as conducting safety training in our facility.

Outside Safety Audit / Inspections:

This calendar year Fehr Foods have had two outside safety audit / inspections conducted, one noise dosimetry audit as well as an ergonomic assessment conducted at the facility.

The findings are as follows:

1. February 14 – 15, AIB Safety Audit conducted by Jon R. Anderson with AIB International, Manhattan, Kansas
2. Mar 8, OSHCON Health and Safety Inspection conducted by John E. Larson with Texas Department of Insurance, Abilene, Texas
3. May 8, OSHCON Industrial Hygiene Noise Dosimetry Audit conducted by John E. Larson with Texas Department of Insurance, Abilene, Texas
4. March 22 and April 3, Ergonomic Assessment conducted by Scott Werner and Justin Thiberville with West Texas Rehabilitation Center, Abilene, Texas

AIB will conduct another safety audit on February 20, 2008.

Safety and Health Achievement Recognition Program (SHARP):

Fehr Foods will be applying for SHARP certification at the end of calendar year 2007.

Certification of this program requires an employer to:

1. Work with OSHCON for at least one year.
2. Receive a comprehensive OSHCON consultant visit (Completed March 8, 2007)
3. Days Away Restricted and Transferred (DART) and a Total Case Rate (TCR) below the national averages for the cookie and cracker industry.

1.9 Safety Measurements

There are several measurements for safety related items, but two main measurements in which OSHA will track a company's safety performance. In addition to the two OSHA measurements there are four additional measurements, two of which are

similar to those of OSHA which will help a company gauge how well their safety program is performing and not just how many accidents have occurred. With these measurements lower scores are better, like playing golf.

The first measurement is Days Away Restricted and Transferred (DART) which computes the number of accidents that were a lost-time accident, had time restricted or transferred to another position because of the injury. The calculation is figured by taking the total number of DART injuries multiplying it by total number of hours and then multiplying that by 200,000 which produces the DART rate. The 200,000 is a factor that has the equivalent of 100 full-time workers working during 40-hours per week, 50 weeks per year.

The next measurement is Total Recordable Case (TCR) which is the total number of recordable injuries. OSHA has a publication defining what is considered a recordable injury. Currently the publication is modified each year to include new standards due to continuous improvement. TCR is figured by taking the total number of recordable accidents and multiplying it by the total number of hours, then by multiplying the product by the factor of 200,000.

The measurements that Fehr Foods employs to determine safety proficiency include Injury Frequency Rate (IFR), Disabling Frequency Rate (DFR), Severity Rate (SR) and Safety Index (SI). The IFR, DFR and SR combine to yield the SI. These evaluations are preferred because they assess how well a safety program is performing based on a factor of how each measurement weights on the SI. IFR is equivalent to the TCR and is calculated using the same methodology. DFR is similar to DART, however DFR only evaluates the number of lost-time accidents. DFR is taking the total number of lost time accidents multiplying it by the total number of hours worked, then by multiplying by the factor of 200,000. SR is a measurement of the severity of the lost-time accident. SR is the total number of days of lost-time multiplied by total number of hours worked, then by multiplying by the factor of 200,000 to get the SR.

The SI is calculated by summing the weighted measurements of the IFR, SR, and DFR. The SI score is the true measurement of how well the company's safety program is doing. The factors are weighted by the outcome of the injury and the effects that the factors have on the SI. DFR are you more serious injuries which have the heaviest weight on the SI. SR also plays a major part to the SI score since it calculates the number of lost time days, which come from the lost time injury. IFR is your recordable injuries that are minor in nature and have the least amount of effect on the SI. The formula for this calculation is as follows: (figure 1.6)

Figure 1.6 Formula for Calculating Safety Index (SI)

Safety Index (SI) = Injury Frequency Rate (IFR)/7.5

+ Disabling Frequency Rate (DFR)

+ Severity Rate (SR)/5

CHAPTER II: PURPOSE OF SAFETY

2.1 Introduction

Why are safety programs important? What is the importance of a safety professional's job in the agribusiness industry? The purpose behind safety is making sure that every employee goes home every day the same way they came to work -- uninjured! What is safety? Safety is frequently defined as "freedom from hazards." However, it is practically impossible to eliminate all hazards. Safety is therefore a matter of relative protection from exposure to hazards: the antonym of danger. People are company assets, so having a strong safety program will help protect the enterprises' assets, along with the well being of the companies in the agribusiness industry. The following example refers to a plant improving a process in which cost was considered to be more important than safety.

A Manufacturing Safety Example

A manufacturing facility is planning a major expansion in six months during the slow production season for the cyclical product, at which time it will be replacing an aging production line with completely new equipment. The annual safety audit of the plant recommends that emergency shutdown interlocks be installed on the aging line because this would have prevented some serious injuries at other plants in the industry. However, due to the age and complexity of the equipment and the design and layout of the equipment and the plant, installing the new interlocks would require shutting down the line for at least a week and the line is being run around the clock to meet demand during this busy season.

The plant manager reviews the results of the safety audit with his manufacturing, maintenance, and safety managers. He explains the problems that would arise if he shuts down the line and misses production targets. The safety manager agrees with the audit recommendation but reports that this plant has never had the type of incident that the interlock would prevent. The manufacturing manager and maintenance manager agree that meeting the production target will be impossible if the line has to be shut down, and since the line will be shut down in six months anyways, recommend that the shutdown be deferred. Three weeks later a serious injury occurs that would have been avoided by an

emergency shutdown. Why didn't these managers take action, after being explicitly told that other plants had experienced serious incidents?

2.2 Pyramid Theory

In 1931, H.W. Heinrich reported on a study of accidents that he classified according to severity. Heinrich's report showed that for each serious injury incident, about 29 minor injuries and 300 near miss or property damage incidents should be expected. His conclusions are often depicted with a pyramid or triangle indicating a single serious incident at the peak and a broad base of non-injury incidents.

In 1969, the Insurance Company of North America conducted a subsequent and more thoroughly documented study using more than 1.7 million incidents reported by nearly 300 companies in 21 industrial groups. That study revealed a similar pattern with slightly different ratios. For each serious injury, there were 10 minor injuries, 30 property damage incidents and 600 near miss incidents that resulted in no injury or property damage. (Figure 2.1)

Figure 2.1 Accident Pyramid



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These relationships may be accurate for large populations and are often used to stress the importance of paying attention to details. The concept is that if the small incidents (near misses and property damage incidents) continue to occur unabated, that eventually, an incident resulting in a serious injury will occur. To a certain degree the assumption may be accurate. The only difference between a near miss and a serious injury is timing – a matter of seconds or inches. It is certainly important for each worker to master the fundamentals of occupational safety to prevent injury and property damage, but there is a risk in limiting the focus to the causes of minor injury and non-injury incidents.

When applying the ratios of the Heinrich and North American models, it has been suggested that safety efforts be focused on preventing less serious events as an indirect means to prevent a single serious event. Consideration should be given to the causal relationships. Is it always true that serious injuries are caused by the same factors that cause less serious incidents? Do the conditions and practices that apply to slip, stumble or back strain injuries differ from those that apply to falls from elevation, getting caught in machinery, being struck by falling material or electrocution? The allocation of resources must also be considered. How much effort will it take to reduce the base of the pyramid enough to affect the peak?

While the pyramid theory is interesting and important to understand, perhaps a more direct approach to accident prevention should be used. Through a risk assessment, safety managers can identify specific work processes and perform a simple evaluation of the associated risk (a function of the likelihood of a potential incident and level of severity of that incident). The conditions and practices associated with the most risk (most likely to result in severe injury) are addressed first. These represent the peak of the pyramid. Those with a remote possibility of a minor injury or property damage (the base) are assigned lower priority and may be addressed individually when the higher priority risks are controlled.

Clearly, some of the same conditions and practices that contribute to minor incidents also contribute to serious incidents. Sometimes the difference is only a matter of inches or seconds. Consider the relationship as two-way. The pyramid theorists advise attacking these root causes to affect the peak indirectly. Taking the direct approach affects the peaks directly and the base indirectly by controlling the factors that simultaneously affects the potentially serious incidents and the minor incidents. A thorough analysis of most serious workplace risks generally reveals at least one basic, fundamental control that applies across the board. Only by addressing the most serious risks directly can there be confidence in preventing the most serious injuries.

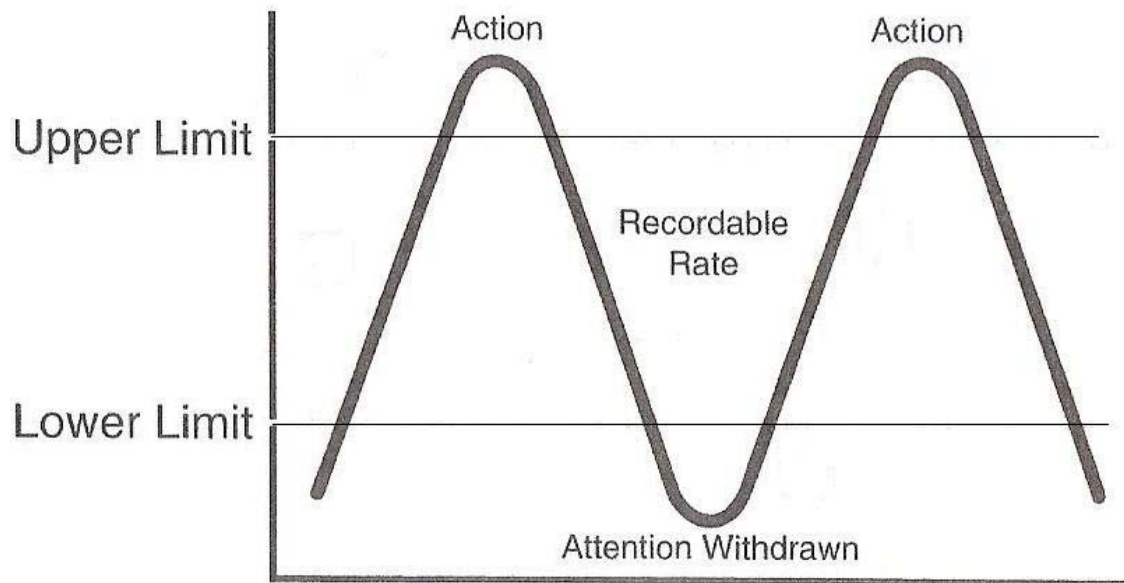
2.3 Accident Cycle and Continuous Improvement

The driving mechanism for continuous improvement in safety is the proper use of modern scientific method coupled with employee involvement (Krause, 2005). Management is faced with the challenge of maintaining the focus required for continuous improvement. Change is generally met with resistance. Folger & Skarlicki (1999) claim that "organizational change can generate skepticism and resistance in employees, making it sometimes difficult or impossible to implement organizational improvements." There are four basic structures that support the improvement effort; measurement, feedback, continuous training, cultural values and systems. Safety has always been a field handicapped by a lack of adequate structure.

It is typical in the agribusiness industry that the focus is on production and making profits from efficient production. However, safety is a performance area for which it is much more difficult to maintain a focus on continuous improvement. Safety systems are lacking in most companies (Darrel Canada, phone conversation, 2007).

Managers typically have attributed variations in safety performance to variations in "awareness." Engineering, facilities, and maintenance over time have received attention and have provided some safety improvement. Accidents primarily originate from the human elements or behaviors. When there is a high awareness for safety, accidents are generally lower. Both new and seasoned employees are at-risk for injuries because both are low in responsiveness to safety challenges -- the novice through lack of job experience and the old through complacency. The workers that are least at-risk understand critical task behaviors, and have not become set in their ways (James Rudd, phone conversation, 2006). Thomas Krause (1995) suggests management should learn how to maximize this level of readiness for the workforce as a whole. The lack of effective answers has led to a variable performance known as the accident cycle. (Figure 2.2)

Figure 2.2 Accident Cycle



Thomas Krause (1995)

In figure 2.2, the accident cycle is unfortunately where most companies spend their time in safety versus preventative measures. When an accident occurs the curve or action due to the accident goes up creating more focus on the issue versus a plateau of continuous improvement. When there are no accidents focus is at low priority or attention is withdrawn increasing the risk that another accident may occur. The idea is to maintain a plateau of focus on safety, so a wave affect is not created as shown in the accident cycle. This can be accomplished by continuous improvement and new innovation to any safety program. Continuous improvement is the scientific method is where basic knowledge is drawn by behavioral science and statistics. To obtain continuous improvement combine the behavioral / statistics along with employee involvement to achieve continuous improvement. (Figure 2.3)

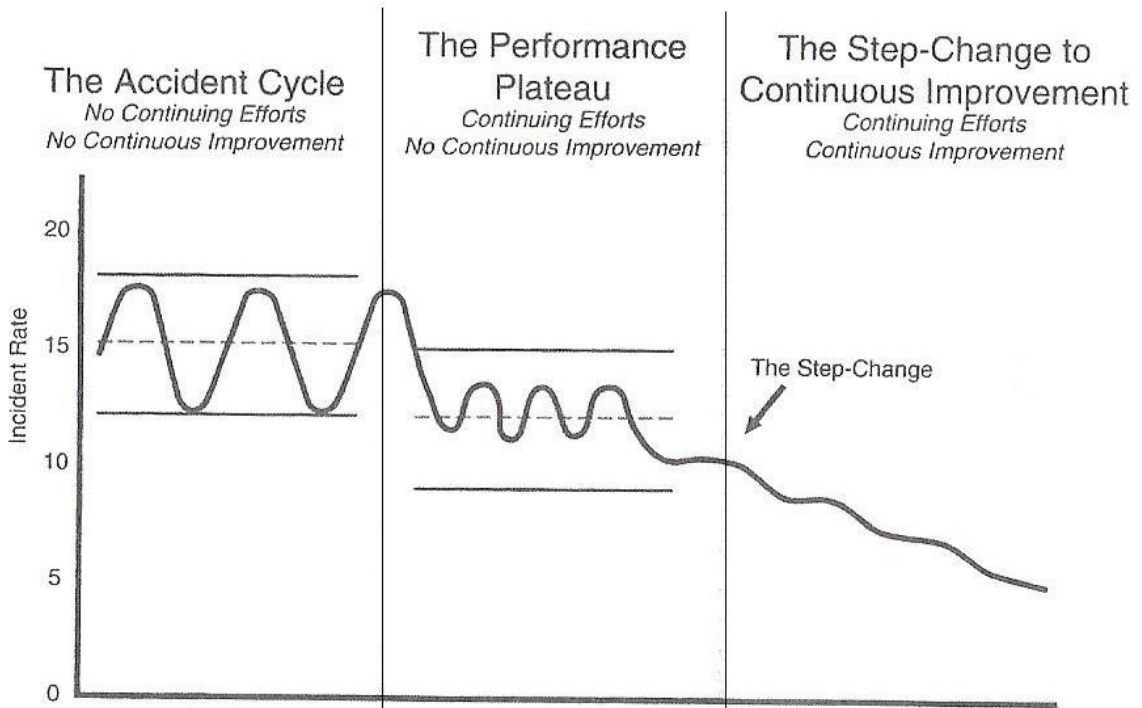
Figure 2.3 Continuous Improvement Equation
Employee Involvement + Scientific Method = Continuous Improvement

Safety is becoming more of a science and by that he means it is no longer an engineering solution that keeps a company wrapped up in the accident cycle.

2.3.1 Three Stage Cycle

There are three stages companies usually go through with safety performance: The accident cycle, the performance plateau, and the step-change to continuous improvement (Thomas Krause, 1995). (Figure 2.4)

Figure 2.4 Three Stage Cycle



Thomas Krause (1995)

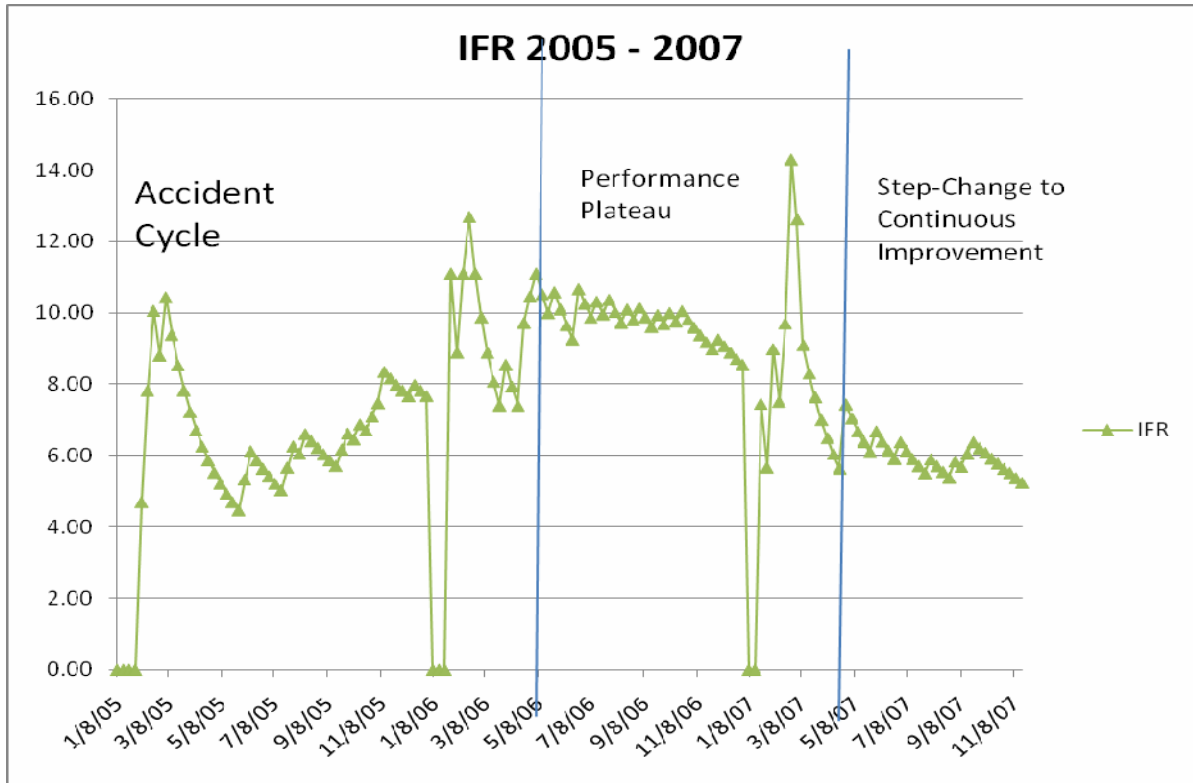
In the accident cycle, rising incident rates trigger, increased attention to safety after which, performance improves whereupon, resources move elsewhere and there follows yet another period of rising incident rates or injury frequency rates and safety index. In the accident cycle companies tend to become reactive versus proactive. The idea is to stay in the proactive or preventative phase rather than remaining in a constant accident cycle.

The performance plateau is the next phase in the three-step performance. Once we get past the accident cycle, which is a great achievement, the performance plateau stage represents constancy of both purpose and practice in relation to safety. In this stage safety plateaus off or flattens out if movement into the continuous improvement stage does not occur.

The step-change to continuous improvement stage transpires upon the development of methods to measure, track, and improve performance with site-specific critical safety related behaviors.

The three stage cycle can be applied to any industry. With the company that most of these programs were created for the three stage cycle can be well applied as the company has spent time in all three cycles. When a company has more than 1 accident a month they spend a great deal of time in the accident cycle. Once the focus on safety is an everyday concern in regards to safety the company moves in to the performance plateau. Problem with the performance plateau, a company becomes complacent in thinking they have a great program. The company fell into the plateau stage and failed to understand that it must continuously improve in order to continue to drop the incident rate to achieve or become part of the step-change to continuous improvement stage. Currently the company has been able to focus its attention in the area of accident prevention through behavioral based safety and continuous improvement programs such as plant inspections and audits. Figure 2.5 is an example of the three stages using the Injury Frequency Rate measurement for the company.

Figure 2.5 IFR results using three stage cycle



Company Confidential

2.4 Behavioral Based Safety

Safety, at one time, was centered on the engineering concepts to improve workplace protection. Through the evolution of safety, individual behavior has emerged as a primary focus. A company can do everything within its power to guarantee a plant or facility is secure by using optimal engineering practices, however the human element remains an important factor. Prevention of all accidents can be accomplished through making equipment safer, properly training employees on equipment and modifying behavioral safety skills.

Coaching employees to abandon bad habits through positive reinforcement is the key to developing an excellent safety program. Although positive reinforcement is the preferred method of behavioral modification, sometimes negative reinforcement will be necessary in order to handle a safety related issue. There are a number of behaviorally

based products that are marketed to assist with OSHA training. Examples of such programs include SAFESTART, SAFETRACK, STOP, BTS, and various other video based programs. Many companies market behavioral based products as an OSHA requirement or an OSHA initiative; however, OSHA does not require any specific product. Some of the products can be useful in educating employees about safety, but they are not required by OSHA. Also, each of the programs offer excellent concepts, but may not be cost effective for smaller companies.

All of the behavioral based safety programs discuss two main principles; Critical Errors and Critical Behaviors. Critical errors and critical behaviors have a dependent relationship; therefore, when a critical behavior is present the outcome is a critical error. There are four critical behaviors associated with failures in safety observation including: (1) eyes not on task, (2) mind not on task, (3) line-of-fire, and (4) balance, traction, grip. The critical error phase suggests four underlying causes: (1) rushing, (2) fatigue, (3) frustration, and (4) complacency. When the critical behaviors cause a critical error the pyramid theory becomes evident in practice, in which a near miss, property damage, minor or serious injury transpires. A company regresses back into the accident cycle, and the reactive mode of safety comes to the front.

What exactly are rushing, fatigue, frustration, and complacency? These are extremely simple principals to understand. Rushing is the state of executing processes faster than that which is typically observed. If the normal pace is at an accelerated rate, then the tempo is not considered rushing. Fatigue, is being tired generally due to a lack of sleep or working too many hours but can also be attributed the temperature of the room. When employees work more than eight hours a day it can have a negative effect on them depending on the environment in which they work. What about frustration? When a person has reached a state of mind in which they are upset at someone or something that just happened or happened earlier, it is considered frustration. Frustration will make a person lose focus on the task at hand. Complacency is the most difficult of the four critical errors to determine. Complacency occurs when an individual becomes

confident in the processes in which he is engaged and as a result, loses respect for the dangers surrounding him.

A critical error must occur to have a critical behavior to take place. “Eyes not on task,” “mind not on task,” “line-of-fire,” and “balance, traction, and grip” are all a product of the critical errors. “Eyes and mind not on task” are both very similar in that a loss of focus occurs due to a wandering eye or mind. “Line-of-fire” is when a person puts himself path of a potential accident. “Balance, traction, and grip” is when a loss of footing or hand hold results in a fall.

Identification of the existence of these critical behaviors can aid in preventing accidents. Figure 2.6 is a form that I created by linking together the behavioral based programs and provides an example to follow when observing employees.

Figure 2.6 Observation Checklist

Safe Observation Checklist

Observer: _____ Date: _____ Time: _____

Job Task: _____ # of People Observed: _____

Instructions: For each safety practice you observe, record a "x" in the appropriate column to indicate whether (a) 100% of worker(s) you observed are safe on the specific behavior, or (b) a practice that causes you to be concerned about the potential for injury. Describe each concern in the comments section. Record "job specific safe practices" in the appropriate space.

Personal Protective Equipment

- Hard hat, eye and face protection
- Hearing protection
- Protective clothing / gloves
- Fall protection
- Appropriate working attire

Safe	Concern	Comments (Do not use names)

Body Position / Body Mechanics

- Clear of "line of fire"
- Clear of pinch points, sharp edges & hot surfaces
- Body mechanics when lifting, reaching, pulling, pushing, carrying

Eyes on task
 Ascending/descending/stairs, steps or fixed ladders (3 points of contact)
 Appropriate pace (not rushing)
 Action to protect others
 Adequate personnel for job

Tools and Equipment

Proper selection and use of tools & equipment
 Condition of tool & equipment
 Trained personnel using tools or operating equipment
 Location, storage, position, or transport of tools & equipment

Work Conditions and Housekeeping

Work areas clean; free of slip or trip hazards
 Lockout / Tagout and equipment de-energized
 Proper permits
 Signs, barricades, guards, handrails, safety equipment
 Fire and emergency equipment
 Weather conditions; adequate lighting

Vehicles and Mobile Equipment

Condition and maintenance
 All vehicle safety (motion & parking); wearing seatbelts
 Forklift use
 Use of safety equipment

Job Specific Safety Procedures

CHAPTER III: PURPOSE OF THE SAFETY MANUAL

3.1 Introduction

Every safety program needs to have a backbone to the program in the way of policies and procedures. I have decided with my thesis to include a section that covers some of the basic required programs to be used in creating a safety program on paper to set the policies and procedures for certain required OSHA items. Not all of these programs that I am including are required. It is important to know or consult with a safety expert to find out what is needed and what is not. It is also important to include a section before the programs as an introductory section that includes meeting times, basic policies & rules, accident investigation procedures, accident reporting procedures, inspection programs, and other site specific safety rules that may need to be developed. There is no specific requirement to have an introduction or an organized safety manual, but it is helpful as an organizational tool.

A safety manual generally provides a structural organizational for the plant safety program that meets OSHA requirements. The manual identifies roles and responsibilities of managers, supervisors, and others, indicates how the program is structured and what the approach to safety in the work place will be. (Jon Anderson, personal communication, March 06, 2007).

3.2 Setting Policy

When setting policy or creating standards related to safety issues in any facility, it is best to have the safety committee and management collaborate on the topics that should be included in those standards. The importance of sustaining cooperation between management and the safety committee is to guarantee ownership by all parties and not just partial ownership by either party. Policies should be clear and direct, but should not be so detailed that those policies are in constant need of adjustment when a minor change takes place.

