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2011 ANNUAL REPORT

TRACKING WORK-RELATED DEATHS IN MICHIGAN



MICHIGAN FATALITY ASSESSEMENT AND CONTROL EVALUATION

TRACKING WORK-RELATED DEATHS IN MICHIGAN

2011 ANNUAL REPORT

MARCH 1, 2013

REVISED: JUNE 19, 2013 (SEE PAGE 30-31 BOLD TEXT)

SUMMARY

This is the 11th annual Michigan Fatality Assessment and Control Evaluation (MIFACE) report on acute traumatic work-related (WR) deaths in Michigan. There were **140 WR deaths in 2011**, representing 135 employers and 136 separate incidents. The number of WR deaths occurring in 2011 was down slightly compared to the number of WR deaths in 2010 (147), as was the injury rate per 100,000 workers (3.3) in 2011 compared to 3.5/100,000 in 2010.

Construction had the largest number of deaths (25), followed by Agriculture (23) and then Manufacturing (15). **Agriculture** had the highest incidence rate (26.5), followed by Construction (20.1) and then Transportation & Warehousing (12.0).

The **most common cause** of a WR death was a **motor vehicle** (25), then a fall from a height or a machine (20 each). The year 2011 had the highest number of WR suicides (16) since the inception of the MIFACE program.

The number of WR deaths in Public Administration (NAICS 92) more than doubled from 5 in 2010 to 11 in 2011. This increase was due to an increase in the number of deaths occurring to police/sheriff/parole offi-

cers (4 in 2010 compared to 7 in 2011). Adding to the increase in the number of deaths in Public Administration were three individuals employed in governmental agencies (MVA and two homicides) and one individual who worked in human resource administration (MVA).

In Manufacturing, there was an increase of 9 deaths (15 in 2011 compared to 6 in 2010). Contributing to the increase was an aircraft crash which killed three individuals. The number of machine deaths increased from 1 in 2010 to 5 in 2011. Two new causes of death compared to 2010 were an electrocution and a fire/explosion.

Individuals who died were most likely to be men (91%), white (85%), 40-49 years of age (27%), married (57%), and have at least a high school education (92%). The average age was 48 years old. The youngest (14 years) and oldest (83 years) deaths occurred to individuals who worked in Agriculture.

Tuesday had the largest number of WR deaths (28 deaths, 20.7%). August and October were tied (16 incidents, 11.4%) for the months with the next largest number of injuries resulting in a WR death. The most

common four-hour time period for an incident resulting in a WR death was 12:00 p.m.- 3:59 p.m. (37 incidents, 32.2%)

Fifty of Michigan's 83 counties had a fatal WR incident. Wayne County had the highest number of fatal incidents (21), followed by Oakland (12), and then Washtenaw (8).

Of the 140 WR fatalities, 36 (25.7%) were MIOSHA program-related and investigated by MIOSHA.

The 2011 US hours-based WR fatality rate was 3.5/100,000 full-time equivalent (FTE) workers. Four of the five industry sectors where an hours-based WR fatality incident rate could be calculated for Michigan for 2011 were greater than the US hours-based rate of 3.5.

NOTE: DUE TO A LATE NOTIFICATION, THE NUMBER OF 2011 WR DEATHS HAS INCREASED TO 141. THIS ANNUAL REPORT DATA IS BASED ON 140 DEATHS.

BACKGROUND

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In 2001, MSU OEM instituted a tracking program for all traumatic WR deaths, first with financial assistance from LARA and then from NIOSH. This is a joint project of LARA/MIOSHA and MSU OEM.

The purpose of the [MIFACE](#) tracking project is three-fold: 1) Identify types of industries and work situations where workers are dying from acute traumatic incidents; 2) identify the

underlying causes of the WR fatality, and 3) formulate and disseminate prevention strategies to reduce future WR fatalities.

MIFACE uses the National Institute of Occupational Safety and Health (NIOSH) Fatality Assessment and Control Evaluation (FACE) as a model. MIFACE investigations have provided aggregate data to identify high-risk industries and work practices as well as provided the stories or “faces” necessary to make the statistics real and influence change in the workplace. Emphasis on information dissemination and translation of information into user-friendly materials is an important part of the MIFACE program.

The MSU OEM webpage, (www.oem.msu.edu) has many [Resources](#) available to assist employers, employees, safety and health pro-

fessionals and others understand more about WR illnesses, injuries and death.

A **traumatic injury** is any unintentional or intentional wound or damage to the body resulting from acute exposure to energy or from the absence of such essentials as heat or oxygen caused by a specific event, incident or series of events within a single workday or shift.

Work is defined as legal duties, activities or tasks that produce a product as a result and that are done in exchange for money, goods, services, profit or benefit. Volunteers and inmates who are exposed to the same work hazards and perform the same duties or functions as paid employees are included in the MIFACE program.

