1997

The Effect of Safety Training at the Ford Assembly Plant in Norfolk, Virginia

Maggie Daniels
Old Dominion University

Follow this and additional works at: https://digitalcommons.odu.edu/ots_masters_projects
Part of the Education Commons

Recommended Citation
https://digitalcommons.odu.edu/ots_masters_projects/308

This Master's Project is brought to you for free and open access by the STEM Education & Professional Studies at ODU Digital Commons. It has been accepted for inclusion in OTS Master's Level Projects & Papers by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.
SIGNATURE PAGE

This research paper was prepared by Maggie Daniels under the direction of Dr. John M. Ritz in OTED 636, Problems in Education. The report was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Adult Education.

Approved By

[Signature]

Dr. John M. Ritz
Advisor and Graduate Program Director

6-25-97

# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNATURE PAGE</td>
<td>i</td>
</tr>
<tr>
<td>TABLE OF TABLES</td>
<td>iv</td>
</tr>
<tr>
<td>TABLE OF FIGURES</td>
<td>v</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I.  INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>2</td>
</tr>
<tr>
<td>Research Goals</td>
<td>2</td>
</tr>
<tr>
<td>Background and Significance</td>
<td>3</td>
</tr>
<tr>
<td>Limitations</td>
<td>5</td>
</tr>
<tr>
<td>Assumptions</td>
<td>5</td>
</tr>
<tr>
<td>Procedures</td>
<td>5</td>
</tr>
<tr>
<td>Definitions of Terms</td>
<td>6</td>
</tr>
<tr>
<td>Summary</td>
<td>7</td>
</tr>
<tr>
<td>II. REVIEW OF LITERATURE</td>
<td>8</td>
</tr>
<tr>
<td>Potential Work Related Hazards in a Manufacturing Plant</td>
<td>8</td>
</tr>
<tr>
<td>Safety Training Objectives</td>
<td>10</td>
</tr>
<tr>
<td>General Information on the Norfolk Ford Assembly Plant</td>
<td>13</td>
</tr>
<tr>
<td>Potential Work Related Hazards at the Norfolk Ford Assembly Plant</td>
<td>14</td>
</tr>
<tr>
<td>Types of Safety Training and Precautions at the Norfolk Ford Assembly Plant</td>
<td>15</td>
</tr>
<tr>
<td>Summary</td>
<td>17</td>
</tr>
<tr>
<td>III. METHODS AND PROCEDURES</td>
<td>21</td>
</tr>
<tr>
<td>Population</td>
<td>21</td>
</tr>
<tr>
<td>Instrument Design</td>
<td>22</td>
</tr>
<tr>
<td>Data Collection</td>
<td>22</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>22</td>
</tr>
<tr>
<td>Summary</td>
<td>23</td>
</tr>
<tr>
<td>IV. FINDINGS</td>
<td>24</td>
</tr>
<tr>
<td>Safety Commitment</td>
<td>24</td>
</tr>
</tbody>
</table>
Lost Hours.............................. 24
Safety Incident and Lost Hour
    Tracking............................. 26
    Summary.............................. 30

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS... 31
    Summary.............................. 31
    Conclusions.......................... 32
    Recommendations..................... 34

SELECTED BIBLIOGRAPHY.......................... 35

APPENDIX

    A. Norfolk Assembly Plant Health and
       Safety Mission Statement......... 37
    B. Loss Control Policy............... 39
    C. Lost Hours Over the Last Three Years.. 41
    D. Health Data Analysis................. 43
    E. 8-Discipline Report............... 45
TABLE OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safety Work Order Completion Percentages</td>
<td>27</td>
</tr>
<tr>
<td>(Body Department)</td>
<td></td>
</tr>
<tr>
<td>2. Safety Work Order Completion Percentages</td>
<td>28</td>
</tr>
<tr>
<td>(Final Department)</td>
<td></td>
</tr>
<tr>
<td>3. Health Data Analysis Report</td>
<td>29</td>
</tr>
</tbody>
</table>

iv
# TABLE OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Norfolk Assembly Plant Safety Walk/ECTA Data Collection Flow Chart</td>
<td>18</td>
</tr>
<tr>
<td>2.</td>
<td>Norfolk Assembly Plant SPR Board Organization</td>
<td>19</td>
</tr>
<tr>
<td>3.</td>
<td>Norfolk Assembly Plant SPR Board Roles and Responsibilities</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>Norfolk Assembly Plant Health and Safety Bulletin</td>
<td>25</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

There are several reasons to desire a safe workplace. Not only are there regulations to be adhered to and money to be saved, but the safety of employees, especially in industrial companies, is always a concern. Keeping safety violations and accidents reduced keeps workers' compensation costs down and the production line flowing and workers' attitudes in the right place. It also keeps federal government inspectors away from every day operations.

