

**A COMPREHENSIVE EVALUATION OF THE EMPLOYEE
EMERGENCY PLAN FOR KI, GREEN BAY**

By

Benjamin M. Kohlbeck

A Research Paper

**Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
With a Major in**

Risk Control

Approved: 3 Semester Credits

Investigation Advisor: Dr. Brian Finder

**The Graduate School
University of Wisconsin-Stout
May 2002**

**The Graduate School
University of Wisconsin-Stout
Menomonie, WI 54751**

ABSTRACT

Kohlbeck	Benjamin	M		
(Last Name)	(First)	(Initial)		
<u>A Comprehensive Evaluation of the Employee Emergency Plan for KI, Green Bay</u>				
(Title)				
M.S. in Risk Control	Dr. Brian J. Finder	May 2002	56	
(Graduate Major)	(Research Advisor)	(Month/Year)	(Pages)	
<u>American Psychological Association Style Manual</u>				
(Name of Style Manual Used in this Study)				

The effectiveness of implementation levels within the workplace establishes the validity and the support for programs by the work force. By focusing on the technique of introduction, as well as the retention of the given information to the intended recipients, businesses can better promote their messages and or plans to the workforce. From an implementation and employee information retention standpoint, it is believed by this researcher that the Employee Emergency Plan is one such plan whose need for accuracy is crucial to the survival of the workforce in the event of an emergency.

The purpose of this study is to evaluate the effectiveness of implementation training and retention of the workforce for the employee emergency plan at the Green Bay, WI location. In the summer of 2001, KI implemented a new employee emergency plan. This program laid the foundation for emergency response and actions at KI and

contained the minimum requirements for compliance for the regulations enforced by OSHA.

A survey was designed to collect responses relating to the information presented during the employee emergency plan training sessions. The desired number of participants from the workforce that week was targeted. The employees were approached while conducting routine work tasks and were asked to for a few minutes of their time to answer a couple of general questions relating to the information supplied during the training of the employee emergency plan.

The data collected from the employee emergency plan survey was statistically analyzed by using the Chi-Square Test. The data was analyzed between several different factors. Every answer was analyzed against all data supplied for that particular question. After the results were compiled, each question was broken down by number of participants, gender, and shift.

ACKNOWLEDGEMENT

I would like to thank my family and friends for their support throughout this process of fulfilling my journey of earning my degree. I would like to thank Elbert Sorrell, Eugene Ruenger, Craig Jameson, Steven Senior, Mary Fandry and Lyle Koerner for all the expert guidance; they helped me to find the confidence to further my education and career goals. Special thanks goes to Brian Finder for providing me the advice to shoot or fire my proofreader. Finally, I want to thank my angel for always making sure I stayed focused and on track, this degree is half yours.

TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGEMENT.....	iii
TABLE OF CONTENTS.....	iv
LIST OF FIGURES.....	vi
CHAPTER I: INTRODUCTION.....	1
Purpose of the Study	4
Goals of the Study.....	4
Background and Significance.....	4
Definition of Terms.....	5
Limitations.....	5
CHAPTER II: REVIEW OF LITERATURE.....	6
Introduction.....	6
Lessons Learned.....	6
Comparison Of OSHA 1910.38 Regulation and KI’s Emergency Action Plan.....	8
Response Measurement Tools.....	16
What Other Companies are doing.....	19
Company A.....	20
Company B.....	22
Conclusion.....	24
CHAPTER III: METHODOLOGY.....	26
Introduction.....	26
Survey Form Development.....	26

Emergency Acton Plan Survey.....	27
Subject Selection.....	28
Data Collection.....	28
Data Analysis.....	29
Assumptions.....	29
Limitations.....	29
CHAPTER IV: RESULTS OF THE STUDY.....	31
Introduction.....	31
Results.....	31
Cross Tabulation.....	38
CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS.....	41
Introduction.....	41
Conclusion.....	41
Recommendations.....	43
REFERENCES.....	46
APPENDIX A.....	48
KI Emergency Action Plan.....	49

LIST OF FIGURES

1. Gender and shift of respondents.....	32
2. Statistical data from question 1.....	32
3. Statistical data from question 2.....	33
4. Statistical data from question 3.....	33
5. Statistical data from question 4.....	34
6. Statistical data from question 5.....	35
7. Statistical data from question 6.....	35
8. Statistical data from question 7.....	36
9. Statistical data from question 8.....	36
10. Statistical data from question 10.....	37
11. Statistical data of cross tabulation of Question 1 and 2.....	38
12. Statistical data of cross tabulation of Question 3 and 2.....	39
13. Statistical data of cross tabulation of Question 4 and 5.....	39
14. Statistical data of cross tabulation of Question 6 and 5.....	40

CHAPTER I

Statement of the Problem

Introduction

The effectiveness of implementation levels within the workplace establishes the validity and the support for programs by the work force. By focusing on the technique of introduction, as well as the retention of the given information to the intended recipients, businesses can better promote their messages and or plans to the workforce. From an implementation and employee information retention standpoint, it is believed by this researcher that the Employee Emergency Plan is one such plan whose need for accuracy is crucial to the survival of the workforce in the event of an emergency. If there were an emergency in the facility, one would want every employee to know precisely what to do and when to do it. It is every employer's duty to provide a safe and effective employee emergency plan. From a regulatory standpoint, the Occupational Safety & Health Administration (OSHA) regulations require a plan that covers those designated actions employers and employees must take to ensure employee safety from fire and other emergencies (OSHA, 2002).

With over 4,000 employees worldwide, KI's Corporate Headquarters is located in Green Bay, Wisconsin. Their manufacturing facilities include: Green Bay, Bonduel, Manitowoc, and Fort Atkinson, Wisconsin; Tupelo, Winona, and Pontotoc, Mississippi; Madisonville, Kentucky; High Point, North Carolina; Los Angeles, California; Pembroke, Ontario Canada; and Treviso, Italy. KI has numerous sales offices and showrooms located throughout the world. Founded in 1941, KI manufactures a comprehensive and diverse line of office, commercial, institutional, and educational furniture. Formerly known as Krueger International, KI markets products through sales

representatives and furniture dealers, architects, interior designers, and end-users throughout the world. Over the years, KI has developed into an industry-leading, award-winning furniture manufacturer with an international presence. Product offerings include ergonomic seating, flexible furniture systems, wall systems, adjustable work surfaces, folding and stack chairs, auditorium and lecture hall seating, folding and fixed leg tables, filing and storage cabinets, and site furnishings. All products embody KI's commitment to the highest levels of quality, aesthetics and craftsmanship (www.KI.com).

In the summer of 2001, KI implemented a new employee emergency plan. This program laid the foundation for emergency response and actions at KI and contained the minimum requirements for compliance for the regulations enforced by OSHA. There are eight areas addressed in the employee emergency plan. The eight areas are all deemed equally important and were thoroughly discussed prior to the plan's creation to ensure that the best solution and procedure was created while, at the same time, completely solving the problem of facility compliance. The first area deals with escape procedures. The means of egress activities were made the same for all locations to help with the limitation of confusions during an emergency. Locations of emergency exits, meeting areas, escape routes, and physically challenged employees are points that are laid out under the escape procedures. The second issue addressed is Critical plant. There are three critical plant operations that were deemed potential hazardous to employees and emergency workers: natural gas, water, and electrical shutdown. Locations of emergency shutoff, shutdown procedures, and responsible persons were assigned to each operation. The third area was employee accountability. There were two forms of employee accountability created to ensure proper location of all employees present in the plant.

The plant used check sheets, which originated from morning meetings and the corporate side used the buddy system in departments. The proper rescue and medical notification procedure and telephone numbers were created in case of any emergency was the next area addressed. A list of employees who will explain the operations of the employee emergency plan during an emergency was the fifth area developed. The alarm system was the sixth area addressed and focused on the notification of employees to emergencies. An alarm system was created with two distinctly different notification alarms. For directing employees outside, an alarm with a distinct horn audible was installed and for directing employees inside, a taped recording was installed to direct workers to designated areas within the facility. Evacuation procedures were developed for inside and outside emergencies. Locations of designated meeting areas were created depending on the type of emergency. The eighth and final area covered was training. Training procedures were created following a specific regimen, developed by the plant engineer and safety specialist, and training and retraining times were created to inform employees of new changes.

The employee emergency plan was implemented between the months of September and December of 2001, with the hopes that all employees, management and labor, would greet this tool with open arms. Due to the slowing economy and financial rearranging, the implementation process may not have been as thorough as predicted. Consequently, a potential lack of follow through regarding the implementation of the employee emergency plan at KI is placing the organization at risk of being unable to adequately respond to emergency situations.

Purpose of the Study

The purpose of this study was to evaluate the effectiveness of implementation training on employees for the employee emergency plan at the Green Bay, KI location.

Goals of the Study

There are four main goals established for this study. They are:

1. To inspect\evaluate KI's plan to determine if compliance with OSHA regulations has been achieved.
2. To determine the level of implementation effectiveness
3. To establish a criterion for implementation to evaluate insufficient levels of implemented information.
4. To establish a criterion for KI's inspections\evaluations to determine compliance levels.