Deaths from natural causes, such as heart attacks are not included. Suicides are included, following the protocol established by the NIOSH FACE program as well as that of the Bureau of Labor Statistics (BLS), which collects the official statistics of WR deaths in all states.

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**All WR deaths MUST
be reported to
MIOSHA within 8
hours of the death.**

**The toll-free hotline to
report a WR death is:
1-800-866-4674**

WR DEATHS TRACKING PROCEDURES IN MICHIGAN

IDENTIFY INDIVIDUALS	GATHER INFORMATION	CONTACT EMPLOYER/FARM FAMILY	MIFACE SITE VISIT
<ul style="list-style-type: none"> ◆ Receive Report of Death ◆ Determine if WR Death <ul style="list-style-type: none"> - Paid employee or self employed - Working at job or family business when incident occurred - Traveling “while on-the-clock” or compensated travel - Volunteers - In parking lot of business 	<ul style="list-style-type: none"> ◆ Contact <ul style="list-style-type: none"> - MIOSHA if fatality is program-related - Appropriate Police and Fire Departments, request written report and pictures of incident scene, as appropriate. - Medical Examiner, obtain ME Death Scene investigation and autopsy reports ◆ Obtain newspaper clippings 	<ul style="list-style-type: none"> ◆ Send Letter and Brochure about MIFACE program ◆ Follow-up phone contact <ul style="list-style-type: none"> - Answer questions and inquire if employer and/or family will participate - Voluntary participation - If firm/family agree to participate, schedule date and time for MIFACE site visit - If firm/family decline to participate, case summary or MIFACE Summary of MIOSHA Investigation is written 	<ul style="list-style-type: none"> ◆ Explain MIFACE program ◆ Complete appropriate research forms ◆ Conduct interviews with appropriate personnel <ul style="list-style-type: none"> - Learn about process, equipment involved, work activities of deceased, training, safety programs, etc. ◆ Observe area and/or equipment involved ◆ Take pictures, ensuring identifiers are noted and removed for final report
MIFACE REPORT	FOLLOW UP ACTIVITIES	FOLLOW UP ACTIVITIES	SOURCES USED TO IDENTIFY WR DEATHS
<p>Report Includes:</p> <ul style="list-style-type: none"> - Summary Statement - Detailed narrative of the investigation - Cause of death as determined by the Medical Examiner - Recommendations to prevent future fatalities, including a discussion - References - Pictures, drawings, sketches of equipment or source of injury - Review of draft report by outside experts and MIFACE Advisory Board - Send MIFACE Report to Employer, Farm Family and Stakeholders 	<ul style="list-style-type: none"> ◆ Identify Stakeholders <ul style="list-style-type: none"> - Internet search for similar companies and/or trade groups ◆ Update Database <ul style="list-style-type: none"> - Information collected from each site visit and statewide tracking entered into a database ◆ Analyze Data <ul style="list-style-type: none"> - Annual Report developed analyzing and discussing data ◆ Educational Outreach <ul style="list-style-type: none"> - MIFACE Summary of MIOSHA Investigation if MIOSHA investigation takes place - Hazard Alert 	<ul style="list-style-type: none"> ◆ Educational Outreach <ul style="list-style-type: none"> - Post on MSU OEM website: <ul style="list-style-type: none"> • Investigation Report • MIFACE Summary of MIOSHA Investigation • Hazard Alert - Send notice of posted publications to MIFACE e-mail distribution list - Guest speaker, display booths at health and safety conferences, industry trade group training programs 	<p>MIFACE utilizes multiple sources to identify the Michigan WR fatalities.</p> <ul style="list-style-type: none"> • MIOSHA • Death Certificates • Newspapers • Medical Examiners • Police/Fire/EMT Departments • Workers’ Compensation Agency • MSU Extension • Michigan Farm Bureau • Federal Agencies (MSHA, NTSB, etc) • Internet searches • Michigan citizens

RESULTS

There were 140 traumatic WR deaths in 2011.

One hundred thirty five (96.4%) of the WR traumatic incidents occurred in 2011. Five individuals died in 2011 due to complications from WR injuries sustained in a previous year (as noted by the medical examiner on the death certificate:

- 1967 - motor vehicle crash - complications of a closed head injury.
- 1972 - unknown injury cause - cerebrovascular disease, which was a complication of spinal injuries sustained at a construction site.
- 1981 - motor vehicle crash - kidney complications caused by a spinal cord injury and paraplegia.
- 1986 - fall from 3-story-high scaffold - complications of a head injury.
- 2010 - fire - smoke inhalation and complications due to an intentionally set fire in a group home.



