January 2017

Appraising The Current Status Of The National Institute For Occupational Safety And Health's Fatality Assessment Control Evaluation Program

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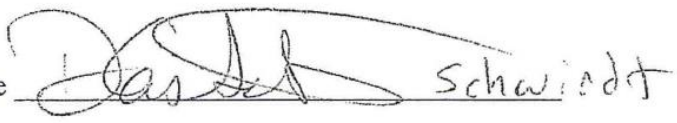
Signature  Schmidt

Date 4-21-2017

APPRAISING THE CURRENT STATUS OF THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH'S FATALITY ASSESSMENT CONTROL EVALUATION PROGRAM

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MASTER OF SCIENCE

May, 2017

DEDICATION

This thesis is dedicated to my wife

Deborah Schwindt

AND

Professor Grant Wilson

who taught me to teach is to learn

ACKNOWLEDGEMENTS

I would like to thank my professor, Scotty Dunlap, for his guidance and diligence in assisting me in my endeavors. I would also like to thank my wife Deborah has remained my driving force pushing me towards my goals. It is through her steadfast encouragement that I have been able to master the life challenges and academic requirements. Additionally, I want to thank my children, Devin and Shannon who have supported their father in his quest to improve himself.

ABSTRACT

Today, generally 13 U.S. workers die from workplace injuries. In 1970 on average, there were as many as 38 workplace fatalities on each day (DOL 2016). As a response to this alarming reality, the government enacted the Occupational Safety and Health Act in 1970. This governmental legislation created the Occupational Safety and Health Administration to regulate safety in the workplace; as well as, The National Institute of Occupational Safety and Health who was charged with " developing new knowledge in the field of occupational safety and health and to transfer that knowledge into practice" (CDC NIOSH 2017).

In order to understand and educate the public on why workplace deaths occur; NIOSH enacted the Fatality Assessment and Control Evaluation (FACE) program in 1982. Since its inception, the NIOSH FACE program has used workplace death investigations as an important methodology for educating the public about the hazards associated with simply going to work. While this noble cause is laudable there has been no inquiry investigating the results produced from this governmental program. Therefore, this research shall analyze the data produced from the NIOSH Face program, which was utilized to create their Federal FACE database. Specific focus will also be given to the degree of hierarchical safety controls recommended from the workplace death investigations that have occurred over the last 32 years; as the means, for understanding the interrelationships of the recommendations forwarded from NIOSH FACE programs.

TABLE OF CONTENTS

CHAPTER PAGE

LIST OF ABBREVIATIONS

Name	Abbreviation
National Institute of Occupational Safety and Health	NIOSH
Occupational Health and Safety Act	OSH Act
NIOSH Fatality Assessment Control Evaluation	FACE
U.S. Centers for Disease Control and Prevention Agency	CDC
U.S. Department of Labor	DOL
U.S. Department of Health and Human Services	HHS

CHAPTER 1

INTRODUCTION

Executive Summary

Issue/Problem. Every day in the United States, workers are killed in the workplace. Since the inception of the Occupational Safety and Health Act in1970, the workplace has become a safer place. Nonetheless, according to Department of Labor's Occupational Safety and Health Administrations Commonly Used Statistics website on average, almost 93 workers are killed each week in the United States, which equates to 13 worker deaths every day.(DOL 2016). To combat this appalling reality, our nation's leaders created the National Institute of Occupational Safety and Health (NIOSH) as the means for conducting research on how to reduce the number of worker injuries and deaths. To this end, NIOSH created the Fatality Assessment and Control Evaluation (FACE) program that was tasked with conducting research designed to identify and study the causes of fatal occupational accidents. Equally significant, this research program was envisioned to prevent further occupational deaths by ascertaining those high-risk work circumstances that resulted in workplace accidents causing deaths of workers. Consequently, the FACE program is charged with formulating work place hierarchal safety solutions to mitigate job hazards and disseminating these solutions to the workplace via the NIOSH FACE reports.

Purpose of Communication. Since the inception of the NIOSH FACE program there has been limited success in reducing workplace fatalities. Given the aforementioned

issue, it becomes evident that more research of the NIOSH Face program status needs to be undertaken.