3.3 Drug and Alcohol Policy

It is important to have a policy in relation to Drug and Alcohol. Drugs and alcohol have been a problem plaguing society for many decades. There have been multiple times

throughout history that movements were formed to address substance abuse and its effects. These range from the early temperance movements, prohibition in the United States, the banning of absinthe, the various campaigns against drug producers and traffickers, and the increasingly vigorous measures currently being taken against drinking and driving. Over the recent years, one important development has been the growing realization that drug and alcohol abuse is an important workplace issue. The traditional method of handling concerns of alcoholism and illicit drug abuse was to sweep the issue under the carpet, but in recent years organizations have realized that it is an important contributor in accidents, absenteeism and illness. Employees who abuse drugs and alcohol have a tendency to have five times as many accidents. In today's globalized economy with its emphasis on rapid reaction, innovation and the capacity to constantly renew skills, it is easy to see that ignoring workplace substance abuse problems, and absorbing their costs, is not a viable option.

3.3.1 Sample Drug and Alcohol Policy

(Company Name) realizes the importance of providing a safe and healthy work environment for all employees and visitors. With this in mind, the company has adopted the following policy regarding Illegal Drugs, Substances, Contraband, Weapons, Stolen Property and Unauthorized Items. Violation of this policy is grounds for immediate termination without prior warning.

All employees, employees of clients/vendors/partners, and other invitees are hereby notified that the use, possession, concealment, transportation, promotion or sale of the following items or substances while on company property and/or while conducting company business is strictly prohibited:

1. Illegal drugs, controlled substances (including trace amounts) look-alike and designer drugs
2. Alcoholic beverages
3. Firearms, weapons, explosives and ammunition
4. Any stolen property or drug paraphernalia

5. Unauthorized prescription drugs (NOTE: Employees taking prescription medication must notify their supervisors in writing of the possible effects of the medication. All prescription drugs must be kept in their original container)

The company reserves the right, at all times, while on company premises and properties and circumstances warrant, to have company supervisors or authorized specialists conduct reasonable searches and inspections of individual employees, or other persons and their personal effects, including (but not limited to): baggage, desks, clothing and personal vehicles, for the purpose of determining if such employees or other persons are in possession, use, transportation or concealment of any of the prohibited items and substances. All searches and inspections conducted by outside authorized specialists will be in the presence of company supervisors.

The sale, use, transfer, or possession of an illegal drug or drug paraphernalia is a violation of the law. The company will report information concerning the possession, distribution and use of any illegal drugs to the appropriate law enforcement officials.

Drugs and alcohol tests will be administered under the following conditions:

1. Prior to date of hire, when all new hires will be required to pass a pre-employment drug and alcohol screening test as a condition of employment
2. When an employee shows signs of impairment on the job
3. After any accident or occurrence that results in an injury on the job as defined by the Occupational Safety and Health Administration (OSHA). A positive test result for any illegal drug or alcohol will result in immediate termination of employment and forfeiture of any and all workplace injury benefits.
4. After any vehicular accident while traveling on company business or in company owned vehicles.
5. After any incident or occurrence of property damage regardless of injury
6. Random testing (see below)

No employee or person search, inspection or test will be conducted without written consent. Employees have the right to refuse to be inspected or have personal effects searched or to cooperate in the requested tests. However, an employee who refuses to permit such searches, inspections or tests or is found to be in possession, use, or

transportation of any illegal substance, contraband, company property, or any of the above mentioned drugs and unauthorized items, will be terminated and not allowed to return to any of the company's properties or facilities.

Random Testing

(Company Name) will perform random drug testing to assure our workplace stays drug-free. Any employee who refuses to take a drug test will be terminated for cause.

If an employee is still in their 90-day probationary period and produces a positive drug test for any illegal drug or alcohol, they will automatically be terminated. When an employee, who has completed their 90-day probationary period, produces a positive drug test for any illegal drug other than Cannabinoids (THC) or alcohol at or above prohibitive levels, they will be terminated. However, should the employee produce a positive drug test for Cannabinoids (THC) or alcohol, the company reserves the right to either immediately terminate the employee or give the employee a one-time and one-time only chance to become drug-free. The criteria upon which this decision will be based are:

1. Attendance (few absences and late arrivals/early departures)
2. Performance (steady productivity and positive contribution to the workplace)
3. Attitude (respect for superiors and co-workers)

If the employee meets the above criteria and agrees to cease the use of drugs, he/she will immediately be suspended for a minimum of five (5) full workdays without pay. Vacation time and/or personal days cannot be used during this suspension and any holiday pay will be permanently forfeited. Thereafter, the employee will be drug tested on a regular basis for a minimum of six (6) months. Should the employee produce a positive test at any time during this period, he/she will be terminated immediately.

(Company Name) is serious about having a drug, alcohol and contraband free work place and employing only persons who comply with this policy.

3.4 Recordkeeping and Documentation

It is important to follow the OSHA guidelines on recordkeeping in regards to accidents. Also when training is conducted in the area of safety, one should have a sign-in sheet to document who attended the training. Documentation also helps to know when training was conducted for a particular employee so a company knows when to retrain that employee. A typical sign-in sheet will have the subject matter of the training, the instructor's name, date of training, and the printed name and signature of the employees in attendance.

In the event of an accident there are several forms that need to be completed for regulatory reasons and to help the company understand why the accident occurred. A company would fill out the OSHA 300 log for recordable accidents, first aids in the first aid log; and the accident investigation to understand why an accident occurred.

3.4.1 OSHA 300 Log

The OSHA 300 log is what OSHA looks at or could look at in the event of an inspection. This log is required to be kept on file for 5 calendar years. This log is used to classify work-related injuries and illnesses and to note the extent and severity of each case. There are three parts to the 300 log. Part 1 is the log itself where the work-related injuries and illness are documented. Part 2 is the summary of work-related injuries and illnesses which is filled out at the end of the year to report the data to OSHA and the BLS (Bureau of Labor Statistics). Part 3 contains the details about each case/accident on the OSHA 300 log and this is known as the OSHA 301.

Which work-related injuries and illnesses should you record? Record those work-related injuries and illnesses that result in:

1. Death
2. Loss of consciousness
3. Days away from work
4. Restricted work activity or job transfer
5. Medical treatment beyond first aid.

A company must also record work-related injuries and illnesses that are significant, such as cases involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum as stated in 29 CFR 1904.7.

3.4.2 First Aid Log

Any company must inventory their first aid supplies, not only so that a company is aware of minor cuts and scrapes, but also to identify the location of the incident and address the cause. What needs to be recorded on the first aid log? Absolutely everything injury related, from first aid to major accident. This includes the employee's name, supervisor, date of first aid/injury, and a description of the events causing the injury or employee complaint. Following the proper documentation procedures related to an injury eliminates delays and complications for the employee and the company.

3.4.3 Accident Investigation

For the accident investigation, it is most important to state facts only, do not create opinions on accident investigations. Accident investigations should be completed by a committee and not assigned to one individual. The purpose of the accident investigation is to clarify the facts and create solutions to prevent a secondary accident.

An investigation should include the employee's name, date of birth, how long they have been employed by the company, what they were doing prior to the accident, what they were doing to cause the accident (facts only), last time the employee was involved in an accident, corrective actions from the accidents or recommendations, who completed the accident and an investigation review by an executive or manager to review the completeness of the accident.

3.5 Plant Inspection Procedure

Companies should create an inspection / audit procedure to inspect the plant and to grade how programs are working in a facility. The procedure should have the ability to help identify, correct, and control hazards on an ongoing basis.

Comprehensive audits are detailed and look at the programs with a non bias view. External auditors are always recommended. An audit should identify existing and potential hazards and non-compliance issues that should be addressed. Good auditors will conclude the audit with a meeting to recommend what needs to be fixed or changed and what is going right with the companies' safety program. Audits are graded on a percentage scale from 0 to 100.

Plant / Facility inspections should be done on a monthly basis, and it is best to split the location up into 4 sections to do a section a week with the safety committee or an inspection team. A checklist should be used to identify what should be looked at and whether there was any safety hazards noted that need to be corrected. These inspection records should be maintained on file for 5 years. A corrective action plan should be developed on any deficiencies.

3.6 Training

Every company should be committed to providing safety and health related orientation and training to all employees at all levels. This training should be aggressive to target problem areas within the facility. A training program should educate and familiarize employees with safety and health procedures, rules and work practices of the facility. The management team should encourage and require involvement and participation of all managers, supervisors, and employees. The executive level needs to support the orientation and training program with allocations in funding, staff, resources, and time to develop and implement a superior training program.

The training subjects and materials are developed utilizing industry and site specific criteria relating to identified and potential hazards, accident and incident data, and training required by federal regulations. The orientation and subsequent training sessions will should include, but not be limited to, the following:

- Hazards associated with the work area;
- Hazards of the job or task assignment;

- Emergency Procedures;
- Specific equipment operation training;
- Employee reporting requirements;
- Accident procedures;
- Substance abuse;
- Any federally required training not included or addressed above

The required training to be conducted on an annual basis is fire extinguisher use, hearing conservation, and blood-borne pathogens. It is a common misconception that there are several annual training requirements. Most standards are performance based, therefore training is conducted when the program is developed, when hazards are introduced and/or when the plans/programs change. Training is also required by some standards to be revisited when employees demonstrate the need for retraining.

The training program shall be administered in two phases consisting of new employees and regular periodic training and refresher sessions. Aside from the formal safety and health related training classes, employees need to receive guidance and instruction on safe operating procedures of each assigned job or task. The training should be documented so a record can be established. OSHA's training requirements are representative of the minimal amount of training to be conducted by corporations; however, more extensive training for employees leads to greater memory retention.

3.7 Conclusion

Since I started developing the safety program for the company I am presently working for the safety index has gone from a 15.89 to a 5.53 in less than a year time. Engineering a solution was the idea of the past, now correcting behaviors is a major part of safety. By follow-up and continuous improvement in the area of safety goals can be

achieved and people can come to work and go home the same way when they started the day.

The following pages will comprise the programs; each section includes a table of contents. These programs are in no particular order and the bakery equipment and grain programs are industry specific.

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Appendices: SAFETY PROGRAM EXAMPLES:

Appendix A: Employee Emergency Response and Evacuation Plan

A.1 Employee Emergency Plan – Responsibilities and Administrative Duties

A.1.1 Application:

The (Company Name) has developed and implemented this Employee Emergency Plan to address all potential emergency situations and establish procedures to ensure the safety of all employees. A review of the facility, production and storage areas, weather histories, and surrounding businesses and activities has been conducted to determine the types of potential emergencies.

Responsibility for the development and implementation of this program has been assigned to the (Job Function) for (Company Name). Accountability for this plan includes the following activities:

Identification and prediction of all types of potential emergencies that may occur at this facility.

1. Develop emergency escape and take cover procedures and assign emergency escape routes.
2. Develop procedures for employees who remain to operate critical plant operations before evacuation.
3. Form a method of accounting for all employees after evacuation and take cover procedures have been performed.
4. Identify medical and rescue duties for employees who may perform them.
5. Implement a method of reporting emergencies and establish a relationship with local public safety agencies.
6. Provide a list of names or regular job titles of persons who can be contacted for further information concerning the plan.

7. Establish an effective employee alarm system.
8. Establish a training program to effectively train and inform all employees at this location.

A.2 Employee Emergency Response Plan

The written emergency action plan covers designated actions that must be taken to ensure employee safety from fire and other emergencies. However, no set of procedures and instructions can cover all the requirements for coping with every emergency. The application of good judgment and sound management decisions are necessary to implement all procedures. With this in mind, Management shall apply the elements of this program and make appropriate decisions specific to particular plant operations and environment.

A.1.2 Potential Emergencies Covered by this Plan:

Bomb Threat

Building Structural Fire

Weather Related Emergencies

Flood

Explosion

Earthquake

Equipment Fire

Natural Gas Release

A.3 Emergency Escape Procedures and Escape Route Assignments

A.3.1 Emergency Definition:

An emergency or crisis at the facility is defined as any situation or event that might be interpreted in any manner harmful to the company or its employees. An emergency may

also include any situation or event that draws attention of the public to the company in a potentially negative light.

A.3.2 .Emergency Response Agencies:

The appropriate emergency response personnel must be contacted as soon as possible to ensure quick and efficient response to any and all types of emergencies. The following agencies and phone numbers should be used to contact the appropriate emergency response personnel:

Police Department	911
Fire Department	911
Ambulance	911

If the facility does not have 911 accessibility, then include the direct phone numbers to the police, fire and ambulance.

A.3.3 Management Response Protocol:

If an emergency or crisis should arise at a facility, the (Job Function) on site during the emergency will contact the first person on the following list. Then, proceed to call each person on this list until all have been notified.

<u>Manager</u>	<u>Phone Number</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

The following fire emergencies have been identified and procedures have been written to indicate the appropriate response:

A.3.4 Structural Fire – Equipment Fire – Welding Fire

Employees designated to use portable fire extinguishers must be trained to use fire extinguishers and will be expected to fight fires in the beginning stages. If the fire is so large that it cannot be contained or extinguished with one fire extinguisher, the evacuation alarm will be sounded and plant evacuation procedures will be initiated.

When a fire emergency is observed or discovered by an employee, that employee will notify the nearest (Job Function). The (Job Function) will determine if plant evacuation is required, notify (Job Function), who will activate the alarm, and notify the Fire Department.

If plant evacuation is necessary, the (Job Function) will activate the evacuation alarm system. When the evacuation alarm is activated, none essential personnel will precede to the nearest plant exit by taking the primary escape route. If the primary escape route is blocked or inaccessible, the secondary escape route will be taken.

(Job Function) will ensure that equipment has been turned off and will then proceed to evacuate the facility by taking the primary escape route. If the primary escape route is blocked or inaccessible, the secondary escape route will be taken.

Employees will follow the posted “Exit” signs, identified by an arrow pointing in the direction of the exit and then to an “Exit” leading to the outside of the building. Employees exiting the facility will take the shortest route possible to the designated gathering place. The designated gathering place is the area in which employees will congregate to allow each supervisor to take a head count and determine if all employees have safely evacuated the facility.

Employees with medical training should get the first aid kit and help with any primary aid needs until emergency medical and rescue personnel arrive.

A.4 Additional Emergencies Other Than Fire

A.4.1 Take Cover Procedures for Weather Related Emergencies:

Weather related emergencies will require personnel to seek shelter in an area of the facility that will protect them from possible building damage and/or structural failure. The area of the facility selected as the weather emergency shelter is marked for identification.

Weather radios will be positioned in key locations to monitor weather conditions. The person monitoring the weather radio will inform employees of the need to take cover when weather related emergency is announced. Employees will be notified by utilizing the public address system or intercom system. The person making the announcement will instruct employees of the need to take cover when weather related emergency is announced. The person making the announcement will instruct employees to proceed to the designated area and take cover.

Each supervisor will be responsible for determining if all employees in his or her work area have safely taken shelter. A head count will be made by the supervisor. If an employee or employees have not yet taken shelter, the supervisor will attempt to locate the individual(s). If the absent employee(s) is located, they will be instructed to take shelter immediately.

A.4.2 Flood Emergency:

In the event of a flood, employees will be instructed to evacuate the facility. The direction of evacuation will be determined by the nature and location of the flood. The weather emergency radio will be utilized to assist in determining the direction of evacuation. Local

emergency response personnel will also be utilized (if possible) to determine the direction of evacuation from the facility. Employees will evacuate the facility grounds in a calm, safe, and organized manner.

A.4.3 Structural Failure:

When structural failure occurs, the nearest supervisor will make the determination to evacuate the facility and sound the alarm.

When the evacuation alarm is activated, line employees will proceed to the nearest plant exit by taking the primary exit route. If the primary escape route is blocked or inaccessible, the secondary escape route will be taken.

(Job Function) will ensure that their equipment has been fully shut down. Operators will then proceed to evacuate the facility by taking the primary or secondary escape routes. Employees will follow the posted "Fire Exit" signs, identified by an arrow pointing in the direction of the exit and then to an "Exit" leading them to the outside of the building.

A.4.4 Explosion or Natural Gas Release:

When an explosion or release of natural gas occurs, the nearest supervisor will make the determination if plant evacuation is necessary.

If plant evacuation is necessary, the supervisor will activate the evacuation alarm system.

When the evacuation alarm is activated, line employees will proceed to the nearest plant exit by taking the fire exit route. If the primary fire exit route is blocked or inaccessible, the secondary escape route will be taken.

(Job Function) will ensure that their equipment has been fully shut down and turned off. Equipment operators will then proceed to evacuate the facility by taking the primary or secondary escape routes.

Employees will follow the posted "Exit" signs, identified by an arrow pointing in the direction of the exit and then to an "Exit" leading them to the outside of the building.

A.4.5 Earthquake:

If an earthquake occurs, each employee will try to avoid standing, walking or taking shelter under equipment. Employees will also try to avoid standing close to walls and other structures that may fail.

When the earthquake has dissipated, employees will promptly evacuate the facility by taking the primary fire exit or secondary evacuation routes. Employees will then proceed to the employee parking lot and gather for a head count. The supervisor will determine if all employees in their work area have safely evacuated. If any employees cannot be accounted for, Senior Management will then be notified so that rescue procedures can be initiated. Rescue will be performed by the appropriate emergency response agencies. Facility employees will not be expected to perform rescue.

A.4.6 Bomb Threat:

The following instructions should be followed if a bomb threat is made over the phone at this facility.

If a telephone call is received announcing a bomb threat - DON'T Panic. The person receiving the call may be the only source of information management available when trying to respond to this incident. The person who receives the bomb threat (if by phone) should make every attempt to utilize the bomb threat report included in the appendix of this program. The form should be used to try and obtain as much information as possible about the bomb threat and caller.

Keep the caller on the phone as long as possible. Ask the caller to repeat the message and try to get as much information as possible recorded on the bomb threat report. If the caller does not give the location of the bomb or possible time of detonation, the person receiving the call should ask the caller for this information.

Pay particular attention for strange or peculiar noises such as motors running in the background, music and the type of music, or any other noise that might give a remote clue as to where the call might be coming from.

Try to determine if the caller is male or female.

Immediately after the caller hangs up, the person receiving the call must report this information to the local police department, fire department and ambulance service by dialing 911. After calling emergency services, the following list of people must then be notified of the emergency:

Management Personnel

Phone Number

Bomb Threat Evaluation:

Generally, there are three (3) types of calls:

1. Crank Calls: They are not specific.
2. A Bit More Specific: The call may go like this: "A bomb will go off in your building at 3 PM today!" This call requires more serious consideration.
3. Specific Calls: They tell where, when, etc. They are to be considered very serious.

Decision:

Calls that can definitely be identified as being made internally are generally crank calls.

There are only two good reasons for such calls being made:

1. To legitimately warn management that a bomb has been placed in the plant.
2. To give management time to protect employee's lives.

A decision will be reached from the information taken.

Search:

All work and storage areas will be checked by local bomb disposal experts who are knowledgeable and experienced in this matter. Plant evacuation will take place and plant personnel will not be expected or allowed to attempt removal of any suspicious objects.

Search and removal of suspicious objects will be the responsibility of local bomb disposal experts.

A.4.7 Emergency Evacuation Route Maps:

To assist all employees and building occupants, escape route maps have been posted in various work areas throughout the facility. Each map indicates the location of the reader, primary and secondary routes to an exit as well as assembly areas outside of the plant. Employees will evacuate the building by following the fire exit route as indicated on the route map. In the event the primary fire exit escape route is blocked or otherwise inaccessible. The secondary route of escape will be followed.

Copies of the Emergency Evacuation Route Maps are included in this program for review. The route maps will also indicate the location outside of the facility employees will gather to determine if all employees have safely evacuated the facility.

A.4.8 Procedures for Operating Critical Plant Operations before Evacuation:

The (Job Function) responsible for plant maintenance will remain behind during an evacuation to operate or shut-down critical plant operations. The shutdown of critical operations will be done only when the procedure can be done safely and without risk. The following procedures will be accomplished only when the emergency does not expose the (Job Function) person to any unnecessary risk. The organization does not expect any employee to endanger themselves by entering into an area that has become involved in any type of emergency.

When a fire or other type of emergency involves the gas system, the designated maintenance employee(s) will shut the gas supply off at the main valve.

If an electrical system becomes involved in a fire, the designated Maintenance employee will shut off the electrical supply to the equipment involved in the emergency. A minor electrical fire will be isolated by shutting off power at the electrical disconnect for the equipment. A major fire will be isolated by shutting down power at the main power panel for the work area or process line.

A.4.9 Procedures to Account for All Employees after Emergency Evacuation has been completed:

Employees will evacuate the facility and locate in the following area:

When evacuation is complete, a head count will be made by the supervisor from each department to determine if all employees have safely evacuated the building. Department supervisors will account for all employees assigned to them and will notify the Plant Manager if any employees are missing.

All visitors, vendors, service contractors or delivery persons, etc., will be required to sign in with the receptionist so that they may be accounted for in an emergency. The receptionist will account for visitors, vendors, service contractors or delivery persons, etc. A complete accounting will be provided to the Plant Manager and in the event of a fire, to the Fire Department Incident Commander.

A.4.10 Rescue and Medical Duties for those Employees who are to perform them:

Rescue and medical duties for employees are identified in the Medical Services and First Aid Program. Employees will be made aware of the persons designated to provide first aid care. Medical duties such as first aid treatment will be provided by designated first aid responders until such time that professional medical attention is available.

Rescue will be attempted only by the emergency response service(s) summoned to the scene of the emergency. (Company name) employees will not be expected to attempt rescue. The senior manager on site at the time of the emergency will inform the person in charge of the emergency response team if any employee(s) remain inside the facility. The approximate location of the individuals will also be communicated.

A.4.11 The Preferred means of Reporting Fires and Other Emergencies:

Employees are to notify the nearest available supervisor of the emergency. The supervisor will make the decision to notify upper management or sound the evacuation or take cover alarm. After the supervisor sounding the evacuation alarm notifies upper management, emergency response services will be notified. Emergency response services include the local fire department, police, and/or ambulance service (911). The receptionist will then attempt to contact persons listed in the Management Protocol list. If the emergency situation does not allow the receptionist to safely contact each person on the Protocol list, attempts to contact these people will be made after evacuation.

When an emergency occurs at times other than regular business hours, the supervisor first made aware of the emergency will contact the local emergency response services such as the local fire department, police and/or ambulance service (911). The supervisor will then attempt to contact persons listed in the Management Protocol List. If the emergency situation does not allow the supervisor to safely contact each person on the Protocol List, attempts to contact these people will be made after evacuation.

A.4.12 Names of Persons or Departments who can be contacted for further information or explanation of duties under the plan:

<u>Name</u>	<u>Job Title</u>
_____	_____
_____	_____
_____	_____
_____	_____

A.4.13 General Emergency Procedures:

The following general rules and procedures are applicable to employees during emergency situations:

1. Employees shall notify the supervisor immediately upon discovery of a fire or other emergency and the supervisor or Plant Manger will sound the evacuation alarm.
2. When ordered by the supervisor, machinery and utilities shall be shut off depending on the emergency and the time available.
3. When an order to evacuate a plant or work area is used, all employees not actively engaged in resolving the emergency will follow the established routes in an orderly manner and evacuate the plant or area.
4. After evacuating the facility, employees are to proceed immediately to the designated department congregation area. This is done so an accountability for all employees can be conducted.

5. In the event of an emergency, do not use the telephone or paging system unless instructed to replay messages or instructions.
6. Do not block access routes or hinder the emergency response personnel during an emergency.

BOMB THREAT REPORT

Name of person receiving call: _____

Date of Call: _____

Time _____ am/pm

Origin of call:

Local Long Distance

Phone Booth

Internal

IDENTITY OF CALLER:

Voice

- Male *or* Female
- Loud Soft
- High Pitch Deep
- Raspy Pleasant

Speech

- Stutter Nasal
- Fast Slow
- Distinct Distorted

Language	Accent	Manner
<input type="checkbox"/> Good <input type="checkbox"/> Foul <input type="checkbox"/> Poor <input type="checkbox"/> Other _____	<input type="checkbox"/> Local <input type="checkbox"/> Ethnic <input type="checkbox"/> Typical <input type="checkbox"/> Foreign <input type="checkbox"/> Regional	<input type="checkbox"/> Calm <input type="checkbox"/> Angry <input type="checkbox"/> Rational <input type="checkbox"/> Irrational <input type="checkbox"/> Coherent <input type="checkbox"/> Incoherent <input type="checkbox"/> Deliberate <input type="checkbox"/> Emotional <input type="checkbox"/> Righteous <input type="checkbox"/> Nervous Laugh
Additional information:	Additional information:	Additional description:

Background Noise:

- | | |
|---|---|
| <input type="checkbox"/> Office Machines | <input type="checkbox"/> Trains |
| <input type="checkbox"/> Factory Machines | <input type="checkbox"/> Music |
| <input type="checkbox"/> Animals | <input type="checkbox"/> Quiet |
| <input type="checkbox"/> Airplanes | <input type="checkbox"/> Street Traffic |
| <input type="checkbox"/> Voices | |

Other:

Whom did you inform about the call? _____

If caller seemed familiar with our building, plant, operation, indicate how: _____

As well as you can, write what the caller said: _____

Ask caller to repeat message stating that you want to be sure you understand, did not understand, bad connection, etc. This tactic may keep the caller talking.