Lead operator fell approximately 30 feet to steel platform

INCIDENCE MEANS THE NUMBER OF NEW CASES OF AN ILLNESS, INJURY, OR OTHER HEALTH-RELATED EVENT THAT COMMENCE DURING A SPECIFIED TIME PERIOD IN A SPECIFIED POPULATION.

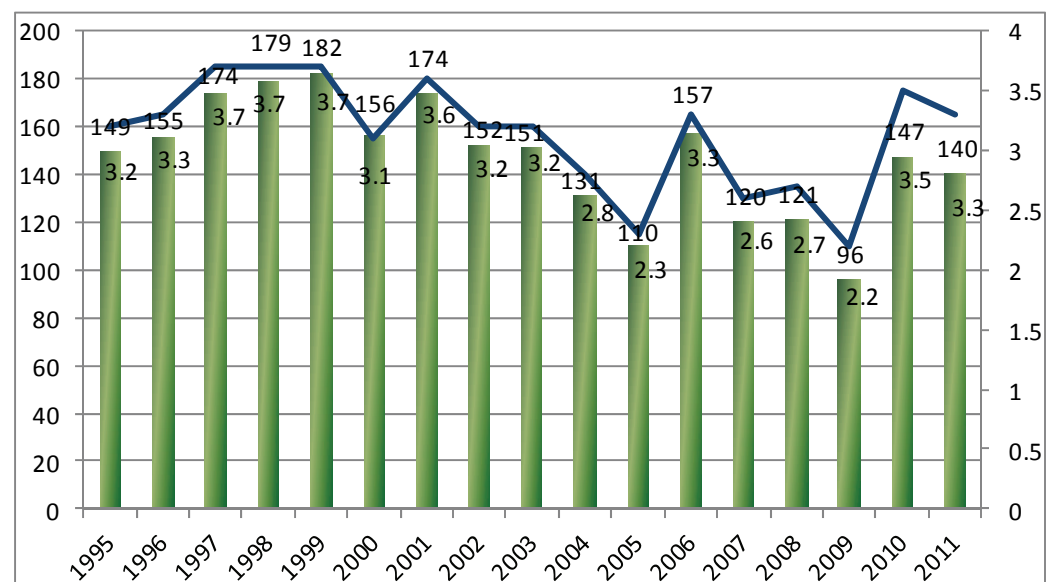


Farmhand asphyxiated in silo

NUMBER OF TRAUMATIC WR FATALITIES IN MICHIGAN

The number of traumatic WR deaths per year in Michigan since 1992 is shown in **Figure 1**. Incidence rates (per 100,000 workers) are shown by the **blue** line. The number of WR deaths per year are shown by the **green** columns. Incidence rates shown from 1995-2000 were provided by the BLS website. Rates shown for 2001-2011 were determined from MIFACE statistics.

Figure 1. Number and Incidence Rate of Traumatic Work-Related Fatalities, Michigan, 1992-2011



DEMOGRAPHICS

Race/Ethnicity

Table 1 shows the distribution of demographic characteristics of the 140 traumatic WR fatalities in Michigan in 2011.

One hundred nine (109, 85.2%) of the 128 men were White, 11 were Black, 4 were Asian/Pacific Islander, 2 were American Indian/Alaska Native and 2 were identified as Hispanic for race on their death certificates.

Five men were of Hispanic ethnicity. Three of the 109 White men had Hispanic identified as their ethnicity, and, the 2 men identified as Hispanic for race also were noted as Hispanic for ethnicity.

Ten of the 12 females who died in 2011 were White and 2 were Black. None of the females were identified as Hispanic for ethnicity.

Age

The age distribution of the 140 individual who died from a WR injury is shown in **Table 1** and **Figure 2**. The ages ranged from 14 to 83; 2 deaths in youths 18 years of age and younger (ages 18 and 14) and 13 (9.3%) deaths in individuals 70+ years of age. The youngest (14 years) and oldest (83 years) deaths occurred to individuals who worked in Agriculture. Five of the 13 (38.5%) WR deaths of individuals aged 70+ occurred to individuals working in Agriculture.

The average age was 48.0 years, down from the average age of 49.0 years in 2010.