Summary. Research appraising the value of NIOSH FACE program recommendations as a whole has never been undertaken. Therefore this study is intended to dissect the NIOSH FACE program as the means for providing key decision makers the adequate data to make informed decisions regarding occupational health and safety educational programs; rather than relying upon unfounded information. The study's postulates are: (a) The degree that NIOSH Face reports identify each individually recognized hierarchal control for promoting safety in the workplace, (b) The cause of the worker fatality as reported by the FACE program, (c) Identifying the target populations that were included within the FACE program, as well as, (d) Ascertaining the number of Federal NIOSH FACE reports generated since the program's inception.

CHAPTER 2

THESIS STATEMENT

American workers are still at risk of being injured or killed as reported by numerous governmental agencies. While great progress has been made in reducing workplace fatalities since the industrial revolution; there is still considerable evidence that the workplace can be dangerous since on average America loses 13 human lives per day to workplace accidents. (DOL 2016). Therefore, more must be done to protect workers. As a result of this reality, the Federal legislature created the OSH Act promulgated in 1970. The OSH Act granted OSHA the regulatory authority to levy fines and penalties against those employers who fail to adhere to the general duty clause requiring the employers to make the workplace safe. Consequently, OSHA became the primary regulatory agency for workplace safety and was placed under the Department of Labor (DOL).

The OSH act also recognized the importance of conducting independent workplace safety research as the means of propagating any new federal rules and regulations affecting organizations. Thus, NIOSH was created as a research agency whose mission is to study worker safety and health, while educating employers to foster safe and healthy workplaces in America. NIOSH was placed under the auspices of the U.S. Centers for Disease Control and Prevention, which is a division of the U.S. Department of Health and Human Services, to be the check and balance to OSHA's regulatory oversight.

NIOSH was created to promote workplace safety via independent research and the education of all parties concerned. The NIOSH FACE program is an educational undertaking of workplace hazard awareness based upon investigating work related fatalities. It is significant to point out that all of the accident causation theories and models have met with limited successes in preventing workplace accidents, injuries, and deaths and thus it becomes apparent that America's workforce may be subjected to future accidents. Accordingly, it would be prudent to conduct research as to the capabilities of the NIOSH FACE program. Presently there are no research studies designed to evaluate the FACE programs inclusive constituents and the recommendations that have been promoted to the workforce. The NIOSH FACE database has never undergone a systematic evaluation of the entire program's hierarchal safety recommendations provided, and the inclusion criteria used within the program; consequently, there is no data to support or condemn the continued success of the program. This research is designed to answer some of these questions, thereby allowing the public an opportunity to evaluate the validity of the NIOSH FACE program.

CHAPTER 3

HISTORICAL PERSPECTIVE

The National Institute for Occupational Safety and Health was created by 29 UFC 651, identified as the OSH Act. Under this Federal code, OSHA was charged with regulatory oversight of the workplace (DOL n.d). NIOSH was placed under the auspices of the U.S. Department of Health and Human Services. NIOSH's primary mission is to assure safe and healthful working conditions for workers by providing research, information, education, and training in the field of occupational safety and health (DOL 2016). The NIOSH FACE program began in 1982 with participating states notifying NIOSH of occupational fatalities within their jurisdictional control that met the inclusion criterion set forth by the FACE program's administrative staff. It must be noted that the inclusion criteria has been influenced by the FACE program's administrator based upon OSHA's actual fatality reporting system which requires every employer to report workplace fatalities within 8 hours of occurrence. Additionally, state FACE programs began in 1989. Currently, seven state health or labor departments have cooperative agreements with NIOSH for conducting surveillance, targeted investigations, and prevention activities at the state level using the FACE model. (CDC, 2017)

CHAPTER 4

LITERATURE REVIEW

Origins of Occupational Injury Prevention

The occupational safety and health discipline has its origins rooted in the social science of medicine. Italian Physician Bernardo Ramazzini wrote "A Treatise of the Diseases of Tradesmen", which directly linked occupational exposures to injuries for the first time in history (Ramazzini, 1763). This concept was to be expanded upon by Charles Turner Thackrah's work that incorporated an epidemiological aspect into worker related maladies. Thackrah stated, "From a reference to fact and observation, I reply, that in many of our occupations, the injurious agents might be immediately removed or diminished." (Thackrah, 1832) He was the catalyst by which occupational health and safety initiatives became focused upon prevention strategies and methodologies designed to eliminate or reduce the exposure upon the human worker.