An effective way to keep the safety violations and accidents to a minimum is to provide a thorough safety program. The livelier the program, the more the employees will benefit from it (Lucas, 1996, p. 14). The employees cannot always be expected to be thrilled to attend safety training. They must be motivated to learn and practice safe workplace behaviors. Goals, incentives and feedback should be used to build intrinsic characteristics. Some of these characteristics are interest, responsibility, personal growth and development and knowledge of results (Hatcher, 1995, p. 11).

Once the employees have been motivated to learn and practice safe behavior in the workplace, recognition of this behavior is also worthwhile for the
company. The violators of the program should not be the only ones recognized. Bribery need not be used, but perhaps a bonus if a fiscal quarter is completed without injury. Even a company-wide competition and small rewards go a long way to ensure safe practices (Lucas, 1996, p. 14).

STATEMENT OF THE PROBLEM

The problem of this study was to determine if lost time due to work related accidents and safety violations at the Ford Assembly Plant in Norfolk, Virginia, was influenced after safety training was conducted.

RESEARCH GOALS

These research goals were established to answer the problem and provide guidelines to conduct the research:

1. Determine when, how often, and under what conditions safety training was given.
2. Determine what teaching method was used in the delivery of safety training.
3. Determine the amount of lost time due to safety violations before and after the safety training was given.
BACKGROUND AND SIGNIFICANCE

There have been many changes in the American workplace over the last few decades. They included workplace demographics, global competition and the focus from a manufacturing to a service economy. These changes brought with them the need to teach safe work behaviors on the job (Hatcher, 1996, p. 3).

The result of these changes has been an abrupt increase in workplace training with managers, professionals and technical workers being the main beneficiaries of this increase (Carnevale, 1994, p. S22). More employers have become willing to provide formal company training due to this increasing training need. The employees most trained were the ones with the most education. The reason for this being that those who sought a higher education were thought to be more committed to their careers (Carnevale, 1994, p. S22).

The six occupations that showed smaller-than-average percentages of workplace training were: nontechnical professionals, service workers, machine operators, laborers, craft workers and transportation employees. Some reasons for this trend were that it was expensive to take people off the job for training
due to lost wages and decreases in productivity (Carnevale, 1994, p. S23).

A company's response to new safety regulations was shown to depend on its existing safety atmosphere. Its willingness to provide comprehensive safety training depended on the importance the company attached to safety. Many companies did not have a choice but were required to meet government regulations. Other companies, however, were reluctant to invest in training because safe working conditions normally did not produce more business or reduce operating costs (Saari, 1993, p. 65).

In many safety-oriented manufacturing companies there were high levels of cooperation between employers, unions, employees, schools and other training institutions (Lynch, 1993, p. 1). The company and union provided the intrinsic motivation that the employees needed to practice safe workplace behaviors as discussed in the introduction of this chapter. It became just as important to train the nontechnical employees as the managers and professionals. Safety practices have been and will continue to be very important factors in measuring a company's success, not just its profit margin.
LIMITATIONS

The limitations were outlined to keep this study manageable. They were as follows:
1. The amount of lost time was tracked over a period of time due to the ongoing nature of the safety training.
2. The sample of employees was taken from the hourly production line and skilled trade workers in the Paint, Body and Final Assembly Departments at Ford Motor Company, Norfolk, Virginia.

ASSUMPTIONS

The following assumptions were made in this study:
1. The data were collected from the Training and Development Leader at the Ford Assembly Plant and assumed to be accurate.
2. The results found in the study could also have been influenced by employee education level, amount of new hires and number of repeat offenders.
3. The results of the effectiveness of the safety training depended on the method of teaching used, as well as the level of employee motivation and interest.

PROCEDURES

The data for this research was compiled from the training methods used and other relevant safety practice information that was collected by Neal Jefferis, the Training and Development Leader at the Ford Assem-
bly Plant. The lost time due to safety violations and accidents was documented and analyzed, seeking an after-training influence or fluctuation in the results. Training program information was documented and methods used were measured for effectiveness and impact on employees. Other variables such as employee education, motivation and seniority on the job were noted and a relationship between the variables and the outcome of training were investigated.

DEFINITIONS OF TERMS

The following definitions were important to understanding terms used in this research study.

1. **BEW** - Basic Equipment Wellness Training.
2. **Extrinsic Motivation** - interest resulting from promise of prizes or awards.
3. **FTPM** - Ford Total Productive Maintenance Program.
4. **Intrinsic Motivation** - behavior that comes from within oneself, not from promises of money or awards.
5. **Safety Training** - the training given to illustrate to employees the proper method of operating equipment and behaving in the workplace to prevent injury to themselves or others.
7. **UAW** - United Auto Workers Union.
SUMMARY

Chapter I has provided the problem of the study as well as why the problem arose and the importance of this study. Limitations and assumptions were listed to keep the problem manageable and easily understood by the reader. Procedures were outlined to explain how the data was collected and the significance of the results. Definitions were supplied to keep terms clear.