Figure 2. Age Distribution of Traumatic Work-Related Fatalities, Michigan, 2011

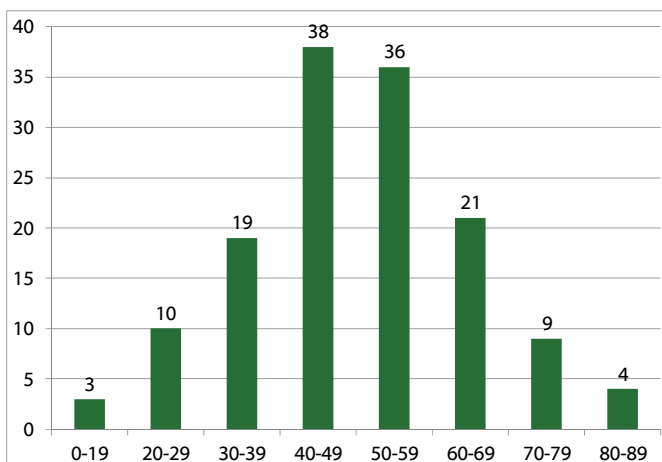


Table 1. Demographic Characteristics of Traumatic Work-Related Fatalities, Michigan, 2011

Demographic Characteristics	Number	Percent
Sex		
Male	128	91.4
Female	12	8.6
Race		
White	119	85.0
Black	13	9.3
Asian /Pacific Islander	4	2.9
American Indian/Alaskan Native	2	1.5
Hispanic (as identified on DC)	2	1.5
Age		
<20	3	2.1
20-29	10	7.1
30-39	19	13.6
40-49	38	27.1
50-59	36	25.7
60-69	21	15.0
70-79	9	6.4
80-89	4	2.9
Marital Status		
Never Married	33	23.7
Married	79	56.8
Divorced	26	18.7
Widowed	1	0.7
Unknown	1	--
Educational Level		
Less than High School	20	14.5
High School Graduate	62	44.9
GED	1	0.7
Some College (1-4 years)	52	37.7
Post College (5+ years)	3	2.2
Unknown	2	--
Country of Origin		
United States	130	92.9
South Korea	2	1.4
Mexico	2	1.4
Iraq	1	0.7
Canada	1	0.7
Romania	1	0.7
Sri Lanka	1	0.7
India	1	0.7
Australia	1	0.7
Total	140	

By gender, for the 128 males, the 50-59 age group were the most likely to sustain a WR death (33, 25.8%). For females, 8 of the 12 (66.7%) WR deaths occurred in the age group 40-49.

By race, for individuals who were White, the age group mostly likely to sustain a WR death is 40-49 (32, 26.9%) followed by the 50-59 age group (30, 25.2%). For individuals who were Black, 4 deaths each (30.8%) occurred in the age groups of 40-49 and 50-59.

THE 2002 NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) HAS 20 SECTORS GROUPING ESTABLISHMENTS INTO INDUSTRIES ACCORDING TO PRIMARY ECONOMIC ACTIVITY. MIFACE CLASSIFIES AN ESTABLISHMENT TO AN INDUSTRY WHEN THE ESTABLISHMENT'S PRIMARY ACTIVITY MEETS THE DEFINITION FOR THAT INDUSTRY.

DEMOGRAPHICS

Age

Table 2 shows the age of the individual who died and the industry in which he/she worked. Two of the three individuals aged 14-19 worked in Agriculture. A 14-year-old male's head struck a corn grinding machine due to a 3/8-inch rubber belt wrapped around his arm. The 18-year-old male was engulfed and asphyxiated in a silo filled with corn. The 19-year-old male worked in Education; he committed suicide.

In 2011, in industries hav-

ing 11 or more deaths, of the 23 WR deaths in Agriculture, 12 (52.2%) were 60+ years of age, compared to 7 (28%) of 25 WR deaths in Construction, 2 (13.3%) of 15 WR deaths in Manufacturing, 2 (14.3%) of 14 WR deaths in Transportation & Warehousing, and 2 (18.2%) of 11 WR deaths in Public Administration.

From 2001-2011, there have been 275 individuals aged 60+ years who have died due to a traumatic WR incident. Eighty-six

(31.2%) of the 275 individuals had worked in Agriculture and 39 (14.2%) occurred in Construction.

In 2011, 34 WR deaths of individuals aged 60+ occurred. Two industry sectors accounted for greater than 50% of all 60+ years of age WR deaths; 12 (35.3%) occurred in Agriculture and 7 (20.6%) occurred in Construction.

Table 2. Traumatic Work-Related Fatalities by Age of Victim and Industry Sector, Michigan, 2011

Industry Sector (NAICS Code)	14-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	Total
	Number	Number	Number	Number	Number	Number	Number	Number	
Agriculture, Forestry, Fishing & Hunting (11)	2	1	1	1	6	7	3	2	23
Utilities (22)	--	--	--	--	1	--	--	--	1
Construction (23)	--	--	5	6	7	4	2	1	25
Manufacturing (31-33)	--	2	2	5	4	1	1	--	15
Wholesale Trade (42)	--	--	1	--	2	1	--	--	4
Retail Trade (44-45)	--	2	2	1	3	2	--	--	10
Transportation & Warehousing (48-49)	--	1	2	5	4	2	--	--	14
Information (51)	--	--	--	1	--	--	--	--	1
Real Estate & Rental & Leasing (53)	--	--	--	1	1	--	--	--	2
Professional, Scientific, & Technical Services (54)	--	--	--	1	--	1	--	1	3
Administrative & Support & Waste Management & Remediation Services (56)	--	1	1	4	1	--	--	--	7
Education (61)	1	--	--	--	2	--	1	--	4
Health Care & Social Assistance (62)	--	--	--	3	1	1	1	--	6
Arts, Entertainment & Recreation (71)	--	2	--	2	1	--	--	--	5
Accommodation & Food Services (72)	--	1	2	--	--	--	--	--	3
Other Services (except Public Administration) (81)	--	--	1	1	2	--	1	--	5
Public Administration (92)	--	--	2	6	1	2	--	--	11
Unknown	--	--	--	1	--	--	--	--	1
Totals	3	10	19	38	36	21	9	4	140