Background and Significance

In the past 10 years, KI has experienced a dramatic growth increase due to the acquisition of several smaller companies. Newly developed processes have been due to the leaps and bounds in new technology. The workforce has experienced a steady increase due to the high levels of productivity in all facilities. With this newfound growth, KI has not had time to catch up with compliance standards at their various locations. Lately, the Green Bay location has found itself without a safety manager due to corporate rearrangement. The safety aspect would have fallen completely to the side of the road if not for the Plant Engineer, who tried to do the best he could. Changes, recommendations, implementations, and planning for safety programs have failed to become a permanent facet in the work ethic of safety for KI. The employee emergency plan for compliance had been outdated, yearly audits had not been kept up, and work settings had changed making the action plan non-compliant. The fear of physical injury,

lost wages, workers compensation, OSHA compliance fines, and liability (general and monetary) due to non-compliance, poor training, and improper implementation techniques, forced the company to have their safety manual overhauled.

Definition of Terms

The following definitions of terms are important for clear understanding of the employee emergency plan.

1. Emergencies – i.e., fire, explosion, chemical spill, tornado, sever weather, flood, hurricane, bomb threat, etc (KI Emergency Action Plan).
2. OSHA - The Occupational Safety & Health Administration, governmental body who regulates the safety of the workplace for the employee.

Limitations

The focus of this study is limited to the effectiveness of the implementation of the employee emergency plan and the follow-through of training for it at the Green Bay, Wisconsin corporate headquarters location only.

CHAPTER II

Review of Literature

Introduction

Imagine being at work busily working on the task at hand when, without any warning, all employees are engulfed in a fiery explosion. Everyone has to make his or her way through twisted, burning metal and leaking ammonia to reach the meeting area outside. On April 2, 2001 at the Morning Glory Dairy warehouse in Ashwaubenon, Wisconsin, this exact terror unfolded when a small business jet crashed into the warehouse. By using the proper procedures laid out in the evacuation portion of the employee emergency plan, the 35 to 40 employees working in the warehouse all made it safely to their designated meeting areas outside. The employees knew what measures to take because of careful planning, detailed implementation tactics, and proper training sessions created by the company (www.wbay.com).

Lessons Learned

History often is used as a guide when creating the employee emergency plan. In this researcher's opinion, people generally tend to base their future plans and actions from past failures or triumphs. On December 30, 1903, Chicago experienced one of its most disturbing disasters. The Iroquois Theater, believed to be fireproof, caught fire and within minutes the flames were out of control. The lights had gone out and in little more than 15 minutes, at least 600 people lost their lives (www.chipublib.org/004chicago/timeline/iroqfire.html). The theater management had added iron gates over many of the exit doors. Some of the gates were locked, others were unlocked, but opening them required operation of a small lever of a type unfamiliar to most theater patrons. Other doors opened inwards. The theater had had no fire drills so

ushers and theater personnel neither opened the doors, nor directed people to safe exits. Many people were trapped behind unopened doors. The time it took to open other doors added to the fatal panic as it forced almost everyone to use the main exits. One result of the horrible tragedy was the adoption of a new set of safety regulations for the evacuation of theaters (www.chipublib.org/004chicago/disasters/iroquois_fire.html).

In 1942, four hundred and ninety two lives were lost when a fire, that was believed to have been started by a light match, spread through the Coconut Grove nightclub in Boston, Massachusetts (www.co.clark.nv.us/fire/assembly.htm). The nightclub was packed beyond its legal capacity. The club was full of artificial coconut trees made of paper, which burned very fast. The one stairway became a chimney, carrying a fireball upwards that engulfed all who were using it to get out. When they got to the doors, many were locked. The revolving door quickly became jammed and useless (www.nonfictionreviews.com/article1151.html). The Coconut Grove nightclub fire gained national attention for the importance of exits and fire safety. The public became even more aware of exits with many hotel fires in 1946 like on June 5th in Chicago at the LaSalle Hotel where 61 people died, on June 9th in Dubuque, Iowa at the Canfield Hotel where 19 people died, on June 21st in Dallas, Texas at the Baker Hotel where 10 people died, and on December 7th in Atlanta, Georgia at the Winecoff which was considered to be 'fireproof', 119 people died and 91 were injured (www.emergency-management.net/hotel_fire.htm).

Since the 1940's, more stringent regulations regarding evacuation and means of egress have been developed, in part from the information learned at several sites of tragic accidents in the past. The newfound knowledge learned from these experiences

eventually laid the foundation for the regulatory bodies known today, which in turn developed the necessary compliance regulations, at a minimum, required by OSHA. From these minimum requirements, companies can create a best practice employee emergency plan for their specific facility.

Comparison Of OSHA 1910.38 Regulation and KI's Emergency Action Plan

It is felt by this researcher that for a program to have any amount of effectiveness, it has to have a logical basis to follow while being created. All safety policies should consider OSHA regulations as a guide to base their plan off of. The safety regulations created by OSHA are there to set, at a minimum, the correct policies and procedures used to regulate activities in the work place. While creating company policies, they should follow the enforced regulations, but should be detailed and created for the specific site and needs.

In the development of an employee emergency plan, there are eight minimum elements that are required by OSHA. The KI plan was created by taking all eight minimum elements and developing a best practice requirement procedure. By using a best practice approach to develop the employee emergency plan, KI has critiqued the requirements to the location and need-specific.

As stated in the OSHA regulation, the first element required is emergency escape procedures and route assignments. While the wording for this element is very vague, it can aid in the writing of a plan and allow the creator a greater variance, in exploring different avenues that will adequately provide coverage for this element. The element tells the writer what is needed, but not how to do it. It is ultimately up to the company on how to incorporate a solution for the minimum requirements.

By interpreting the OSHA requirements, KI developed escape procedures and route assignments that were a best practice for their facility. The escape procedures are the same for each designated area. This helped with making sure that all employees know how to get to their designated meeting areas even if they were transferred to another department. The procedures were made universal to cut down on employee confusion. The plan states that at the first sign of danger, one needs to calmly stop what he/she is doing, stand up, evacuate the area in a calm and orderly fashion using the designated escape route, and proceed to he/she designated meeting area away from the building. Designated meeting areas were created outside of the building and were fashioned with a colored number, which coincided with a colored section represented in the work facility. The facility was broken up into nine different sections, which had a represented color for each section. To choose the proper designated meeting area outside, one only needs to look for the corresponding color or section number (KI Emergency Action Plan, 2001).

Procedures to be followed by employees who remain to operate critical plant operations before they evacuate are required; a step-by-step procedures at a minimum. The procedures need to be detailed in a fashion that all critical procedures in a facility are addressed in an orderly fashion before evacuating the building. OSHA requires these procedures, at a minimum, in the regulation (OSHA, 2002).

A critical operation is an action that will add dangerous elements to an emergency or will cause additional damage to a facility after an emergency has been contained, controlled, or has passed. Three critical operations were established in the facility, Natural Gas supply turn off, the shut-down of the #1 and #3 electrical sub stations, and

the turn off of the water supply, potable, process, and sprinkler water. Specific procedures were created for each individual operation. The natural gas shut-off valve is located on the South wall of the plant, West of the tennis courts, directly next to the South Block House outside of the building. The valve wrench was painted yellow to be readily recognized and needs to be in the 12 o'clock position, then pulled down 90 degrees to the 3 o'clock position (KI Emergency Action Plan, 2001).

Four electrical sub stations are located in the facility, but only two are required to be shut down. Sub station 1 is located along the South wall above the South Block House. The main throw-lever needs to be pulled straight down until it stops. Sub station 3 is located in the center of the plant above the restrooms, in the corporate mezzanine directly East of the Paint Line. Both throw levers need to be pulled straight down until they stop. Electrical power will be shut down to sub stations 2, 3, and 4 (KI Emergency Action Plan, 2001).

Potable, process, and sprinkler water shut offs valves are located in the well on the East side of plant between the plant and satellite building, directly west of the weight room. The yellow valves control the potable and process water and need to be turned clockwise until they stop. The red valves control the sprinkler water and will be turned clockwise until they stop. For all three critical operations, picture diagrams with step-by-step procedures showing the exact motion for shut down have been created. The laminated picture/procedures are located next to all three critical operations (KI Emergency Action Plan, 2001).

Procedures to account for all employees after an emergency evacuation has been completed are essential to a properly written plan. Accountability of employees is vital

to medical, rescue, and emergency personnel. This will tell them if there are missing persons in the facility and which department they are missing from (OSHA, 2002).

Trying to keep track of an entire plant full of employees is not a very easy task. Due to illnesses, vacations, voluntary layoffs, and missed days, employees are often moved from one department to another depending on which department is in need of a few extra employees. For this fact, the creation of morning huddles was formed. In these huddles, process managers will discuss daily activities, worker placement, and general information passed onto the employees. During daily shift huddles, at the beginning of each shift, Process Managers take attendance when assigning daily jobs for each person in order to obtain an accurate employee count. This employee count is then tallied and used as the accountability check sheet, in case of an emergency (KI Emergency Action Plan, 2001).

Employees who are to perform rescue and medical duties are also used to determine who should be contacted depending on the type of emergency. Depending on the emergency, (fire, explosion, chemical spill, hazardous management, tornado, etc.) different individuals are to be contacted to aid necessary skills and knowledge to help control the situation (OSHA, 2002).