Domino Theory

In 1831, H.W Heinrich sought to explain accident causation factors. Heinrich developed the domino theory, which largely blamed the injured worker's educational and social background; as the drivers of unsafe workplace behaviors, which then result in accidents and injuries (Heinrich, 1931). This worker centric accident causation model was short lived and subsequently replaced by the Multiple Causation Theory, which identifies behavioral and environmental causation factors for workplace accidents. This model was then expanded upon to create the Systems Theory of Accident Causation,

which states, “A system is a group of regularly interacting and interrelated components that together form a unified whole…an accident may occur as a system comprised of the following components: person (host), machine (agency), and environment.” (Goetsch, 1998) This accident causation theory focuses attention toward interactions between all factors. This logic path is extended with new research that is defined by Combination Theory, which incorporates all of the aforementioned accident causation factors into account when determining the best methodologies for preventing accidents.

History of Occupational Injuries and Deaths in the U.S.

According to the CDC, “At the beginning of this century, workers in the United States faced remarkably high health and safety risks on the job. Through efforts by individual workers, unions, employers, government agencies, scientists such as Dr. Alice Hamilton, and other stakeholders, there has been considerable progress in workplace safety improving these deplorable conditions.” (CDC, 1999) Despite these successes, much work remains, the goal is for all workers to have a productive and safe working life and a retirement free from long-term consequences of occupational disease and injury. Using the limited data available at the time, this CDC report documents a large decline in fatal occupational injuries during the 1900s, while highlighting the mining industry as an example of improvements in worker safety, and discusses new challenges in occupational safety and health for all industries.

CHAPTER 5

DEFINITION OF COGNITIVE STRUCTURES

This inquiry will be an observational study based upon the NIOSH FACE reports actual data that is maintained by the program website. This investigation will involve a cross sectional analysis of all of the FACE reports from 1982 through 2014 contained within the Federal database. The individual state FACE data will not be a part of this research protocol. The study will involve evaluating the hierarchal controls as illustrated by figure 1.

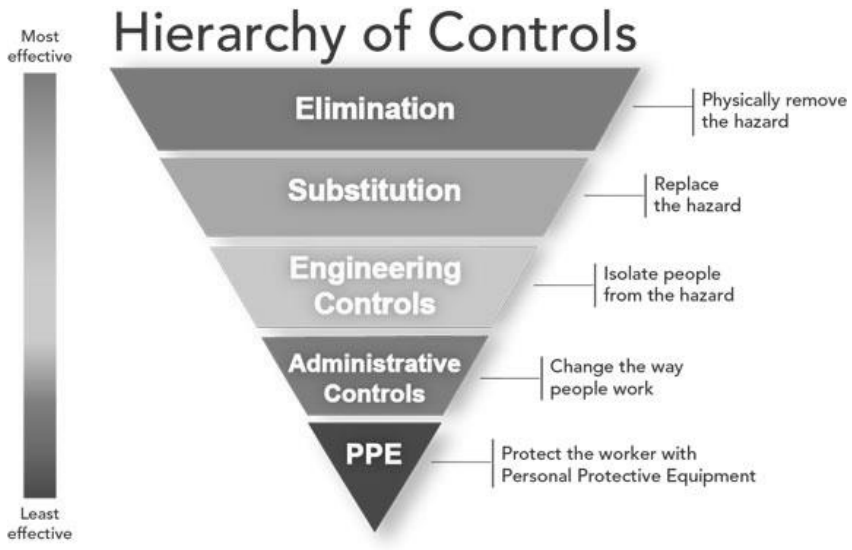

Figure 1 *NIOSH Hierarchy of Controls*

Retrieved from https://www.cdc.gov/niosh/topics/hierarchy/default.html.