DEMOGRAPHICS

Marital Status

Thirty three (23.7%) individuals had never married, 79 (54.0%) were married, 26 (18.7%) were divorced and 1 (0.7%) was widowed. The marital status was unknown for one male. Of the 126 men (the 14-year-old male and the individual whose marital status was unknown are not included in this analysis), 29 (23.0%) were never married, 72 (57.1%) were married, 24 (19.0%)

were divorced and one (0.8%) was widowed.

Of the 12 females, 3 (25.0%) had never married, 7 (58.3%) were married and 2 (16.7%) were divorced.

Educational Status

Table 3 shows the distribution of educational level by industry.

Overall, 20 (14.5%) individuals did not complete high school, one (0.7%) was granted a

GED, 62 (44.9%) completed high school but had not attended college, 52 (37.7%) had attended college, and 3 (2.2%) had post-graduate degrees.

Two of the 20 individuals who had not completed high school were students at the time of their death.

The educational level was unknown for two individuals.



Forklift driver pinned between dunnage rack and fork lift

Within industries having 11 or more deaths, the most common educational level was completing high school but no college (35), followed by attending some college (33). Construction had both the highest number (13) and highest percentage (52.0%) of individuals whose highest level of education was a high school diploma. Transportation & Warehousing had 50% of the deaths involving a worker with a high school diploma and Public Administration had only one (10.0%) individual.

Ninety percent of the Public Administration WR deaths involved workers who at-

tended college (80.0%) or had attained a graduate (10.0%) degree.

In Manufacturing, 60.0% of the deaths occurred to workers who had attended at least 1-4 years of college.

Table 3. Traumatic Work-Related Fatalities by Educational Level and Industry Sector, Michigan, 2011

Industry Sector (NAICS Code)	Did Not Complete High School		Completed High School No College		GED		Some College (1-4 Years)		Post College (5+)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry, Fishing & Hunting (11) ^a	8	34.8	9	39.1	--	--	6	26.1	--	--
Utilities (22)	--	--	1	100.0	--	--	--	--	--	--
Construction (23)	6	24.0	13	52.0	--	--	6	24.0	--	--
Manufacturing (31-33)	1	6.7	5	33.3	--	--	9	60.0	--	--
Wholesale Trade (42)	--	--	1	25.0	--	--	3	75.0	--	--
Retail Trade (44-45) ^b	--	--	5	55.6	--	--	4	44.4	--	--
Transportation & Warehousing (48-49)	3	21.4	7	50.0	--	--	4	28.6	--	--
Information (51)	--	--	--	--	--	--	1	100.0	--	--
Real Estate & Rental & Leasing (53)	--	--	1	50.0	--	--	1	50.0	--	--
Professional, Scientific & Technical Services (54)	--	--	--	--	--	--	2	66.7	1	33.3
Administrative & Support & Waste Management & Remediation Services (56)	--	--	5	71.4	--	--	2	28.6	--	--
Education (61)	--	--	4	100.0	--	--	--	--	--	--
Health Care & Social Assistance (62)	--	--	4	66.7	--	--	1	16.7	1	16.7
Arts, Entertainment & Recreation (71)	--	--	2	40.0	--	--	3	60.0	--	--
Accommodation & Food Services (72)	--	--	2	66.7	1	33.3	--	--	--	--
Other Services (except Public Administration) (81)	2	40.0	2	40.0	--	--	1	20.0	--	--
Public Administration (92) ^b	--	--	1	10.0	--	--	8	80.0	1	10.0
Unknown NAICS	--	--	--	--	--	--	1	100.0	--	--
Total	20		62		1		52		3	

^a Two individuals (aged 14 and 18) were students at the time of their deaths.

^b Education level unknown for one individual.

DEMOGRAPHICS

Education, continued

Overall, of the 20 individuals who had not completed high school, 2 were still students (both Agriculture). There were no individuals aged 20-29 who had not completed high school.