At KI, it was determined that there was a need for several different areas of rescue and medical services, depending on the severity of the emergency, necessary to keep the facility safe during times of emergency. The initial area includes the use of first responders. These responders will assist with the first-aid care of any injured employees after the emergency has been contained and before the proper medical teams arrival

onsite. Once local medical teams arrive, assistance can be given if requested by the proper medical teams (KI Emergency Action Plan, 2001).

A consulting physician is on call 24 hours a day to aid in times of emergency. KI's consulting physician is contacted if medical assistance is needed immediately. The consulting physician assists with the first-aid care of any injured employees after the emergency has been contained and before the proper medical teams arrival onsite. Assistance from the consulting physician can be given to the proper medical teams only if requested (KI Emergency Action Plan, 2001).

The Fire Department is immediately dispatched if there is a fire, explosion, or an emergency deemed that further medical assistance would be needed. It is believed by KI that no fire is too small to call the fire department and in the event of an emergency, any employee has the right to contact this agency by dialing 9-911 (KI Emergency Action Plan, 2001).

The use of chemicals throughout the facility is commonplace. Chemical leaks can happen and may cause severe damage if not dealt with immediately and in an appropriate manner. Upon learning about a hazardous materials spill, employees are authorized to dial 9-911 for immediate assistance and the responding fire department will assess the severity of the situation as well as help determine if more assistance is needed. If more assistance is needed, the proper Hazardous Materials Service, contracted by the Plant Engineer, will be notified by the Plant Engineer or Environmental Engineer and will be in control of the situation (KI Emergency Action Plan, 2001).

The names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan has to be available for all

employees. This document is distributed in case an emergency occurs and employees do not remember some or all of their job responsibilities (OSHA, 2002). In the event that a person, or persons, needs further information, an explanation of their duties under the Employee Emergency Plan or the need for general help, the Plant Engineer/Facilities Manager or the corporate Facilities Manager can be contacted. These two people are the only employees designated to discuss information or explain duties to employees during a time of need (KI Emergency Action Plan, 2001).

As detailed within the OSHA emergency response standard (1910.165), the employer shall establish an employee alarm system. As called for in the standard, the employee alarm system needs to provide warning for necessary emergency action, a reaction time for safe escape of employees from the workplace or the immediate work area, or both. It is the employer's responsibility to instruct each employee on the preferred means of reporting emergencies, such as manual pull box alarms, public address systems, radio or telephones. The employer shall also post emergency telephone numbers near telephones, or employee notice boards, and other conspicuous locations when telephones serve as a means of reporting emergencies. Where a communication system also serves as the employee alarm system, the standard dictates that all emergency messages must have priority over all non-emergency messages while the employee alarm must be capable of being perceived above ambient noise or light levels by all employees in the affected portions of the workplace. Tactile devices may also be used to alert those employees who would not otherwise be able to recognize the audible or visual alarm. The standard specifies that the employee alarm needs to be distinctive and recognizable as a signal to evacuate the work area or to perform actions designated under the

emergency action plan. If the employee alarm system is used for alerting fire brigade members, or for other purposes, a distinctive signal for each purpose has to be used.

While the employer must establish procedures for sounding emergency alarms in the workplace, direct voice communication is an acceptable procedure for sounding the alarm provided all employees can hear the alarm in organizations with 10 or fewer employees in a particular workplace (OSHA, 2002).

At KI, the employee alarm system provides warning for necessary emergency action and proper reaction time to allow safe escape of employees from workplace or the immediate work area. The employee alarm system emits an alarm at a high enough decibel to be perceived above any ambient noise and strobe lights to be perceived above any ambient light levels. In the case of a fire, explosion, or chemical spill, the sounded alarm is distinctive and recognizable as a signal to employees to evacuate the area. This alarm is a recorded message preceded by several horn blasts to attract employee's attention away from working practices. The ensuing recorded message informs employees of danger, directs them to the nearest emergency exit, and to their designated meeting areas outside. In the case of a tornado or severe weather, after the distinctive and recognizable alarm is sounded, the National Weather Service warning is announced to have the employees take the proper actions. Using the same alarm system to alert employees to severe weather and fire danger, two distinct recordings have been created to direct employees to their designated meeting areas outside or severe weather shelters inside (KI Emergency Action Plan, 2001).

Following the OSHA regulation, one necessary component the employer needs to establish in the employee emergency plan is the types of evacuation to be used during

emergency circumstances. The type of evacuation depends on the category of emergency occurring in or around the building. When emergencies arise inside the facility, the employees need to exit outside to the designated meeting area. As soon as urgent situations are taking place outside, the workforce is instructed to collect at their designated shelters area inside (OSHA, 2002).

In the case of a fire, explosion, or chemical spill, the escape procedures listed in KI's Emergency Action Plan dictate that the employees retreat to their designated meeting areas outside. In the case of a tornado or severe weather, the escape procedures listed in the Emergency Action Plan require all employees to follow set escape routes and eventually meet in their designated shelter location (KI Emergency Action Plan, 2001).

Before implementing the employee emergency plan, the employer is required to designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees. It is essential for the employer to review the plan with each employee at the following times:

1. Initially when the plan is developed,
2. Whenever the employee's responsibilities or designated actions under the plan change, and
3. Whenever the plan is changed.

The employer needs to review with each employee, upon initial assignment, those parts of the plan that they must know to protect them in the event of an emergency. The written plan must be kept at the workplace and made available for employee review. For those employers with 10 or fewer employees the plan, may be communicated orally to employees and the employer need not maintain a written plan (OSHA, 2002)

Before implementation of KI's Emergency Action Plan, the designated and trained persons who will assist in the safe and orderly evacuation of employees consist of the plant, process, and corporate, department managers. KI will review the Employee Emergency Plan with each employee covered at the following times:

1. Initially when the Emergency Action Plan is developed,
2. When a person is hired after the implementation date of the Emergency Action Plan,
3. Whenever the employee's responsibilities or designated actions under the Emergency Action Plan change, and
4. Whenever the Emergency Action Plan is changed (KI Emergency Action Plan, 2001).

By using the regulation as a rough outline to help write the employee emergency plan steps can be taken to ensure compliance with OSHA and also establish a best practice criterion to create the ideal plan for the facility. The best practice approach ultimately creates policies and procedures that are more stringent and thus exceed the minimum requirements set by OSHA. KI closely followed some of the minimum requirements, but most areas were surpassed when a best practice approach was created to cover the necessary components in the employee emergency plan.

Response Measurement Tools

When implementing the employee emergency plan, organizations can use several tools for response measure. These tools will help the company learn how well its employees understand as well as process the information given to them during initial training sessions for the new plan. Not all tools have to be utilized by the company, only

those they see fit to help them with measuring their responses. Adaptations of any tool can be used to create the perfect instrument for that specific facility.

Fire/severe weather drills are one of the most common tools used to measure the quality of employee's responses during an emergency. Every person who has attended school as a child probably remembers having to go outside when the alarm went off or meeting at the nearest tornado shelter. This tool will quickly tell the company if the employees received the appropriate information during training. A drill is simple instrument that forces the employees to perform the evacuation procedures and directs them, depending on the alarm, to their designated meeting area. The decisive factor for this tool is simply time. By setting a standard time as a goal, a company can either achieve that objective or work towards it by retraining and conducting more drills (www.em.doe.gov/otem/09072v2.pdf).

Tabletop drills look to have the same effects on response fire/severe drills do, but from a managerial approach. There are usually two teams when performing a tabletop drill. The response and the information team work in different rooms to sharpen their skills when dealing with all types of emergencies. A tabletop drill can be conducted in several different variations, but all have the same goal of helping build a more effective response from management during a crisis. An emergency situation will be brought to the response team. From whatever little information is given, they are responsible for devising a viable solution to the emergency. Using the training received, a mock drill for that emergency is played out between the members of the team. From this drill a possible solution to the emergency is reached. Their resolution is given to the information team where they respond to the new information and see what their course of action would be,

whether it is to take further steps, or if the employees need to be evacuated from the building. This process goes back and forth until the emergency is resolved. During these drills, several different emergency circumstances are introduced (www.em.doe.gov/otem/09072v2.pdf).

The people in a company are very valuable sources of event descriptions, diagnostic evaluations, and effective reactions when it comes to an incident in the work environment. With the help of interviews, businesses are able to talk to employees and see how the work force is feeling. Two of the most popular techniques used are the formal and informal interview. The formal interview is performed in a predetermined setting, at a set time, and with specific questions to be answered. This will be done when the researcher is looking for precise answers to specific questions. The informal interview is just the opposite in that the interviewer gives little guidance to the respondent in terms of questions or possible answers. This process is performed on the work floor as the employee is going about his/her daily tasks. The use of these compassionate methods can lead to improved relations with the members of the organization and is ideal when companies only want the input of a small sample of organizational members (Lawler, Nadler, & Cammann, 1980).

In addition to the before-mentioned interview techniques, a survey is a powerful tool for measuring responses if it is used the right way. A survey works by systematically and objectively collecting data about the system being researched through the use of specially formulated questions. After the data is collected, it is fed back into the organization and analyzed. Corrective action steps are created based on the results of the data. A survey will create a snapshot of what the company is doing at that time. This

will provide information or feedback to determine if the business is achieving its level of effectiveness. A survey can be created to answer several questions about a specific subject and it gives the employee the freedom to express their opinions about how the process is being measured or what can be done to ensure forward movement of the plan (Kraut, 1996).