A cross-sectional analysis of each of these tenants of safety control was conducted. Additionally, each of the FACE program's inclusion criterions were identified, including

industry, causation, and population demographics being targeted within the FACE program's parameters.

Research Design Purpose

Modeling. This longitudinal study conducted under the exploratory research modeling, whereby the NIOSH FACE program reports become the primary driver of all conclusions rendered. The researcher's primary objectives are to illuminate:

- The degree that NIOSH FACE reports identify each individually recognized hierarchal control for promoting safety in the workplace
- The cause of the worker fatality as reported by the FACE program
- Identifying the target populations that were included within the FACE program
- Ascertaining the number of Federal NIOSH FACE reports generated since the program's inception.

To address the objectives of this study, the investigation incorporated exploratory methods via descriptive research by qualitative statistical analysis of data garnered. The study plan for this inquiry was based upon a non-experimental research design whereby no variable will undergo any treatment. Consequently, this research shall remain descriptive in nature by illuminating the intricacies of the NIOSH FACE program. Due to the inherent limitations of this study, no attempt to translate the findings into a predictive study design were undertaken.

Descriptive Research Design. According to Rutgers University (n.d.), the descriptive research's purpose is to provide systematic data about a social phenomenon. Following this example, this research was not subjected to a hypothetical premise during its inception. It is this researcher's intent that the data gathered support further

investigative examination, based upon these findings. Each FACE program determinant was designed to be a standalone variable by which quantitative analysis could be applied to determine outcomes. Each of the questions and data points were subjected to population measures and analysis.

Design Summary. In order to ensure validity, this research was conducted under strict scientific methodology principles. Consequently, the research design will involve following a predetermined research design model that demands rigorous data management analysis of the information that confers quality and reliability of the study's results. The research modeling design demonstrates this research's adherence to the critical thinking postulates that radiate quality and trustworthiness of the study through:

- Credibility of primary data sources
- Transferability of research findings to further studies
- Dependability/integrity of researcher to identify internal bias
- Conformability to scientific methodologies

The model design also requires that the entire research process was conducted with data transparency, whereby end users are allowed the opportunity to gauge the quality of the research. This provision safeguards the research from internal biases, thereby ensuring soundness of the entire research study.

Samples and Population. This study involved non-probability census sampling; the entire NIOSH FACE database was utilized as the population for this research. There was one case report that was omitted from the analysis due to the fact that the NIOSH case record did not have any reportable material contained in the data. Additionally, two case reports involved significant injury that comprised amputations to a minor workers.

Consequently, these reports were deleted from the population sample which deals with workplace death.

Field Procedures Methodology. This research involved a singular researcher reviewing each Federal NIOSH FACE case report and identifying the types of hierarchal controls recommended following each workplace death investigated. Furthermore, each case report underwent further scrutiny identifying types of variables utilized by NIOSH in their data collection. Each of these research facets were identified and underwent further analysis.

CHAPTER 6

DATA RESULTS

This study is original with no previous studies being found in a literature review. This study used data from the Federal NIOSH FACE program online data base exclusively. This investigation excluded 1,996 case reports, which are contained in the state FACE programs due to the fact that only seven states are participating in the State FACE program. Additionally, the state FACE programs data presented were inconsistent and therefore excluded by study design. The research involved 610 case reviews (n=610). The level of confidence was 95% with a 5% error level with the confidence interval being 0.0% as the entire population was under review. The study was a longitudinal study that included data from 1982 until 2014.

Age

In Table 1, the age demographics identified that the study population ranged from an 8 years old farm worker (who according to NIOSH, was employed by a dairy farm to help clean the cow pens) to a 79 year old; with the largest amounts of workplace deaths occurring in the 21-30 year old populace representing 158 deaths or 25.9% reported. It must be noted that The next subset of workers were the 31-40 year old age group with 139 deaths reported comprising 22.7% of all the deaths reported during the FACE data collections. Finally, the 41-50 age groups represented 14.9% of the total deaths reported with 91 workers killed. The aforementioned age demographics represent over 78.2% of the total worker deaths from 1982 until the year 2014. For the remaining deaths it must

be noted that in remaining percentage of workers killed the FACE data collection did not include the specific age of the deceased worker in 14.7% of the time consequently their ages cannot be reflected in the data presented in this investigation. Additionally, the FACE reports identified that older workers above the age of 51 represented 10% of the workplace deaths investigated.