Questions to ask:

1. When is the bomb going to explode? _____
2. Where is the bomb right now? _____
3. What kind of bomb is it? _____
4. What does it look like? _____
5. Why did you place the bomb? _____

Appendix B: Fire Prevention Program

B.1 Fire Prevention Plan – Administrative Responsibilities

B.1.1 Scope:

The Fire Prevention Plan addresses the need for fire prevention in the workplace. This plan includes a list of major workplace fire hazards, proper handling and storage procedures, potential ignition sources, control procedures, and effective fire protection equipment or systems. The persons responsible for maintenance of equipment or systems installed to prevent or control fires are also identified.

B.1.2 Application:

Controlling fuel source hazards is also a concern of this program. The accumulation of flammable and combustible materials is controlled by a written housekeeping procedure. All employees are trained to recognize fire hazards of materials and processes to which they are exposed. Heat producing equipment is properly maintained to avoid fire hazards. The responsibility for the (company name), Fire Prevention Plan includes the following administrative responsibilities:

1. Develop a Written Description of the Fire Prevention Plan.
2. List major workplace fire hazards and proper handling and storage procedures.
3. Identify potential ignition sources and control procedures.
4. Selection and maintenance of fire protection equipment.
5. Names or job titles of personnel responsible for maintenance of equipment and systems to prevent or control fires.
6. Housekeeping procedures to control accumulations of flammable and combustible wastes.
7. Names of personnel responsible for control of fuel source hazards.
8. Maintenance procedures of heat producing equipment to prevent accidental ignition of combustible materials.
9. Train employees on fire hazards associated with materials and processes to which they are exposed.
10. Maintain the Fire Prevention Plan in the workplace for employee review.

11. Maintain Records Related to Contractor Safety and Health Program and review as necessary.

B.1.3 List Workplace Fire Hazard

B.1.4 Potential Ignition Sources

Heat Producing Equipment

Welding, Cutting Operations

Overheating Electrical Systems

Spontaneous Combustion (Shop rags)

Smoking

Lightening Strike

Arson

B.1.5 Fire Protection Equipment and Systems

The (Job Function) has been assigned the responsibility of inspecting and maintaining fire prevention and suppression equipment. In addition, a local fire extinguisher service company is utilized to assist in the maintenance of portable fire extinguishers.

Fire Protection Equipment and Suppression Systems are listed below:

B.1.6 Fuel Sources and Housekeeping Procedures

A cleaning schedule is utilized to control waste and other items which may contribute to a fire. The cleaning schedule is utilized by the sanitation department to organize cleaning efforts and to make the process of plant clean-up more efficient.

(Job Function) are also responsible for the control and accumulation of flammable and combustible materials. Flammable and combustible materials include finished product, packaging materials, flammable and combustible liquids, waste, and etc.

B.1.7 Maintenance of Heat Producing Equipment

Pre-start up inspections are conducted on each oven by the maintenance department to assure each safety device is functioning properly. The inspection is documented to verify the activity.

Preventative maintenance is conducted on each oven at least once every two months to ensure proper function of each safety device. Preventative maintenance schedules are documented to verify the activity.

B.1.8 Equipment Training and Program Review

All employees have been made aware of fire hazards regarding the materials and processes to which they are exposed. Employees have also been instructed to properly respond in the event of a fire and plant evacuation. The Employee Emergency Response Plan will be utilized in the event a fire requires plant evacuation.

Employees may request copies of the Employee Emergency Response Plan and the Fire Prevention Plan for review.

Appendix C: Bloodborne Pathogens Exposure Control Program

C.1 Bloodborne Pathogens Program – Administrative Responsibilities

C.1.1 Application:

The intent of this program is to protect (company name) employees from potential exposure to bloodborne pathogens such as Hepatitis B and HIV. This protection is necessary since exposure could result in transmission of bloodborne pathogens which may lead to serious health implications.

(Company name), has developed and implemented this program to provide employees who could “reasonably anticipate” contact with blood and other potentially infectious materials covered as the result of performing their job duties. Employees covered by this standard will be listed under the Exposure Determination section of this program.

Responsibility for the development and implementation of this program includes the following activities:

1. Identification of job classifications in which employees have some level of exposure to blood or other potentially infectious material (OPIM).
2. Identify the tasks associated with the potential exposure for each job classification.
3. The development and implementation of practical Universal Precautions that prevent contact with blood or OPIM.
4. Implement engineering controls when feasible and institute work practice controls (hand washing, housekeeping) to eliminate or minimize employee exposures.
5. Provide and maintain appropriate Personal Protective Equipment (PPE) for employees designated by this program to provide aid to an injured employee.
6. Contain, label and manage potentially infectious wastes and develop a method of disposal of infectious wastes.

7. Provide designated employees with the opportunity to receive the Hepatitis B vaccination. Obtain declination forms from those employees who decline the vaccination.
8. Conduct Post-Exposure medical evaluation and follow-up to all employees who have an exposure incident. Maintain exposure records as required by 29 CFR 1910.20 and maintain the confidentiality of all records.
9. Provide required training initially when the program is implemented and annually afterward.

C.2 Bloodborne Pathogens – Exposure Control Program

In compliance with the Occupational Safety and Health Administration's Bloodborne Pathogens standard, this exposure control plan has been developed to protect employees of the (company name) facility.

C.2.1 Exposure Determination:

The employees indicated in this section have been included in the Exposure Control Plan. These employees have been designated to provide primary first aid care to injured employees until professional medical attention can be provided. These individuals have been given the additional work related responsibility of responding to the needs of employees injured at work. They are also required to decontaminate the injury site and any equipment contaminated with blood or Other Potentially Infectious Materials (OPIM).

Employee Name	Job Classification	Shift Assignment

C.3 Compliance Method – Universal Precautions

Employees who have been designated under this plan are required to observe Universal Precautions to prevent contact with blood or other potentially infectious materials. *All blood or other potentially infectious materials are to be considered infectious regardless of the perceived status of the source individual.* In other words, all persons are considered to be potential carriers of a bloodborne pathogen.

C.3.1 Engineering and Work Practice Controls:

Engineering and work practice controls have been utilized when practical to eliminate or minimize exposure to employees. Where occupational exposure remains after institution of these controls, personal protective equipment (PPE) shall also be utilized. These controls are examined and maintained on an annual schedule.

Hand washing facilities have been made available to the employees who incur exposure to blood or other potentially infectious materials. The disinfectant hand washing and cleaning chemicals provided for use by employees has been rated as a tuberculocide by the Environmental Protection Agency. Federal OSHA requires that these facilities be readily accessible after incurring exposure, therefore hand washing facilities have been conveniently located within the facility. After removal of personal protective gloves, employees have been instructed to wash hands and any other potentially contaminated skin area immediately or when feasible with the disinfectant provided for this purpose.

If employees incur exposure to their skin or mucous membranes, those areas shall be washed with the disinfectant and flushed with water when feasible following contact.

C.3.2 Work Area Restrictions:

Employees are not to eat, drink, apply cosmetics or lip balm, smoke, or handle contact lenses in areas where a reasonable likelihood of exposure to blood or Other Potentially Infectious Materials (OPIM) exists (for example, the first aid room). Food and beverages are to be kept in the refrigerator located in the employee break room.

Personal protective equipment must be worn in the work areas designated by the PPE program Hazard Assessment to prevent injury. Prevention of injuries also prevents employee exposure to blood and OPIM.

C.3.3 Contaminated Equipment:

Production equipment, work tools, containers, floor surfaces, etc. which have become contaminated with blood or OPIM shall be examined before servicing, use, or shipping and shall be decontaminated as necessary unless decontamination is not feasible.

Decontamination is performed by the designated and trained individuals listed in the Exposure Determination section of this program.

C.3.4 Personnel Protective Equipment:

All personal protective equipment used in the facility is provided without cost to employees. Personal protective equipment is chosen based on the anticipated exposure to blood or other potentially infectious materials. The protective equipment is considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach the employees' clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time that the protective equipment is to be used.

All personal protective equipment is cleaned, and disposed of at no cost to the employees.

All repairs and replacements are made no cost to employees.

All garments that are penetrated by blood shall be removed immediately or when feasible.

All personal protective equipment is removed before leaving the work area.

Gloves shall be worn when and where it is reasonably anticipated that employees are likely to have hand contact with blood, other potentially infectious materials, non-intact skin, and

mucous membranes. Gloves have been made available in various locations within the facility.

Disposable gloves are not to be washed or decontaminated for re-use and are to be discarded when they become contaminated, torn, punctured, or when their ability to function as a barrier is compromised. Utility gloves may be decontaminated for re-use provided that the integrity of the glove is not compromised. Utility gloves are discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

Masks in combination with eye protection devices, such as goggles or glasses with solid side shield, or chin length face shields, are required to be worn whenever splashes, spray, splatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can reasonably be anticipated.

One way CPR valves are provided and used in the event resuscitation is needed. The valves are stored in emergency response kits located in easily accessible locations throughout the facility.

Decontamination is accomplished by utilizing Bleach (in the proper concentration, 1 part bleach to 10 parts water) and EPA registered germicides.

All contaminated work surfaces, tools, and containers are decontaminated after first aid care has been provided. Clean-up takes place immediately or when feasible after any spill of blood or other potentially infectious materials has occurred in the work area.

C.3.5 Regulated Waste Disposal:

Regulated waste shall be placed in an appropriate container and properly labeled. Labeling practices comply with the requirements of this standard and serves to inform employees of hazards associated with the container contents.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

C.3.6 Labeling:

Warning labels shall be affixed to containers of regulated waste containing blood or other potentially infectious materials. These labels shall be fluorescent orange or orange-red, with lettering or symbols in a contrasting color. The symbol used to indicate hazardous waste is the biohazard symbol.

Labels are affixed to the container to prevent loss or unintentional removal. Red bags or red containers may be substituted for labels.

Labels required for contaminated equipment shall be in accordance with this section and shall also state which portions of the equipment remain contaminated. Regulated waste that has been decontaminated need not be labeled or color-coded as indicated by the Bloodborne Pathogens standard.

C.3.7 Recordkeeping:

All records required by the OSHA Bloodborne Pathogens standard are kept on file to comply with this regulation. The personal records of each employee are available for review by the employee. Each individual has the right to copy all medical documents within their medical file.

The availability of these records has been communicated to the employees through the employee handbook. In addition, a posting has been made at the employee entrance to ensure employees understand they have access to this information.

C.3.8 Hepatitis B Vaccine:

All employees who have been identified as having an occupational exposure to blood or other potentially infectious materials are offered the Hepatitis B vaccine, at no cost to the employee. The vaccine is offered at the time this program is implemented, or within 24 hours after an actual exposure incident has occurred. The vaccine is not necessary if the employee has previously had the vaccine or wishes to submit to antibody testing that shows the employee to have sufficient immunity.

Employees who decline the Hepatitis B vaccine sign a form that uses the wording in Appendix A of the OSHA standard.

Employees who initially decline the vaccine but who later wish to have it may then have the vaccine provided at no cost.

C.3.9 Exposure Incident and Follow-up:

All employees who incur an exposure incident are offered post-exposure evaluation and follow-up in accordance with the OSHA standard. Exposure incidents records are to be maintained by Human Resources. The exposure evaluation and follow-up includes the following information:

- ❖ **Documentation of the route of exposure and the circumstances related to the incident.**
- ❖ **If possible, the identification of the source individual, and if possible, the status of the source individual. The blood of the source individual will be tested (after consent is obtained) for HIV/HBV infectivity.**
- ❖ **Results of testing of the source individual will be made available to the exposed employee with the exposed employee informed about the applicable laws and regulations concerning disclosure of the identity and infectivity of the source individual.**
- ❖ **The employee will be offered the option of having their blood collected for testing of the employees HIV/HBV serological status. The blood sample will be preserved for at least 90 days to allow the employee to decide if the blood should be tested for HIV serological status. However, if the employee decides prior to that time that testing will be conducted then the appropriate action can be taken and the blood sample discarded.**
- ❖ **The employee will be offered post exposure prophylaxis according to the current recommendations of the U.S. Public Health Service.**
- ❖ **The employee will be given appropriate counseling concerning precautions to take during the period after the exposure incident. The employee will also be given information on what potential illnesses to be alert for and to report any related experiences to appropriate personnel.**

C.3.10 Interaction with Healthcare Professionals:

A written opinion shall be obtained from the health care professional who evaluates employees of this facility. A written opinion is obtained in the following instances:

- (1) When the employee is sent to obtain the Hepatitis B vaccine.
- (2) When the employee is sent to a health care professional following an exposure incident.

Health care professionals shall be instructed to limit their opinions to the following:

- (a) Whether the Hepatitis B vaccine is indicated and if the employee has received the vaccine, or for evaluation following an incident
- (b) That the employee has been informed of the results of the evaluation, and
- (c) The employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials.

C.3.11 Training:

Training and education for designated employees is conducted before initial assignment to tasks where occupational exposure may occur. Training is provided by contract trainers and in-plant staff using videotapes, lecture and other materials. All designated employees receive annual refresher training. Sample information and the outline for the training program are located in the Human Resources Office. The annual training program includes the following elements:

- 1. The OSHA standard for Bloodborne Pathogens.**
- 2. Epidemiology and symptomology of bloodborne diseases.**
- 3. Modes of transmission of bloodborne pathogens.**
- 4. This Exposure Control Plan (i.e., points of the plan, lines of responsibility, how the plan is implemented, etc.).**
- 5. Procedures which might cause exposure to blood or other potentially infectious materials at this facility.**
- 6. Control methods which are used at the facility to control exposure to blood or other potentially infectious materials.**
- 7. Personal protective equipment available at this facility and who should be contacted concerning.**

- 8. Post Exposure evaluation and follow-up.**
- 9. Signs and labels used at the facility.**
- 10. Hepatitis B vaccine program at the facility.**

C.3.12 Hepatitis B Vaccine Declination Form

(company name), (city, state)

Appendix A

I understand that, due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection.

I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease.

If, in the future, I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Signature: _____ Date: _____

C.3.13 Post Exposure Evaluation Form:

Employee: _____ Social Security #: _____

Date of Exposure: _____ Date form completed: _____

Description of exposure incident (indicate route of exposure): _____

Name of source individual (must have consent): _____

Blood test results of source individual (must have consent):

Exposed Employee's blood test results: _____

Post exposure treatment (in accordance with current recommendations of the
U.S. Public Health Service): _____

Health counseling for exposed employee (check after completion):

_____ Employee has been informed of evaluation results.

Employee has been told of any medical conditions resulting from exposure to blood or
OPIM that require further evaluation or treatment.

All other findings or diagnoses shall remain confidential and shall not be included in this
written report.

Signature of Healthcare Professional Title

Date

Appendix D: Permit Required Confined Space Entry Program

D.1 Permit Required Confined Space Entry Program – Administrative Duties

D.1.1 Application:

The Permit-Required Confined Space Entry program has been developed to ensure that proper procedures are followed before and during entry into confined spaces. Entry into Permit-Required Confined Spaces located within the (company name) facility is to be conducted by specific employees. These employees are listed in this program. Their specific responsibilities and training requirements are also indicated.

D.1.2 Scope:

It is the responsibility of (company name) to identify all permit-required confined spaces in the workplace; inform exposed employees of dangers associated with the confined spaces; prevent unauthorized entry; protect authorized workers from hazards by developing and implementing a written permit space program; and train employees that enter, attend, or supervise confined space entry.

D.1.3 Confined Space Identification and Analysis:

A survey was made to determine what confined spaces exist within the facility. The following definitions were used as the guideline for determining if an area or piece of equipment could be considered as a confined space.

Confined space is a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- (3) Is not designed for continuous employee occupancy.

Permit-required confined space (permit space): A confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross- section; or
- (4) Contains any other recognized serious safety or health hazard.

All confined spaces within the facility have been identified and documented in this program. Additionally, a sign located at or near the entrance of the confined space, provides a warning to employees and indicates the area may be hazardous

D.1.4 Confined Space Hazard Analysis:

Each of designated confined spaces has been analyzed to determine the types of hazards associated with entry and during all types of work associated with entry into the confined space. Analysis and hazard determination have been accomplished by using the control specifications on the Confined Space Entry Permit and with information generated on the Confined Space Hazard Evaluation Form. These forms are kept on file with the Confined Space Entry Program for annual (or more frequent) review.

A copy of the Confined Space Hazard Evaluation Form is included in the Appendix to this program. The form is to be used to identify the confined space, the various types of jobs that may be performed, and the specific hazards associated with working in the confined space. The completed document will thereby indicate the hazards for which precautions must be taken. Development and utilization of the Confined Space Entry Permit will be based on the hazards identified in the hazard evaluation form.

D.1.5 Identification of Site-Specific Confined Spaces:

After reviewing each definition of Confined Spaces and Permit-Required Confined Spaces, and utilizing the Confined Space Hazard Analysis and Evaluation form; the following items have been identified as confined spaces.

Confined Space	Location

D.1.6 Notification of Site-Specific Confined Spaces:

Employees at the facility are notified of the existence and hazards associated with the confined spaces present in the facility. Notification is accomplished by identifying confined spaces within the text of this program and by posting warning signs near the entrance to the confined space.

Signs are posted at or near the entrance to the confined space to provide employees with a warning of hazards associated with the confined space. The signs indicate “Permit-Required Confined Space, Do Not Enter”, “Confined Space, Authorized Personnel Only”, or something similar.

Another method of notifying employees of the confined spaces within the work place is accomplished through training. Training sessions are conducted to inform the employees of the confined space definition, examples of confined spaces (specific to this location), hazards associated with entry into the confined space, the permit system, personal protective equipment, work place monitoring, specific employee responsibilities, rescue, etc.

D.1.7 Prevention of Unauthorized Entry:

Measures have been taken to prevent the unauthorized entry into confined spaces by persons unfamiliar with this program and the hazards associated with confined spaces. These measures are to include training and information, and signs posted at the entrance into confined spaces. In addition, the authorized attendant and entry supervisor are required to prevent unauthorized entry as indicated in their responsibilities.

D.2 The Confined Space Entry Permit System

Permits are filled out by the Entry Supervisor prior to entry into the permit required confined space to ensure that all necessary precautions are taken to confirm safe entry into the confined space. The necessary precautions have been identified on the permit form. The permit form is used for the duration of the job and must be posted at the job site while work is in progress. Canceled permits are kept on file for at least one year for the purposes of review and information.

D.2.1 Equipment Required for Entry into Permit-Required Confined Spaces:

When an employee of ours is expected to enter a permit-required confined space, the following equipment is provided at no cost. Outside contractors are expected to utilize and provide the same type of equipment listed below.

- Testing and monitoring equipment to determine atmospheric conditions within the confined space.
- Ventilating equipment needed to obtain acceptable entry conditions.
- Communications equipment (if necessary) for maintaining contact between the entrant(s) and the attendant.
- Personal protective equipment as deemed necessary.
- Lighting equipment needed to see well enough to work safely and to exit the space quickly in an emergency.
- Barriers and shields.
- Equipment, such as ladders, needed for safe ingress and egress by entrants.
- Rescue and emergency equipment, except for equipment provided by rescue services.

- Any equipment necessary for safe entry into and rescue from permit spaces.

D.3 Steps for Specifying Acceptable Entry Conditions

D.3.1 Atmospheric Monitoring:

Atmospheric monitoring is required prior to entry in confined spaces designated as permit-required for entry. The atmospheric monitoring is done to determine the following hazards: **breathable oxygen content** (acceptable levels - 19.5% to 23.5%), **flammable gases** (acceptable levels - lower than 10% of lower explosion limit), and **toxic gases** (acceptable levels are levels lower than the permissible exposure limits). Atmospheric monitoring must be conducted in this order (breathable oxygen, flammable gas, toxic gas) as prescribed by the Confined Space Entry standard.

Monitoring is conducted prior to entry and prior to the installation of ventilation equipment. The monitoring results taken at this time indicate the worst case scenario, thereby providing more useful information regarding the acceptable entry conditions.

Atmospheric monitoring is conducted at regular intervals during the entire time work within the confined space is in progress. The results of the monitoring are documented on the permit form and posted in the work area. When monitoring indicates a hazardous atmosphere within the confined space, all entrants are instructed to evacuate the confined space immediately. A comprehensive review and inspection is conducted to determine the cause and source of the unacceptable atmospheric condition. Upon determining the cause and source of the unacceptable atmospheric condition, the entry procedures and entry permit is adjusted to control the situation and to prevent the hazard from occurring again.

D.3.2 Ventilation and Control of Atmospheric Hazards within Permit-Required Confined Spaces:

Forced air ventilation is required to maintain acceptable atmospheric conditions during certain entry procedures. The ventilation equipment must be at the work site prior to entry and utilized during entry to ensure the safety of entrants. The intake area for the ventilation fan is protected to prevent air contaminants from being introduced into the space during work.

Proper ventilation and air exchange within the ovens is obtained by opening the side panels and utilizing the exhaust system. Prior to entering the oven, the exhaust system must be allowed to run the same amount of time required prior to oven start-up.

D.4 Canceling of Entry Permits

The entry supervisor is responsible for concluding entry operations when work within the confined space has been completed. The following procedures have been established for this purpose:

1. The list of entrants' names entered on the confined space permit form are systematically checked off as the entrants exit the confined space.
2. A visual inspection (from outside of the confined space) is made to ensure all tools and equipment, etc. have been removed from the confined space. Tools and equipment are inventoried after all entrants have vacated the confined space to ensure no items remain behind.
3. Ventilation equipment is removed from the confined space.
4. The opening to the confined space is closed and secured. Any barriers or blockades used during entry are removed.
5. All Lockout/Tagout devices are removed and the restoration of power and energy is completed. This process follows the procedures for restoring power and energy as detailed in the Control of Hazardous Energy Program.
6. All in-feed lines, supply pipes, and gas lines, etc. are opened and restored to operating condition. This process follows the procedures for restoring power and energy as detailed in the Control of Hazardous Energy Program.
7. The confined space entry permit form is signed by the entry supervisor to indicate that work has been completed and that the confined space has been returned to operating condition. The permit form is then filed for annual review.

D.5 Designation and Training of Affected Employees

The workers considered to be affected employees are identified by job title and designated as authorized entrants, authorized attendants, and entry supervisors. Training is provided so that designated employees have the knowledge and skills necessary for safe entry into the confined spaces within (company name) facility.

Training shall be provided to each affected employee before the employee is first required to work in a confined space and before any change occurs in their assigned duties. For

example: employees are trained when they change designation status from authorized entrant to authorized attendant.

Training also takes place when a hazard occurs that has not been taken into consideration during previous training or confined space analysis.

Training is to be conducted when deviations from the permit space entry procedures are recognized or if prior training has failed to provide the authorized employee with the knowledge or use of these procedures.

D.6 Authorized Entrants

Authorized entrants are the employees who enter and work in the designated confined spaces when an outside contractor is not utilized. These employees are identified by job title in the list below and by name on the permit entry form. (Authorized entrants are issued a chest or full body harness with retrieval line attached at the center of the entrant's back.)

D.6.1 List of Authorized Entrants:

Training Requirements for Authorized Entrants:

The authorized entrant is trained to:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Properly use monitoring equipment, ventilation equipment, communications devices (as required per confined space), personal protective equipment, lighting equipment (as required per confined space), barriers, ladders, rescue and emergency equipment, and any other equipment deemed necessary by management of the company;
- Communicate with the attendant enabling the attendant to alert entrants of the need to evacuate the space when an emergency occurs;
- Alert the attendant whenever any warning sign or symptom of exposure to a dangerous situation is detected or when the entrant detects a prohibited condition;
- Exit from the permit space as quickly as possible whenever the order to evacuate is given by the attendant or the entry supervisor;
- Exit from the permit space when the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or when the entrant detects a prohibited condition, or when an evacuation alarm is activated.

D.7 Entry Supervisors

Entry Supervisors are the employees who are immediately responsible for safe entry into the confined space. These employees are identified by job title in the list below and are identified by name on the permit entry form.

D.7.1 Authorized Supervisors:

D.7.2 Training Requirements for the Entry Supervisor:

The entry supervisor is trained to:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Terminate the entry and cancel the permit as required when the job is completed or when a condition not allowed by the entry permit arises;
- Verify that rescue services are available and that the means for summoning them are operable;
- Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
- Determine whenever responsibility for a permit space entry operation is transferred, and that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

D.8 Emergency Rescue

D.8.1 Rescue and Emergency Services:

The following requirements apply to employers who have employees enter permit spaces to perform rescue services.

The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from permit spaces.

Each member of the rescue service shall be trained to perform the assigned rescue duties.

Each member of the rescue service shall also receive the training required of authorized entrants and indicated in this program.

Each member of the rescue service shall practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). At least one member of the rescue service holding current certification in first aid and in CPR shall be available.

When an employer (host employer) arranges to have persons other than the host employer's employees perform permit space rescue, the host employer shall:

Inform the rescue service of the hazards they may confront when called on to perform rescue at the host employer's facility, and

Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets

may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52m) deep.

If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

D.9 Outside Contractors

Under certain circumstances the company will arrange for an outside contractor to perform work within a permit-required confined space. When this occurs, it will be the company's responsibility to:

- The Chief Maintenance Engineer will inform the contractor that the workplace contains permit spaces and that entry is allowed only by utilizing the permit space program;
- The Chief Maintenance Engineer will notify the contractor of the program elements and the hazards associated with the confined space;
- The Chief Maintenance Engineer will notify the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel are to be working;
- The Chief Maintenance Engineer will coordinate entry operations with the contractor, when both host employer personnel and contractor personnel are to be working in or near permit spaces;
- The Chief Maintenance Engineer is to discuss with the contractor any hazards encountered or created during work within the confined space.

D.10 Permit-Required Confined Space Entry Program Review

An annual review covering all confined space entries performed within one year is to be conducted by the Maintenance Supervisor. A record is kept of each annual review.