When creating the employee emergency plan, it is up to the discretion of the creator on how the minimum regulations will be met. After the plan is implemented, measuring the response of the employees can be done through several types of tools. One company's tool might not be right for another. It is up to that facility to discover what works best for the company. Depending on what the organization wants to find out will dictate what type of tool it will use.

What Other Companies are doing

There are 25 million small companies in the U.S. today, a number that is growing about 2% annually (www.bizstats.com/bizsizes98.htm). Out of that number, 99% of all employers are small business owners, 40% of all US sales come from small businesses, and 75% of net new jobs are created by small businesses (www.vmn.org/sbnewsspring01.htm#SECTION%201). Small companies far outnumber large companies, but in this researchers opinion, small companies are more frequently delinquent in implementing an employee emergency plan as well as promoting the philosophy of continuously measuring and monitoring their plan. Considering size and economic stature, small businesses may approach the plan differently compared to large businesses. An evaluation of one small and one large business's views on what type of plan works for their individual company, from a compliance standpoint, and what type of

tools are used to measure success or failure will be discussed. The two companies are located in the greater Midwest.

Company A

Company A is a very large corporation with more than 600 plants, mills, warehouses and offices in North America, Europe and Asia. A larger organization recently acquired the facility being focused on. With this new acquisition, the parent company made it clear that safety and accountability was one of its main goals, but already having a very good safety record and program meant that little had to be changed at the facility.

Training for the employee emergency plan starts with an eight hour, three-day training session for all new employees. During this meeting, employees cover escape routes, emergency exits, escape procedures, and designated meeting locations. Locations of posted evacuation routes and emergency exit maps are made clear to all employees during their orientation tour. Employees will be retrained every year or whenever the Safety Department feels that it is necessary. Tests that deal with evacuation procedures, alarm notification, evacuation routes and destination, and emergency exits are part of the retraining process. Depending on the type of emergency, (i.e., fire/explosion or tornado/severe weather), drills are conducted twice a year for individual departments and the entire facility runs through one to two drills annually. These drills are conducted during shift changes or safety meetings. The alarm system is tested every month to ensure proper working condition. Annually, there is an entire emergency response system audit that provides all levels of management with feedback on the effectiveness of this plan.

If the facility would have an accidental chemical spill or fire, the response team would be called to deal with the emergency. The response team is an organized group of employees throughout the company who are trained in medical first aid, CPR, fire extinguisher use, and primary chemical spills. These individuals are trained and retrained in several areas every year. Monthly meetings consisting of 10-15 employees are held to discuss risk control related topics and walk through example conditions. These employees also help the Safety Department in the weekly inspections of departments. A specific department is targeted every Tuesday of the week to be inspected. Employees within that area are asked questions pertaining to the emergency plan and their department is inspected to see if all precautions are being met when dealing with employee evacuation. The form in which this happens is an impromptu interview while the employees are working. Recommendations for changes in departments are made to supervisors and employees, if needed, after the walk through.

Impromptu interviews are not the only tools of measure used by the safety department when dealing with the employee emergency plan. Another helpful instrument is an annual perception survey is conducted facility wide. This will help the safety department identify any concerns the employees have. The perception survey helps inform management how the worker perceives the workings of the employee emergency plan, from evacuation procedures to what the alarm for a fire drill sounds like. If discrepancies occur, retraining will be conducted on specific problem areas with department personnel.

Tabletop drills are conducted every 30 days at the monthly safety meeting at Company A. The response team and the Safety Department work in different rooms to

help hone each other's emergency reaction skills. A tabletop drill can be conducted in several ways. In one approach, an emergency will be brought to the response team from the safety department. From whatever little information is given, they are responsible for coming up with a viable reaction to the emergency placed before them. Their solution is given to the safety department and they take action based on this new information.

Depending on what their response to the situation would be, further steps might need to be taken such as evacuating the employees from the building. This process goes back and forth until the emergency is resolved. Several different emergency circumstances are introduced at each meeting to aid in all possible situations.

Company B

Company B is quite a bit smaller than Company A. Their manufacturing and warehouse space consists of 200,000 square feet and is operated by a staff of over 100 employees. They are an established company with a 40+-year history. They started out very small and have gradually increased in size over the years, but are nowhere near the size of Company A.

To be compliant with OSHA regulations governing the development of an employee emergency plan, employers with 10 or more employees have to have a plan in writing. At this time there is no plan in writing at Company B, but it is in the process of being constructed. They may not have a plan created, but they do already have some requirements and other best practice activities that deal with the employee emergency plan. Escape routes are labeled and made known to all employees. Emergency exits are also labeled, marked, and made known to employees through verbal communication.

The alarm system and emergency lighting is tested every month to ensure proper working

condition. Tornado/severe weather shelters are all clearly identified with a sign designating them as a safe place. Several shelters were designated to accommodate all employees. Fire extinguishers are checked every month and thoroughly inspected annually for any defects. Every week, each department conducts safety audit inspections on another department for safety violations and apparent issues are discussed at the monthly safety meeting. Several procedures are correctly conducted to best practice standards even though the facility is without a written employee emergency plan.

In an emergency, employees can use fire extinguishers to fight fires, but individuals have had no training on how to operate such devices or even how to fight a fire properly. From the specific measuring tools discussed previously, Company B's facility is not using any, except for weekly safety audits. There was no mention of any training for employees at new-hire orientation or periodic retraining at the facility. Also no fire/severe weather drills conducted or tabletop drills and no established way for employees to convey their thoughts and feelings about the employee emergency plan.

It is quite likely that the potential lack of safety and governmental regulations knowledge puts the smaller companies in the United States at a greater risk of not being properly prepared for an emergency. Without the aid of a safety department or director, smaller businesses may be delinquent in the safety area. This is apparent when looking at the previously mentioned companies. Company A has a strong safety background and culture ingrained throughout the entire facility, which is lead by an active safety department. Company B is lacking the safety influence present in the large business, but is willing to strive for safety.

Conclusion

History is an excellent tool from which to draw future actions from. Mishaps and other blunders throughout history can demonstrate what can happen when plans are not properly researched, clearly analyzed for all contingencies, and corners are cut. From an analysis of certain disasters as well as their current processes/procedures, companies can develop and substantially revise their plans by looking at what went wrong as well as what could occur.

OSHA regulations were created for employees to have a safe and healthy work environment, while not compromising productivity. These policies are set up at a minimum level to help employers with lateral movement when creating their own safety plans. A guideline to follow can be drawn from the regulations and from this employers will have room to curtail a safety plan to fit their specific facility.

After the employee emergency plan is created, it has to be implemented into the workplace. There are more than a few ways that it can be executed and there are several things a company has to focus on when putting their plan into action. Specific training, re-training when needed, informing employees of changes in the plan, and testing employees on what they have learned are all key actions needed during a plans formation.

After the employee emergency plan is up and running, steps have to be taken to ensure that it is operating correctly, that all employees know how it works, and what they have to do. Simple techniques can be instilled in the work ethic of management to ensure proper retention on behalf of the employees when it pertains to the emergency plan. A fire/tornado drill can be performed once a year, table top drills run, interviews and feedback from the employees given freely when problems occur, and surveys conducted

to poll the employees for certain information. All these steps can ensure a well implemented employee emergency plan.

CHAPTER III

Methodology

Introduction

An ultimate level of commitment regarding retention is greatly desired from the work force so that an adequate response to emergency situations can be guaranteed. The purpose of this research is to measure that level of retention for the employee emergency plan by the personnel at KI and determine the quantity of implementation effectiveness. The retaining of knowledge for the newly executed emergency plan can be measured several ways. The most suitable way determined to measure the level of retention for the employee emergency plan was an informal survey.

Survey Form Development

The questions on the survey are simple and to the point. The intention of the questions is to determine if the message of the employee emergency plan was conveyed clearly, precisely, and with the proper amount of knowledge for all employees to understand and process the plan in a way that there would be no doubt in their minds what to do in case of an emergency. The questions were not created to put the employee on the spot, but rather have them express their knowledge of the subject. The Plant Engineer approved all questions before any informal survey was conducted.

The questions were derived directly from the initial training session so as to test only the knowledge bestowed on them about the employee emergency plan. The questions were identical for all employees who were asked to participate. The following form is the actual survey used in the researching of knowledge retention for the employee emergency plan at the Green Bay, KI location.

Emergency Action Plan Survey

The purpose of this survey is to determine how well KI employees remember the emergency response information that they were provided when the company's Emergency Action plan was implemented during the summer of 2001.

Employee Consent

*I understand that by returning this questionnaire, I am giving my informed consent as a participating volunteer in this study. I understand the basic nature of this study. I am aware that the information is being sought in a specific manner so that only minimal identifiers are necessary and so that confidentiality is guaranteed.