Individuals completing high school but had not attended high school included:

- 3 individuals in their 30s,
- 4 individuals in their 40s,
- 3 individuals in their 50s,
- 5 individuals in their 60s
- 1 individual in his 70s, and
- 1 individual in his 80s

Nineteen of the 20 individuals who completed high school were male.

Of the 52 individuals who had completed 1-4 years of

college:

- 7 were in their 20s,
- 4 were in their 30s,
- 20 were in their 40s,
- 13 were in their 50s,
- 6 were in their 60s,
- 1 was in his 70s, and
- 1 was in his 80s.

All of the individuals who completed a post-graduate education were male.



Welder pinned between cylindrical tank and the frame of the feed rollers rotating the tank

MIFACE USES
0.08% BLOOD
ALCOHOL
CONTENT TO
DEFINE
INTOXICATION
AND TO BE
POSSIBLY
CONTRIBUTORY
TO THE FATAL
INCIDENT

DRUG / ALCOHOL / MEDICATION USE

Of the 123 individuals whose death was not a suicide or a drug overdose, a toxicology screen for alcohol, illegal, prescription or non-prescription drugs was performed on 83 (67.5%) individuals; 55 (69.9%) individuals had detectable levels of these substances.

Twelve (14.5%) of the 83 individuals with detectable levels of alcohol, illegal, prescription and non-prescription drugs had levels that may have been a contributory factor to the fatal incident.

One of the five individual who had measurable **blood alcohol** levels had a blood alcohol exceeding 0.08% which was

thought to be contributory. He also tested positive for marijuana and its metabolite.

Nine additional individuals tested positive for **marijuana** and/or a marijuana metabolite. Due to privacy regulations, MIFACE cannot determine the individual's participation in the Michigan Medical Marijuana program. One of the ten individual tested positive for both marijuana and hydrocodone. It is unknown if his hydrocodone use was as a prescribed medication or was being abused.

One individual tested positive for a **cocaine metabolite**.

Prescription medications that were considered possibly contributory were: zolpidem, venlafaxine, laudanosine, midazolam, ketamine, morphine, and oxycodone.

Non-prescription drugs excluded from analysis were caffeine, nicotine/nicotine metabolites, ibuprofen, acetaminophen and theobromine. Diphenhydramine, pseudoephedrine and dextromethorphan were also excluded from analysis because the cause of death was homicide.



Custodian slipped and fell, striking his head while refinishing band room floor

WORK-RELATED EVENT DETAILS

Day of Injury

Table 4 shows the distribution of the 2011 fatalities by day of week.

Of the 135 known days of fatal injury, 56% of the fatal injuries occurred during the middle of the work week. Tuesday had 28 (20.7%), Wednesday and Thursday (24 each, 17.8%). Sunday's total

(16 fatal injuries) is the highest number of fatal injuries since the inception of the MIFACE data collection.

In Construction, Tuesday and Wednesday were the primary days of injury (16 of the 24 known day of injury, 66.7%). Tuesday had 9 (37.5%) fatal injuries and Wednesday had 7

(17.8%) injuries.

Sixty percent (60%) of the fatal injuries in Manufacturing occurred on the same two days. Tuesday had 4 (26.7%) and Wednesday had 5 (33.3%) fatal injuries.

Agricultural fatal injuries were evenly distributed throughout the work week.



Accountant died as a result of complications of a dog attack

Table 4. Traumatic Work-Related Fatalities by Day of Week, Michigan, 2011

Day of Injury	All Deaths		Construction (NAICS 23) ^a		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Manufacturing (NAICS 31-33)		Transportation & Warehousing (NAICS 48-49)		Public Administration (NAICS 92)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Monday	18	13.3	3	12.5	4	18.2	2	13.3	--	--	3 ^e	30.0	3	20.0
Tuesday	28	20.7	9	37.5	4	18.2	4	26.7	3	21.4	2	20.0	2	13.3
Wednesday	24	17.8	7 ^d	29.2	2	9.1	5	33.3	--	--	2 ^d	20.0	1	6.7
Thursday	24	17.8	3	12.5	4	18.2	1	6.7	3	21.4	2 ^e	20.0	3	20.0
Friday	15	11.1	--	--	4	18.2	1	6.7	3	21.4	--	--	4	26.7
Saturday	10	7.4	1	4.2	--	--	1	6.7	4	28.6	--	--	--	--
Sunday	16	11.8	1	4.2	4	18.2	1	6.7	1	7.1	1 ^d	10.0	2	13.3
Total	135[*]		24^c		22^c		15		14		10^c		15	

^a Only industries with 11 or more deaths are included in the table.

^{*} Day of week of fatal injury unknown in five cases.

^c Day of week unknown for one individual.

^d One death was a homicide.

In Manufacturing, although all weekdays had at least one WR fatal injury, one-third of them occurred on Wednesday (5, 33.3%). Tuesday had the next largest number of deaths (4, 6.7%).