Canceled permits are kept on file and the Confined Space Entry Analysis Forms are used to facilitate program review.

The intent of the review is to determine and ensure that employees covered by this program are properly protected. Annual reviews are documented and filed with information supporting this program.

A review of entry operations is to take place when it is apparent that precautions taken under the confined space program may not protect employees. The program is revised to correct the deficiency before any work is allowed to take place within the confined space.

Examples of circumstances requiring the review of the permit-required confined space program are listed as follows:

- Any unauthorized entry of a permit space. Any employee complaints about the effectiveness of the program.
- The detection of a permit space hazard not covered by the permit.
- The detection of a condition prohibited by the permit.
- The occurrence of an injury or near-miss during entry.
- A change in the use or configuration of a permit space.

D.11 Confined Space Evaluation Form

Revision date: _____

Confined Space: _____

Has the confined space been identified? _____

Reasons for entry: _____

Authorized entrants (list by name on permit): _____

Attendants (list by name on permit): _____

Entry Supervisor (indicate by name on permit): _____

Hazards of the Permit Space

- | | |
|--|---------------------------------|
| 1. Potential for oxygen depletion.
specify: | Yes No
() () |
| 2. Potential for combustible gases and vapors.
specify: | Yes No
() () |
| 3. Potential for toxic gases and vapors.
specify: | Yes No
() () |
| 4. Potential for welding/release of hazardous fumes.
specify: | Yes No
() () |
| 5. Will forced air ventilation be required?
specify: | Yes No
() () |
| 6. Inwardly converging walls or sloping floor.
specify: | Yes No
() () |

- | | |
|--|--------------------------|
| 7. Potential for engulfment.
specify: | Yes No
() () |
| 8. Potential for mechanical hazards.
specify: | Yes No
() () |
| 9. Required personal protective equipment.
specify: | Yes No
() () |
| 10. Extraction equipment.
specify: | Yes No
() () |
| 11. Other safety or health hazards.
specify: | Yes No
() () |

This evaluation form is designed to assist in the development of a Confined Space Entry Permit and is not intended to take the place of a specific Confined Space Entry Permit.

Developed by: _____
Date: _____

D. 12 Confined Space Entry Permit

ALL COPIES OF PERMIT REMAIN AT THE JOB UNTIL JOB IS COMPLETED

LOCATION and DESCRIPTION of Confined Space _____

Date _____ Time _____

PURPOSE of Entry _____

DEPARTMENT _____ Expiration _____

ENTRY SUPERVISOR {NAME}: _____

AUTHORIZED ENTRANTS {NAME(S)}: _____

Special Requirements	Yes	No	Yes	No
----------------------	-----	----	-----	----

Hot Work Permit			Escape Harness	
-----------------	--	--	----------------	--

Lock Out - De-energize			Lines Broken - Capped or Blanked	
------------------------	--	--	----------------------------------	--

Tripod emergency escape unit			Purge - Flush and vent	
------------------------------	--	--	------------------------	--

Lifelines			Ventilation	
-----------	--	--	-------------	--

Fire Extinguishers			Secure Area	
--------------------	--	--	-------------	--

Lighting			Breathing Apparatus	
----------	--	--	---------------------	--

Protective Clothing			Resuscitator - Inhalator	
---------------------	--	--	--------------------------	--

Respirator				
------------	--	--	--	--

TEST(S) TO BE TAKEN (Valid for one 8-hour turn only)

Yes No Record Continuous Monitoring or Every Two (2) hours

P.E.L. *

% of Oxygen 19.5% - 23.5%

% of L.E.L. * Any % over 10

Carbon Monoxide 50 ppm

Aromatic Hydrocarbon 10 ppm

Hydrocyanic Acid 10 ppm

Hydrogen Sulfide 10 ppm

Sulfur Dioxide 5 ppm

Ammonia 25 ppm

Monitor Operator (NAME): _____

(Note: Continuous/periodic tests shall be established before beginning job. Any questions pertaining to test requirements contact person conducting atmospheric monitoring.)

INSTRUMENTS USED _____

Name	Type	Identification No.
------	------	--------------------

Authorized Attendant _____

Name	Type	Identification No.
------	------	--------------------

--	--	--

METHOD(S) OF COMMUNICATION WITH ENTRANT(S): _____

IN-HOUSE RESCUE TEAM (phone #) _____

AMBULANCE (phone #) _____

FIRE (phone #) _____

*P.E.L. _____ *L.E.L. _____

Permissible Exposure Limit _____ Lower Explosion Level _____

Original to Department

Copy to Safety Manager

(Note: Permits must be maintained for at least one year for review.)

Definitions

Acceptable entry conditions: The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant: An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

Authorized entrant: An employee who is authorized by the employer to enter a permit space.

Blanking or blinding: The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space: A space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- (3) Is not designed for continuous employee occupancy.

Double block and bleed: The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency: Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment: The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is

considered to have occurred when any part of the entrant's body breaks the plane of an opening into the space.

Entry permit (permit): The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of this section.

Entry supervisor: The person (such as the employer, supervisor, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

Hazardous atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- (1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- (2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

- (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- (5) Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, §1910.1200 of this part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot work permit: The employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately dangerous to life or health (IDLH): Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Note: Some materials-hydrogen fluoride gas and cadmium vapor, for example-may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting: The displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation: The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line breaking: The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Non-permit confined space: A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen deficient atmosphere: An atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere: An atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space (permit space): A confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

Permit-required confined space program (permit space program): The employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit system: The employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited condition: Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue service: The personnel designated to rescue employees from permit spaces.

Retrieval system: The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing: The process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Appendix E: Power Industrial Trucks – Forklift Safety Program

E.1 Forklift Safety Program – Administrative Responsibilities

E.1.1 Application:

The (company name), Forklift Safety Program has been established to protect our forklift operators and all other employees from the hazards associated with this type of equipment. The program is designed to comply with federal OSHA standard, 29 CFR 1910.178. Responsibility for this program has been given to the (Job Function). Administrative responsibilities include:

- A. Develop written procedures describing compliance with fire protection, design requirements, maintenance, and safe use of forklifts.**
- B. Classify hazardous and non-hazardous locations to ensure proper selection of forklifts.**
- C. Develop a policy regarding modifications and additions to forklifts.**
- D. Ensure proper safety guards are in place for all forklifts.**
- E. Implement procedures for storage and handling of propane fuel.**
- F. Ensure the battery recharging station is equipped with eye wash and drench shower facilities, personal protective equipment, fire protection, and ventilation.**
- G. Implement procedures to evaluate and control carbon monoxide gas created by propane powered forklifts.**
- H. Implement procedures for the safe operation of forklifts during loading and unloading of highway trucks.**
- I. Develop, conduct, and document formal training programs for all operators.**
- J. Develop and implement procedures to ensure proper maintenance of powered industrial trucks.**

E.2 Forklift Safety Program – Policy and Procedure

The Forklift Safety Program has been developed and implemented to ensure the safety of the forklift operator and all other employees in the work area. This program addresses safety requirements concerned with design, maintenance, and use of powered industrial trucks.

The company is committed to training employees in the safe operation of industrial trucks and strives to make all workers aware of the hazards associated with this equipment. Inspection procedures have been developed to detect safety issues, implement repairs and ensure prompt restoration of safe operating conditions.

E.2.1 Modifications and Additions to Powered Industrial Trucks:

As a matter of policy, minor repairs and servicing activities are performed by plant maintenance employees. Major repairs, modifications, and additions to the powered industrial trucks are done only by the service department provided by the equipment dealership.

The regulations clearly indicate that no modifications or additions to equipment may be made without approval from the manufacturer.

E.2.2 Guarding of Powered Industrial Trucks:

Operators and maintenance personnel have been instructed to maintain the required safety guarding installed on all powered industrial trucks. Guarding is provided to protect the operator from falling objects and to comply with the section on equipment guarding. The vertical load back rests (mast guards) are in place to prevent loads from falling backward onto or into the driver's compartment. Guarding is also installed as standard equipment over the driver's compartment. This type of guarding is provided to protect the operator from falling objects and to offer roll over protection.

E.2.3 Storage and Handling of Liquefied Petroleum Gas:

Liquefied petroleum gas is not used as a fuel source for powered industrial trucks at this location. Therefore, the requirements for storage and handling of this flammable gas do not apply to daily activities. If in the event equipment powered by liquefied petroleum gas is used in the future, this program will be modified to include storage, handling, and employee training requirements.

Or

Liquefied Petroleum Gas storage shall be located outside of the building, except when in use on the forklifts in accordance to 29 CFR 1910.110(b)(6). When handling propane operators must adhere to the following procedures:

1. Always make sure before filling any bottles, the proper personal protective equipment (PPE) is in use. This would include Face Shield, Rubber Glove (that cover arm), and Rubber Apron.
2. Check and make sure that all of the bottles are secured down on the holding rack and then use a forklift to carry the rack out to the main propane tank to begin filling.
3. After connecting the gas hose to the bottle always open up the vent valve on the top of the bottle first and then open up the valve on the gas line and begin filling.
4. After your bottle is full, close the vent valve.
5. After closing the vent valve, close the valve on the gas line and then close the valve on the tank.
6. Once the valve on the tank is closed, disconnect the gas line from the bottle.
7. If any bottles have issues they need to be tagged with what is wrong with them written on the tag.
8. Load all of the bottles back on the rack and secure them down. Then take them back to the proper storage area.
9. **NEVER** smoke anywhere near the propane tanks.

Personnel protective equipment is provided by the company for filling and handling liquefied petroleum gas. When changing the bottle on the forklift leather gloves and eye protection shall be worn.

E.2.4 Battery Recharge Stations:

The battery recharge station is located in the shipping area of the warehouse. The structure that contains the recharging units is guarded and protected against possible damage from the forklifts. The required eye wash and drench shower station is located within quick and easy reach of the batteries and recharging units. The shower station is monitored and inspected to ensure the proper operation and supply of fresh water.

The proper type of personal protective equipment is provided to ensure the safety of the employee charging batteries. The use of personal protective equipment is required while charging batteries. The requirement for personal protective equipment has been identified in the Personal Protective Equipment Standard. Use of personal protective equipment is mandatory.

A neutralizing compound (baking soda) is provided in the recharging station and is applied to spilled electrolyte. The neutralizing compound is available to protect workers from exposure to acid while at work and during clean-up. Fire extinguishers are provided in the area in the event a fire should develop.

Ventilation is adequate to prevent the hazardous accumulation of potentially explosive gasses during the recharging process.

E.2.5 Control of Carbon Monoxide Accumulation in the workplace:

Internal combustion engines are not utilized to drive the powered industrial trucks at this facility. Therefore, the powered industrial trucks are not considered to be a source of carbon monoxide.

E.2.6 Safe Tractor Trailer Loading and Unloading Operations:

As a matter of policy, the wheels of the transport trailers must be chocked before loading and unloading. Entering a trailer with a forklift may create a hazardous situation if the trailer wheels are not secured. An unsecured trailer may shift position when a forklift enters allowing the forklift to fall from the dock platform or load out door. The forklift operator is instructed to check the wheels of the trailer to make sure the chock device has been applied and the driver is required to set the hand brake. This has been established to assure the safety of the operator.

E.3 Employee Training of the Safe Operation of Powered Industrial Trucks

The company ensures that each potential operator of powered industrial truck is capable of performing the duties required of the job. The content of the training programs complies with federal requirements. The operator is expected to demonstrate the level of knowledge and skills required and expected of this job. Training sessions consist of a combination classroom instruction and practical training exercise. Each operator is evaluated by the persons designated to implement and maintain this program.

Training program content is designed to include the requirements listed in the federal OSHA standard 2 CFR 1910.178(l)(3) Training Program Content. Topics include: operating instructions, controls and instrumentation, steering and maneuvering, visibility, use of forklift attachments, capacity and stability, inspections, refueling and recharging, operating limitations, pedestrian traffic, etc.

The training is documented and certified to indicate the activity was conducted and that the person understood the content of the program. Documentation is kept on file for verification. Retraining is done when observation of activities and behaviors indicates a need for review.

Employees not involved in the operation of powered industrial trucks are informed of the hazards associated with the equipment. They are instructed to walk only in the designated aisles and to avoid areas of forklift traffic. The training for these employees takes place in meetings that discuss work place rules and general safety topics.

E.4 Inspection and Maintenance of Powered Industrial Trucks

Forklifts used at this facility are inspected regularly to detect any safety issues and to facilitate necessary repairs. The intent of the inspection program is to ensure the safe operating condition of the equipment. Forklifts that need repair to correct a safety issue are removed from service until repairs can be made.

Each forklift is inspected by the operator before each shift. The inspection is documented and kept on file. When safety issues are observed during the inspection, a work order is written and the equipment is removed from service until repairs can be made.

APPENDIX F: Respiratory Protection Program

F.1 Respiratory Protection Program – Administrative Duties

F.1.1 Application:

The Respiratory Protection Program establishes the proper use and care of respirators to prevent exposure to harmful airborne contaminants. Whenever respirators are required to control harmful exposures, only respiratory equipment approved for that purpose shall be used. Respirators used by employees shall be approved by the Mining Enforcement and Safety Administration and/or the National Institute for Occupational Safety and Health. When (company name) is unable to remove harmful atmospheric hazards at the source, the company shall provide approved respiratory equipment. Additionally, the employee exposed to such hazards is required to use approved respiratory equipment. The administrative responsibilities for the Respiratory Protection Program includes:

1. Evaluating the work environment to determine if employee exposures to airborne contaminants exist above acceptable levels.
2. Development of a written respiratory protection program to indicate the methods of limiting exposure to airborne contaminants.
3. Identify and locate the source of air contaminant exposures and investigate methods of eliminating or controlling the hazard.
4. Develop procedures for the selection of respirators based upon the type and degree of hazards that make up employee exposure.
5. Develop and implement written procedures for the use, care, inspection, and maintenance of respirators.
6. Conduct initial and periodic medical surveillance for all employees who may wear respirators while performing work duties.
7. Conduct and document annual fit tests on all employees who may wear respirators while performing work duties.
8. Train employees who wear respirators annually to inform them of proper use, care, inspection, maintenance, and limitations.
9. Manage all records relating to the respiratory protection program, including exposure records, medical and occupational surveillance records, training and fit testing records, and equipment inspection records.

10. Evaluate and review the program on an annual basis to ensure continued effectiveness.
Revise the program as necessary and document each evaluation.

F.2 Respiratory Protection Program

F.2.1 Worksite Evaluation:

An evaluation of the work environment is used to determine if employee exposure to airborne contaminants exists above acceptable levels. This worksite analysis indicates if respirators are necessary to protect the safety and health of the employees.

The evaluation is performed by an Industrial Hygienist for Certified Environmental Management, Ltd., an industrial hygiene services consulting group. The results of the primary and all additional surveys may be found in the appendix section of this program. Additional air contaminant monitoring is to be conducted whenever exposures are expected to change. For example, whenever modifications to equipment or processes may reduce or increase exposures to air contaminants or when new raw materials are used or the production process changes.

F.2.2 Eliminating or Control of Atmospheric Hazards:

Considering the industrial hygiene survey, it may be determined that employee exposure to airborne contaminants exists above acceptable levels. The nature of the airborne contaminant may be controlled, reduced, or eliminated through engineering, administrative, or work practice controls.

Engineering controls may include equipment modification, equipment enclosure, or ventilation. Administrative controls may include substitution of the hazard source for less hazardous materials, employee rotation from work areas with a high hazard exposure to low hazard exposure areas. Personal protective equipment may also be utilized as an administrative control. Respirators are effective in protecting the safety and health of employees.

However, the primary objective will be to eliminate the hazard completely or to significantly reduce the hazard exposure to safe levels.

Considering the data from the original industrial hygiene survey, the following chart indicates the atmospheric hazard exposure that was found to exceed permissible exposure

limits. The chart also indicates the steps taken to eliminate or reduce the amount of exposure to employees, the results and the date in which the steps were taken.

Work Area	Hazard Exposure	Engineering Control	Administrative Control	Results of Control Efforts	Date

F.2.3 Respirator Selection:

All work place hazards will be identified by the industrial hygiene survey, by information gathered from observation of each work place and information on material safety data sheets. The respirators used at this facility will be selected based upon the hazard exposure in the various work areas.

Job Function	Work area	Hazard Exposure	Respirator Type & Protection

F.2.4 Respirator Cleaning, Maintenance and Storage:

Cleaning and maintenance of respirators (other than disposable dust masks) will be the responsibility of management. Respirators will be issued when they are needed and a record of issuance will be maintained. Information concerning: (1) receipt date, (2) location and (3) monthly inspection records will be maintained on file.

Respirators are stored to protect them from dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals. Unprotected respirators can sustain damaged parts or face piece distortion making them ineffective.

Before being stored, the respirator is carefully wiped with a damp cloth and dried. It is stored without sharp folds or creases and is never hung by the elastic headband or put down in a position that will stretch the face piece. Respirators other than disposable dust masks are sealed in clean plastic bags.

Respirators will not be thrown into tool boxes or left on work benches where they may be exposed to dust, damage and other harmful materials.

F.2.5 Maintenance of Respirators:

The ongoing maintenance of the respirators themselves is an essential part of the respiratory protection program. If the equipment malfunctions through poor maintenance, the employee may unknowingly be exposed to a potentially significant health hazard.

The maintenance program incorporates the manufacturer's instructions and includes provisions for disassembly, including the removal of the respirator's purifying elements, cleaning, sanitizing, inspection for defects, repair (if necessary), installation of purifying elements, reassembly, packaging, and storage.

The air-purifying elements (chemical cartridges or filters) should not be cleaned or exposed to excess moisture, including high humidity. Discard the elements if there is any question about their usefulness.

When respirators (other than the disposable dust masks) are required to for protection, supervisors will be responsible for equipment inspection, particularly of functional parts such as exhalation valves and filter elements. Inspections take place prior to the use of equipment.

Weekly inspections are also made of respirators and are conducted by trained persons.

During the weekly inspection, rubber parts should be stretched slightly for detection of fine cracks. The rubber should be worked occasionally to prevent setting (one of the causes of cracking), and the headband should be checked to be sure that the wearer has not stretched it in an attempt to secure a snug fit.

F.2.6 Cleaning and Sanitizing:

Each time an employee uses a respirator, it must be in a clean and sanitized condition. Respirators to be used in emergencies or on a non-routine basis should be cleaned and sanitized after each use.

The respiratory protection equipment is to be dismantled and washed with detergent in warm water using a brush, thoroughly rinsed in clean water, and then air dried in a clean place. Care is taken to prevent damage from rough handling. This method is an accepted procedure for a small respirator program or where each worker cleans his or her own respirator. Detergents containing a bactericide are used for cleaning.

Be sure that the cleaned and sanitized respirators are rinsed thoroughly in clean water no hotter than 50° C (120° F) so that all traces of detergents and cleaners are removed.

Otherwise, skin irritation or dermatitis may result when the employee wears the respirator. Allow the respirators to air dry by themselves on a clean surface.

F.2.7 Storage:

When the respirator is not in use, it will be placed in a plastic bag or sanitary container and then stored to avoid damage and contamination. Respirators should be stored with the face piece and exhalation valve in a more-or-less normal position to prevent the rubber plastic from taking a permanent distorted "set."

F.2.8 Inspection of Respirators:

After cleaning and sanitizing, each respirator is reassembled and inspected for proper working condition and repair or replacement of parts. Respirators are to be inspected routinely by the user immediately before each use. This is to ensure that the respirator is in proper working condition.

An inspection checklist is provided in the Appendix section of this program. The inspection checklist is used for training purposes for employees who utilize disposable dust masks.

F.2.9 Medical Evaluations of Users for Respirators:

Prior to assignment to any position requiring respirator use, a medical evaluation of the employee's physical ability to work while wearing a respirator will be necessary. A periodic evaluation similar to the preplacement evaluation will be done initially (when the program is first implemented and when a new employee will be placed in a work area or required to perform a job function that requires the use of a respirator) and periodically. If a change in the employee's medical condition occurs, the interval for periodic evaluation will be established by the physician.

The physician will be provided with a description of the work assignment or work area, the hazard exposure, the respirator that is to be worn, and the length of time the employee will be in the hazard area. The physician will then decide upon the type of evaluation required. Physician's approval will be necessary before a respirator will be assigned.

F.2.10 Employee Fit Testing

Respirator fit testing will be provided for each person expected to wear a respirator to perform a specific job function. Fit testing is done to ensure a proper face to face piece fit. Every respirator wearer receives fitting instructions including demonstrations and practice in how the respirator is to be worn, how to adjust it, and how to determine if it fits properly. Respirators are not to be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the face piece, or temple pieces on glasses. To assure proper protection, the face piece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's face piece fitting instructions.

Fit testing protocols are provided in the program Appendix for review and information.

F.2.11 Employee Training:

Training in the use and limitations of respirators is provided to all respirator users. Once the respirator has been selected, the wearer must be trained in its use and care. This is important for every type of respirator. Each respirator wearer shall be trained initially in the use of respirators and retrained annually.

Training will include the following:

1. Reasons for respiratory protection, explanation of what other controls and methods are being used to reduce the hazards.
2. Explanation of the respirator selection procedure used by health and safety professionals, including identification and evaluation of the hazard.
3. Proper fitting, donning, wearing, and removing of the respirator.
4. Limitations, capabilities, and operation of the respirator.
5. Proper maintenance and storage procedures.
6. Wearing of the respirator in a safe atmosphere to allow the user to become familiar with its characteristics.
7. Wearing of the respirator in a test atmosphere under close supervision of the trainer--one in which the wearer can simulate work activities and detect respirator leakage or malfunction.
8. How to recognize and cope with an emergency situation.
9. Instructions for special use as needed.
10. Explanation of any regulations governing the use of respirators.

F.2.12 Program Evaluation and Records Maintenance:

The Respiratory Protection Program is reviewed periodically or when changes in the work area introduce new atmospheric hazards. A review form is provided in the Appendix of this program. The overall evaluation of the respirator program will be conducted by the Program Administrator and documentation is maintained to verify the activity.

All records (exposure records, training, fit testing, and inspection records) related to the Respiratory Protection Program will be kept on file with the safety program records (with the exception of medical records). Medical evaluation records are kept in the medical files located in the main office area.

F.3 Respirator Inspection Form:

Inspector: _____

Date: _____

Disposable respirators should be checked for:

1. Holes in the filter Yes No
(if yes, obtain new disposable respirator)
2. Straps have lost elasticity or are otherwise damaged Yes No
(if yes, obtain new disposable respirator)
3. Metal nose clip is bent or otherwise damaged Yes No
(if yes, obtain new disposable respirator)

Air-purifying respirators (qtr and half-mask, full face piece) should be checked for:

Face piece

1. Excessive dirt Yes No
(if yes, remove all dirt from respirator)
2. Cracks, tears, or holes dirt Yes No
(if yes, obtain a new face piece)
3. Distortion dirt Yes No
(if yes, free face piece from constraints, see if distortion disappears - if not, obtain new face piece)
4. Cracked, scratched, or loose-fitting lenses Yes No
(if yes, contact manufacturer to obtain replacement - otherwise, obtain new face piece)

The head straps

1. Breaks or tears Yes No
(if yes, replace headstraps)
2. Loss of elasticity Yes No
(if yes, replace headstraps)
3. Broken or malfunctioning buckles or attachments Yes No
(if yes, obtain new buckles\attachments)

4. Excessively worn serrations on the head harness that might allow the facepiece to slip Yes No
(if yes, replace headstrap)

The inhalation and exhalation valves

1. Detergent residue, dust particles or dirt on valve or valve seat Yes No
(clean residue with soap and water)
2. Cracks, tears, or distortion in the valve material or valve seat Yes No
(contact manufacturer for instructions)
3. Missing or defective valve cover Yes No
(obtain valve cover from manufacturer).

The filter elements

1. Proper filter for the hazard Yes No
2. Missing or worn gaskets Yes No
(if yes, contact manufacturer for replacement)
3. Worn threads - both filter threads and face piece threads Yes No
(if yes, replace filter or face piece, whichever is applicable)
4. Cracks or dents in filter housing Yes No
(if yes, replace filter)
5. Deterioration of gas mask canister harness Yes No
(if yes, replace harness)
6. Out of date service life indicator, expiration date, or end-of-service date Yes No

F.4 Respirator Program Evaluation:

Signature: _____

Date: _____

1. Are all records complete and up to date?

Yes _____ No _____

If no, what action has been taken to improve future performance?

2. Has air contaminant monitoring been conducted at operations where new raw materials or production processes are in use?

Yes _____ No _____

If no, what action has been taken to determine exposure?

3. Are employees wearing the respirators which have been selected for the job?

Yes _____ No _____

If no, what action has been taken to eliminate the use of improper respirators?

4. Do all employees wearing respirators have medical approval and fit test?

Yes _____ No _____

If no, what is being done to correct the situation?

5. Have all employees completed their initial or refresher respirator training?

Yes _____ No _____

If no, what is being done to complete training?

6. Do employees who have completed training understand limitations, use and inspection of respirators?

Yes _____ No _____

If no, what improvements in the training program are being implemented?

F.4.1 Fit Testing Protocols:

The following information is provided to allow the employer to conduct fit test procedures. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT).

The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers.

Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. This instruction may not constitute the subject's formal training on respirator use; it is only a review.

The test subject shall be informed that he/she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted, maintained and used properly, will provide substantial protection.

The test subject shall be instructed to hold each face piece up to the face and eliminate those which obviously do not give a comfortable fit.