Chapter II reviewed corresponding literature to this study. Chapter III described the methods and procedures used for collecting data. Chapter IV presented the data collected and Chapter V included the summary, conclusions and recommendations that resulted from the study.
CHAPTER II
REVIEW OF LITERATURE

The purpose of this chapter was to outline the related literature to the problem statement and objectives. The topics included in this chapter were: 1) potential work related hazards in a manufacturing plant, 2) safety training objectives, 3) background and general information about the Ford Assembly Plant in Norfolk, Virginia, 4) potential work related hazards at the Norfolk Ford Assembly Plant and 5) the type of safety training and precautions in existence at the Norfolk Ford Assembly Plant. These topics laid a solid foundation prior to analyzing the data collected.

POTENTIAL WORK RELATED HAZARDS IN A MANUFACTURING PLANT

The many reasons that companies were concerned about safety training were listed in the introduction of this paper. They were: keeping 1) accidents and violations reduced, 2) costs down on workers' compensation and time lost, 3) the production line flowing, 4) the workers' attitudes in the right place and 5) the federal government inspectors away from every day operations. Money was not only lost through production down time, but through medical costs of injuries and the lost input of the knowledgeable,
skilled employees. To prevent such losses, identifying the potential work related hazards was the first step in determining what type of safety training was needed. One canned training session just would not apply across the board to all companies. Food service companies, for example, had different needs than a heavy equipment manufacturing company such as Ford. One common injury that most companies as well as corporate offices had, however, was the back injury. According to OSHA (Occupational Safety and Health Administration), back injuries were the most common workplace injury and the nation's top workplace safety problem (How to Cut Workers' Compensation Costs, 1996, p. 32B). They accounted for one of every five workplace injuries or illnesses according to the Bureau of Labor Statistics (How to Cut Workers' Compensation Costs, 1996, p. 32B). Something as common as the back injury required lifting technique training and/or physical conditioning to reduce muscle strain. Lifting was found to be the cause of three-fourths of the lower back injuries, so this training was a definite necessity (How to Cut Workers' Compensation Costs, 1996, 32B).

The back injury has affected many of the reasons that were listed in favor of safety training. Back injuries have caused companies to sustain a slow in
production, increase in workplace accidents, possible workers' compensation costs and a chance of closer scrutiny from a federal organization. One-fourth of all compensation claims involved back injuries (How to Cut Workers' Compensation Costs, 1996, 32B).

Other types of safety precautions that have been implemented at most manufacturing companies were the requirement to wear protective clothing. This clothing included hard hats, face masks, goggles, ear protection, steel-toed boots, and arm and face protection. Training was not the only tool used to encourage the use of such items. Monitoring and company rules and regulations made the wearing of such items a must. Only a small percentage was found of injuries to those wearing the protective equipment (How to Cut Workers' Compensation Costs, 1996, p. 32B). Effective safety training and follow-up reduced such injuries.

SAFETY TRAINING OBJECTIVES

Safety training should have been given to all employees, but there were three groups of people to especially concentrate on: new hires, young workers and repeat offenders. New employees were a high risk because they often did not receive the information they needed to conduct their job, even involving dangerous equipment. According to the Bureau of Labor Statis-
tics, nearly half of the workers injured in 1979, for example, had been on the job less than a year (How to Cut Workers’ Compensation Costs, 1996, 32B). Young workers were also a high risk because they thought that they were immortal and they did not receive health and safety information in high school (Sulski, 1996, p. 60).

Repeat offenders, according to many companies, were a small percentage of employees accounting for a large percentage of lost-time injuries (Hager, 1996, p. 68). The repeat offenders did not necessarily get injured on purpose. Some were in high risk jobs and some may have had a recurring injury. Whatever the reason, they could not just be dismissed to hire new employees. This left companies open to problems with union contracts, the Americans With Disabilities Act or with lawsuits for wrongful termination or discrimination (Hager, 1996, p. 68). Without the option of dismissing these offenders, the companies had to turn to a strong safety program which included practical methods of attitude control, balanced body mechanics, stress management and a strategic understanding of the multiple contributing factors in accidents (Hager, 1996, p. 68).
To provide this training several methods have been used effectively. Most companies have used the classroom as the main method of training. There are companies that have produced custom-made videos that helped employees recognize, avoid and eliminate unsafe conditions on the job (Safer Operating, Safer Jobsites, 1996, p. 14).

No matter what procedure was used, most research in this area stressed that motivating the employee was crucial to effective training. A highly motivated employee was more successful in applying the learned material than those that were not motivated (Hatcher, 1995, p. 2).