Gender: male
 female

Shift: 1st
 2nd
 3rd

1. At the first sign of danger, (i.e., fire, explosion), what are you to do?

<input type="checkbox"/> a. find a fire extinguisher	<input type="checkbox"/> b. find your supervisor
<input type="checkbox"/> c. calmly stand up/evacuate the building	<input type="checkbox"/> d. keep working

 2. In case of an emergency evacuation, do you know where to go? Yes No

 3. If there was an emergency, (i.e., fire, explosion), what would the alarm sound like?

<input type="checkbox"/> a. an announcement over the pa system	<input type="checkbox"/> b. horn blast and light strobes
<input type="checkbox"/> c. announcement over the computer	<input type="checkbox"/> d. other

 4. At the first sign of danger, (i.e., tornado, severe weather), what are you to do?

<input type="checkbox"/> a. meet at your designated shelter location	<input type="checkbox"/> b. keep working
<input type="checkbox"/> c. ask your supervisor what to do	<input type="checkbox"/> d. drop to the floor and cover head

 5. In case of severe weather/tornado, do you know where to go? Yes No

 6. If there was an emergency, (i.e., tornado, severe weather), what would the alarm sound like?

<input type="checkbox"/> a. an announcement over the pa system	<input type="checkbox"/> b. horn blast and light strobes
<input type="checkbox"/> c. announcement over the computer	<input type="checkbox"/> d. other

 7. Do you feel that your training has provided you with the necessary knowledge to make a decision in the event of an emergency? Yes No
- Comments: _____
-
8. Where do you go when evacuating the building?

<input type="checkbox"/> a. find friends and wait for the ok to go back in
<input type="checkbox"/> b. designated meeting area
<input type="checkbox"/> c. just getting out of the building is the main objective

 9. If you had a question about what to do when there is an emergency, whom would you contact? _____

 10. If there was a fire burning that was not out of control, but was increasing in size each second, what would you do?

<input type="checkbox"/> a. I would grab the nearest fire extinguisher and proceed to fight the fire
<input type="checkbox"/> b. I would pull the nearest fire alarm and head for my designated meeting area
<input type="checkbox"/> c. I would contact 9-911, my supervisor or other manager and tell them what was going on

Subject Selection

An informal survey was conducted during the week of the 16th through the 19th of May, 2002, at the KI Green Bay location. The desired number of participants was 147, which was about 67% of the workforce that week. The employees targeted for this research were plant-floor employees, supervisors, engineers, and management. These employees were surveyed on all three-work shifts. The randomness of employees that were picked to take part was up to the discretion of the researcher. The employees were approached while conducting routine work tasks and were asked to take a few moment of their time to answer a couple of general questions relating to the information supplied during the training of the employee emergency plan. This researcher and one employee of KI, who is a youth apprentice in the CAD-department, approached the employees with the surveys. Both individuals informed willing subjects of the research being conducted and answered any questions by employees. Most employees were willing to supply answers during the informal survey in hopes that it would help in the updating of training and information given to the employees dealing with the emergency action plan.

Data Collection

The Plant Engineer at KI conducted the initial training session on the newly implemented employee emergency plan. A lengthy presentation was conducted at the engineering level. This information was then transferred from the engineers to all managers who in turn trained the floor workers in daily huddles. Ideally the flow of information was supposed to happen that way. From this implementation session, specific questions were created to assess the fundamental knowledge transferred to all

employees based from the initial training presentation for the employee emergency plan. These specific questions were created with the help of the Plant Engineer.

Data Analysis

The data will be analyzed between several different factors. Every answer will be analyzed against all data supplied for that particular question. The data collected for questions 1 and 3 will be compared to question 2 and the information given for questions 4 and 6 will be evaluated against question 5. Only like questions will be analyzed against like questions. The statistics for all questions will be judged verses the gender of the participants. When the initial training session was held, it was noticed by the researcher that the female employees participating were more receptive to the information, supplied feedback, and generally asked questions to learn more. The males were not as receptive to the training.

Assumptions

There are two assumptions for the survey and it's method. They are:

1. It will assume that all information has been transferred to the lower levels from the above levels for the implementation of the employee emergency plan.
2. The assumption that all employees, no matter where the researcher goes, will have been given the correct, same, and all the information form the initial training session

Limitations

The results of the survey will be limited due to the amount of training that was transferred to the employees from the lengthy presentation conducted at the engineering level. The potential inability to train the floor employees and truly inform them of the implemented emergency action plan will have a negative effect on data collection. The

amount of employees plant wide, due to voluntary layoffs, early retirements, and layoffs, will limit the amount of data collected.

CHAPTER IV

Results of the Study

Introduction

The purpose of this study was to evaluate the effectiveness of implementation training and retention of the workforce for the employee emergency plan at the Green Bay, WI location. In the summer of 2001, KI implemented a new employee emergency plan. This program laid the foundation for emergency response and actions at KI and contained the minimum requirements for compliance for the regulations enforced by OSHA. An informal survey was conducted during the week of the 16th through the 19th of May, 2002, at the KI Green Bay location. The desired number of participants was 147, which was about 67% of the workforce that week. The employees were approached while conducting routine work tasks and were asked to for a few minutes of their time to answer a couple of general questions relating to the information supplied during the training of the employee emergency plan. The data was analyzed between several different factors. Every answer was analyzed against all data supplied for that particular question. The data collected for questions 1 and 3 was compared to question 2 and the information given for questions 4 and 6 was evaluated against question 5. Answers given for all questions were assessed between the genders of the participants.

Results

The data collected from the employee emergency plan survey was statistically analyzed by using the Chi-Square Test. After the results were compiled, each question was broken down by number of participants, gender, and shift. Figure 1 indicates the number of participants by gender and according to shift. The male to female ratio is virtually the same and the majority of the employees surveyed came from 1st shift.

Figure 1. Gender and shift of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	80	54.4	54.8	54.8
	female	66	44.9	45.2	100
	Total	146	99.3	100	
	Missing System	1	0.7		
	Total	147	100		
Valid	1st shift	101	68.7	68.7	68.7
	2nd shift	27	18.4	18.4	87.1
	3rd shift	19	12.9	12.9	100
	Total	147	100	100	

Figure 2 indicates the finding between genders for what the employees are to do at the first sign of danger. The correct answer is stand and evacuate and for this question, males had a smaller percentage of right responses compared to the females.

Figure 2. Statistical data from question 1

	1. At the first sign of danger, (i.e., fire, explosion), what are you to do?				Total
	find extinguisher	find your supervisor	stand and evacuate	multiple response	
Gender male					
count	11	4	62	3	80
Expected Count	9.3	4.4	63.6	2.7	80
% within Gender	13.8%	5.0%	77.5%	3.8%	100.0%
female					
count	6	4	54	2	66
Expected Count	7.7	3.6	52.4	2.3	66
% within Gender	9.1%	6.1%	81.1%	3.0%	100.0%
Total					
count	17	8	116	5	146
Expected Count	17	8	116	5	146
% within Gender	11.6%	5.5%	79.5%	3.4%	100.0%

Figure 3 conveys the results between genders responding whether or not the employees know where to go during an emergency evacuation. Between all three shifts, 94.9% of males thought that during a fire, chemical spill, or explosion they knew where they were supposed to escape and 93.1% of both genders responded that they know where to go during an evacuation.

Figure 3. Statistical data from question 2

		2. In case of an emergency evacuation, do you know where to go?		Total
		yes	no	
Gender	male			
	count	75	4	79
	Expected Count	73.6	5.4	79
	% within Gender	94.9%	5.1%	100.0%
	female			
	count	60	6	66
	Expected Count	61.4	4.6	66
	% within Gender	90.9%	6.9%	100.0%
Total	count	135	10	145
	Expected Count	135	10	145
	% within Gender	93.1%	6.9%	100.0%

Knowing what the alarm sounds like during an emergency is very important for employees to know. Figure 4 discusses the findings of that specific subject between all shifts and gender. The correct answer is an announcement over the PA system, 38.6% of individuals surveyed thought the correct answer was horn blast and strobe lights.

Figure 4. Statistical data from question 3

		3. If there was an emergency, (i.e., fire, explosion), what would the alarm sound like?				Total
		announcement over pa	horn blast & strobes	other	multiple response	
Gender	male					
	count	35	33	10	2	80
	Expected Count	38.6	30.9	8.3	2.2	80
	% within Gender	43.8%	41.3%	12.5%	2.5%	100.0%
	female					
	count	35	23	5	2	65
	Expected Count	31.4	25.1	6.7	1.8	65
	% within Gender	53.8%	35.4%	7.7%	3.1%	100.0%
Total	count	70	56	15	4	145
	Expected Count	70	56	15	4	145
	% within Gender	48.3%	38.6%	10.3%	2.8%	100.0%

During a tornado or severe weather, there are certain procedures that need to be taken so they will ensure safety for all employees. Figure 5 discusses the findings of 146

employees who were surveyed and it was found that a high amount, 92.5%, of employees answered correctly.