The more comfortable face pieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

The following criteria shall be used to help determine the adequacy of the respirator fit:

- (a) Chin properly placed;
- (b) Adequate strap tension, not overly tightened;
- (c) Fit across nose bridge;
- (d) Respirator of proper size to span distance from nose to chin;
- (e) Tendency of respirator to slip; and
- (f) Self-observation in mirror to evaluate fit and respirator position.

The test subject shall conduct the negative and positive pressure fit checks as described below. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another face piece shall be selected and retested if the test subject fails the fit check tests.

(a). Positive pressure test. Close off the exhalation valve and exhale gently onto the face piece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(b.) Negative pressure test. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s). Inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds. If the face piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

If at any time the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different face piece and to be retested.

The employer shall maintain a record of the fit test administered to an employee. The record shall contain at least the following information:

- (a) Name of employee;
- (b) Type of respirator;
- (c) Brand, size of respirator;
- (d) Date of test; and

Test Exercises. The test subject shall perform exercises, in the test environment, in the manner described below:

- (a) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
- (b) Deep breathing. In a normal standing position, without talking, the subject shall breathe slowly and deeply, taking care so as to not hyperventilate.

(c) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(d) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(e) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

(f) Grimace. The test subject shall grimace by smiling or frowning.

(g) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(h) Normal breathing. Same as exercise 1. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

F.5 QUALITATIVE FIT TEST (QLFT) PROTOCOLS

F.5.1 Isoamyl Acetate Protocol

(a) Odor threshold screening. The odor threshold screening test, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate.

F.5.2 Irritant Fume Protocol

The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) filters. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute.

Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep his/her eyes closed while the test is performed. The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. He/she shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

The test exercises mentioned above shall be performed by the test subject while the respirator seal is being challenged by the smoke.

F.5.3 Quantitative Fit Test (QNFT) Protocol

Saccharin Solution Aerosol Protocol. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

Threshold screening as well as fit testing subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

The test enclosure shall have a 3/4-inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle. The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her wide open mouth with tongue extended.

Using a nebulizer the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand. Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked

whether the saccharin is tasted. If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the taste of saccharin is detected, the fit is deemed unsatisfactory and a different respirator shall be tried or the respirator will be refitted.

Appendix G: Electrical Safety Related Work Practices

G.1 Electrical Safety Related Work Practices – Administrative Responsibility

G.1.1 Scope:

This program element addresses electrical safety-related work practices for both qualified and unqualified persons working on, near or with premises wiring, and wiring for connection to power supplies. Qualified persons have training in avoiding the electrical hazards of working on or near exposed energized parts, and unqualified persons have had little or no training.

G.1.2 Policy:

Employee training is under the supervision of the (Job Function). All employees covered by this program are familiar with the electrical safety-related work practices. Qualified persons receive training in the following: 1) distinguishing exposed live parts from other parts of electrical equipment, 2) skills and techniques necessary to determine the nominal voltage of exposed live parts, and 3) the clearance distances and corresponding voltages to which the qualified person is exposed.

Equipment needed to implement the program is provided at no cost to the employee. An annual review of the program is conducted to assure that the program is functioning. Any deficiency in the program is corrected and any changes are made when necessary.

G.1.3 Administrative Responsibilities:

The (Company Name) is responsible for implementing the Electrical Safety-Related Work Practices program at our facility. This program is intended to provide employees with information and training necessary to prevent exposure to electrical hazards.

The (Company Name) will be responsible for the following activities:

1. Development of the written Electrical Safety-Related Work Practices Program.
2. Identification and training of “Qualified and Unqualified” persons.
3. Development of Safety-Related Work Practices when working with energized and deenergized equipment and circuits.
4. Utilize Lockout/Tagout Procedures.
5. Provide appropriate PPE when employees are exposed to electrical hazards.

6. Provide insulated tools and ensure use when exposed to electrical hazards.
7. Develop techniques for alerting employees to hazards from electrical hazards.
8. Maintain all records specific to this program and review the program to make necessary changes, additions, and modifications.

G.2 Identification of Qualified and Unqualified Personnel

G.2.1 Qualified Person:

One familiar with the construction and operation of the equipment and the hazards involved. A qualified person may be required to work on or near exposed electrical parts. A qualified employee is also authorized to lockout and deenergizes electrical circuits.

NOTE: It is possible and in fact likely for an individual to be considered qualified with regard to certain equipment in the workplace, but unqualified as to other equipment. Also, an employee who is undergoing on-the-job training and has demonstrated an ability to perform his or her duties and is under the supervision of a qualified person may be considered to be qualified.

G.2.2 Unqualified Person:

Unqualified persons are those with little or no training in electrical equipment, but may be required to work near exposed electrical parts. Maintenance employees not listed are considered unqualified under the definition in this standard. Unqualified employees are trained in the Use of Portable Equipment, Restrictions on Resetting Circuit Breakers, Clearance Distances from energized parts, Occasional Use of Flammable Liquids near electrical equipment, and the recognition of Alerting Techniques that are outlined the written program.

G.2.3 List of Qualified Employees:

The following employees meet OSHA requirements as Qualified Employees:

Name	Job Title

G.3 Procedure for Working on or Near Exposed De-Energized Parts

Written procedures that describe elements of electrical safety-related work practices is the approved OSHA program taken from 29 CFR 1910.333(b). As indicated in the OSHA Directives STD 1-16.7 Electrical Safety Related Work Practices-Inspection Procedures and Interpretation Guidelines, “a copy of paragraph (b) of 1910.333 maintained by the employer will fulfill this requirement”.

G.3.1 Application:

This paragraph applies to work on exposed de-energized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged in accordance with paragraph (b) of this section shall be treated as energized parts, and paragraph (c) of this section applies to work on or near them.

G.3.2 Lockout / Tagout:

While any employee is exposed to contact with parts of fixed electric equipment or circuits that have been de-energized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this paragraph and 29 CFR 1910.147. The requirements shall be followed in the order in which they are presented (i.e., paragraph (b)(2)(i) first, then paragraph (b)(2)(ii), etc.

Memo: Lockout/Tagout procedures developed to comply with the Lockout/Tagout Program element will be utilized in addition to this procedural statement to provide added protection for our employees.

Note 1: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with paragraphs (c) through (f) of §1910.147 will also be deemed to comply with paragraph (b)(2) of this section provided that: (1) The procedures address the electrical safety hazards covered by this Subpart; and (2) The procedures also incorporate the requirements of paragraphs (b)(2)(iii)(D) and (b)(2)(iv)(B) of this section.

G.3.3 Procedures:

The employer shall maintain a written copy of the procedures outlined in paragraph (b)(2) and in 29 CFR 1910.147, Control of Hazardous Energy, and shall make it available for inspection by employees and by the Assistant Secretary of Labor and his or her authorized representatives.

G.3.4 De-energizing Equipment:

(A) Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment is de-energized.

(B) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

(C) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(D) Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

G.3.5 Application of Locks and Tags:

(A) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in paragraphs (b)(2)(iii)(C) and (b)(2)(iii)(E) of this section. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(B) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(C) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(D) A tag used without a lock, as permitted by paragraph (b)(2)(iii)(C) of this section, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(E) A lock may be placed without a tag only under the following conditions:

- (1) Only one circuit or piece of equipment is de-energized, and
- (2) The lockout period does not extend beyond the work shift, and
- (3) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

G.3.6 Verification of De-energized Condition:

The requirements of this paragraph shall be met before any circuits or equipment can be considered and worked as de-energized.

(A) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(B) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

G.3.7 Reenergizing Equipment:

These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(A) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(B) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(C) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

(1) The employer ensures that the employee who applied the lock or tag is not available at the workplace, and

(2) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

(D) There shall be a visual determination that all employees are clear of the circuits and equipment.

G.4 Procedures for Working on Energized Parts

G.4.1 Scope:

Only QUALIFIED employees are allowed to work on energized parts under the procedures of paragraph (b) of this section. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary

techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

Table S-5.

Approach Distances for Qualified Employees - Alternating Current

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact.
Over 300V, not over 750V.	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV.	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV.	2 ft. 0 in (61 cm).
Over 15kV, not over 37kV.	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV.	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV.	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV.	4 ft. 6 in. (137 cm).

G.4.2 Personnel Protective Equipment:

Employees are required to wear non conductive approved head protection wherever there is a danger of head injury due to electric shock or burns due to contact with energized parts. Employees are required to wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electric arcs or flashes or from flying objects resulting from electrical explosion. Electrician's gloves must also be worn when working with high voltage (600 volts +). Non-conductive mats and sleeves must also be used when working with high voltage.

G.4.3 Tools and Equipment:

Employees are required to use non-conductive tools and equipment when working near exposed energized parts. Use fuse pullers when pulling fuses when used near exposed energized parts, ropes, hand lines, tape measures, etc. are made of non-conductive material.

G.4.4 Working Near Overhead Energized Lines:

Unqualified persons may not work within 10 feet of overhead lines of 50kV or less. If the overhead line is more than 50kV the clearance distance is required to be 10 feet plus 4 inches for each 10kV over 50kV.

Qualified persons are required to avoid contact with energized overhead lines up to 300V. From 300V to 750V the clearance distance to be maintained are to be 1 foot. Over 750V, employees are required to maintain at least 10 feet clearance.

The above clearance distances include the possible contact of overhead lines by long dimension tools and equipment such as broom handles, tape measures, elevating platforms, ladders etc.

G.4.5 Illumination:

Illumination is provided for all work on energized parts. Employees may not reach blindly into areas which may contain energized parts.

G.4.6 Confined Work Areas:

Employees are required to use protective barriers, insulating materials etc. when working near energized parts in a confined area. Doors of hinged panels are secured to prevent swinging into an employee.

G.4.7 Conductive Equipment:

Conductive equipment is handled in a manner that does not contact energized parts. Long objects such as conduit, ducts, pipes etc. are handled in such a way as to prevent contact with energized parts.

G.4.8 Portable Ladders:

Only ladders with non-conductive side rails are allowed to be used in the facility.

G.4.9 Apparel:

Conductive material such as rings, necklaces, and other jewelry are not to be worn near energized parts.

G.4.10 Housekeeping and Sanitation Duties:

Only qualified employees are allowed to clean around exposed energized parts such as inside electrical cabinets.

G.5 Procedure for Use of Portable Electrical Equipment

1. Cord & plug connected equipment is not to be raised or lowered by the cord.
2. Power cords & extension cords are visually inspected before each use.
3. Plug adapters that defeat grounding capabilities of cord set must not be used.
4. Do not use tools in wet locations that are not designed for that use.
5. Do not plug or unplug electrical cords with wet hands.
6. Do not cut off or remove ground pin from electrical plugs.

G.6 Circuit Breakers

1. Routine opening and closing of circuit breakers to turn on lights or operate equipment is not done unless the circuit breakers are designed specifically for that purpose.
2. A circuit breaker may not be reset until the cause of the “trip” is determined. However, if the “trip” can be determined to have been caused by an overload rather than a fault, then it may be reset.
3. Only Qualified employees are authorized to reset circuit breakers.

G.7 Alerting Techniques

1. Safety signs and or labels are used to indicate electrical hazards
2. Barricades are used to limit access to areas where exposed electrical equipment may be present such as during remodeling, installation of new equipment, or construction.
3. Attendants may be required if barricades do not provide sufficient warning.

G. 8 Use of Flammable Liquids

When occasional use of flammable liquids occurs in the plant, electric equipment capable of igniting them shall not be used. Some examples include paints, solvents, cleaners and floor surfacing material that are used occasionally.

G.9 Training

The training provided to our employees will be based upon their classification as Qualified or Unqualified persons as it relates to this program. The level of training will be based upon the risk to the employee as it pertains to the actual or potential jobs they may be expected to perform. Unqualified employees will be trained initially upon date of hire; qualified employees will be trained on an annual basis.

Each training program consists of a classroom session and on-the-job exercises. This method of training allows provides relevant information and education for our employees. The training is documented and kept on file in the program binder located in the Central Records Office.

G.9.1 Unqualified Employees:

Those affected employees who are not qualified to work on or near exposed energized parts shall be trained in and familiar with the safety related work practices that apply to their job assignments. These safe work practices include the Use of Portable Electrical Equipment, Circuit Breakers, the Alerting Techniques used in the plant and the Use of Flammable Liquids. In addition, any safe work practices not covered in the above rules but are necessary for their job assignment are addressed in the training.

G.9.2 Qualified Employees:

Employees who are qualified to work on or near exposed energized parts are trained in and familiar with:

1. The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
2. The skills and techniques necessary to determine the nominal voltage of the exposed live parts.
3. The clearance requirements specified in this written program to be maintained from exposed energized parts.

In addition to the above, employees who actually perform work on exposed energized parts are trained in the procedures outlined in this program for working safely on energized parts.

G.10 Recordkeeping

All records related to this program are kept in the program binder located in the Central Records Office. Information required to be maintained includes the list of “Qualified” and “Unqualified” employees as the terms relate to this program. This list is updated as needed.

Training information is kept in the program binder to document the type of information provided and to indicate the on-the-job exercises performed by each employee.

G.11 Program Review

On an annual schedule, the Electrical Safety-Related Work Practices Program is reviewed for compliance. Each review is documented and revisions are made when required. The

review process is coordinated by the Safety Manager. The following form is used to document the review process and initiate any required changes.

G.12 Electrical Safety Related Program Review Form

Person Conducting Review _____

Title: _____

Review Date: _____

1. Designated Person assigned to implement and oversee program?

Yes ____ **No** ____

Comments: _____

2. Designated Person has appropriate skills to oversee program?

Yes ____ **No** ____

Comments: _____

3. Written procedures developed, implemented, and complied with to establish the facility's Electrical Safety-Related Work Practices Program?

Yes ____ **No** ____

Comments: _____

4. "Qualified and Unqualified" persons identified and is the list current?

Yes ____ **No** ____

Comments: _____

5. Employee training provided for "qualified/unqualified" persons (classroom and OJT)?

Yes ____ **No** ____

Comments: _____

6. Safety-related work practices established/enforced for work around energized equipment?

Yes ____ **No** ____

Comments: _____

7. Are lockout/tagout procedures are in place and functional?

Yes ___ No ___

Comments: _____

8. Is appropriate PPE provided and used when required?

Yes ___ No ___

Comments: _____

9. Are the appropriate insulating tools used when working near exposed energized systems?

Yes ___ No ___

Comments: _____

10. Appropriate alerting techniques utilized to warn & protect employees from hazards?

Yes ___ No ___

Comments: _____

11. Are records properly maintained and managed?

Yes ___ No ___

Comments: _____

APPENDIX H: ERGONOMICS MANAGEMENT PROGRAM

H.1 Ergonomic Management Program – Administrative Responsibilities

The (company name) is responsible for the development and implementation of the Ergonomic Management Program at our facility. The intent of this program is to attempt to eliminate, reduce, and avoid exposures to working conditions that may increase the employee's potential for ergonomic related injury or illness.

H.1.1 Ergonomic Management Program Includes:

1. Development and implementation of a written program for the Ergonomic Management Program.
2. Ensure that the Ergonomic Management Team review and analyze injury and illness records.
3. Identify work positions that need quantitative analysis of ergonomic hazards. This is to be achieved by utilizing an Ergonomic Consultant and periodic worksite review by the Ergonomic Management Team.
4. Ensure the Ergonomic Management Team conducts periodic worksite surveys to continually identify ergonomic hazards.
5. Implement engineering and administrative controls to reduce or eliminate ergonomic issues. Engineering and administrative controls will be coordinated by the ergonomics management team.
6. Ensure that training is provided for affected employees, engineers, and maintenance personnel, etc. Document all training and education sessions.
7. Establish a medical management system for early recognition and reporting, evaluation and treatment return to work programs, and monitoring of worksites. This will be done with the assistance of medical professionals utilized for this function.
8. Manage all records required by this program and conduct periodic reviews to ensure compliance. Revise the program as necessary.

H.2 Ergonomic Management Program

H.2.1 Policy:

The goal of the Ergonomic Management Program is to prevent injuries and illnesses by removing their causes. For ergonomics, this goal includes reducing or eliminating worker exposure to ergonomic hazards or risk factors that lead to cumulative trauma disorders (CTDs) and related injuries and illnesses. At our facility, we seek to adapt the job and workplace to the worker by designing tasks within the worker's capabilities and limitations. Experience has shown that instituting programs in ergonomics has significantly reduced the incidence of CTDs and improved productivity.

H.3 Management Commitment and Employee Involvement

Commitment and involvement are complementary and essential elements of a sound safety and health program. Commitment by our management team provides the organizational resources and motivating force necessary to deal effectively with ergonomic hazards. Employee involvement and feedback through clearly established procedures are likewise essential, both to identify existing and potential hazards and to develop and implement effective ways to abate such hazards.

H.3.1 Commitment by Top Management:

The implementation of an effective Ergonomics Program includes a commitment by upper management to provide the visible involvement of top management, so that all employees, from management to line workers, fully understand that our company is seriously committed to this Ergonomic program. An effective program has a team approach, with management leading the team by demonstrating the following:

- ✓ Involvement demonstrated through personal concern for employee safety and health by the priority placed on eliminating Ergonomic hazards.
- ✓ A policy that places safety and health on the same level of importance as production. Our implementation of this policy requires our company to integrate production processes with safety and health concerns to assure that this protection is part of the daily production activity within each facility.

✓Committing to assign and communicate responsibility for various aspects of the Ergonomics Program so that all managers, supervisors, and employees involved know what is expected of them.

✓Commitment to provide adequate authority and resources to all responsible parties, so that assigned responsibilities are met.

✓Commitment to ensure that each manager, supervisor, and employee of our facility is responsible for the Ergonomics and Safety Programs and that they are accountable for carrying out those responsibilities.

H.3.2 Employee Involvement:

Our company provides for and encourages employee involvement in the Ergonomics Program and in projects that affect worker safety and health, including the following:

✓A procedure and training that encourages prompt and accurate reporting of potential CTDs by employees so they can be evaluated and treated if needed.

✓Safety and health committees that receive information on ergonomic problem areas (through the process of worksite analysis), review the data, and make recommendations for corrective action.

✓Ergonomic teams with the required skills (achieved through training) to identify and analyze jobs for ergonomic stress and recommend solutions.

H.4 Ergonomics Management Team

H.5 Typical Ergonomic Team Meeting Agenda

Regular Program Review and Evaluation

Review of Employee Involvement

Written Program Review

Regular Program Review and Evaluation:

Procedures and mechanisms should be developed to evaluate the implementation of the Ergonomics Program and to monitor progress accomplished. Top management should review the program regularly--semiannual reviews are recommended--to evaluate success in meeting its goals and objectives.

1. Report on Worksite Analysis
2. Analysis of trends in injury/illness rates.
3. Employee surveys.
4. Before-and-after surveys/evaluations of job worksite changes.
5. Review of results of plant evaluations.
6. Report on Hazard Prevention and Control Projects
7. Medical Management Update
8. Training and Education Programs

The results of management's review should be a written progress report and program update, which should be shared with all responsible parties and communicated to employees. New or revised goals arising from the review--identifying jobs, process, and departments--should be shared with all workers. Any deficiencies should be identified and corrective action taken.

H.5.1 Written Program:

The written program should be communicated to all personnel, as it encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It should establish clear goals, and objectives to meet those goals, that are communicated to and understood by all members of the organization. The written program should include the earliest feasible implementation dates for completion of each program element.

Managers, supervisors, and employees should review the program frequently to reevaluate goals and objectives and discuss changes.

H.6 Program Elements

The Ergonomics Program at our facility includes four main components:

Worksite Analysis
Hazard Prevention and Control
Medical Management
Training and Education

H.6.1 Worksite Analysis:

Worksite analysis is performed by members of the Ergonomics Management Team. The Ergonomics Management Team has identified problem jobs and risk factors associated with the work place. Our first step has been to determine what jobs and workstations are the source of our greatest problems. Thus, a systematic analysis by the Ergonomics Management Team includes a review of injury and illness records. Worksite analysis is documented and kept with the Ergonomics Management Program file. This review has accomplished the following:

- ✓ Provided information from all existing medical, safety, and insurance records, including the OSHA 300 Log, for evidence of trends in cumulative trauma disorders.
- ✓ Identified and analyzed apparent trends or clusters of ergonomic problems related to particular departments, process units, production lines, job titles, operations, or workstations.

In addition, our Ergonomic Management Team periodically reviews work sites and conducts worker surveys of jobs considered to be "high risk". This process has assisted in targeting specific worksites that have and may cause problems.

For a more detailed analysis and review of work tasks and positions identified as ergonomic problem areas, we have developed checklists and surveys. The checklist and surveys are performed by direct observation, employee interview, or if necessary, videotape review. The analysis is periodically performed and documented by a trained member or members of the Ergonomic Management Team, Medical Management Consultant, and/or by an Ergonomics Consultant. Sample forms are included in this program under the Attachments section.

H.6.2 Risk Factors:

Some typical risk factors for CTDs that are uncovered during analysis of work areas and job functions include:

- ✓excessive repetition/prolonged activities
- ✓forceful exertions, usually with the hands
- ✓pinch grips
- ✓prolonged static postures of body, trunk and/or its extremities
- ✓awkward body posture (reach above shoulders/behind back)
- ✓excessive bending or twisting of the wrist
- ✓continued elevation of the elbow
- ✓continued contact w/work surface (contact w/edge of machines)
- ✓temperature extremes
- ✓inappropriate or inadequate hand tools
- ✓restrictive workstations/inadequate clearances
- ✓vibration from power tools
- ✓improper seating/support

The analysis considers the concept of multiple causation, where the combined effect of several risk factors results in the onset of CTDs. Jobs, operations, or workstations that have multiple risk factors have a higher probability of causing these disorders. Therefore, our worksite analysis focuses on the multiple risk factor probability.

All risk factors within a problem area are identified and proper controls are implemented to eliminate or control each of them. The idea of an ergonomic approach is to make things better than they were before. Incremental improvements in reducing or eliminating some, if not all, risk factors within a problem area will reduce the cumulative risk and the overall level of physical stress for the worker

H.6.3 Hazard Prevention and Control:

Ergonomic hazards are prevented primarily by effective design of a job or job site. Our company has established procedures to correct or control ergonomic hazards using

appropriate engineering, work practice, and administrative controls. These activities are coordinated and supervised by the Ergonomic Management Team, Maintenance Engineer, and Ergonomics Consultant.

Engineering controls are the preferred method of control at this facility. The primary focus of an ergonomic program is to make the job fit the person, not force the person to fit the demands of the job. This is accomplished by redesigning the workstations, work methods, work tools, and work requirements to reduce or eliminate excessive exertion, repetitive motion, awkward postures, and other risk factors.

H.6.4 Engineering Controls:

The first step is to identify the present problems. To do this, we select the jobs with high incidence rates (a "worst first" approach). We observe those jobs; interview and survey the workers and supervisors who perform the job and utilize their suggestions and solutions. We may also videotape jobs; and conduct task analyses. Steps we follow in a task analysis are:

- From the videotape describe the job in a step-by-step manner.
- Identify the risk factors (see the list of risk factors in section II. A.) those parts of the job that are associated with ergonomic problems.
- Propose alternatives that should eliminate or reduce the risk factors.
- Interview workers doing the job, and supervisors about the possible solutions.
- Test and evaluate alternatives where possible.
- Select the most appropriate alternatives.
- Implement chosen alternatives.
- Monitor the effects of the changes.
- Document the changes in the incidence rates.

H.6.5 Principals of Workstation Design:

We attempt to design workstations that accommodate the majority of persons who work on a given job. Because workers vary considerably, it is not adequate to design for limbs,

work piece orientation, work piece holding, and layout. These characteristics of workstations are interdependent. A change in one often affects others.

H.6.6 Static Loading of Muscles:

Static loading causes rapid fatigue. Workstations can contribute to static loading by causing the work to be done in awkward postures or requiring that items be constantly held by the worker. A prime example is where a worker has to hold a tool constantly, even when it is not being used.

H.6.7 Work Activity Height:

Height is especially important to control postural risk. Workers who must stoop and reach are not comfortable and are more likely to become injured. A general guideline or "rule of thumb" for working height has been 2 inches below the elbow for many tasks, with lower heights recommended for working requiring high precision. These "rules of thumb" are, however, a starting point and the working height should be evaluated for the specific task. Note that this is working height and not necessarily work surface height. Work height can be adjusted in three ways. The first and preferred way is to provide an adjustable work surface. The second is to provide a lower work surface and place the work piece in a fixture that raises it to the proper height for that worker.

The last and least desirable way to adjust the working height is to provide a relatively high work surface and provide adjustable platforms or platforms of various sizes for the worker to stand on. This last way is usually the least expensive and most often adopted. It does, however, create a new tripping hazard.

H.6.8 Reach:

The reach at which task components are performed affects the strength, precision capability, stress, and other biomechanical aspects of the worker. Therefore, maximum reach distance should be kept within the normal reaching distance--somewhere between 14 and 18 inches. The distance depends on the difficulty of the task, the forces exerted, and the frequency of the activity. Reaches above the shoulder, behind the worker, and far in front or to the side of the worker should be avoided. To accommodate this, the work piece

should be located close to the worker as should any tools, parts, and other items. This can be accomplished by providing workstations and delivery bins which can accommodate the height and reach limitations of workers of various sizes.

H.6.9 Force Requirements:

Force is reduced or minimized when possible. The worker should not be exerting high forces. Work can be performed more efficiently and more safely by providing a mechanical advantage. If workers are required to exert high forces, the work piece should be located and stabilized such that the forces are optimal and minimized. Force can sometimes be reduced by using fixtures and proper workstation height.