Most Transportation & Warehousing fatal injuries occurred toward the end of the work week (Thursday and Friday, 3 each and Saturday with 4 fatal injuries).

In Public Administration, surprisingly, no WR deaths occurred on the

weekend days of Friday and Saturday.

Most WR homicides occurred on Friday (4, 26.7%). All of the WR homicides that occurred on a Monday involved an individual who worked in Public Administration.



Farm laborer run over by excavator while installing drainage tiles

WORK-RELATED EVENT DETAILS



Diesel mechanic died when struck by an exploding rim of a tractor-trailer tire.

Month of Injury

Table 5 shows the month of the WR injury and industries with 11 or more deaths.

Overall, August and October (16 each, 11.4%) had the highest number of WR injuries resulting in fatalities. March, April and May were the months with the next largest number (13, 9.3%), followed by July (12, 8.6%), June and September (11 each, 7.9%) and November (10, 7.1%).

Construction WR fatal

injuries (4) accounted for 25% of all WR injuries in August. With the exception of May, Construction had at least one WR injury leading to a fatality in each month.

Agriculture accounted for 30% of all WR injuries in May (4 of 13, 30.8%).

The harvest months (August-November) proved to be the most deadly in Agriculture (13 of 23 fatal injuries, 56.5%).

Manufacturing injuries were most likely to occur in March (5, 33.3%), The

number of Manufacturing WR injuries in March accounted for nearly 40% of all of the March WR injuries in 2011 (5 of 13, 38.5%).

Transportation & Warehousing WR injuries leading to a fatality were fairly evenly distributed throughout the year; the exception was January and February (0 fatal injuries each).

August and October (3 each) were the months when most WR homicides occurred.

Table 5. Traumatic Work-Related Fatalities by Month of Injury and Industry Sector, Michigan, 2011

Month of Injury	All Deaths		Construction (NAICS 23) ^a		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Manufacturing (NAICS 31-33)		Transportation & Warehousing (NAICS 48-49)		Public Administration (NAICS 92)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
January	9	6.4	2	8.0	2	8.7	1	6.7	—	—	2 ^b	18.2	2	13.3
February	7	5.0	1	4.0	2	8.7	—	—	—	—	—	—	—	—
March	13	9.3	2	8.0	—	—	5	33.3	1	7.1	1	9.1	1	6.7
April	13	9.3	2	8.0	—	—	2	13.3	2	14.3	2 ^b	18.2	1	6.7
May	13	9.3	—	—	4	17.4	1	6.7	1	7.1	—	—	1	6.7
June	11	7.9	2	8.0	—	—	1	6.7	1	7.1	1 ^b	9.1	1	6.7
July	12	8.6	3	12.0	2	8.7	—	—	2	14.3	—	—	—	—
August	16	11.4	4 ^b	16.0	3	13.0	1	6.7	2	14.3	1 ^b	9.1	3	20.0
September	11	7.9	2	8.0	3	13.0	—	—	1	7.1	2 ^b	18.2	1	6.7
October	16	11.4	2	8.0	4	17.4	2	13.3	2	—	2 ^b	18.2	3	20.0
November	10	7.1	3	12.0	3	13.0	1	6.7	1	7.1	—	—	1	6.7
December	9	6.4	2	8.0	—	—	1	6.7	1	7.1	—	—	1	6.7
Total	140		25		23		15		14		11		15	

WORK-RELATED EVENT DETAILS

Month of Injury by Cause

Table 6 shows the month of the WR fatal injury and the cause of death.

Motor vehicles were involved in 25 (17.9%) of all WR fatal injuries. Motor vehicle incidents occurred most frequently in April (5), followed by June, July, October and November (3 each).

Falls and machines

were tied for second in as a cause of a WR fatal injury (20 each, 14.3%).

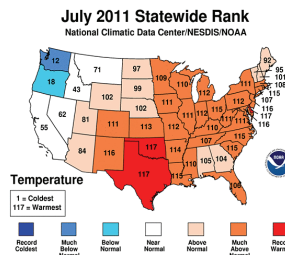
Fatal falls occurred most frequently in October (4 of 20, 20.0%). Seven months of the year had two WR falls (February, April-June, August, September and November).

Machine-related deaths occurred most frequently in July, and October (3 each). Four months (May, August, September and

November) each had two WR fatal injuries.

The number of WR suicides increased from 10 in 2010 to 16 in 2011.

March was the month with the highest number of WR suicides (4) followed by April (3).