Figure 5. Statistical data from question 4

	4. At the first sign of danger, (i.e., tornado, severe weather), what are you to do?				Total
	designated meeting area	keep working	ask supervisor	drop/cover head	
male					
count	71	2	3	4	80
Expected Count	74	1.1	1.6	3.3	80
% within Gender	88.8%	2.5%	3.8%	5.0%	100.0%
female					
count	64	0	0	2	66
Expected Count	61	0.9	1.4	2.7	66
% within Gender	97.0%	0.0%	0.0%	3.0%	100.0%
Total					
count	135	2	3	6	146
Expected Count	135	2	3	6	146
% within Gender	92.5%	1.4%	2.1%	4.1%	100.0%

Figure 6 presents the results between genders on whether or not the employees know where to go during severe weather or a tornado. Between all three shifts, 90.1% of the employees believed they knew that during severe weather or tornado, they knew where they were supposed to go.

Figure 6. Statistical data from question 5

	5. In case of severe weather/tornado, do you know	
--	---	--

	where to go?		Total
	yes	no	
Gender male			
count	72	5	77
Expected Count	69.4	7.6	77
% within Gender	93.5%	6.5%	100.0%
female			
count	56	9	65
Expected Count	58.6	6.4	65
% within Gender	86.2%	13.8%	100.0%
Total			
count	128	14	142
Expected Count	128	14	142
% within Gender	90.1%	9.9%	100.0%

Knowing the difference between the various alarm sounds will help direct employees to the appropriate meeting areas during an emergency. Figure 7 discusses the findings of what the employees think the alarm sounds like during a tornado or severe weather. The correct answer is an announcement over the PA system.

Figure 7. Statistical data from question 6

	6. If there was an emergency, (i.e., tornado, severe weather), what would the alarm sound like?					Total
	announcement over pa	horn blast & strobes	announcement on computer	other	multiple response	
Gender male						
count	49	16	1	10	2	78
Expected Count	47.2	19.8	1.1	8.2	1.6	78
% within Gender	62.8%	20.5%	1.3%	12.8%	2.6%	100.0%
female						
count	37	20	1	5	1	64
Expected Count	38.8	16.2	0.9	6.8	1.4	64
% within Gender	57.8%	31.3%	1.6%	7.8%	1.6%	100.0%
Total						
count	86	36	2	15	3	142
Expected Count	86	36	2	15	3	142
% within Gender	60.6%	25.4%	1.4%	10.6%	2.1%	100.0%

Figure 8 presents the opinionated findings of whether or not the employees feel that the training was adequate to instill the necessary knowledge to make a decision during an emergency. Only 144 employees surveyed responded to this question.

Figure 8. Statistical data from question 7

	7. Do you feel your training has provided the necessary knowledge to make a decision in an emergency?		Total
	yes	no	
male			
count	67	13	80
Expected Count	58.3	21.7	80
% within Gender	83.8%	16.3%	100.0%
female			
count	38	26	64
Expected Count	46.7	17.3	64
% within Gender	59.4%	40.6%	100.0%
Total			
count	105	39	144
Expected Count	105	39	144
% within Gender	72.9%	27.1%	100.0%

When evacuating the building, employees are to report to the designated meeting area is the correct answer and the findings for this question is displayed in Figure 9. There were 38 individuals that thought just getting out of the building was the most important response.

Figure 9. Statistical data from question 8

	8. Where do you go when evacuating the building?				Total
	find friends & wait	designated meeting area	get out of building	multiple response	
male					
count	1	63	15	1	80
Expected Count	1.1	57.5	20.8	0.5	80
% within Gender	1.3%	78.8%	18.8%	1.3%	100.0%
female					
count	1	42	23	0	66
Expected Count	0.9	47.5	17.2	0.5	66
% within Gender	1.5%	63.6%	34.8%	0.0%	100.0%
Total					
count	2	105	38	1	146
Expected Count	2	105	38	1	146
% within Gender	1.4%	71.9%	26.0%	70.0%	100.0%

9. The only question that required the employees to create their own response was question nine and it was if they had a question about what to do when there is an emergency, whom would you contact?

The responses that were being sought after were opinionated answers based from their training about whom the employees' thought was the best person to contact. The

answers given ranged between the plant engineer, Human Resources, leaving the question blank, and their direct supervisor. The correct response was the plant or facilities engineer. About 70% of the employees listed their direct supervisor or process manager as the individual they would contact.

The employee emergency plan specifically instructs the work force not to fight a fire. Either answer 2 or 3 was acceptable for the right response. The findings of what to do if a fire was burning that wasn't out of control, but was increasing in size are presented in Figure 10. There was double the amount of men over women who would fight the fire above all else.

Figure 10. Statistical data from question 10

	10.If there was a fire burning that wasn't out of control, but was increasing in size, what would you do?							Total
	1. fight fire	2. Pull fire alarm	3. call 911 /supervisor	1 & 2	1 & 3	2 & 3	1,2,3	
Gender male								
count	24	29	21	1	2	0	3	80
Expected Count	19.2	36.7	18.6	0.5	1.1	0.5	3.3	80
% within Gender	30.0%	36.3%	26.3%	1.3%	2.5%	0.0%	3.8%	100.0%
female								
count	11	38	13	0	0	1	3	66
Expected Count	15.8	30.3	15.4	0.5	0.9	0.5	2.7	66
% within Gender	16.7%	57.6%	19.7%	0.0%	0.0%	1.5%	4.5%	100.0%
Total								
count	35	67	34	1	2	1	6	146
Expected Count	35	67	34	1	2	1	6	146
% within Gender	24.0%	45.9%	23.3%	0.70%	1.4%	0.70%	4.1%	100.0%

Cross Tabulation

Figure 11 presents the data cross-referenced between if individuals knew where to go during a fire/explosion evacuation and what they were to do at the first sign of danger (i.e., fire, explosion). The need for an employee to stand and evacuate was the correct answer and had the highest amount of responses with 80.1%

Figure 11. Statistical data of cross tabulation of Question 1 and 2

2. In case of an emergency evacuation, do you know where to go?	1. At the first sign of danger, (i.e., fire, explosion), what are you to do?				Total
	find extinguisher	find your supervisor	stand and evacuate	multiple response	
Answer yes					
count	14	8	110	4	136
Expected Count	14.9	7.5	109	4.7	136
% within number 2	10.3%	5.9%	80.9%	2.9%	100.0%
Answer no					
count	2	0	7	1	10
Expected Count	1.1	.5	8	.3	10
% within number 2	20.0%	.0%	70.0%	10.0%	100.0%
Total count	16	8	117	5	146
Expected Count	16	8	117	5	146
% within number 2	11.0%	5.5%	80.1%	3.4%	100.0%

Figure 12 presents the data cross-referenced between if individuals knew where to go during a fire/explosion evacuation and what they thought the alarm sounds like during a fire/explosion emergency. An announcement over the PA system was the correct response with 48.5%, but horn blasts and strobes had almost the same percentage of replies at 38.2%.

Figure 12. Statistical data of cross tabulation of Question 3 and 2

2. In case of an emergency evacuation, do you know where to go?	3. If there was an emergency, (i.e., fire, explosion), what would the alarm sound like?				Total
	announcement over pa	horn blast & strobes	other	multiple response	
Answer yes					
count	66	52	14	4	136
Expected Count	65.7	51.6	15	3.8	136
% within number 2	48.5%	38.2%	10.3%	2.9%	100.0%

no					
count	4	3	2	0	9
Expected Count	4.3	3.4	1	.2	9
% within number 2	44.4%	33.3%	22.2%	0.0%	100.0%
Total					
count	70	55	16	4	145
Expected Count	70	55	16	4	145
% within number 2	48.3%	37.9%	11.0%	2.8%	100.0%

Figure 13 presents the data cross-referenced between if individuals knew where to go during severe weather/tornado and what they were to do at the first sign of danger (i.e., tornado, severe weather). The need to report to the designated meeting area was the correct answer and 92.9% of the no responses to knowing where to go gave this reply.

Figure 13. Statistical data of cross tabulation of Question 4 and 5

5. In case of severe weather / tornado, do you know where to go?	4. At the first sign of danger, (i.e., tornado, severe weather), what are you to do?				Total
	designated meeting area	keep working	ask supervisor	drop/cover head	
yes					
count	119	2	3	5	129
Expected Count	119.1	1.8	2.7	5.4	129
% within number 5	92.2%	1.6%	2.3%	3.9%	100.0%
no					
count	13	0	0	1	14
Expected Count	12.9	0.2	0.3	0.6	14
% within number 5	92.9%	0.0%	0.0%	7.1%	100.0%
Total					
count	132	2	3	6	143
Expected Count	132	2	3	6	143
% within number 5	92.3%	1.4%	2.1%	4.2%	100.0%

Figure 14 presents the data cross-referenced between if individuals knew where to go during severe weather/tornado and what they thought the alarm sounds like during a tornado/severe weather emergency. Only 60.4% of the respondents replied with the correct answer, which should have been an announcement over the PA system.

Figure 14. Statistical data of cross tabulation of Question 6 and 5

5. In case of severe weather / tornado, do you know where to go?	6. If there was an emergency, (i.e., tornado, severe weather), what would the alarm sound like?					Total
	announcement over pa	horn blast & strobes	announcement on computer	other	multiple response	

Answer	yes						
	count	79	32	1	11	3	126
	Expected Count	76.1	31.7	1.8	13.6	2.7	126
	% within number 5	62.7%	25.4%	0.8%	8.7%	2.4%	100.0%
	no						
	count	5	3	1	4	0	13
	Expected Count	7.9	3.3	0.2	1.4	0.3	13
	% within number 5	38.5%	23.1%	7.7%	30.8%	0.0%	100.0%
Total	count	84	35	2	15	3	139
	Expected Count	84	35	2	15	3	139
	% within number 5	60.4%	25.2%	1.4%	10.8%	2.2%	100.0%

After completion of this analysis, it was conceived by this researcher that an adequate sampling of employees at KI produced a sufficient amount of data pertaining to the employee emergency plan. A statistical analysis was conducted on all responses using the Chi-Square Test. Each question was broken down by number of participants, gender, and shift after the results were compiled.