The method of instruction was not the only factor to effective training. Some items that should have been taken care of prior to training were: determine training needs, conduct a workplace environmental assessment, review potential training programs, develop effective instructors, carefully select who will attend training, win support from supervisors, prepare trainees in advance and distribute pre-course material (Minter, 1996, pp. 33-34).

The following were steps taken during training to ensure maximum commitment to training: provide adequate training facilities, provide adequate resources for the
trainer, insist on documentation and offer recognition to attending employees (Minter, 1996, p. 34).

The delivery of safety training was not where safety awareness stopped. Follow-up was vital to reinforcing learned material. The following steps were completed to ensure application of the classroom or video material: meet with trainees, provide opportunities to apply training, provide feedback and support, provide expert coaching, provide resource material, provide job aids, evaluate performance and provide periodic refresher training (Minter, 1996, p. 34). Implementing these steps before, during and after training improved the employee's retention of the material.

GENERAL INFORMATION ON THE NORFOLK FORD ASSEMBLY PLANT

The information contained in the following three segments of this chapter was obtained from Neal Jefferis, the Training and Development Leader of the Norfolk Ford Assembly Plant. The Ford Assembly Plant has been in the same location in Norfolk, Virginia, since 1925. There were approximately 2300 hourly and 200 salaried employees at the plant at the time of this study. The plant produced roughly 470 trucks per shift or about 940 trucks per day. There were 3900 parts per vehicle. Fifty to fifty-five train cars and 130
tractor-trailers full of these parts arrived at the plant per day and usually lasted a twenty-four hour period. If the production line went down for any reason, production would stop and would cost the plant around $5,000 to $7,000 a minute. The importance of keeping the production line moving at this plant was apparent. There was no time for accidents and injuries.

POTENTIAL WORK RELATED HAZARDS AT THE NORFOLK FORD ASSEMBLY PLANT

Some of the potential injuries that occurred at the Norfolk Assembly Plant were back injury, lacerations, twisted ankles and a possible injury to a pedestrian from a power material handling vehicle (i.e., forklift). Safety precautions were put into place to prevent such injuries. Safety glasses were mandatory for all employees and visitors who enter the production area. Those that worked in the Body Department were required to wear long sleeves to minimize lacerations from the sheet metal.

Whenever there were a series of injuries, the ergonomics of the process were reviewed and investigated. For example, a battery was placed in each truck by hand. Because this caused back strain, a machine was developed to put the battery in each truck.
other example involved the 168 robots on the Body Shop assembly line which were kept in cages. They were designed to electrically disconnect when the cage was opened to avoid electrical injury. Along with these safety precautions and devices, safety training was vital to keeping accidents and occurrences down at the plant.

**TYPES OF SAFETY TRAINING AND PRECAUTIONS AT THE NORFOLK FORD ASSEMBLY PLANT**

There were three main types of safety training at the plant: 1) Initial Training, 2) Job Specific Training and 3) Recurring/Refresher Training. The Initial Training was given to the new hires. It was classroom training which included four hours of general responsibilities and safety practices, four hours of hazard communications (recognition and reaction to hazardous situations) and one hour of pedestrian safety.

Job Specific Training was given to those in the skilled trades, those in special circumstances (such as high climbing) and anyone that handled specialized equipment. For example, for Equipment Power Lockout Training, the skilled trade workers, their supervisors and the cleaning people attended. The Job Specific Training consisted of classroom information, a
practical demonstration by the instructor and application by the student under the supervision of the instructor.

The Recurring/Refresher Training was given when specified by the UAW/Ford contract agreement. The course included an hour and a half of general responsibilities and safe practices. This training usually occurred when there were updates or changes in equipment and procedure.

There were also several safety programs in effect at the plant. Ford Total Productive Maintenance (FTPM) Program consisted of small group activities around small equipment. When an equipment or safety issue came up, this group convened to discuss and find a solution to the problem. A "single point lesson" was then developed and issued to those who used the equipment. These different training programs were developed to meet the many safety needs of a highly productive manufacturing plant.

Weekly safety walks were conducted through each area to provide a fresh look from "outside eyes" to look, document and track safety programs. If a problem was found, a safety work order was put in which had priority over the other work orders. Figure 1 shows an
example of a safety walk/ECTA data collection flow chart.

Lastly, the Safety Process Review Board (SPR) meets every other week. Figure 2 and 3 illustrate the organizational chart of SPR attendees and their roles and responsibilities. They discussed progress on safety work orders. If the orders were still open, the status was reported at these meetings. The board also kept track of lost time accidents, number of cases and which process of assembly was involved.