Table 1: *Age demographic of deaths reported in NIOSH Federal Face program*

Age Group	Number of deaths reported	Percentage
Not reported	90	14.70%
0-20	66	10.80%
21-30	158	25.90%
31-40	139	22.70%
41-50	91	14.90%
51-60	48	7.80%
61-70	14	2.20%
Total	610	

Cause of Death (COD)

The FACE data revealed 34.7% of the workers killed were electrocuted in the workplace; while 22.9% of workers fell at work, as depicted in Table 2. The data reflects 9.6% of the workers were struck by equipment. Another 8.8% of the workers died due to asphyxiation, 8.1% were crushed on the jobsite and 7.0% of the reports identified workers being struck by objects.

Table 2: *Cause of Death Categories*

Cause of Death (COD)	Number of deaths	%
Electrocution	212	34.7%
Fall	140	22.9%
Struck by Equipment	59	09.6%
Asphyxiation	54	08.8%

Table 2 “continued”

Cause of Death (COD)	Number of deaths	%
Crushed	50	08.1%
Struck by Object	43	07.0%
Unknown	15	02.4%
Drowning	9	Less than 1%
Burns	7	Less than 1%
Traffic Accident	7	Less than 1%
Chemical Exposure	6	Less than 1%
Explosion	6	Less than 1%
Choking	1	Less than 1%
Heat Stroke	1	Less than 1%
Total	610	

Occupational Categories

The FACE database also included the occupation categories as defined by NIOSH FACE of the killed worker. This factor was reported in 100% of the FACE reports reviewed. The documents confirmed that the construction industry is the most dangerous occupation representing over 41.8% of the total workplace deaths investigated by the NIOSH FACE program as represented in Table 3. The data also demonstrates that electricians and linemen are also at significant risk while performing their job duties with 11.8% of the workplace deaths being investigated involving electrocution of electrical workers. The NIOSH data also reflected that 7.7% of production workers killed were on the factory floor despite being in a more controlled work setting. The data also suggests that the tree trimming industry represents 6.5% of the occupational deaths occurring. The maintenance professional also, faces the risk of dying on the job with 5.2% of the deaths reported being attributed to maintenance work. While painter and driver accounted for less than 5% of the deaths reported.

Table 3: *Occupations Categories Reported*

Occupation Categories	Number of Deaths	%
Construction	255	41.80%
Electrician/lineman	72	11.80%
Production	47	7.70%
Tree	40	6.50%
Maintenance	32	5.20%
Painter	27	4.40%
Driver	23	3.70%
Farm	16	2.20%
Mechanic	15	2.40%
Warehouse	8	1.30%
Oil	6	0%
Welder	6	0%
Operator	5	0%
Retail	5	0%
Billboard	4	0%
Garbage	4	0%
HVAC	3	0%
Laborer	3	0%
Plumber	3	0%
Pool	3	0%
Restaurant	3	0%
Window	3	0%
Boater	2	0%
EMS	2	0%
Highway	2	0%
Soldier	2	0%
Elevator	2	0%
Fisherman	1	0%
Foundry	2	0%

Worker Classification

The study also identified the deaths associated with the employee's work classification within the organization. Table 4 identifies that the "worker" classification suffers the highest chance of being killed on the job with 86.7% of the total deaths reported. The "supervisor/journeyman" group represented anyone that was charged with direct supervision of workers that were assigned under them. This class represented 8.6% of those killed on the job. For the purpose of this study, the higher strata within the organization has been combined into an inclusive group labeled "combined group" including owners, directors, presidents and managers, which together represented the lowest percentage of those killed in the workplace.

Table 4: *Worker Classification*

Classification	Deaths
Director	1
Manager	7
Owner	17
President	3
Supervisor	53
Worker	530
Total	611
Combined group	28
Supervisor	53
Worker	530
Total	611

Tenure

The tenure of an employee was measured as related to deaths in the workplace. However, this critical factor was largely underreported by the NIOSH FACE report data with 47% of the cases reviewed failing to identify how long the employee was on the job. Consequently, this study's postulate has been omitted from the findings due to the

potential of a high probability of error in correlating job experience and the number of workplace deaths reported.