H.6.10 Hard or Sharp Edges:

Hard or sharp edges can be a hazard in a workstation. When the worker's arm or hand repeatedly comes in contact with a hard or sharp edge, damage to the tissues, including nerve or blood vessel damage can result. Control measures include rounding edges, padding edges, or relocating equipment so people will not hit the edges. Contact with thermally conducting work surfaces can be responsible for loss of heat in the hands and arms. This can cause discomfort and, if the wrist and fingers become cold, the tendons and joints become stiff. This may cause symptoms of CTDs to develop.

H.6.11 Proper Seating:

Seating is made available to workers when and where the job permits. This is possible in many jobs where tradition has dictated that standing is the only way to do the job. Sometimes a new look at the job, workstation, and tools will be necessary to identify ways to allow for seated or sit/stand work, but it will result in significantly less fatigue. It is important to provide support for the limbs - both arms and legs. Often, when the arms are provided a comfortable place to rest, the worker will become less fatigued and will be better able to perform accurately and consistently throughout the day. Foot rests for seated workers and rails to allow a variety of standing postures will reduce the stress on the worker.

H.6.12 Work Place Orientation:

Orientation can cause numerous problems, including higher than necessary repetitions, higher than necessary forces, static postures, and awkward postures. Care should be taken to ensure that the work piece is in such a position that the required tasks do not expose the workers to unnecessary hazards. Proper workstation height and proper fixtures and orientation devices can reduce or eliminate this problem.

H.6.13 Work Place Holding:

Properly holding a tool or work piece is a simple solution to ergonomic hazards which is often overlooked. Fixtures that hold the work piece and orient it for ease of work can greatly reduce the stress of the job and often increase productivity. The worker should not have to hold the work piece--mechanical devices do this much better. This is accomplished by providing adjustable fixtures and rotating tables which can reduce stress on the worker because the position of the work piece can be firmly held and easily manipulated.

H.6.14 Layout of a Workstation:

The layout of the workstation has an impact on all of the preceding points of workstation design. A good layout will facilitate the flow of materials and product through the station. It will also make designing for less stressful work easier.

H.6.15 Tool and Handle Design:

Tools and handles increase worker productivity by extending and amplifying abilities. Proper attention is paid to the selection and design of tools and workstation layouts to minimize the risks of CTDs. For any tool, a variety of sizes is available for a variety of workers. The appropriate tool must be used to do a job. Tools and handles should be selected to eliminate or minimize the following risk factors:

- High contact forces and static loading.
- Extreme or awkward joint positions.
- Repetitive finger action.
- Tool vibration.

- Excessive grip strength requirements.

Improper use of and/or poor design of handheld tools can cause damage to the hand and arm that may involve considerable pain and possible disability. The specific conditions that contribute to these ergonomic problems are: (1) awkward hand postures or movements that are repeated many times a day, (2) excessive pressure on the hands and wrists, (3) exertion of force with the hand and wrist in awkward positions, and (4) vibrating tools.

H.6.16 Back Injury Prevention:

While most back disorders result from cumulative trauma or gradual insult to the back over time, some injuries are caused by a sudden excessive load or fall. These disorders are typically the largest single category of all lost-time injuries, and have potentially enormous financial implications. It is now recognized the effective back injury prevention requires an ongoing effort with long term commitment to:

- Redesigning existing workplaces, jobs, and equipment
- Providing training and education for all members of an organization on the causes and means of preventing back injuries as well as proper individual body mechanics.

There are a number of specific risk factors that may act alone or in combination to increase the risk of back disorders in a particular workstation. A list of relevant job and workstation considerations include:

Workplace and workstation layout. The relationship of the position of work surfaces, equipment, tools, and other materials to each other and the employee affects the employee's posture, working height, manual handling body mechanics, and the accompanying frequency and duration of most work actions and movements. The layout should permit the employee to adopt an upright and forward-facing work posture. The majority of tasks should be performed at or near waist height and within easy reach.

Actions and movements. These should not cause undue discomfort and should be performed with control. Manual materials handling should be performed with a balanced

and comfortable posture. Extreme ranges of joint movement should be avoided, especially when the activity is either prolonged or repetitive.

Working posture and work position. Work activities should allow the employee to adopt several different, but safe and healthful working postures. No single posture should be maintained for sustained periods. When possible, work should be arranged so that the employee can adopt either a seated or standing work posture.

Frequency and duration. The risk of injury rises as the frequency and duration of manual handling activities increases for a worker. Whole body fatigue, as well as fatigue localized to certain body parts such as the hands or arms should be minimized.

Load considerations. The degree of risk for a back injury is affected not only by the weight of an object to be handled, but also by its size, shape, symmetry, and ability to be grasped. The position of the object relative to the worker when it is lifted and the location to where it must be placed are also significant factors which contribute to the risk of back injury. These factors are all addressed in the *NIOSH Work Practices Guide for Manual Lifting*, which should be required for anyone responsible for programs to reduce CTDs and overexertion injuries in materials handling. A model of certain lifting tasks is prepared which allows an investigator, after obtaining a few measures of the lifting task, can determine quantitatively if the lifts are acceptable or not. Engineering controls as well as administrative recommendations are specifically addressed to aid the investigator in the effort to reduce back injury problems.

H.6.17 Work Practice Controls:

The Ergonomics Management Program for hazard prevention and control includes procedures for safe and proper work that is understood and followed by managers, supervisors, and workers. Key elements of a good work practice program for ergonomics include proper work techniques, employee conditioning, regular monitoring, feedback, maintenance, adjustments and modifications, and enforcement.

H.6.18 Proper Work Techniques:

A program for proper work techniques, such as the following, includes appropriate training for employees:

- Task activities including work methods that improve posture and reduce physical stress.
- Proper materials handling body mechanics.
- Proper use and maintenance of hand and power tools.
- Correct use of equipment, workstations, and fixtures.

New Employee Conditioning Period. Employees in certain jobs require conditioning or break-in periods. New and returning employees should be gradually integrated into a full workload **as appropriate** for specific jobs and individuals. Employees should be assigned to an experienced trainer for job training and evaluation during the break-in period. Employees reassigned to new jobs should also have a break-in period if needed.

Monitoring. Regular monitoring at all levels of operation helps to ensure that employees continue to use proper work practices. This monitoring should include a periodic review of the techniques in use by the employees and their effectiveness in eliminating or reducing risk factors. A determination of whether the procedures in use are those specified, and if not, it should be determined why changes in the work method have occurred and whether corrective action is necessary.

H.6.19 Personal Protective Equipment:

A potential ergonomic hazard is considered when selecting PPE. Appropriate PPE is provided in a variety of sizes and accommodates the physical requirements of workers and the job, and does not contribute to extreme postures and excessive forces.

H.7 Administrative Controls

A sound, overall ergonomics program includes administrative controls that reduce the duration, frequency, and severity of exposure to ergonomic hazards.

H.7.1 Job Rotation:

Job rotation is used at our facility to alleviate physical fatigue and stress to a particular set of muscles and tendons by rotating employees among other jobs that use different muscle-tendon groups. The job analyses ensure that the same muscle-tendon groups which are

used in the first task are not the same as the muscle-tendon groups used on subsequent tasks.

H.7.2 Facility, Equipment and Tool Maintenance:

The Ergonomic Management Program utilizes a preventative maintenance program for facility, equipment, and tools to minimize ergonomic hazards. This function includes the following measures:

- A preventive maintenance program for mechanical and power tools and equipment, to verify that they are in proper working order and within original manufacturer's specifications. This includes vibration monitoring.
- Performing maintenance regularly and whenever workers report suspected problems. Sufficient numbers of spare tools are available to facilitate regular maintenance.
- Effective housekeeping programs to minimize slippery work surfaces which may cause slips and falls.

H.8 Medical Management

The medical management program for CTDs is essential to the success of our total Ergonomic Program.

A representative from Barnes Care with training in Ergonomics has developed and supervises the Medical Management section of this program. This section will also be supervised by the program coordinator.

The training and background of Barnes Care includes instruction in the prevention, early recognition, evaluation, treatment, and rehabilitation of CTDs, and in the principles of ergonomics and epidemiology, physical assessment of employees, and OSHA recordkeeping requirements.

Each work shift has access to health care providers in order to facilitate treatment, surveillance activities, and recording of information. If, in the event, such personnel are not employed full-time, part-time employment of appropriately trained health care providers or employment of such specialists on a consultative basis will be utilized.

The components of a Medical Management program for the prevention of and treatment of CTDs are:

- Periodic Workplace Walkthrough
- Symptoms Survey
- Identification of Restricted Duty Jobs
- Health Surveillance
- Employee Training and Education
- Early Reporting of Symptoms
- Appropriate Medical Care
- Accurate Recordkeeping
- Periodic Program Evaluation

H.8.1 Periodic Workplace Walkthrough:

In an effective program, health care providers conduct periodic, systematic workplace walkthroughs to remain knowledgeable about operations and work practices, to identify potential restricted duty jobs, and to maintain contact with employees. Health care providers are also involved in identifying risk factors for CTDs in the workplace as part of the ergonomic team.

These walkthrough surveys are conducted periodically as well as whenever a particular job task changes in order to identify any new or increased ergonomic risk factors. A record is kept documenting the date of the walkthrough, area(s) visited, risk factors recognized, and what action was initiated to attempt correcting identified problems. Follow-Up is initiated and documented to ensure corrective action has taken place.

Symptoms Survey:

Symptoms surveys are used to:

- Determine whether CTD problems exist within the facility and to what extent.
- Identify specific jobs or departments where ergonomic problems exist.
- Provide a background disorder rate to evaluate the effectiveness of corrective measures over time.

The strength of the survey approach is in collecting information from workers experiencing cumulative trauma disorder symptoms who may not be reporting their symptoms to their

supervisor or to the company health care provider. Reported pain symptoms by several workers on a specific job indicate the need for further investigation of that job.

H.8.2 Components of the Survey:

Those responsible for the medical management programs develop a standardized measure of the extent of work-related cumulative trauma disorders. (See Putz-Anderson, 1988.)

A survey of employees is conducted to measure employee awareness of work-related CTDs and to report the location, frequency, and duration of discomfort. Body diagrams are used to facilitate the gathering of this information.

In order to encourage employee participation, the surveys do not include employees' personal identifiers (e.g., employee name, social security number). Survey information may include information such as that in the Symptoms Survey Checklist.

The survey is repeated periodically to detect any major change in the prevalence, incidence, and/or location within the facility of reported symptoms.

H.9 Identification of Restricted Job Duties

The objective for assigning a worker to a restricted duty job is to allow the injured muscle-tendon group to rest. Therefore, a restricted duty assignment must be tailored to the individual workers signs and/or symptoms of a CTD. The ergonomist, or similarly qualified person, and health care providers(s) should develop a list of jobs with the lowest ergonomic risk. For such jobs, the ergonomic risk factors and muscle-tendon groups required to perform the job should be described. Access to this information will assist health care providers in recommending assignments to restricted duty jobs. The list should be periodically reviewed and updated.

H.9.1 Health Surveillance:

The development of a health surveillance program is to be pursued until ergonomic problems are recognized, evaluated, and eliminated or controlled. If ergonomic problems are controlled and the number of CTDs remains high, health surveillance is to be continued.

The goal of health surveillance is to identify CTD problems early in their development and ultimately prevent their progression to a more severe, disabling condition. An effective health surveillance program includes the following three elements:

- Baseline Health Assessment
- Post-Conditioning Period Assessment
- Periodic Health Assessment

Data gathered on workers as a result of health surveillance is documented and filed in individual employee medical records. This information is kept for the duration of employment plus 30 years based on the requirement in 29 CFR 1910.20 Access to Exposure and Medical Records.

H.9.2 Baseline Health Assessment:

The purpose of a baseline health assessment is to establish a base against which changes in health status can be compared and evaluated, not to preclude people from performing work. (See NOTE below.) Prior to assignment, all new and transferred workers who are to be assigned to positions involving exposure of a particular body part to ergonomic stress should receive baseline health assessments. The baseline health assessment includes, where possible, a medical and occupational history, and physical examination of the musculoskeletal and nervous systems as they relate to known risk factors in the work environment. The examination may (upon the opinion of medical professional) include inspection, palpation, range of motion (active, passive and resisted), and other pertinent maneuvers of the extremities and back. Laboratory tests, x-rays and other diagnostic procedures are not a routine part of the baseline assessment.

NOTE: Using medical screening tests or examinations to identify workers at risk for developing CTD problems has not been effectively demonstrated.

H.9.3 Post Conditioning Period Assessment:

New and transferred workers assigned to jobs with high ergonomic risk factors or physically intensive jobs should be given the opportunity during an adequate break-in period to condition their muscle-tendon groups prior to working at full capacity. Health care providers should perform a follow-up assessment of these workers after the break-in

period (or after one month, if the break-in period is longer than a month) to determine if conditioning has been successful; whether any reported soreness or stiffness is transient and consistent with normal adaptation to the job or whether it indicates the onset of a cumulative trauma disorder. If a cumulative trauma disorder is identified, appropriate diagnosis and treatment are required.

H.9.4 Periodic Health Assessment:

Periodic health assessments--every 2 to 3 years--may be conducted on all workers who are assigned to positions involving exposure of a particular body part to ergonomic hazards and risk factors (based upon level of risk and exposure). The content of this assessment is to be similar to that outlined for the baseline.

H.9.5 Employee Training and Education:

Health care providers participate in the training and education of employees, including supervisors and other plant management personnel, on the different types of CTDs and means of prevention, causes, early symptoms and treatment of applicable conditions. This information is reinforced during workplace walkthroughs and the individual health surveillance appointments. All new employees are given such education during orientation. This demonstration of concern by the health care providers and the distribution of information facilitate the early recognition of CTDs prior to the development of more severe and disabling conditions and increase the likelihood of compliance with prevention and treatment.

H.9.6 Early Reporting of Symptoms:

Employees are encouraged by health care providers and supervisors to report early signs and symptoms of CTDs to the in-plant health facility. This allows for timely and appropriate evaluation and treatment without fear of discrimination or reprisal. It is important to avoid any potential disincentives for employee reporting, such as limits on the number of times an employee may visit the health unit.

H.9.7 Accurate Recordkeeping:

The Department of Labor distinguishes between occupational illnesses and occupational injuries. Occupational injuries are caused by instantaneous events in the work environment while occupational illnesses develop over a period of time from repeated exposure to work environment factors.

H.9.8 Occupational Illnesses:

Under the OSH Act, all work-related illnesses must be recorded on the OSHA 200 form, even if the condition is in an early stage of development. Diagnosis of these conditions may be made by a physician, registered nurse, or by a person who, by training or experience, is capable of making such a determination. If the condition is "diagnosed or recognized" as work-related, the case must be entered on the OSHA 200 form within six workdays after detection.

Most conditions classified as "illness cumulative trauma disorder" will be recorded on the OSHA 200 form as an occupational illness under the "7F" column, which are "disorders associated with repeated trauma." These disorders are caused, aggravated, or precipitated by repeated motion, vibration, pressure, or awkward postures.

In order for the illness to be recordable, the following criteria must be met:

- The illnesses must be work-related. This means that exposure at work either caused or contributed to the onset of symptoms, or aggravated existing symptoms to the point that they meet OSHA recordability criteria. Simply stated, unless the illness was caused solely by a non-work-related event or exposure off-premises, the case is presumed to be work-related. Examples of work tasks or working conditions that are likely to elicit a work-related CTD are as follows:
 - Excessive repetition/prolonged activities.
 - Forceful exertions, usually with the hands.
 - Pinch grips.
 - Prolonged static postures of the body, trunk and/or its extremities.

- Awkward postures of the upper body, including reaching above the shoulders or behind the back.
- Excessive bending or twisting of the wrist.
- Continued elevation of the elbow.
- Continued physical contact with work surfaces: e.g., contact with edges of machines.
- Temperature extremes.
- Inappropriate or inadequate hand tools.
- Restrictive workstations--inadequate clearances.
- Vibration from power tools.
- Improper seating/support.
- A CTD must exist. There must be either physical findings, OR subjective symptoms and resulting action. Namely, there must be either:
 - At least one physical finding (e.g., positive Tinel's, Phalen's, or Finkelstein's test; or swelling, redness, or deformity; or loss of motion); OR
 - At least one subjective symptom (e.g., pain, numbness, tingling, aching, stiffness, or burning), and at least one of the following: (1) medical treatment (including self-administered treatment if made available to employees by their employer); (2) lost workdays (includes restricted work activity); or (3) transfer/rotation to another job.

If the above criteria are met, then a CTD exists that must be recorded on the OSHA 200 form.

A case is considered to be complete once there is complete resolution of the signs and symptoms. After resolution of the problem, if signs or symptoms recur, a new case is established and thus must be recorded on the OSHA 200 form as such. Further-more, failure of the worker to return for care after 30 days indicates symptom resolution. Any visit to a health care provider for similar complaints after the 30-day interval implies re-injury or re-exposure to a workplace hazard and would represent a new case.

H.9.9 Occupational Injuries:

Injuries are caused by instantaneous events in the work environment. To keep recordkeeping determinations as simple and equitable as possible, back cases are classified as injuries even though some back conditions may be triggered by an instantaneous event and other develop as a result of repeated trauma. (See BLS Recordkeeping Guidelines, 1986 or later editions as published.)

Any occupational injury involving medical treatment, loss of consciousness, restriction of work or motion, or transfer to another job is to be recorded on the OSHA 200 form. Refer to the BLS guidelines for a definition of "medical treatment."

H.10 Periodic Program Evaluation

The Ergonomics Management Team and Health care providers periodically review health care facility sign-in logs, OSHA 200 forms, and individual employee medical records to monitor trends for CTDs in the plant. This ongoing analysis may be done in addition to the "symptoms survey" (described previously in this Section) in order to monitor trends continuously and to substantiate the information obtained in the periodic symptoms survey. The analysis is to be done by department, job title, work area, etc.

The information gathered from the periodic symptoms survey helps to identify areas or jobs where potential CTDs exist. This information may be shared with anyone in the plant, since employees' personal identifiers are not solicited.

The analysis of medical records (e.g., sign-in logs and individual employee medical records) may reveal areas or jobs of concern, but it may also identify individual workers who require further follow-up. The information gathered while analyzing medical records

will be of a confidential nature; thus care must be exercised to protect the individual employee's privacy.

The information gained from this ongoing analysis and symptoms survey is to help determine the effectiveness of the various programs initiated to decrease CTDs in the plant.

H.11 Training and Education

The last major program element for an effective Ergonomic Program is training and education. The purpose of training and education is to ensure that employees are sufficiently informed about the ergonomics hazards to which they may be exposed and thus are able to participate actively in their own protection. Employees are adequately trained about the employer's Ergonomics Program.

Our training program includes the following individuals:

- All affected employees.
- Engineers and maintenance personnel.
- Supervisors.
- Managers.

The program is designed and implemented by qualified persons. Appropriate special training has been provided for personnel responsible for administering the program.

The program is presented in language and at a level of understanding appropriate for the individuals being trained. It provides an overview of the potential risk of illnesses and injuries, their causes and early symptoms, the means of prevention, and treatment.

H.11.1 Training for Affected Employees:

The training program consists of both general and specific job training:

General Training: Employees who are potentially exposed to ergonomic hazards are given formal instruction on the hazards associated with their jobs and with their equipment.

Training also includes information on the varieties of CTDs, what risk factors cause or contribute to them, how to recognize and report symptoms, and how to prevent these disorders. This instruction is to be repeated for each employee as necessary.

Job Specific Training: New employees and reassigned workers receive an initial orientation and hands-on training prior to being placed in a full-production job. Training

lines may be used for this purpose. Each new hire receives a demonstration of the proper use of, and procedures for, all tools and equipment. The initial training program includes the following:

- Care, use, and operating techniques for tools.
- Use of special tools and devices associated with individual workstations.
- Use of appropriate guards and safety equipment, including personal protective equipment.
- Use of proper lifting techniques and devices.

H.11.2 Training for Supervisors:

Supervisors are responsible for ensuring that employees follow safe work practices and should receive appropriate training to enable them to do this. Supervisors therefore undergo training comparable to that of the employees, and additional training that will enable them to recognize and refer to the health care provider early signs and symptoms of CTDs, to recognize and correct hazardous work practices, and to reinforce the employer's Ergonomic Program, especially through the ergonomic training of employees as may be needed.

H.11.3 Training for Managers:

Managers are aware of their safety and health responsibilities and receive sufficient training pertaining to ergonomic issues at each workstation and in the production process as a whole so that they can effectively carry out their responsibilities.

H.11.4 Training for Maintenance Personnel:

Plant engineers and maintenance personnel should be trained in the prevention and correction of ergonomic hazards through job and workstation design and proper maintenance, both in general and as applied to the specific conditions of the facility.

H.12 Workstation Checklist

1. Does the working space allow for a full range of work movements?
2. Are mechanical aids and equipment provided where feasible?
3. Is the work surface height proper and adjustable?
4. Can the work surface be tilted or angled?
5. Is the workstation designed to minimize or eliminate:
 - ✓ twisting at the waist?
 - ✓ reaching above the shoulder?
 - ✓ bending at the waist?
 - ✓ static muscle loading?
 - ✓ extension of the arms?
 - ✓ bending or twisting of the wrist?
 - ✓ elevation of elbows?
6. Do the employees have the option to vary their posture?
7. Are the employees hands or arms subjected to pressure from sharp edges on work surfaces?
8. Is an armrest provided where needed?
9. Is a footrest provided where needed?
10. Is the floor surface irregular, slippery, or sloping?
11. Are cushioned floor mats provided for workers who are required to stand for long periods?
12. Where chairs or stools are provided are they easily adjustable and suited to the task?
13. Is the workplace temperature too hot or too cold?
14. Are all task requirements visible from comfortable positions?
15. Is there a preventive maintenance program for mechanical aids, tools, and other equipment?

H.13 Task Analysis Checklist

1. Does the design of the task adequately minimize:
 - ✓ twisting?
 - ✓ bending?
 - ✓ crouching?
 - ✓ reaching?
 - ✓ bending or twisting of the wrist?
 - ✓ extension of arms?
 - ✓ elevation of elbows?
 - ✓ static muscle loading?
 - ✓ clothes wringing motions?
 - ✓ finger pinch grip?
2. Are mechanical devices used when necessary?
3. Can the task be done with either hand?
4. Can the task be done with two hands?
5. Are push-pulling forces involved?
6. Are the required forces acceptable?
7. Are the materials handled:
 - ✓ slippery?
 - ✓ bulky?
 - ✓ awkward?
 - ✓ sharp?
8. Are good handholds provided on containers?
9. Are jigs, fixtures and vises in use where needed?
10. Can the job be done without gloves?
11. When gloves are needed are they of proper size and composition?
12. Does the task involve contact with sharp edges?
13. Are foot pedals necessary or needed?
14. Are push buttons necessary or needed, and of proper design?
15. Does personal protective equipment impede the task?

H.14 Hand Tool Analysis Checklist

1. Are tools selected to avoid:
 - ✓ excessive vibration?
 - ✓ excessive forces?
 - ✓ bending or twisting of the wrist?
 - ✓ finger pinch grip?
 - ✓ problems associated with trigger finger?
 - ✓ excessive torque?

2. Are tools powered where necessary and feasible?

3. Are the tools evenly balanced?

4. Are tools counterbalanced when heavy?

5. Does the tool allow adequate visibility of the work?

6. Does the tool grip/handle become slippery during use?

7. Are the tools equipped with:
 - ✓ handles of proper diameter?
 - ✓ handles that do not end in the palm area?
 - ✓ handles of textured non-conductive material?

8. Are different handle sizes available to fit a wide range of hand sizes?

9. Does the tool handle dig into the palm of the hand?

10. Can the tool be used safely with gloves?

11. Can the tool be used by either hand?

12. Is there a preventive maintenance program to keep tools operating as designed?

13. Have employees been trained:

- ✓ in the proper use of tools?
- ✓ when and how to report problems with tools?
- ✓ in proper tool maintenance?

14. Are high rates of repetitive motion avoided by:

- ✓ job rotation?
- ✓ job enlargement?
- ✓ self pacing?
- ✓ sufficient rest pauses?
- ✓ adjusting the job to the skill level of the worker?

15. Are high rates of repetitive motion promoted by:

- ✓ incentive programs?
- ✓ production requirements?
- ✓ assembly line rates?

16. Is the employee trained in:

- ✓ proper work practices?
- ✓ when and how to utilize adjustments?
- ✓ signs and symptoms of potential physical problems?

H.15 Materials Handling Checklist

1. Is the weight(s) to be handled excessive?

2. If so, can it be reduced?

3. Are distances that materials are moved minimized?

4. Is the distance between the object and the body minimized?

5. Are walking surfaces:
 - ✓ level?
 - ✓ wide enough?
 - ✓ clean?
 - ✓ dry?
 - ✓ visible?

6. Are objects moved:
 - ✓ difficult to grasp?
 - ✓ unstable?
 - ✓ awkward?
 - ✓ slippery?

7. Are there handholds on these objects?

8. Are gloves required, and if so, are proper sizes available?

9. Is the proper footwear being utilized?

10. Is there enough room to maneuver?

11. Do objects need to be placed accurately or precisely?

12. Can mechanical devices be employed?
13. Are working surfaces adjustable to optimal handling heights?
14. Does material handling involve:
- ✓ movements below knuckle height?
 - ✓ movements above shoulder height?
 - ✓ static muscle loading?
 - ✓ sudden movements during handling?
 - ✓ twisting at the waist?
 - ✓ excessive reaching?
15. Is help available for heavy or awkward lifts?
16. Are highly repetitious material handling tasks:
- ✓ paced by machine or conveyor?
 - ✓ spurred by piece rates or incentive programs?
17. Are high rates of repetition avoided by:
- ✓ job rotation?
 - ✓ job enlargement?
 - ✓ self pacing?
 - ✓ sufficient rest pauses?
18. Are high pushing or pulling forces involved?
19. Is the employee's vision obscured during the handling task?
20. Is there a preventive maintenance program for mechanical aids and associated equipment?
21. Are workers trained in correct handling and lifting procedures for their specific jobs?