SUMMARY

This chapter, the Review of Literature, has discussed potential work related hazards in manufacturing plants, safety training objectives, general information on the Norfolk Ford Assembly Plant, potential work related hazards at the Norfolk Ford Assembly Plant and a description of the safety training and precautions that the Norfolk Ford Assembly Plant implemented. The next chapter, Methods and Procedures, will cover the methods and procedures used to collect data.
NORFOLK ASSEMBLY PLANT
SAFETY WALK / ECTA DATA COLLECTION
FLOW CHART

DEPARTMENT
DATE / DAY OF WEEK
ZONE

WALK AROUND EVALUATORS
UAW HEALTH & SAFETY REP.
SAFETY ENGINEER
AREA PM PLANNER
AREA FTPM COORDINATOR
ZONE SUPERVISOR

DEPARTMENTAL
ZONE EVALUATION

CONCERNS ARE IDENTIFIED
ANDREWED BY:
PM PLANNER

ALL CONCERNS NOTED AT
TIME OF EVALUATION
ARE ENTERED IN TO ECTA
AND ASSIGNED AS A
CORRECTIVE WORK ORDER

FTPM SMALL GROUP ACTIVITY
SAFETY CONCERNS
FOR AREA ARE ADDRESSED
ON DAY OF ZONE EVALUATION

ALL TRACKING % ARE
REPORTED AND DISCUSSED
TWICE A MONTH AT PLANT
AIR BOARD MEETING

ALL SAFETY CORRECTIVE
WORK ORDERS ARE ISSUED
TO PROPER SKILLED
CLASSIFICATION FOR
RESOLUTIONS

ALL SAFETY CORRECTIVE
WORK ORDERS ARE OPENED
AND CLOSED AS A SEPARATE
GROUP ITEM TO TRACK %
OF COMPLETION

Figure 1
NORFOLK ASSEMBLY PLANT
S.P.R.BOARD
ORGANIZATION

Figure 2
NORFOLK ASSEMBLY PLANT

SPR BOARD ROLES AND RESPONSIBILITY

- **CO-CHAIRS**
  - PLANT MANAGER
  - UAW CHAIRMAN

- **DEPARTMENTS**
  - FINAL ASSEMBLY/CENTRAL MAINT.
  - BODY / MATERIAL HANDLING
  - PAINT

- **DEPARTMENTAL REPORTS**

- **LOST TIME ACCIDENTS REPORTED OUT OF HDA**

- **MEDICAL VISIT COUNT BY AREA AND DROT**

- **SALARY**
  - AREA MANAGER
  - M.E. MANAGER
  - H.R. MANAGER
  - SAFETY ENGINEERS
  - SELECTED SUPERVISORS

- **UAW CHAIRMAN**
  - H&S REPS.
  - P.M. PLANNERS
  - AREA FTPM COORDINATOR

- **LOOK FOR COMMON CAUSE INCIDENTS / PROCESS-ERGONOMIC CONCERNS**

- **P.W. PLANNER REPORT OPEN & CLOSED SAFETY WORK ORDERS**

- **P.W. PLANNER REPORT**
  - % OF COMPLETION FOR PRESENT MONTH AND YEAR TO DATE

- **OPEN DISCUSSION ON PENDING EXPENDITURES AND TIME LINES FOR OPEN SAFETY ITEMS**

**Figure 3**
In order to effectively carry out this study, the researcher used the historical research design. The Norfolk Ford Assembly Plant gave a continuous program called Basic Equipment Wellness (BEW) to several groups of employees and this training was used as the independent variable in the study. The FTPM program at Ford aimed to integrate safety into production and maintenance. The BEW training gathered small groups around their respective equipment and empowered those employees to take part in contributing ideas to the ergonomics and safety involved in each process. This chapter discussed the population, instrument design, methods of data collection and method of analyzing the data.

The population used for this study were the hourly employees that actually spend their whole shift on the assembly line and the hourly skilled trade workers. This included the employees in the Paint, Body and Final Departments. A total of 1000 employees had attended the BEW training at the time of this study.
INSTRUMENT DESIGN

The instrument used was that of the Ford Motor Company in Detroit, Michigan. Each assembly plant had a strict and thorough method of keeping track of safety incidents and accidents. Hours worked for each employee from each plant were sent to Detroit including time lost. A representative from the Norfolk Plant took the hours worked and the hours lost from the last three years and documented them to analyze the increase or decrease in hours lost in order to improve the numbers.

DATA COLLECTION

The data were collected by the researcher from Neal Jefferis, the Training and Development Leader at the Norfolk Assembly Plant. He had gathered and documented the data to indicate time lost due to accidents and injuries prior to and after the training. As this was a historical study, it was assumed that the data was accurate.

STATISTICAL ANALYSIS

After the data was collected, the researcher compared and analyzed the raw before and after training numbers to see if there was any affect from the training.
SUMMARY

This chapter covered the methods and procedures of the study including the population, instrument design, data collection and statistical analysis. Chapter IV discussed the findings from the data collected.
CHAPTER IV

FINDINGS

The problem of this study was to determine if lost time due to work related accidents and safety violations at the Ford Assembly Plant in Norfolk, Virginia, was influenced after safety training was conducted. Topics included in this chapter were the safety commitment of the Norfolk Assembly Plant, the outline of lost hours over the last three years and the safety incident and tracking process.