Hierarchal Recommendations

The study design included identifying the specific hierarchal recommendations forwarded by NIOSH as presented in Figure 2. Under this system, each different type of safety control has been classified and rated according to effectiveness. As seen in Figure 2 below, the study identified that in 99% of the workplace deaths examined by the NIOSH FACE program, the investigator felt that the company could have prevented the tragedy by creating and/or enforcing administrative controls. Equally important, the data reflected that 40.1% of the time there may have been an engineering solution which could have isolated the hazard preventing the worker death. The lack of use of personal protective equipment was cited over 37.3% of the time. Whereby, elimination of the hazard represented 21.3% of the deaths reported; only 10.9% of the time the primary investigator felt that the company could have substituted another methodology.

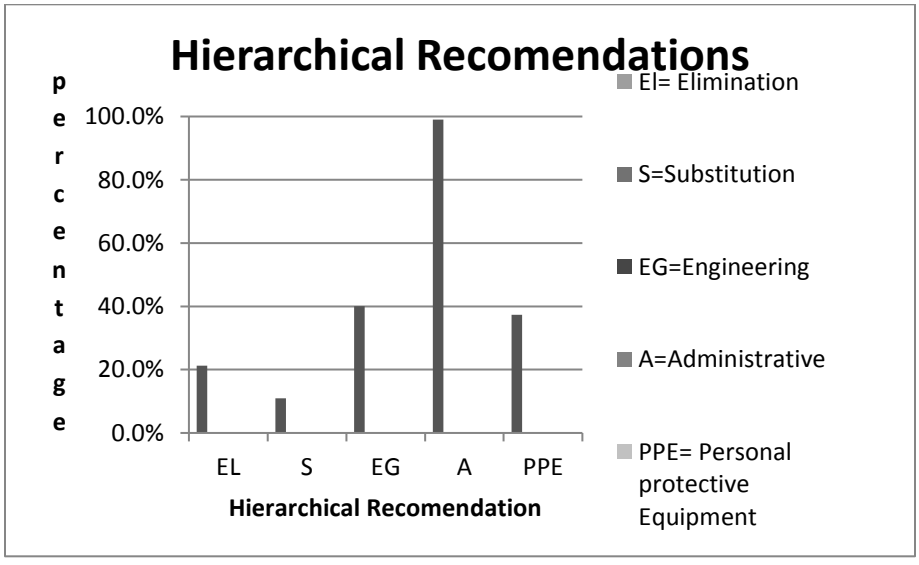

Figure 2: *Hierarchal Recommendations*

Number of Federal FACE Reports Generated Each Year

According to the NIOSH mission statement, their primary objective is, "To develop new knowledge in the field of occupational safety and health and to transfer that knowledge into practice" (NIOSH 2016).This noble sentiment is combined with the following values listed on this Federal Agencies website:

NIOSH (2016).

- Relevance—NIOSH programs are responsive to the occupational safety and health problems that burden today's and tomorrow's workers.
- Quality—NIOSH utilizes only the best science, the highest level of data quality, and the most transparent and independent peer review.
- Partnership—NIOSH accomplishes our mission in partnership with industry, workers, governments, academe, and scientific and professional communities, both nationally and internationally.
- Transparency—NIOSH openly shares information about our work processes and our customers can obtain all NIOSH products and services through traditional, electronic and mobile sources.
- Impact—NIOSH programs are results-oriented and are evaluated by how well they solve the occupational safety and health problems found in today's workplaces and the workplaces of tomorrow.
- Diversity—NIOSH employees and contractors reflect the full spectrum of diversity found in the American workforce and our research and interventions reflect the diversity of solutions needed for the American workplace.

Given the aforementioned mission values, it becomes evident that NIOSH places great emphasis on being able to disseminate their safety lessons to the workforce; because of this statement it would be prudent to investigate the effectiveness of the NIOSH FACE programs overall impact.