H.16 VDT Workstation Checklists

1. Does the workstation lend itself to proper posture considerations such as:

- ✓ thighs horizontal?
- ✓ lower legs vertical?
- ✓ feet flat on floor or foot rest?
- ✓ wrists neutral or slightly extended?

2. Does the chair in use:

- ✓ adjust easily?
- ✓ have a padded seat with a rounded front?
- ✓ have a backrest which is adjustable?
- ✓ provide lumbar support?
- ✓ have casters?

3. Is the keyboard surface:

- ✓ height adjustable?
- ✓ tilt adjustable?

4. Is the keyboard detachable?

5. Does keying require minimal force?

6. Does the thickness of the keyboard affect wrist posture?

7. Is there an adjustable document holder?

8. Are arm rests provided where needed?

9. Are glare and reflections avoided?

10. Do the VDTs have brightness and contrast controls?

11. Is there proper distance between eyes and work?
12. Is there sufficient space for knees and feet?
13. Is the workstation biased toward right or left handed activity?
14. Are adequate rest breaks provided for task demands?
15. Are high stroke rates influenced by:
- ✓ incentive systems?
 - ✓ work flow?
 - ✓ job design?
 - ✓ other pressures?
16. Are high stroke rates avoided by:
- ✓ job rotation?
 - ✓ job enlargement?
 - ✓ self pacing?
 - ✓ adjusting the job to the skill of the worker?
 - ✓ sufficient rest pauses?
17. Are employees trained in:
- ✓ proper postures?
 - ✓ proper work methods?
 - ✓ when and how to adjust their workstation?
 - ✓ how to seek assistance with concerns?

H.17 Symptoms Survey Checklist

Symptoms Survey: Ergonomics Program Date: _____

Plant: _____ Dept#: _____ Job#: _____

Job Name: _____ Years: _____ Months: _____

Shift: _____ Supervisor: _____ Hours

work/week: _____ Time on this job: _____ Other jobs in the last 2 weeks: _____

Have you had any pain or discomfort during the last year?

Yes _____ No _____ (If No, stop here)

Complete a separate page for each area that bothers you.

Check area: Neck _____ Shoulder _____ Elbow/Forearm _____ Hand/Wrist _____

Fingers _____ Upper back _____ Lower Back _____ Thigh/Knee _____

Lower leg _____ Ankle/Foot _____

1. Please put a check by the word(s) that best describe your problem:

_____ Aching _____ Numbness (asleep) _____ Tingling _____ Burning

_____ Pain _____ Weakness _____ Cramping _____ Swelling _____ Other

_____ Loss of color _____ Stiffness

2. When did you first notice the problem? _____ (month) _____ (year)

3. How long does each episode last? _____

4. How many separate episodes did you have in the last year? _____

5. What do you think caused the problem? _____

6. Have you had this problem in the last 7 days? _____ yes _____ no

7. How would you rate this problem? None 1 2 3 4 5 6 7 8 9 10 Unbearable

8. Have you had medical treatment for this problem? _____ yes _____ no

9. How much time have you lost in the last year because of this problem? _____ days

10. How many days in the last year were you on restricted or light duty because of this problem? _____ days

11. Please comment on what you think would improve your symptoms. _____

Definitions

Cumulative trauma disorder is the term used for health disorders arising from repeated biomechanical stress due to ergonomic hazards. Other terms that have been used for such disorders include "repetitive motion injury", "occupational overuse syndrome," and "repetitive strain injury." CTDs are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and the related bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck, and back. The more frequently occurring occupationally induced disorders in this class include carpal tunnel syndrome, epicondylitis (tennis elbow), tendonitis, tenosynovitis, synovitis, stenosing tenosynovitis of the finger, DeQuervain's disease, and low back pain.

Ergonomic hazards refer to the workplace conditions that pose a biomechanical stress to the worker. Such hazardous workplace conditions include, but are not limited to, faulty workstation layout, improper work methods, improper tools, excessive tool vibration, and job design problems that include aspects of work flow, line speed, posture and force required, work/rest regimens, and repetition rate. They are also referred to as "stressors."

Ergonomic risk factors are conditions of a job, process, or operation that contribute to the risk of developing CTDs. Examples include repetitiveness of activity, force required, and awkwardness of posture; for further discussion, see Section II.A. Risk factors are regarded as synergistic elements of ergonomic hazards which must be considered in light of their combined effect in inducing CTDs. Jobs, operations, or workstations that have multiple risk factors will have a higher probability of causing CTDs, depending on the relative degree of severity of each factor.

Ergonomics team refers to those responsible for identifying and correcting ergonomic hazards in the workplace, including ergonomic professionals of other qualified persons, health care providers, engineers and other support personnel, plant safety and health personnel, managers, supervisors, and employees.

Ergonomist or ergonomics professional means a person who possesses a recognized degree or professional credentials in ergonomics or a closely allied field (such as human factors engineering) and who has demonstrated, through knowledge and experience, the ability to identify and recommend effective means of correction for ergonomic hazards in the workplace.

Health care provider is a physician who specializes in occupational medicine, or a registered nurse specializing in occupational health, or other health personnel such as licensed practical nurses (LPNs) working under the supervision of a physician or registered nurse. Health care providers should have the training outlined in Section II.C., "Medical Management."

Qualified person means one who has thorough training and experience sufficient to identify ergonomic hazards in the workplace and recommend an effective means of correction. An example would be a plant engineer fully trained in ergonomics.

Static loading refers to a prolonged or sustained exertion with particular body part, where the sustained exertion is performed without movement of the particular body part. For example, grasping a hand tool for an extended period of time would be considered a static grasp exertion. Working continuously with the elbows elevated would be considered static loading of the shoulders since the shoulder muscles would be contracting to keep the elbows elevated.

Screening Tests

Positive Tinel's sign: Gentle tapping over the median nerve at the wrist resulting in pain, tingling, or numbness in the median nerve distribution.

Positive Finkelstein's test: Ulnar deviation of the hand with the thumb flexed against the palm and the finger flexed over the thumb. Severe pain results at the radial styloid due to stretching of the abductor pollicis longus and extensor pollicis brevis.

Positive Phalen's test: Unforced, complete flexion of the wrist for 60 seconds resulting in pain, numbness, or tingling in the median nerve distribution.

APPENDIX I: HAZARD COMMUNICATION PROGRAM

I.1 Hazard Communication Program – Administrative Responsibilities

I.1.1 Purpose:

The Hazard Communication program for the (company name) facility is intended to address the issue of evaluating the hazards associated with chemicals used and stored in the workplace. The process includes the responsibility of communicating hazard information and appropriate protective measures to employees.

I.1.2 Scope:

The (company name) Hazard Communication program applies to any hazardous or potentially hazardous chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

I.1.3 Responsibility:

The (Job Function) for (company name), has been assigned the responsibility of development and implementation of this program. Administrative responsibilities include:

1. Development, implementation, and maintenance of the Hazard Communications Program.
2. Developing and maintaining a list of chemicals used in the workplace.
3. Proper labeling of chemical containers and piping systems, assuring that labels are maintained in a legible manner.
4. Proper storage and handling of chemicals in the workplace to ensure the safety and health of employees.
5. Collection and availability of Material Safety Data Sheets to provide employees with important hazard information.
6. Develop and implement initial training and retraining programs for all associates and shift coaches regarding the hazards of chemicals and protective measures.

7. Develop procedures to inform associates of the hazards associated with non-routine tasks.
8. Develop procedures to inform contractors of hazardous chemicals they may be and obtain information from contractors concerning hazardous chemicals they introduce into the facility.
9. Maintain records of training, material safety data sheets, and correspondence with suppliers.
10. Review the Hazard Communication program at least annually to ensure it is current and in compliance with all regulations.

I.2 Hazard Communication Program

This program applies to all work operations where employees, temporary employees, and contractors, may be exposed to hazardous chemicals under normal working conditions or during an emergency situation.

Our employees are informed of the hazardous chemicals in the work place, safe handling procedures, personal protective equipment, and the health effects as a result of exposure to chemicals. Employee training also explains the hazards associated with non-routine tasks and the hazards associated with chemicals in unlabeled pipes.

I.3 Job Classification with Exposure to Hazardous Chemicals

Job Classification	Work Area

I.4 List of Hazardous Chemicals

A list of hazardous chemicals, known to be present in the work place is maintained for reference. The hazardous chemical list is available to employees and can be found in the Material Safety Data Sheet file.

The list of chemicals used and stored at this facility is included in the MSDS file binder and up-dated periodically by the Safety Manager. Separate chemical lists are available for each work area and each list is included in the work area specific MSDS file and available to all employees for their review. A copy of the Hazard Communication program is filed with the MSDS binder to ensure availability.

The list of chemicals for our facility is organized to comply with the specific federal requirement indicated in the Hazard Communication standard. The list is used to organize each binder containing the Material Safety Data Sheets (MSDS) and also serves as the table of contents for organizing MSDS. The list is also used as an inspection form to determine if any chemicals are present in the work place that have not been accounted for in the MSDS file.

I.5 Material Safety Data Sheets

The Safety Manager is responsible for maintaining Material Safety Data Sheets (MSDS) for hazardous chemicals known to be in the work place. MSDS's are readily available in each work area. Only chemicals approved by the shift coach may be obtained for use at our facility.

A list of chemicals and a copy of this Hazard Communication program is provided in the following locations, supplying employees with specific chemical hazard information.

Location of Chemicals	Location of Chemicals

I.6 Labels and Other Forms of Warning

We will ensure that all containers of hazardous chemicals are properly labeled. To comply with this section, labels shall provide at least the following information:

- ❖ Name and Address of manufacturer, importer or distributor.
- ❖ Chemical Identity.
- ❖ Appropriate Hazard Warnings.

Employees responsible for receiving items into the facility will confirm that hazardous chemicals shipped to this location are properly labeled when received. Any container that is not properly labeled is refused and returned to the supplier.

Damaged or illegible labels are replaced as needed during plant safety inspections.

I.6.1 Secondary Use Containers:

Hazardous chemicals transferred from a labeled container to a portable container must be labeled to indicate the name of the chemical and the hazard warning.

I.6.2 Hazardous Chemicals Transferred by Piping Systems:

Pipes or piping systems containing hazardous chemicals are labeled as a good safety practice to inform employees of the contents of the piping system.

I.7 Training

All employees with exposure to hazardous chemicals receive training when first employed, when new chemical hazards are introduced into their work area, when employees change job responsibilities, and on an annual basis. In addition to the annual refresher training, retraining is required when chemical hazards in the work area change or when new chemical hazards are introduced into the work place. Training programs include the following information and topics:

- ❖ Summary of the standard and this written program

- ❖ Chemical and physical properties of hazardous materials (e.g., flash point, reactivity) and methods that can be used to detect the presence or release of chemicals (including chemicals in unlabeled pipes).Chemical Identity.
- ❖ Physical hazards of chemicals (e.g., potential for fire, explosion, etc.).
- ❖ Health hazards, including signs and symptoms of exposure, associated with exposure to chemicals and any medical condition known to be aggravated by exposure to the chemical.
- ❖ Procedures to protect against hazards (e.g., personal protective equipment required, proper use and maintenance; work practices or methods to assure proper use and handling of chemicals; and procedures for emergency response).
- ❖ Work procedures to follow to assure protection when cleaning hazardous chemical spills and leaks.
- ❖ Where MSDS's are located, how to read and interpret the information on both labels and MSDS, and how employees may obtain additional hazard information.

I.8 Non-Routine Tasks

If and when facility employees are required to perform hazardous non-routine tasks (i.e. painting, pesticide application, entering confined spaces, etc.), specific training sessions are conducted to inform employees of the hazardous chemical exposures they are about to face. Training and information covers all required elements and explains the proper precautions required to eliminate or avoid exposure.

A non-routine task is a function employees may occasionally be asked to perform but is not included in their regular job description. The reason for the inclusion of non-routine tasks in the hazard communication standard is that sometimes employees assigned to these tasks have not been properly trained. The performance of these tasks may involve the use or

exposure to hazardous chemicals in a hostile environment or the performance of non-routine tasks may require wearing unfamiliar personal protective equipment (e.g., positive pressure respiratory protection).

These tasks have been analyzed for hazards and training is provided for employees assigned to perform the work.

Non-Routine Tasks	Non-Routine Tasks

I.9 Portable Containers

Portable containers are usually smaller containers such as a one or five gallon bucket or spray bottle used by employees at individual work stations. Chemicals are transferred to the portable container for more convenient use and handling. Portable containers are selected based on chemical type and are designed to withstand the affects of the various chemicals used at this location.

Portable containers used by employees are labeled to indicate the name of the chemical and the particular hazard warning. Chemical containers shipped to our facility must be labeled to indicate the contents of the container, name and address of manufacturer, appropriate hazard warnings, and all other required information.

I.10 Department Purchasing Policy

All received chemicals used at our facility for production, cleaning procedures and maintenance must be rigidly controlled. Failure to do so may result in a serious safety and health risk to our employees. In order to prevent the entry of any unapproved chemical into our facility, all chemicals must be approved before shipment to this location.

Unless formally approved, no chemical may be considered for receipt. Please contact facility management for more information concerning chemical approval.

I.11 Contractors

Contractors are advised of chemical hazards that may be encountered during their work at our facility. The member of management that has obtained the services of the outside contractor serves as the contact person for the contractor. The contact person provides the contractor with information necessary to inform the contractor's employees of hazards in the work area.

The labeling system and requirements for identifying hazardous chemicals is explained to the contractor by the contact person. The contractor is notified of the availability and location of MSDS's.

Additionally, each contractor bringing chemicals on-site shall provide the safety manager with a list of hazard chemicals and copies of MSDS's for those chemicals.

I.12 Procedure for Contractor's

1. Notify the company awarded the contract that it shall be required to inform facility management of any chemicals used at our facility and to provide the following information:
 - ❖ MSDS for each chemical brought into our facility.
 - ❖ A description of the labeling system used by the contractor.
 - ❖ A description of precautions needed to protect employees during the contractor's normal operations and in foreseeable emergencies.
2. The following information is provided to the contractor selected to perform work in or near areas where hazardous chemicals are located:
 - ❖ A copy of this Hazard Communication Program.
 - ❖ A copy of the MSDS for each hazardous chemical used in or near the area.

- ❖ A description of the labeling system in use at this facility.
- ❖ A description of precautions taken to protect the contractor's employees during normal operations and in foreseeable emergencies.
- ❖ A description of the evacuation routes from the plant.

I.13 Recordkeeping and Program Review

All records specific to the implementation of the Hazard Communication program will be maintained and kept on file. Training records and training information is documented to verify that our employees have been given the necessary information to avoid exposure to hazardous chemicals.

Material Safety Data Sheets (MSDS) and correspondence requesting hazard information from various suppliers is kept on record to indicate the process of compliance. MSDS are kept in binders located in various plant locations for employee information.

Correspondence between our facility and chemical suppliers will be kept in vender specific files and in the MSDS file. Hazard information (MSDS) specific to contractors will be kept with the hazard information made available to all plant employees.

The program is reviewed on an annual basis to ensure compliance with all requirements.

The program evaluation form included in the attachments section of this program and the essential steps are used as a set of criteria during review. The review document is kept on file for verification.

I.14 Hazard Communication Review Checklist

	<u>Yes</u>	<u>No</u>
1. List all of the hazardous chemicals in the facility.	_____	_____
2. A MSDS for each hazardous chemical in use.	_____	_____
3. Developed a system to ensure that all incoming hazardous chemicals are labeled.	_____	_____
4. Reviewed each MSDS to be sure it is complete. (Review is done by the program coordinator)	_____	_____
5. MSDS are available where necessary.	_____	_____
6. Developed a written Hazard Communication Program.	_____	_____
7. Developed a method to communicate hazards to employees, contractors and others.	_____	_____
8. Informed employees of protective measures for hazardous chemicals used in the workplace.	_____	_____
9. Alerted employees to other forms of warning that may be used.	_____	_____

I.15 Sample Letter Requesting a MSDS

Date

Company

Address

City, State, Zip

Dear Sir/Madame:

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) requires employers be provided Material Safety Data Sheets (MSDS) for all hazardous substances used in their facility, and to make these MSDS available to employees potentially exposed to these hazardous substances.

We request a copy of the MSDS for your product listed as Stock Number _____. We did not receive an MSDS with the initial shipment of _____ we received from you on (*date*). We also request any additional information, supplemental MSDS or any other relevant data that your company or supplier has concerning the safety and health aspects of this product. Please consider this letter a standing request to your company for any information concerning the safety and health aspects of using this product that may become known in the future.

The MSDS and any other relevant information should be sent to us as soon as possible. Delays in receiving the MSDS information may prevent use of your product. Please send the requested information to Mr./Ms. _____, Title, Company, City, State, Zip.

Your cooperation is greatly appreciated. Thank you for your timely response to this request. If you have any questions concerning this matter, please contact Mr./Ms. _____ at phone #.

Sincerely,

Name, Title

Company

APPENDIX J: HEARING CONSERVATION PROGRAM

J.1 Hearing Conservation Program – Administrative Responsibilities

J.1.1 Application:

The Hearing Conservation Program for (company name), has been established to prevent the possibility of work related noise induced hearing loss among our employees. The program is an outline indicating how (company name) intends to comply with the requirements in the general industry standard entitled Occupational Noise Exposure.

J.1.2 Scope:

All employees whose noise exposures equal or exceed an 8-hour time-weighted-average (TWA) of 85 dBA must be included in the hearing conservation program. Although the 8-hour TWA permissible exposure is 90 dBA, a hearing conservation program becomes mandatory at an 8-hour TWA exposure of 85 dBA.

Development, implementation and administration of this safety and health program includes the following responsibilities:

1. The coordination and supervision of workplace noise exposure monitoring. This is the method of determining how high the noise levels are in the work area.
2. Identification of employees working in high noise level areas and who will therefore, be included in the Hearing Conservation Program.
3. The coordination and supervision of audiometric testing program. The audiometric testing program is the hearing tests that establish employee baselines exams and annual hearing tests.
4. Supervision of hearing protector selection. Ear plugs are provided to our employees in a variety of sizes and types and at no charge.
5. Development of policies and requirements relating to the use of hearing protectors.
6. Supervision of employee training and information programs that will be conducted on an annual basis.
7. Coordination and supervision of recordkeeping requirements. This will include maintenance of the OSHA 200 log as it relates to hearing loss illnesses, audiometric test results, workplace noise monitoring, etc.

J.2 Noise Exposure Monitoring

The Hearing Conservation Program requires employers to monitor noise exposure levels in a manner that will accurately identify employees who are subjected to an 8-hour TWA exposure of 85 dBA or more. The exposure measurement must include all noise within an 80-130 dBA range. Based upon workplace noise evaluations, noise exposure levels have been determined and are summarized in additional reports. The results of this evaluation indicate workplace noise exposure levels require the implementation of this program.

J.2.1 Re-monitoring for Workplace Noise Exposure Levels:

The Hearing Conservation Program requires that when there are significant changes in machinery or production processes that may result in increased noise levels, re-monitoring must be conducted to determine whether additional employees need to be included in the hearing conservation program.

J.2.2 Follow-up Noise Exposure Monitoring:

Noise exposure monitoring will be redone when changes occur in the workplace that may affect noise exposure levels.

When new equipment is installed or removed, when equipment and structural modifications take place, when any change occurs that may affect the noise exposure levels; noise monitoring will be redone.

Follow-Up noise exposure monitoring will be conducted and subsequent information will be added to the industrial hygiene report as it is collected. The new data will be used to determine if any additional employees will need to be included in the Hearing Conservation Program.

J.2.3 Workplace Exposure Levels:

Based on the work place noise exposure monitoring data, employees in the following job positions and work areas will be included in the Hearing Conservation Program.

Job Classification	Work Area

J.2.4 Employee's Opportunity to Observe Noise Exposure Monitoring:

During the noise level survey, employees were given the opportunity to observe noise exposure monitoring as it was performed. Noise exposure monitoring is used to determine the noise levels at an eight hour time weighted average. Exposure monitoring also indicates noise levels in various work areas as employees perform their routine job assignments.

J.3 Audiometric Testing

Annual audiometric testing (hearing tests) is performed by an audiometric testing company that specializes in providing hearing tests. This firm will review all audiograms and refer employees with questionable audiograms to management at our facility.

New employees in job positions involved in the hearing conservation program will be provided with audiometric examinations within the first six months of employment or within the first year if we utilize a mobile test van. When the test van is used, we will utilize the mobile test van exception that allows us to provide the base line hearing test for new employees within the first year of their employment.

When utilizing the mobile test van exception, hearing protection will be mandatory for all employees working in high noise areas after the first six months of employment.

Employees will be asked to minimized exposure to high noise levels for 14 hours prior to obtaining the baseline exam. This is done to make sure accurate hearing tests are

achieved. Exposure to high noise levels prior to the hearing tests may result in temporary nerve deafness and give misleading or incorrect test results.

J.3.1 Standard Threshold Shift:

A standard threshold shift (STS) in hearing means that the tone used during the hearing tests must be increased at least 10dBA (as compared to the hearing tests taken the year before) in order for the employee to hear the tone.

If a standard threshold shift (STS) or an average shift in either ear of 10 dB or more at 2000, 3000 and 4000 Hz is identified:

- a. the employee will be notified of the threshold shift within 21 days of this determination**
- b. the employee will be informed of the need for further evaluation if a medical problem is suspected**
- c. the use of hearing protection will continue to be enforced**
- d. the employee will be refitted or retrained in the use of hearing protection**

Testing will be conducted with equipment that meets the specifications of the most recent ANSI standard that governs audiometric testing. Additionally, a current certificate of calibration will be obtained prior to hearing tests are conducted. The tests will be pure tone, air conduction, hearing threshold examinations at test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hz. Each ear will be tested separately.

The functional operation of the audiometer will be checked by biological calibration prior to each day's use. An acoustic check will be performed if the biological calibration indicates deviations of 10 dB or greater, and an exhaustive calibration will be performed if the biological calibration indicates deviations of 15 dB or greater.

J.4 Hearing Protectors

A variety of different types of hearing protection will be given to our employees and the products will provide a noise reduction rating that will effectively reduce noise exposures to safe levels. Hearing protection in high noise exposure areas is mandatory and will be worn by employees in the following job positions:

J.5 Employee Training

Employee training is important because when workers understand the requirements of the hearing conservation program and why it is necessary to protect their hearing, they will be better motivated to actively participate in the program.

Employees exposed to high noise levels must undergo at least annual training in the following:

1. The effect of noise on hearing.
 - Exposure to excessive noise raises your hearing threshold--the degree of loudness at which you first begin to hear.
 - Temporary hearing loss can be caused by exposure to loud noise for a few hours. Fortunately, hearing is usually restored after a period of time away from noise.
 - Permanent hearing loss occurs after the ear has been continually exposed to excess noise and has gradually become unable to recover from temporary hearing loss.
 - Signs of permanent hearing loss include the inability to hear high-pitched or soft sounds; trouble understanding conversation, or speech heard over the telephone; or ringing or roaring in the ears (tinnitus).
 - No cure exists for hearing loss caused by noise. Hearing aids do not restore noise-damaged hearing, although they may help most people.

- Excessive noise may harm overall health. Too much noise may contribute to mental stress, physical stress, certain illnesses and accidents.
 - Everyone is affected by excess noise to some degree, depending on: loudness of the noise; frequency of the noise; length of exposure; and other factors, such as the person's age and general health, distance from noise, and whether noise is continuous, intermittent or sudden.
2. Purpose of hearing protectors, advantages, disadvantages and attenuation of various types, and instructions on selection, fitting, use and care of hearing protectors.
- a. Hearing protectors can be very effective but only if they fit properly and are worn correctly. Although labeled Noise Reduction Ratings (NRRs) typically range from 20-30 decibels, in practice the protection that normally can be achieved is about 10-20 decibels. The more carefully you select and wear hearing protectors, the higher your protection will be. Hearing protectors may feel uncomfortable at first, but after a while, the user will get used to them.
 - b. Initially you may be concerned that you will be unable to hear conversation, machinery sounds, and warning signals while wearing hearing protection. However, unless you already have a significant hearing loss, you will be surprised how well you can hear while in noise. And when you properly wear hearing protectors, you will be able to hear as well at the end of the day as when you started in the morning. People with hearing loss also benefit, since without protection, noise will continue to damage their hearing until it is difficult to distinguish sounds under even the best of conditions.
 - c. Types of hearing protectors:

Protector type	Description	How to Use	Care and Cleaning
Formable Plugs	Compressed or shaped prior to insertion. The most popular variety is made of expandable, slow-recovery foam. One size fits most everyone. Once in the ear, foam plugs gently expand to provide a snug and secure fit.	Slowly roll foam plugs into a very thin cylinder. While compressed, insert plug well into the ear canal. Fitting is easier if you reach around the head with the other hand to pull the ear outward and upward during insertion.	Keep the plugs clean and free from material that can irritate the ear canal. They may be washed in mild liquid detergent and warm water. Squeeze excess water from the plugs and air dry. Washing may be repeated several times. Discard plugs if they harden or do not reexpand to their original size and shape.
Premolded Plugs	Made from flexible materials which are preformed to fit the ear. Generally available with a joining cord to prevent loss. Most premolded plugs are sold in two or more sizes and must be individually sized for each ear. If, after a week or so, you have been unable to get used to your earplugs, check with the fitter to try another size, type, or brand.	With the opposite hand, pull outward and upward on the ear while inserting the plug until you feel it sealing. This may seem tight at first, especially if you have never worn earplugs.	Premolded plugs will normally last several months or more depending upon the type, and upon your work environment, hygiene, and body chemistry. They should be replaced if they shrink, harden, tear, crack, or become permanently deformed. Wash them in warm soapy water and rinse well. When dry, store them in a carrying case.