SAFETY COMMITMENT

As discussed earlier in this paper, poor safety conditions could create a very steep price in a large manufacturing plant such as the Ford Assembly Plant in Norfolk. The company has made it everyone’s business at the plant to be responsible for safety. One walk around the plant showed employees and visitors alike that Ford stressed safety with bulletins such as that in Figure 4. A Health and Safety Mission Statement (Appendix A) and a Loss Control Policy (Appendix B) were given to each employee to illustrate the employee and management commitment to safety.

LOST HOURS

Appendix C illustrates that over the last three years, though the number of hours worked has increased
NORFOLK ASSEMBLY PLANT
HEALTH AND SAFETY
IT'S EVERYONE'S JOB

WHO GETS INVOLVED

UAW SAFETY REPS.
UAW COMMIT.
ENGINEER SAFETY

HEALTH & SAFETY ISSUES

FTPM SGAS
MANAGERS

PM PLANNER
SALARY SUP.
EMPLOYEES

Figure 4
sharply, the hours lost does not. So the lost hours to hours worked ratio has gone down over the last three years. Ford attributed this decrease to the FTPM program in effect since December, 1994. The integration of safety to production maintenance kept safety from being a separate and less important issue. The training was conducted in small groups around the appropriate piece of equipment. This empowered the employees to provide input on ergonomics and safety precautions involved in each process.

SAFETY INCIDENT AND LOST HOUR TRACKING

As stated briefly in the Review and Literature section of this paper, the SPR Board met every other week to track progress on safety work orders and safety incidents. Safety work orders got priority over other work orders. Each department reported at these meetings the status of each work order. The examples in Tables 1 and 2 were from January, 1997, for the Body and Final Departments. The numbers showed that safety discrepancies did not take long to be fixed.

Each injury or incident was documented, tracked and investigated. As shown in the Health Data Analysis in Table 3, each process of production has documented each visit to the medical facility. As seen by the example in Appendix D, some incidents were a reinjury
SAFETY WORK ORDER COMPLETION PERCENTAGES
BODY - 1997

<table>
<thead>
<tr>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK ORDERS CLOSED</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>WORK ORDERS OPEN</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>TOTAL # WORK ORDERS</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PERCENT COMPLETED</td>
<td>100%</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>####</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

YEAR TO DATE COMPLETION PERCENTAGES

WORK ORDERS OPEN

WORK ORDERS CLOSED 100%

SAFETY WORK ORDER COMPLETION PERCENTAGES

Table 1
**SAFETY WORK ORDER COMPLETION PERCENTAGES**

**FINAL**

<table>
<thead>
<tr>
<th></th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK ORDERS CLOSED</td>
<td>49</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>WORK ORDERS OPEN</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL # WORK ORDERS</td>
<td>49</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>PERCENT COMPLETED</td>
<td>100%</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>100%</td>
</tr>
</tbody>
</table>

**YEAR TO DATE COMPLETION PERCENTAGES**

- **WORK ORDERS CLOSED**: 100%
- **WORK ORDERS OPEN**: 0%

Table 2
Health Data Analysis
Visit Count by Process #

Process #

Ta0081
Local
Td0931
Na
Ch0161
Ch0132
Cb1101
Cb1053
Ce0132

Number of Cases

0 0.5 1 1.5 2 2.5 3 3.5 4

Characteristics
All Hourly Wrkrs.
Spec.Department
All OSHA Cases

Plant Location: NORFOLK ASMBY
Reporting Period: from 12/1/96 to 12/29/96

Process # found: 80 plotted: 23
Process #s found: 87 plotted: 10

01/22/1997
3:57:06 PM
to the same employee. Appendix E was an individual incident showing the injury, cause and solution. The investigations and solutions to each incident have prevented similar injuries to other employees thus keeping the lost hours to a minimum and production and profit to a maximum.

**SUMMARY**

This chapter covered the safety commitment, lost hour findings and safety incident and lost hour tracking information. Chapter V was the final chapter of the paper and covered the summary conclusions and recommendations of this research.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter was to provide the summary, conclusions and recommendations of this research topic. The results were used to show that training that was applicable, effective, interesting and necessary would have positive results on employee performance.

SUMMARY

The problem of this study was to determine if lost time due to work related accidents and safety violations at the Ford Assembly Plant in Norfolk, Virginia, was influenced after safety training was conducted.

A study concerning safety training was necessary and important for many reasons. Most companies' success was measured by the bottom line and amount produced. When this was the case, safety incidents and violations caused lost time, worker's compensation costs and the chance of federal inspection and intervention. These were not the problems of successful companies, so integration of a quality and effective safety training program was a must.