CHAPTER V

Conclusions and Recommendations

Introduction

The purpose of this study was to evaluate the effectiveness of implementation training and retention of the workforce for the employee emergency plan at the Green Bay, KI location. In the summer of 2001, KI implemented a new employee emergency plan. This program laid the foundation for emergency response and actions at KI and contained the minimum requirements for compliance for the regulations enforced by OSHA.

There were four main goals established for this study, which include the following:

5. To inspect\evaluate KI's plan to determine if compliance with OSHA regulations has been achieved.
6. To determine the level of implementation effectiveness
7. To establish a criterion for implementation to evaluate insufficient levels of implemented information.
8. To establish a criterion for KI's inspections\evaluations to determine compliance levels.

Conclusion

From the survey which was administered to numerous KI personnel, it was determined that 75.4% of all employees surveyed had correctly answered all the questions. This means that 110 employees out of 147 correctly knew the issues that were presented to them during the survey process. Out of the ten questions on the survey, there were five questions that had lower percentages of correct responses than the overall average. Two questions relating to what the alarm sounds like had the lowest correct

responses as it relates to that of fire/explosion at 48.3% and severe weather/tornado at 60.6%. The results indicate that roughly one out of every four employees surveyed would fight a fire by finding and utilizing a portable fire extinguisher. Approximately 71.9% of the employees indicated that the designated meeting area is where they would go when evacuating the building while only 27.1% of those surveyed felt that their training had not provided the necessary knowledge to make a decision in the event of an emergency.

Statistically, the females' correct answers were generally higher than the males' on the questions that dealt with hard facts while the males' normally responded better on items that were opinionated. From this data, it can be drawn that female employees surveyed had a better understanding of the material presented during the training sessions than the males. The males assumed that they understood the information, while answering fewer correct responses on the questions that dealt with factual subjects.

After reviewing the findings, the plant engineer was very receptive to recommendations and comments. Further relations with KI have been planned in order to discuss the findings of this survey in greater detail. From these meetings, positive actions will be made to ensure that the areas with the lowest percentage of correct answers given will be corrected.

Recommendations

In order to promote an adequate response to emergency situations regarding the implementation of the employee emergency plan at KI, the following measures are recommended:

Alarm Training

As soon as practical, training to distinguish what the alarm sounds like for each emergency situation should be conducted for all employees. Currently, if there was severe weather/tornado, only 60.6% of the employees know what the alarm sound like and only 48.3% would recognize the notification for fire/explosion. That potentially could lead to losing more half of the work force because a fire broke out. Subsequently, the employees are not informed and they need to receive such information before any catastrophes occur.

Drill Variations

It is recommended that variations of all emergency drills be developed. The standard drill for fire/explosion and severe weather/tornado is for all employees to follow the set escape routes out of the department that leads to the emergency exits and then assemble at the designated meeting area. If different escape routes and emergency exits were blocked during an evacuation, employees will have to learn how to look for the secondary and third exit and route options. This practice will help increase the exit and route location awareness for the employees.

Interactive Training Drills

During training sessions, the only interaction for the employees is a plant tour and question/answer time after the presentation. It is in KI's best interest to develop interactive training drills for employee orientation. The use of tabletop drills during training will increase the retention of the newly informed information by having them run through different scenarios that deal with the employee emergency plan. This interaction between the new employees will have two effects; it will bring them closer by having everyone introducing themselves to each other, and it will help ingrain the employee emergency plan into their memory right away.

Male/Female Training Ratio

When the initial training session was held, it was noticed that the female employees participating were more receptive to the information, supplied feedback, and generally asked questions to learn more. Conversely, the males appeared not to be receptive during the training sessions. It is felt that balancing the numbers between males and females during training would increase retention. During the training sessions, the ratio of males to women was about 5 to 1. If the same amount of both genders participates during training sessions, the involvement by all employees would likely be at the same level.

Fire Extinguisher Training

Out of the 146 employees who were surveyed, 44 thought that they should use a fire extinguisher to fight a fire. However, it is written in the employee emergency plan that no member of the workforce is trained to fight fires. Given this underlying belief, it may be prudent to conduct a special training session on fire extinguisher use to inform individuals on how to use such devices correctly. This training would be of assistance in that employees would know how to put out a fire if their life depended on it.

Living Document

The employee emergency plan was created during the summer of 2001. Since then, several changes have occurred throughout the plant that do not agree with the plan anymore. For example, the addition of an alarm pull box for fire/explosion notification as well as a push switch for the triggering of the severe weather/tornado announcement are just a few items that need to be incorporated into the plan. The plant engineer should review the process and procedures quarterly to guarantee that facility/equipment changes are reflected in the employee emergency plan.

Measuring Tool

The Emergency Action Plan Survey created for this research has set a baseline for KI to measure the retention levels of the employees. As the plan changes, it is likely that the survey must change also to reflect the correct findings at the facility. This survey could serve as the basis to measure levels of implemented information and determine compliance levels pertaining to KI's emergency action plan. A regular schedule should be set for the collection of the data from the employees and this process should coincide with any changes to the plan or major changes to the facility and its surroundings.

REFERENCES

- 1903 Iroquois Theater Fire.* (n.d.). Retrieved on April 10, 2002, from
<http://www.chipublib.org/004chicago/timeline/iroqfire.html>
- Guidance for Planning, Conducting and Evaluating Transportation Emergency Preparedness Tabletops, Drills and Exercises.* (2000). Retrieved on May 9, 2002, from <http://www.em.doe.gov/otem/09072v2.pdf>
- Hardy, R. (n.d.) *Reducing Fire Deaths and Panic.* Retrieved on May 9, 2002, from
<http://www.nonfictionreviews.com/article1151.html>
- Hotel Fires.* (n.d.). Retrieved on May 9, 2002, from http://www.emergency-management.net/hotel_fire.htm
- Kraut, A.I. (Ed.). (1996). *Organizational Survey.* San Francisco: Josey-Bass.
- Lawler, E.E., Nadler, D.A., & Cammann, C. (1980). *Organizational Assessment: Perspectives on the Measurement of Organizational Behavior and the Quality of Work Life.* New York: John Wiley & Sons.
- O'Brien, E., Benedict, L. (2001). *1903, December 30: Iroquois Theater Fire.* Retrieved on April 10, 2002, from
http://www.chipublib.org/004chicago/disasters/iroquois_fire.html
- O'Rourke, Patrick. (2002). *Number of Businesses by Annual Revenue.* Retrieved on April 9, 2002, from <http://www.bizstats.com/bizsizes98.htm>
- OSHA. (n.d.). *Employee alarm systems. - 1910.165.* Retrieved on March 26, 2002, from
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9819

OSHA. (n.d.) *Employee emergency plans and fire prevention plans. - 1910.38.*

Retrieved on September 11, 2001, from http://www.osha-slc.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9726

Virginia Microenterprise Network. (2001). *Facts and figures for organizations that help small business owners.* Retrieved on April 9, 2002, from

<http://www.vmn.org/sbnewsspring01.htm#SECTION%201>

White, S. W. (n.d.). *Fire Safety In Places of Assembly.* Retrieved on April 12, 2002, from <http://www.co.clark.nv.us/fire/assembly.htm>

APPENDIX 1
KI EMERGENCY ACTION PLAN

SECTION 3

KI EMERGENCY ACTION PLAN

3.1 Escape Procedures

Escape procedures will be the same for each designated area. First and foremost, it's **YOUR RESPONSIBILITY** to get all the available fire escape information about the location you are in. Take note of the two exits nearest you, and make sure they are unobstructed and unlocked. Make sure that there is sufficient fire protection, as automated sprinklers and or fire extinguishers. If you have guests at KI, inform them about the escape plan, and make sure they know two escape routes from every room while they are visiting.

The Department Manager, as part of the employee training process, will explain designated assembly areas, and all primary and secondary escape routes.

Physically challenged employees will be assigned an employee to assist them in the evacuation of the building. Managers are responsible for assigning an employee to provide assistance in the event of an emergency.

At the first sign of danger, calmly stop what you are doing, stand up, evacuate the area in a calm and orderly fashion using the designated escape route, and proceed to your designated meeting area away from the building.

All designated meeting areas will be fashioned with a colored sign that is labeled with the corresponding area number and a large marking on the ground to designate the meeting place.