Since the inception of the NIOSH FACE program, NIOSH has investigated a multitude of cases over the course of 32 years. Of the cases evaluated, it becomes evident that the number of case reports generated one can see that the program was in its prime in the late 1980's and early 1990's but has been in decline since the year 2000 as depicted by Figure 3 below.

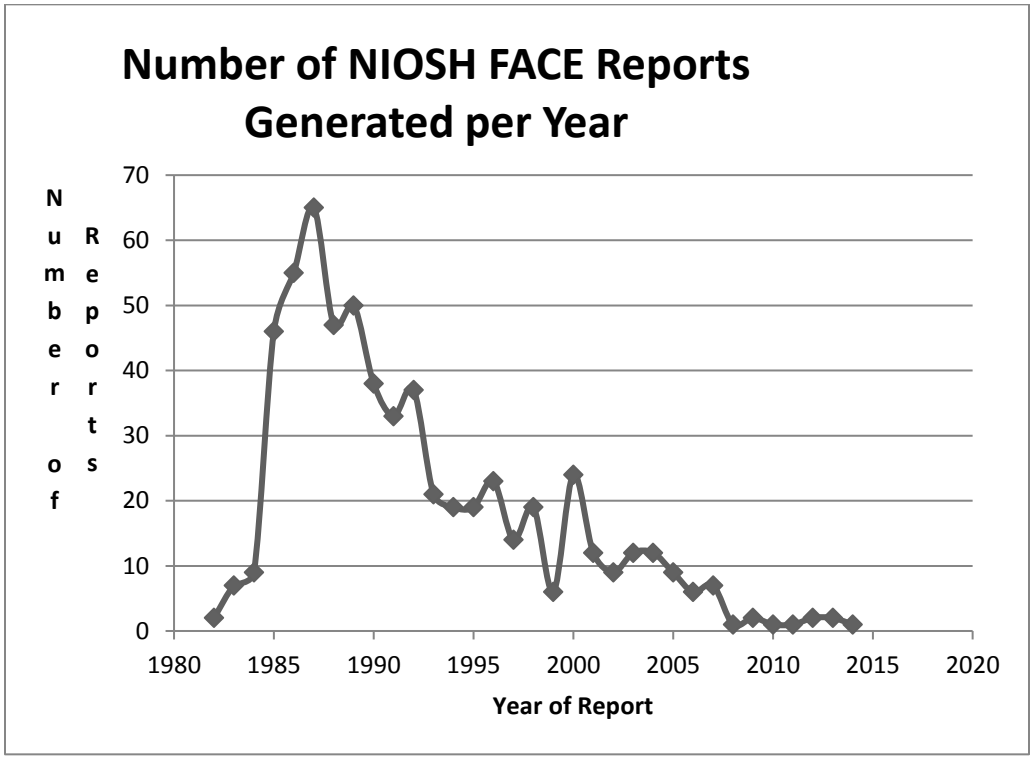

Figure 3: *Number of NIOSH FACE Report Generated by Year*

Figure 3 depicts that the peak of NIOSH Federal FACE reports occurred in the late 1980's until the mid-1990's with the highest year reporting having 65 FACE investigations. In contrast, 2014 has only 1 FACE report for the public to review.

CHAPTER 7

DISCUSSION

The data confirmed that the entire U.S. workforce is at risk for a workplace fatal accident. The majority of the deaths reported occurring between the ages of 21-30 followed closely by the 31-40 age groups and then the 40-50 year old age demographic. The data suggest that age may be a influence; however, the NIOSH FACE data did not provide sufficient data to allow for a more detailed investigation this factor. Further research is needed to isolate the effects of all age groups upon workplace deaths.

The data of this study also clearly demonstrates that American workers are at considerable risk for being electrocuted on the job site with over 1/3 of the total deaths reported being an electrocution. Additionally, the study data suggests that a lack of fall protection or use was cited in almost 23% of the deaths reported. These two causes of death represent more than half the deaths reported over the study period. More research is needed to establish the exact behavioral patterns which were exhibited as the means for understanding the root cause(s) of these tragic workplace deaths. Emphasis must be placed upon identifying whether a lack of hazard recognition and/or worker complacency to the hazards of the job are a major contributor to the high number of deaths. Unfortunately, the NIOSH FACE program never was designed to go into this level of scrutiny, so further studies need to be conducted.