The researcher chose the Ford Assembly Plant because of the high volume production, high profit
margin and the need for many safety programs and precautions.

The population used was the hourly line and skilled trade workers. Approximately 1000 employees had gone through the applicable safety training at the time of this study.

The data was collected through a number of channels. Each incident was well documented and investigated. The three departments tracked their own numbers as well as the Safety Review Board and the Medical Department. The hours worked and lost were sent to Detroit, Michigan for payment. The Norfolk Assembly Plant then gathered the numbers for the last few years from Detroit and noticed the decline in lost hours.

**CONCLUSIONS**

This decline in lost hours was attributed to the FTPM Program. This program successfully integrated safety with production maintenance to keep safety as important as production. The research goals established at the beginning of this study were important to find the solution.

1. Determine when, how often and under what conditions safety training was given. Safety training was given upon hiring at the plant as part of
orientation, for specific jobs and as refresher training. The hourly and line and skilled trade workers received 8.5 hours of BEW training upon which this study was focused. One hour of refresher training was required yearly for each of these employees. The 8.5 hours of BEW training was given as overtime.

2. Determine what teaching method was used in the delivery of safety training. The safety training was given both as classroom instruction, then application on the appropriate equipment.

3. Determine the amount of lost time due to safety violations before and after the safety training was given. The amount of lost time decreased after the employees attended the BEW training. The training was delivered to small groups on appropriate equipment which proved to be very effective. This prevented each employee from having to sit through training which did not apply to them. The employees were also given the opportunity to input their feelings and ideas on processes and safety concerning the equipment which put the employees in a more participatory position. In many instances, employee happiness has led to company success.
RECOMMENDATIONS

Manufacturing companies are the ones most likely to have high incident rates. This makes it very important for employees' safety and the bottom line to have effective training programs. Ford Motor Company is a good model for safety. If they continue to involve employees, make training interesting and necessary and track and solve each safety incident, they are sure to continue the trend toward lowering lost hours.
BIBLIOGRAPHY


APPENDIX A

NORFOLK ASSEMBLY PLANT HEALTH AND SAFETY MISSION STATEMENT
The Norfolk Assembly Plant is committed in its efforts to provide a safe working environment using an interactive process based on communication, documentation and results. This floor level driven and management supported safety process will be built upon training and employee awareness as the proactive tool for eliminating injury and loss through compliance. Through team work the Norfolk facility will continue to achieve our goals of a safe, clean and ergonomically correct work place.
APPENDIX B

LOSS CONTROL POLICY
LOSS CONTROL POLICY

Ford Motor Company's Norfolk Assembly Plant is committed to providing a safe working environment free of accidental loss to its employees and property.

We are committed as a facility to comply with all regulatory agencies and company standards in providing a healthful work environment. We are dedicated to eliminating any foreseeable hazards which may result in personal injury/illness, fires, security losses, damage to property, or losses to the environment.

Loss control is the shared responsibility of all levels of employment both salary and hourly. It requires active management and employee participation through practice coupled with motivation to control accidental losses.

All management functions, will comply with the Norfolk Assembly Plant loss prevention requirement as they apply to the design, operation and maintenance or facility and equipment. All employees will perform their jobs properly in accordance with established procedures and operating philosophy.

Through joint efforts and team work we will build the foundations for a proactive process based on prevention and loss control.
APPENDIX C

LOST HOURS OVER THE LAST THREE YEARS
### NORFOLK ASSEMBLY PLANT

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HOURS WORKED (MILLION)</th>
<th>DAYS WORKED</th>
<th>HOURS WORKED LOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>3.6</td>
<td>4300</td>
<td>835</td>
</tr>
<tr>
<td>1995</td>
<td>4.4</td>
<td>5000</td>
<td>869</td>
</tr>
<tr>
<td>1996</td>
<td>5.7</td>
<td>5200</td>
<td>1102</td>
</tr>
</tbody>
</table>
APPENDIX D