Protector Type	Description	How to Use	Care and Cleaning
Semi-aural Device (Canal Caps)	Consist of pods or flexible tips on a light-weight headband. Because they are quick to put on and take off and easy to store around the neck, they are ideal for intermittent use. They provide less protection than either plugs or muffs and are not usually recommended for continuous long-term wearing.	Hold the large ends of the pods and swivel them to direct the tips into the ear canal openings. Firmly push and wiggle the pods into the canals until a snug seal is obtained. Pulling on the outer ear while pushing on the pods will be helpful to most wearers.	Most can be cleaned in the same way as premolded earplugs. Since the headband holds the tips in place to provide an acoustic seal, do not tamper with it or the protection the device provides may be reduced.
Earmuffs	Have rigid cups with soft plastic cushions which seal around the ears to block noise. Foam-filled cushions are usually preferred over liquid-filled versions because they are lighter, more durable, and equally protective. For very loud noises, wear muffs and plugs together for an additional 5-10 dB or so of protection	Must fully enclose ears to seal against the head. Adjust the headband so cushions exert even pressure around the ears to get the best noise reduction. Pull hair back and out from beneath the cushions. Do not store pencils or wear caps under the cushion.	Cushions can be cleaned with warm, soapy water and rinsed thoroughly. Do not use alcohol or solvents. Cushions normally need replacing twice a year or more--whenever they become stiff, cracked, or do not seal. Do not modify earmuffs in any way, and especially do not stretch or abuse the headbands as this will reduce your protection

3. The purpose of audiometric testing is to determine if workplace noise has had an effect on each employee's ability to hear. The audiometric testing results will be compared to the employee's individual baseline examination. This comparison will indicate if the employee has suffered hearing loss. The audiometric technician will provide an explanation of test procedures.

J.5.1 Access to Information and Training:

Copies of this standard will be made available to employees and their representatives and copy will be posted in the workplace.

J.5.2 Recordkeeping:

Noise exposure measurement records must be kept for 2 years. Records of audiometric test results must be maintained for the duration of the affected employee's employment.

Audiometric test records must include the name and job classification of the employee, the date the test was performed, the examiner's name, the date of acoustic or exhaustive calibration, measurements of the background sound pressure levels in audiometric test rooms, and the employee's most recent noise exposure measurement.

Audiometric test records will be kept with the Human Resources Manager. All records will be provided to employees at their request.

J.6 Annual Hearing Conservation – Program Evaluation

1. Noise exposure level monitoring has been completed in all areas and rechecked as necessary after any alterations which may have resulted in a change in noise levels.

Yes_____ No_____

If no, what action has been taken to complete the monitoring?

2. Baseline audiograms have been completed on all employees hired this year.

Yes_____No_____

If no, what arrangements have been made to complete the audiograms?

3. Annual audiograms have been completed for employees included in the Hearing Conservation Program.

Yes_____No_____

If no, what arrangements have been made to complete the audiograms?

4. All employees included in the Hearing Conservation Program have been provided with hearing protection.

Yes_____No_____

If no, what action has been taken to provide this protection?

5. All employees included in the Hearing Conservation Program have received training in the use of protection, the effects of noise on hearing and the purpose of audiometric testing.

Yes_____No_____

If no, what is being done to complete this training?

6. Standard threshold shifts have been identified.

Yes _____ No _____

If yes, what actions have been taken with these employees?

Definitions

Action level:	An eight-hour TWA of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.
Audiogram:	A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.
Audiologist:	A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech - Language - Hearing Association or licensed by a state board of examiners.
Baseline audiogram:	The audiogram against which future audiograms are compared.
Criterion sound level:	A sound level of 90 decibels.
Decibel (dB):	Unit of measurement of sound level.
Hertz (Hz)	Unit of measurement of frequency, numerically equal to cycles per second.
Medical pathology:	A disorder or disease. For purposes of this regulation, a condition or disease affecting the ear, which should be treated by a physician specialist.
Noise dose:	The ratio, expressed as a percentage, of (1) the time integral, over a stated time or event, of the 0.6 power of the measured SLOW exponential time-averaged, squared A-weighted sound pressure and (2) the product of the criterion duration (eight hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB).
Noise dosimeter:	An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.
Otolaryngologist:	A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Representative

exposure:

Measurements of an employee's noise dose or eight-hour TWA sound level that the employers deem to be representative of the exposures of other employees in the workplace.

Sound level:

Ten times the common logarithm of the ratio of the square of the measurement A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). For use with this regulation, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.

Sound level meter:

An instrument for the measurement for sound level.

TWA sound level:

That sound level which, if constant over an eight-hour exposure, would result in the same noise dose as is measured.

APPENDIX K: LOCKOUT / TAGOUT PROGRAM

K.1 Lockout / Tagout Program – Administrative Duties

K.1.1 Application:

All machinery and equipment capable of being locked out shall be locked out to protect (company name) employees from the accidental or inadvertent start-up of equipment, when such operation could cause injury. The intent of this program is to design, develop, and implement safe operating practices, behaviors, and expectations that prevent injury.

A Tagout shall not be used when equipment is capable of accepting a Lockout. A Tagout shall only be used if a Lockout cannot be utilized to isolate equipment from energy source(s).

All employees and contractors, upon observing a machine or piece of equipment that is locked out and in the process of being serviced or maintained, may not attempt to start, by-pass lockout devices, energize or use that machine or equipment. Failure to comply with the statement, program, and specific procedures, shall result in disciplinary action.

K.1.2 Scope:

This program establishes and maintains the requirements for lockout or tagout of energy isolating devices. It shall be used to ensure that the machine or equipment is isolated from all potentially hazardous energy, and locked out or tagged out before employees perform any servicing or maintenance activities where the unexpected energization, startup or release of stored energy could cause injury.

Specific procedures have been developed for the control of hazardous energy for machinery and equipment in this facility. Employees have access to the procedures during all work shifts.

The following responsibilities and activities will take place to ensure equipment is isolated from all hazardous energy sources before work is attempted.

- 1. Develop a written lockout/tagout program that includes specific lockout/tagout procedures and program requirements.**

2. **Identify potentially hazardous energy associated with equipment, the energy source and the means of isolating that energy from equipment or machinery.**
3. **Develop and review specific lockout procedures for all machinery and equipment that will require a specific lockout procedure.**
4. **Utilize the proper procedures for the restoration of equipment to power after service and maintenance has been performed.**
5. **Establish steps indicating the safe removal and transfer of lockout/tagout devices and who will be responsible for these steps.**
6. **Ensure all outside contractors comply with the lockout/tagout standard and provide specific lockout procedures to ensure an understanding of energy sources and energy isolating devices.**
7. **Investigate all lockout/tagout accidents.**
8. **Provide employee training and retraining when necessary.**
9. **Periodically review the lockout/tagout program to ensure accuracy and compliance.**

K.2 Employee Responsibility

All of our employees are instructed in the significance of the lockout program. Each employee, supervisor, and member of the management staff has been instructed in the purpose, intent, and use of the lockout program.

Affected Employees are those workers who are not involved with the service or maintenance of machinery but whose job requires them to perform various functions with the equipment.

Authorized Employees are those workers who are directly involved with the service or maintenance of machinery and by training and designation are required to isolate equipment from all energy sources.

Other Employees (e.g. office personnel) are those whose work operations are or may be in an area where energy control procedures may be utilized.

K.3 Compliance with this Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The following authorized employees are required to perform lockout in accordance with this procedure.

NAME	JOB TITLE

All employees, upon observing a machine or piece of equipment that is locked out and in the process of being serviced or maintained, may not attempt to start, by-pass lockout devices, energize or use that machine or equipment. Failure to comply with the program and specific procedures stated in this program shall result in disciplinary action.

K.4 Preparation for Lockout / Tagout

A survey of the equipment utilized at our facility was made to locate and identify all energy sources and energy isolation devices. This survey has determined what type of energy is used by each piece of equipment and identified switch(es), valve(s) or other energy-isolating devices that are to be used for equipment lockout or tagout.

K.4.1 Sequence of Lockout

1. Notify all affected employees (employees not involved in service or maintenance) that servicing or maintenance is required on a machine or equipment and that the

machine or equipment must be shut down and locked out to perform the servicing or maintenance.

2. The authorized employee (employees directly involved with service or maintenance) is required to know the company procedure, identify the type and magnitude of the energy that the machine or equipment utilizes, understand the hazards of the energy, and know the methods to control the energy.
3. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open switch, close valve, etc.)
4. Engage the energy isolating device(s) so that the machine is isolated from the energy source(s).
5. Lock out the energy isolating device(s) with assigned individual lock(s). Assigned locks are keyed locks, specific to lockout, standardized and only used for lockout, and singularly identified by employee name or lock number.
6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
7. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment cannot operate.

CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

8. The machine or equipment is now locked out.

K.4.2 Emergency Control Procedure Exceptions – When Documentation is not required

The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist:

- (1) The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.
- (2) The machine or equipment has a single energy source which can be readily identified and isolated.
- (3) The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
- (4) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
- (5) A single lockout device will achieve a locked-out condition.
- (6) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
- (7) The servicing or maintenance does not create hazards for other employees.
- (8) the employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

K.4.3 Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps are taken:

1. Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
3. Verify the controls are in neutral.

4. Remove the lockout device(s) and reenergize the machine or equipment. **NOTE:** The removal of some forms of blocking may require reenergization of the machine or equipment before safe removal.
5. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready to use.

K.5 The Tagout System

A Tagout shall not be used when equipment is capable of accepting a Lockout. A Tagout may only be used if equipment is not designed to accept a Lockout and a Lockout cannot be utilized to isolate equipment from the energy source(s).

1. Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
2. When a tag is attached to an energy isolating device, it is not to be removed without permission of the authorized person responsible for it, and is never to be bypassed, ignored or otherwise defeated.
3. Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
4. Tags and their method of attachment must be made of materials which can withstand environmental conditions encountered in the workplace.
5. **A Tagout shall not be used when equipment is capable of accepting a Lockout. A Tagout may only be used if equipment is not designed to accept a Lockout and a Lockout cannot be utilized to isolate equipment from the energy source(s).**
6. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

K.6 Testing or Positioning of Machines, Equipment or Machinery Components

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device, and the machine or equipment must be energized to test or position the machine or equipment, or machinery components, the following sequence of actions shall be followed:

- (a) Clear the machine or equipment of tools and materials.
- (b) Remove employees from the machine or equipment area.
- (c) Remove the lockout or tagout devices.
- (d) Before the equipment is energized, the authorized employee must make sure all employees are out of the area and away from the point of operation. The authorized employee will then proceed to energize the equipment only when assured that no one is exposed to the action of the machinery. Energize and proceed with testing and positioning.
- (e) De-energize all systems and reapply energy control measures in accordance with the requirements set forth in this instruction.

K.7 Procedures involving more than one person

If more than one person is required to lockout equipment, each person shall place his/her own personal lockout device on the energy isolating device(s). As each person no longer needs to maintain his/her lockout protection, that person removes his/her lockout device.

K.8 Shift or Personnel Changes

A change over period is established in the event of a shift or personnel change taking place before service or maintenance can be completed. This is done so that each authorized employee may safely exchange their assigned lockout device.

The authorized person shall be fully briefed in the scope and stage of the work by those being relieved. The authorized person who assumes control of the lockout must place his/her lockout device(s) on the energy isolating device(s) and the person being relieved must then remove their lockout device.

The transfer of lockout devices must take place with the outgoing and incoming authorized employee present at the time of change over.

K.9 Removal of the Lockout / Tagout Device by other than Authorized Employee

Lockout/tagout devices may only be removed from energy isolating device by the employee who applied it. However, the Shift Leadership Team may remove the lockout device(s) if the authorized employee who applied it is not available and:

- a) it is verified that the authorized employee who applied the device is not at the facility;
- b) all reasonable efforts were made to contact the authorized employee to inform him/her that his/her lockout device has been or is about to be removed;
- c) all members of the shift management team are convinced that it is safe to remove the lockout device and;
- d) the authorized employee has this knowledge (that the lockout has been removed) before he/she resumes work at that facility.

K.10 Informing Outside Contractors

Outside contractors are informed of the elements of this program by facility management. The specific equipment or machinery that is to be serviced or maintained by the contractor must have a specific lockout procedure identifying all necessary procedure elements. The contractor and his/her employees are informed and made knowledgeable of these procedures during a specific training session. Information regarding the contractor's program is obtained by facility management.

The work efforts covered by the procedure shall be fully coordinated and complied with by the contractor, contractor's employees, and our employees.

K.11 Accidents Concerning Lockout / Tagout

The Accident Investigation Team is responsible for fully investigating all lockout accidents, and reporting the cause of such accidents to the Plant Management. If the accident involved the control of hazardous energy with a single lockout source and a

lockout procedure had not been written prior to the accident, a specific procedure is written before work is continued. If the accident involved a specific procedure for a piece of equipment, the specific procedure is evaluated and modified (if necessary) prior to authorizing work to continue.

K.12 Employee Training

All employees receive training to ensure that the purpose and function of the Lockout program is understood. Knowledge of safe application, usage and removal of energy controls is required by all employees. Each training session includes the following:

1. All employees receive training in the recognition of applicable hazardous energy sources, type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
2. Each affected employee is instructed in the purpose and use of the energy control procedure.
3. All other employees whose work operations are or may be in an area where energy control procedures may be utilized, are instructed about the procedure, and about prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

K.12.1 Employee Retraining:

Retraining is provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures. Additional retraining is conducted whenever a periodic inspection reveals, or whenever the supervisor has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedure.

The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

K.12.2 Training Documentation and Verification:

After all authorized, affected, and other personnel have been trained and informed of the energy control program and standard, a certification form is used to document each employee's name, employee number, date of training, training topic, and the instructor's name. The training document is kept on file to verify that training took place.

K.13 Periodic Inspection

Annual inspections of the energy control procedures are conducted by an authorized employee to determine the level of program compliance. The inspection records are kept on file with the Lockout program.

1. The periodic inspection shall be designed to correct any deviation or inadequacies observed.
2. Where lockout is used for energy control, the periodic inspection shall include a review with each authorized employee of that employee's responsibilities under the energy control procedure being inspected.
3. Where tagout is used for energy control, the periodic inspection shall include a review with each authorized employee of that employee's responsibilities under the energy control procedure being inspected.

K.14 Inspection Certification Form

Dates of Inspection _____

<p>Authorized employee performing lockout Inspection:</p> <hr/>
<p>Authorized employee performing lockout Procedure:</p> <hr/>
<p>General lockout/tagout policy has been reviewed: Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Machine or equipment evaluated for proper use of specific energy control procedures. (NOTE: for proper review, the specific lockout procedures must be obtained for review during inspection):</p> <hr/>

Inspection Results:

The specific lockout procedures were properly followed Yes No

If **No**, explain which steps indicated on the specific lockout procedure were not properly followed:

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____

The following specific procedural steps were modified (list below):

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____

7. _____

8. _____

9. _____

The following information was added to the specific procedural steps:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

K.15 Specific Lockout Procedure Form

Equipment, Machinery or Process: _____

Date Approved/Implemented: _____

NOTE: Required for all equipment, machinery and/or processes that fail to meet the exceptions noted in 29 CFR 1910.147(c)(4)(i).

1. Type(s) and magnitude(s) of energy and hazards:
2. Name(s)/job title(s) of employees authorized to lockout/tagout:
3. Name(s)/job titles(s) of affected employees and how to notify:
4. Type(s) and location(s) of energy isolating means:
5. Types(s) of stored energy - methods to dissipate or restrain:
6. Methods selected - (lock, tags, etc.)
7. Test the equipment or machinery to ensure that all energy sources have been disconnected or dissipated. (NOTE: Test equipment shall be used to ensure that electrical parts and circuit elements have been de-energized).
8. Job titles of employee authorized for group lockout or tagout.

RESTORING EQUIPMENT TO SERVICE

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps are taken:

1. **Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.**
2. **Check the work area to ensure that all employees have been safely positioned or removed from the area.**
3. **Verify the controls are in neutral.**
4. **Remove the lockout device(s) and reenergize the machine or equipment.**

NOTE: The removal of some forms of blocking may require reenergization of the machine or equipment before safe removal.

5. **Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready to use.**

APPENDIX L: PERSONAL PROTECTIVE EQUIPMENT PROGRAM

L.1 Personal Protective Equipment Program – Administrative Responsibilities

L.1.1 Application:

Personal Protective Equipment (PPE) for the eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided to our employees by (company name). The equipment must be used by employees when it is found necessary for protection against workplace hazards. (Company name) will also maintain the personal protective equipment in a sanitary and reliable condition.

L.1.2 Scope:

The Personal Protective Equipment Program addresses the requirements of protective equipment, including personal protective equipment for eyes, face, head, hands, and feet. The elements of this standard also explain the specifications for the type and manufacture of personal protective equipment. The (company name), must provide necessary equipment and enforce the use of this equipment to avoid potential injury or illness. This program is also designed to maintain equipment in a sanitary, reliable, and safe condition to further reduce the likelihood of injury. Responsibilities and administrative duties include:

- 1. Development of a written program which describes how PPE is selected and managed at this facility.**
- 2. Perform and Certify Hazard Assessments of each workplace to identify hazards and to indicate the type of PPE required for protection.**
- 3. Properly select PPE based upon the Hazard Assessment, enforce the use of PPE, and replace damaged or defective equipment.**
- 4. Provide informative training and retraining sessions to ensure all employees understand the purpose of this program. Document training to verify the activity.**
- 5. Review the program periodically and revise when needed.**

L.2 PPE Hazard Assessment and Equipment Selection

L.2.1 Hazard Assessment and Equipment Selection:

The intent of this program is to assess each work area with the purpose of determining if hazards are present, or likely to be present. The PPE Hazard Assessment indicates which work areas, job functions, and employees will be required to use personal protective equipment (PPE).

The hazard categories are listed on the Hazard Assessment to assist with the identification of hazard exposures. The evaluation will consider the potential for injury and whether the potential is high, possible or low. After deciding the likelihood that an injury could occur, the assessment will then indicate the potential seriousness of any injury or illness that may result. The PPE Hazard Assessment then indicates the type of required PPE selected to provide protection for our employees.

In work areas or job classifications that expose the employee to hazards, our company management team will:

- ✓ **select PPE based upon the hazard assessment**
- ✓ **communicate PPE selection decisions to affected employees**
- ✓ **select PPE which properly fits each affected employee**
- ✓ **require employees to wear PPE to avoid injury**
- ✓ **not allow the use of defective or damaged PPE**

L.2.2 Workplace Hazard Assessment Certification:

The Safety Management team will generate and certify (sign and date) a document of hazard assessment that is included in this program. The hazard assessment will serve as written certification identifying the work places evaluated, the person responsible for verifying that the evaluation was performed, and the dates of the hazard assessment.

L.2.3 Employee Training:

Our company is committed to providing training to each employee who will be required to use PPE. The requirement for using PPE will be determined by the hazard assessment. Each affected employee will be trained to know at least the following:

- ✓ **when PPE is necessary**
- ✓ **what PPE is necessary**
- ✓ **limitations of PPE**
- ✓ **how to properly put on, take off, adjust, & wear PPE**
- ✓ **proper care, maintenance, useful life, & disposal of PPE**

Before being allowed to perform work requiring the use of PPE, each affected employee will demonstrate an understanding of the training they receive. It is our company's responsibility to verify that each affected employee has received and understood the training through a written certification containing the name of each employee, date of training, and subject matter covered during the training.

L.2.4 Employee Retraining:

Affected employees will be retrained when management feels they no longer have the understanding and skill required by this program. Circumstances where retraining is required include, but will not be limited to:

- ✓ **changes in the work place that render previous training obsolete**
- ✓ **changes in the types of PPE to be used which render previous training obsolete**
- ✓ **inadequacies in an affected employee's knowledge or use of PPE which demonstrates the employee has not retained the requisite understanding or skill**

L.3 Eye and Face Protection

Eye and face protection used by our employees will comply with ANSI Z87.1-1989. The Safety Manager will verify that PPE utilized at our facility will meet the criteria stated by the American National Standards Institute.

L.3.1 Hazard Assessment Results for Eye and Face Protection:

On the basis of the certified hazard assessment on file with this program, eye protection will be used while performing the job functions listed below:

Work Area	Job Function

Each employee in these work areas will use eye and face protection when exposed to eye or face hazards from flying particles, hot objects, injurious chemicals, liquid acids and caustics, gases, vapors, or potentially injurious light radiation.

Eye protection will provide side protection when there is a hazard from flying objects.

Affected employees requiring prescription lenses shall wear eye protection that incorporates the prescription in its design. Employees with prescription requirements may wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Eye and face protection used by our employees will be distinctly marked to facilitate identification of the manufacturer.

Employees involved in welding, cutting, or brazing, shall use equipment with filter lenses that have a shade number that will provide protection from injurious light radiation.

L.4 Head Protection

Head protection used by our employees will comply with the American National Standards Institute (ANSI). The program administrator will verify if head protection is required at our facility and, if so, the program administrator will select head protection that meets the criteria stated by the American National Standards Institute.

L.4.1 Hazard Assessment Results for Head Protection:

On the basis of the certified hazard assessment on file with this program, head protection will be used while performing the job functions listed below:

Work Area	Job Function

L.5 Foot Protection

Where necessary, employees will wear safety shoes to protect them from foot injuries that may occur due to recognized hazards in the work area.

Safety shoes or boots with impact protection will be required for persons who carry or handle heavy objects. Heavy objects could be dropped, potentially causing serious injury. Other activities will be included where objects might fall onto the feet or where other exposures may occur, causing injury. The safety shoes used by our employees will be obtained from a supplier that can provide shoes that comply with the test requirements noted in ANSI Z41-1991.

L.5.1 Hazard Assessment Results for Foot Protection:

On the basis of the certified hazard assessment on file with this program, eye protection will be used while performing the job functions listed below or in the following work areas:

Work Area	Job Function

L.6 Hand Protection

When it is determined by the hazard assessment that employees are exposed to potential hand injuries, personal protective equipment will be worn. Hand protection will be utilized to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of

causing local or systemic effects following exposure. Performance characteristics of gloves relative to the specific anticipated hazard will be identified by the Safety Chairperson and used as the basis for selection. The most effective hand protection will be selected for each job function.

L.6.1 Hazard Assessment Results for Hand Protection:

On the basis of the certified hazard assessment on file with this program, eye protection will be used while performing the job functions listed below:

Work Area	Job Function

L.7 Respiratory Protection

When employees are required to wear respiratory protection, the Safety Management team will verify that requirements of the respiratory protection standard have been fulfilled.

Persons required to wear respirators will be identified in the Respiratory Protection Program. Proper selection of respirators will be indicated based upon the respiratory hazard. Medical evaluations will be provided to all persons required to wear respirators and fit testing will be done to ensure all will achieve a proper face to face piece fit.

Equipment inspection, maintenance, and proper storage practices will be observed. And employees expected to wear the equipment will be properly trained.

L.7.1 Hazard Assessment Results for Respiratory Protection:

On the basis of the certified hazard assessment on file with this program, eye protection will be used while performing the job functions listed below or in the following work areas:

Work Area	Job Function

L.8 Personal Protective Equipment – Cleaning and Maintenance

Personal protective equipment will be kept clean and in effective working condition.

Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision.

Our company is responsible for assuring the adequacy, proper maintenance, and sanitation of personal protective equipment. Methods will be designed to regularly clean, inspect, and replace equipment to ensure the safety and health of our employees. Employees will be instructed to notify their supervisor when personal protective equipment becomes lost, damaged, or in need of repair or replacement. Facilities for cleaning safety glasses and head protection will be provided and employees will be instructed to maintain their equipment. Periodic review will be made during work hours to assess the condition of personal protective equipment.

Respirators will be cleaned and inspected on the frequency indicated in our Respiratory Protection Program. Documentation indicating cleaning, repair, and replacement of respirators will be kept in this program file.

L.9 Hazard Assessment Form

Work Area: _____ Date of Hazard Assessment: _____
Job Function: _____
Hazard Exposure:. _____
Person Conducting Hazard Assessment: _____
Person Authorized to Certify Hazard Assessment: _____

CATEGORY	POTENTIAL (High, possible, Low)	SERIOUSNESS OF POTENTIAL (High, Medium, Low)	PERSONAL PROTECTIVE EQUIPMENT
Impact sources: Struck by or strike against			
Penetration sources: Sharp objects that pierce or cut			
Compression (roll-over): Rolling or pinching			
Chemical sources: Handling of injurious chemicals			
Heat sources: High temps. resulting in burns, eye damage, and ignition of protective clothing			
Harmful dust sources: Airborne contamination			
Light (optical) radiation sources: Welding, cutting, brazing, high intensity lights			

L.10 Reassessment of Hazards Form

The Safety Management team for our facility will reassess the workplace hazard situation as necessary by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE. Each certified reassessment will be kept on file with this program for verification.

OSHA 300 LOG INJURY REVIEW

Review Date:		
Next Review Date:		
Type	Locations	Total
Eye injuries		
Face injuries		
Head injuries		
Hand injuries		
Foot injuries		
Respiratory disorders		

FIRST AID INJURY REVIEW

Review Date:		
Next Review Date:		
Type	Locations	Total
Eye injuries		
Face injuries		
Head injuries		
Hand injuries		
Foot injuries		
Respiratory disorders		