The study proved conclusively that the construction industry still remains one of the most hazardous occupations. This reality is reinforced by the fact that electrocution

and falls are the primary drivers of workplace causes of death. In numerous NIOSH FACE case reports, workers were electrocuted as the heavy equipment they were working near became energized by contact with power lines located on the jobsite. Furthermore, the case reports reviewed offered numerous examples of construction activities that require the workers to be higher than grade while performing their work activities. Given these factors, it becomes evident that many construction industry workers face ever changing dynamic work environments. This then requires increased diligence in hazard recognition and prevention strategies. The NIOSH FACE program does provide numerous workplace death reports as a means for educating the construction workforce on the hazards of their environments. However, the NIOSH reports only offered recommendations that followed their hierarchal approach to safety management. No attempt appears to have been made to perform true root cause analysis of the worker's death.

The NIOSH FACE program was created to educate the workforce as to the cause of deaths on the jobsite. In 99% of the cases investigated, NIOSH recognized the affected organization failed in establishing effective administrative controls over safety; nevertheless, it must be noted that the NIOSH FACE data did not attempt to clarify what types of administrative controls were to be undertaken to reduce workplace deaths. This salient workplace statistic is the most telling when considering the potential impact of reducing workplace fatalities via accident reason and causal chain modeling. If organizations were able to manage their safety administrative controls effectively, overall workplace deaths may be significantly reduced. The same logic can be applied to the other tenants of the NIOSH Hierarchal accident reduction model, whereby any effective

means of reducing impacts upon the worksite should reduce workplace fatalities. Interestingly, administrative controls are placed on the low end of the safety solutions spectrum, being listed as the second to the lowest effective actions for ensuring safety. This scaling is based upon the reality that elimination, substitution, and engineering controls more effectively remove the element of human error.

However, this significant disconnect is problematic due to the aforementioned hierarchal controls are the most expensive, so many organizations fail to enact these safety remedies due to economic realities or concerns. Thus, many organizations are reliant upon administrative controls and PPE as the primary drivers of safety. The data concludes that there is a gap between knowing how to use administrative controls and the actual implementation of critical safety measures. This research has identified more research must be conducted on workplace education focused upon internal enforcement, reinforcement, and purposeful implementation as the means for providing a safe place to work.

Decline in Number of Cases Reported

The NIOSH Federal FACE program was designed to reduce workplace deaths via employer and worker education by evaluating workplace deaths and offering recommendations to prevent these occurrences from recurring. While the program began slowly with only two cases reviewed in 1982, the program then gained legitimacy as NIOSH investigated more cases, such as 65 in 1987. Each individual case review offered a plethora of knowledge for employers and workers to make their work environment safer. While NIOSH maintains that their FACE program is a key component of their mission to educate the workforce, the data garnered in this study negates that sentiment.

In Graph 2 one can easily identify that the federal NIOSH FACE program is in serious decline. It can be argued that the last 10 years of this program have been ineffective, due to a lack of case reviews generated. In fact, in 2014 the Federal FACE program investigated only one single death. Even if one incorporates the state FACE report data of 20 investigations conducted in 2014, this level of investigation has dwindled to less than 1/3 of the fatalities investigated in the program's peak. Given that our nation had 4,679 workers killed in 2014; the number of federal FACE investigations combined with the state Face program data represents less than 1% of the worker deaths being investigated. Consequently, this study brings into question the validity of the NIOSH FACE program's ability to provide relevant and impactful data from which organizations can teach their workers to be safe.

The NIOSH FACE program is invaluable. The data collected has allowed specific industries the opportunity to learn from the tragedy of others. The case reviews provided a valuable insight into how organizational belief systems can influence worker health and well-being. The NIOSH FACE report recommendations are based upon real life workplace deaths, which must be shared with the American workforce. Therefore, it is suggested that NIOSH reevaluate its commitment to the federal and state FACE programs by conducting its own study on how this instrumental program can be reinvigorated and revitalized to truly impact worker deaths within America in the future.

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