HEALTH DATA ANALYSIS (FINAL DEPT.)
<table>
<thead>
<tr>
<th>DATE</th>
<th>VISIT #</th>
<th>PROCESS #</th>
<th>INJURY/ILLNESS</th>
<th>DESCRIPTION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/4/96</td>
<td>96-02000</td>
<td>TA008Y</td>
<td>Tendonitis</td>
<td>Wire harness job - right wrist sore</td>
<td>Referred to Ergonomics - eliminated center locator</td>
</tr>
<tr>
<td>12/5/96</td>
<td>96-02004</td>
<td>TA0081</td>
<td>Sprain/Strain</td>
<td>Wire harness job - new on job - back &amp; wrist sore</td>
<td>Referred to Ergonomics - eliminated center locator</td>
</tr>
<tr>
<td>12/11/96</td>
<td>96-02041</td>
<td>TA0081</td>
<td>Tendonitis</td>
<td>Wire harness job - hand sore - same employee as above</td>
<td>Referred to Ergonomics - eliminated center locator</td>
</tr>
<tr>
<td>12/13/96</td>
<td>96-02064</td>
<td>TA0081</td>
<td>Costochondritis</td>
<td>Wire harness job - pain in side seating harness locator - same employee as above</td>
<td>Referred to Ergonomics - eliminated center locator</td>
</tr>
<tr>
<td>12/5/96</td>
<td>96-02007</td>
<td>TD0931</td>
<td>Sprain/Strain</td>
<td>L/H B-pillar operation - Back sore - new on operation</td>
<td>Referred to Ergonomics</td>
</tr>
<tr>
<td>12/14/96</td>
<td>96-02069</td>
<td>TD0931</td>
<td>Sprain/Strain</td>
<td>L/H B-pillar operation - left knee sore - new on operation</td>
<td>Referred to Ergonomics</td>
</tr>
<tr>
<td>12/3/96</td>
<td>96-01987</td>
<td>N/A</td>
<td>Laceration</td>
<td>Painter - Struck forehead on steel</td>
<td>Painted safety stripes to make beam more visible - not a normal work area</td>
</tr>
<tr>
<td>12/12/96</td>
<td>96-02053</td>
<td>N/A</td>
<td>Sprain/Strain</td>
<td>Unloading tires for Matl Handling - lost footing &amp; strained shoulder</td>
<td>No unsafe condition found</td>
</tr>
<tr>
<td>12/13/96</td>
<td>96-02075</td>
<td>CH0161</td>
<td>Crushing Injury</td>
<td>Caster/camber operation - finger pinched by tool</td>
<td>Operator instructed to use tool if fixture hangs up</td>
</tr>
<tr>
<td>12/19/96</td>
<td>96-02092</td>
<td>CH0161</td>
<td>Sprain/Strain</td>
<td>Caster/camber operation - strained shoulder positioning axle</td>
<td>Assist tool provided</td>
</tr>
<tr>
<td>12/11/96</td>
<td>96-02040</td>
<td>CH0132</td>
<td>Laceration</td>
<td>Rear spring install - hit head on holat</td>
<td>No action taken</td>
</tr>
<tr>
<td>12/13/96</td>
<td>96-02055</td>
<td>CH0132</td>
<td>Sprain/Strain</td>
<td>Rear spring install - pain in left wrist - new on operation</td>
<td>Referred to Ergo. Comm.</td>
</tr>
<tr>
<td>12/13/96</td>
<td>96-02058</td>
<td>CB1101</td>
<td>Sprain/Strain</td>
<td>Seat deck - groin sore - related to hernia repair</td>
<td>Referred to Ergo. Comm.</td>
</tr>
<tr>
<td>12/13/96</td>
<td>96-02059</td>
<td>CB1101</td>
<td>Sprain/Strain</td>
<td>Seat deck - Right knee sore - same operator as above</td>
<td>Referred to Ergo. Comm.</td>
</tr>
<tr>
<td>12/2/96</td>
<td>96-02105</td>
<td>CB1053</td>
<td>Contusion</td>
<td>Flattop pit - rt. shoulder sore from working overhead</td>
<td>Multispindle/art.arm on order</td>
</tr>
<tr>
<td>12/7/96</td>
<td>96-02018</td>
<td>CB1053</td>
<td>Sprain/Strain</td>
<td>Flattop pit - Temp bumper secure backup - back sore</td>
<td>Off-line fixture provided</td>
</tr>
<tr>
<td>12/19/96</td>
<td>96-02091</td>
<td>CE0132</td>
<td>Contusion</td>
<td>Motor mount secure - Transmission bracket fell on toe</td>
<td>Installing catch trays</td>
</tr>
</tbody>
</table>
APPENDIX E

8-DISCIPLINE REPORT
8-DISCIPLINE REPORT

1) TEAM CONTACT:

PHONE NO: 2177       YEAR/ CARLINE: 1997 F-Series
ASSIGNEE: Hollowell  COMPONENT: Wheel lip molding/970005
ACTIVITY: Trim       INITIATOR: FINAL AREA
DATE OPENED: Jan     PLANT: NORFOLK ASSEMBLY

2) PROBLEM DESCRIPTION:

DESCRIPTION: Operator injured hand.

3) ROOT CAUSE (S):

Operator was using palm of hand to seat wheel lip molding.

4&5) ACTIONS:

Operator has been given a hammer to seat wheel lip molding. Operator can place hammer in apron.

6) VERIFICATION:

The hammer will prevent the operator from using hand to pound in molding.

7) PREVENTION:

The above steps will prevent reoccurrence.

8) CONGRATULATE YOUR TEAM!