*Designated Meeting Areas (see Appendix B)

Area 1

- Northwest parking lot behind the plant, along the inside of the fence

Area 2

- Northwest parking lot behind the plant, along the inside of the fence

Area 3

- Southwest fence line, directly West of the South Gate

Area 4

- Northwest parking lot fence line directly behind the plant, along the outside of the fence

Area 5

- South fence line across from the Shipping & Receiving Department

Area 6

- South fence line across from the Shipping & Receiving Department

Area 7

- South fence line across from the Shipping & Receiving Department

Area 8

- Southeast parking lot, along the West fence line

Area 9

- Southeast parking lot, along the West fence line

*Additional Information

If you are trapped in a Fire:

Stay calm. There are many steps you can take to protect yourself.

If possible, go to a room with an outside window or balcony and a telephone.

Close all doors between you and the fire. Use tape or a wet towel to fill cracks around doors and cover vents to keep smoke out.

If there's a phone in the room where you are trapped, call the fire department and tell them exactly where you are, even if you can see fire trucks on the street.

If possible, open the window at the top and bottom and signal firefighters with a light cloth or flashlight. Do not break the window, and be ready to shut it quickly if smoke rushes in.

*Fire Fighting

No KI employee is trained to fight fires. If an employee chooses to use a fire extinguisher, they are limited to incipient stage fires. Incipient stage fires – a fire in its initial stage or beginning and can be extinguished with a single fire extinguisher. Remember, call 9-911 **before** you use a fire extinguisher!

*Fire Extinguisher

Fire extinguisher training will be conducted to every employee at KI on an annual basis. The training will consist of how to select the proper extinguisher for the particular fire, how to identify what type of fire is being dealt with, and how to use the fire extinguisher. **No KI employee is trained to fight fires;** the fire extinguisher training is to familiarize the employee with the workings of the extinguisher. Not how to fight fires.

3.2 Critical Plant Operations

*Critical Plant Operations are considered an operation that will add dangerous elements to an emergency or will cause additional damage to the plant after an emergency has been contained and controlled or has passed.

*The three operations deemed as critical are:

- Natural Gas supply turn off
 - Natural gas shut off must be done from the outside of the plant building. The valve is located on the South wall of the plant, West of the tennis courts, directly next to the South Block House. The yellow valve wrench will be in the 12 o'clock position pull the wrench down until it stops, about 90 degrees, at the 3 o'clock position. The natural gas will be shut off to the entire plant.
- The shut-down of the #1 and #3 electrical sub station
 - Electrical sub stations shutdown must be done at two different locations. Sub station 1 is located along the South wall above the South Block House. The main throw lever needs to be pulled straight down until it stops. The power will be shut down to sub station 1.
 - Sub station 3 is located in the center of the plant above the restrooms, in the corporate mezzanine directly East of the Paint Line. Both throw levers need to be pulled straight down until they stop. Electrical power will be shut down to sub stations 2, 3, and 4.
- The turn off of the water supply, potable, process, and sprinkler water

- Potable, process, and sprinkler water shut offs will be done outside of the plant building. The valves are located in the well on the East side of plant between the plant and satellite building, directly West of the weight room. The yellow valves controls the potable and process water and will be turned clockwise until it stops. The red valves control the sprinkler water and will be turned clockwise until it stops. The water will be shut off to the entire plant.

*In the case of a Fire, Explosion, or Chemical Spill, the Critical Plant Operations will be preformed immediately.

*Shut off of the water will be preformed when the emergency has been contained and controlled and the proper authorities have deemed the environment safe to perform the shutdown procedure.

*In the case of a Tornado or Severe Weather, the Critical Plant Operations will be shutdown after the emergency has passed or the environment has been deemed safe to perform the shutdown procedures.

*The Plant Engineer will work with the Fire Department to delegate the shut down of the Critical Plant Operations.

3.3 Employee Accountability

*Plant

- During daily shift meetings, at the beginning of each shift, Process Managers will take attendance when assigning daily job for each person to have an accurate employee count. This employee

count will be tallied and will then be used as the accountability check sheet, incase of an emergency.

*Corporate

- Department Managers will take a local count of their department to determine if any persons are missing from their department. Persons from that department work on a buddy system to keep further track of employees in the department. The employee count will be used as an accountability check, incase of an emergency.

3.4 Rescue and Medical

*Fire Department

- In the event of an emergency, any employee has the right to contact 9-911. If the situation is out of control, call 9-911 first then contact your supervisor or department manager to alert them to the situation and take the proper evacuation actions as laid out in the Emergency Actin Plan. It is the supervisors or managers responsibility to report this to the Plant Engineer. Remember that no fire is too small to call the Fire Department.
- When calling 911 remember to dial a 9 first. 9-911

*Emergency Responders (see Appendix A)

- First responders will assist with the first-aid care to any injured employees after the emergency has been contained and before the proper medical teams arrival onsite. Once local medical teams arrive, assistance can be given to the proper medical teams only if requested by the medical teams.

*Consulting Physician (see Appendix A)

- KI's consulting physician will be contacted if medical assistance is needed immediately. The consulting physician will assist with the first-aid care to any injured employees after the emergency has been contained and before the proper medical teams arrival onsite. Assistance can be given to the proper medical teams only if requested by the medical teams.

***Hazardous Materials**

- Upon learning about the hazardous materials spill, dial 9-911 for immediate assistance. The Fire Department will assess the severity of the situation and help determine if more assistance is needed.
- If more assistance is needed the proper Hazardous Materials Service, contracted by the Plant Engineer, will be notified by the Plant Engineer or Environmental Engineer and will be in control of the situation.

3.5 Contacts to Explain Duties

*In the event that a person or persons needs further information, an explanation of their duties under the Emergency Action Plan or the need for general help, the Plant Engineer/Facilities Manager or the corporate Facilities Manager can be contacted.

3.6 Alarm System

*The employee alarm system provides warning for necessary emergency action and proper reaction time for safe escape of employees from workplace or the immediate work area.

*The employee alarm system emits an alarm at a high enough decibel to be perceived above any ambient noise and strobe lights to be perceived above any ambient light levels.

*In the case of a Fire, Explosion, or Chemical Spill, the sounded alarm is distinctive and recognizable as a signal to employees to evacuate the building in the manner laid out in the Emergency Actin Plan.

*In the case of a Tornado or Severe Weather, after the distinctive and recognizable alarm, the National Weather Service warning will be announced to have the employees take the proper actions as laid out in the Emergency Actin Plan.

*All employee alarm systems are maintained in operating condition, they are tested monthly to ensure proper operating condition. Alarm system is maintained in operating condition except and only when undergoing repairs or maintenance.

3.7 Evacuation

*In the case of a Fire, Explosion, or Chemical Spill, the escape procedures listed in the Emergency Action Plan shall be followed to evacuate the employees of KI and have them retreat to their designated meeting areas.

*In the case of a Tornado or Severe Weather, the escape procedures listed in the Emergency Action Plan shall be followed to ensure proper sheltering for all employees. Following set escape routes, employees shall meet in there designated shelter location.

3.8 Training

*Before implementation of this Emergency Action Plan, the designated and trained persons who will assist in the safe and orderly evacuation of employees will consist of the Plant, Process Managers and Corporate, Department Managers.

*KI shall review the Emergency Action Plan with each employee covered by the plan at the following times:

- Initially when the Emergency Action Plan is developed,
- When a person is hired after the implementation date of the Emergency Action Plan,
- Whenever the employee's responsibilities or designated actions under the Emergency Action Plan change, and
- Whenever the Emergency Action Plan is changed.

Remember to dial “9” to get an outside line

GREEN BAY CONTACT LIST

Ray Rosenow (Plant Engineer)	work:	home:	
Matt Diedrich (Facilities Engineer)	work:	home:	pager
Stuart Kolb (Plant Manager)	work:	home:	
John Kersten (Operations Manager)	work:	home:	
Terry Brown (Manufacturing Data Operations Manager)	work:	home:	
Sherman Frinak (Human Resources Manager)	work:	home:	
John Shackleton (Engineering Manager)	work:	home:	cell:

CORPORATE CONTACT LIST

Timothy Van Severen (Corporate Risk Manager)	work:	home:	cell:
Randy Steele (Corp. Facilities Manager)	work:	home:	920-499-7390
Kristine Hackbarth-Horn (Corporate HR Director)	work:	home:	cell:

POWER FAILURE (who to contact during a power failure)

In the event of a Power Failure, contact the Plant Engineer (Ray Rosenow). The call in list below can be controlled depending on the situation and circumstances.

Wisconsin Public Service	24 Hour Emergency Service	Electric	1-800-450-7240
		Gas	1-800-450-7280

ADT

Quest Electric office:

Joel Westphal pager: home: cell:
 Hugh "Mac" McWirter home: cell:

MTI office:

Cuttler-Hammer
 Todd Heraly office: pager

Reeke-Marold Company, Inc. office:

IS Department
 Sean Van Handel cell: office:

Phone Department
 Todd Stehle pager cell: home

PUBLIC SERVICE

Fire Department	9-911	or	920-448-4200
Police Department	9-911	or	920-448-4200
County Sheriff	9-911	or	920-448-4200

HOSPITALS

Bellin Memorial	920-433-3500
Brown County Mental Health Center	920-468-1136
St. Mary's	920-498-4200
St. Vincent	920-433-0111
Dr. John Kaiser Consulting Physician	920-613-0842

AMBULANCE/MEDICAL TRANSPORT

Bellevue Rescue/Ambulance Services	(Emergency)	911
	(Non-emergency)	920-469-9779