The high temperatures in July contributed to the two heat-related deaths in July (restaurant cook and professional motocross racer)

Table 6. Traumatic Work-Related Fatalities by Month of Injury and Cause of Death, Michigan, 2011

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Aircraft	--	--	3	--	--	1	--	2	--	--	--	1	7
Animal	--	--	--	--	2	--	--	--	--	--	--	--	2
Asphyxiation	--	1	--	--	1	--	--	--	--	--	--	--	2
Drowning	--	--	--	--	--	--	--	--	1	--	--	--	1
Drug Overdose	--	1	--	--	--	--	--	--	--	--	--	--	1
Electrocution	--	--	--	1	1	--	2	--	1	--	--	2	7
Fall	--	2	--	2	2	2	1	2	2	4	2	1	20
Fire/Explosion	--	1	--	--	--	--	--	--	1	1	--	--	3
Heat/Cold	--	--	--	--	--	--	2	--	--	--	--	--	2
Homicide	2	--	1	1	1	1	--	3	1	3	2	1	15
Infectious Disease	1	--	--	--	--	--	--	--	--	--	--	--	1
Machine	1	--	--	1	2	3	3	2	2	3	2	1	20
Motor Vehicles	2	1	2	5	3	3	3	--	--	3	3	1	25
Other	--	--	--	--	--	--	--	--	--	--	--	1	1
Struck By	2	1	2	--	1	--	--	3	1	--	1	1	12
Suicide	1	--	4	3	--	1	1	1	2	1	1	1	16
Toxic Exposure	--	--	1	--	--	--	--	2	--	1	--	--	4
Unknown Cause	--	--	--	--	--	--	--	1	--	--	--	--	1
Total	9	7	13	13	13	11	12	16	11	16	10	9	140



Maintenance worker died when he was crushed against the machine frame by a lowering steel coil belt wrapper arm

WORK-RELATED EVENT DETAILS

Time of Injury

Table 7 shows the 4-hour time periods for industries with 11 or more deaths and for homicides.

The time of the injury could be determined within a 4-hour time period in 115 of the 140 (82.1%) of the WR deaths.

Overall, nearly 60% of all

WR fatal injuries occurred within the traditional working hours of 8:00a.m. to 3:59p.m. (68 WR injuries, 59.1%). The afternoon hours 12 p.m.-3:59 p.m. had the highest number of WR fatal injury (37, 32.2%), followed by 8:00 a.m.-11:59 a.m. (31, 27.0%).

The time period of 4:00pm-7:59p.m. had the

next highest number of WR fatal injury (22, 19.1%).

Most Construction, Manufacturing, and Transportation & Warehousing WR fatal injuries occurred in the 8:00a.m.-11:59a.m. time period, while most agricultural WR injuries occurred between 12:00 p.m.-3:59 p.m.

Table 7. Traumatic Work-Related Fatalities by Time of Injury and Industrial Code, Michigan, 2011

Time of Incident	All Deaths		Construction ^a (NAICS 23)		Agriculture, Forestry, Fishing & Hunting (NAICS 11)		Manufacturing (NAICS 31-33)		Transportation & Warehousing (NAICS 48-49)		Public Administration (NAICS 92)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
12am-3:59am	7	6.1	--	--	--	--	--	--	2	14.3	2	28.6	3	27.3
4am-7:59am	8	7.0	2	10.5	1	5.3	2	14.3	2	14.3	--	--	--	--
8am-11:59am	31	27.0	7	36.8	5	26.3	5	35.7	4	28.6	1	14.3	2	18.2
12pm-3:59pm	37	32.2	5	26.3	7	36.8	3	21.4	3	21.4	2	28.6	2	18.2
4pm-7:59pm	22	19.1	3	15.8	3	15.8	4	28.6	2	14.3	1	14.3	2	18.2
8pm-11:59pm	10	8.7	2	10.5	3	15.8	--	--	1		1	14.3	2	18.2
Total	115*		19^{ba}		19^c		14^d		14		7^{ef}		11^e	

* Time of Injury unknown for 25 individuals. ^a Only industries with 11 or more deaths are included in the table.

^b Time of Injury unknown for 6 individuals. ^c Time of Injury unknown for 4 individuals.

^d Time of Injury unknown for 1 individual. ^e Industry had 1 homicide. ^f Industry had 6 homicides.



Carpenter died when the 18-foot-long metal roofing material he was handling contacted an energized 4,800-volt power line

In Construction and Agriculture, of the 19 incidents with a known time of WR injury, 12 (63.2%) occurred during the “normal” working hours of 8 a.m. to 4 p.m., 8 of 14 (57.1%) of the Manufacturing WR injuries occurred during “normal”

working hours, and 50% of Transportation & Warehousing WR fatal injuries occurred during “normal” working hours.

Contrasting to the other industry sectors, Public Administration did not have the majority of fatal WR injuries with a known

time of injury occur during “normal” working hours; only 3 (42.9%) of the known time of injury fatal injuries occurred during this time period.

WORK-RELATED EVENT DETAILS

Location in State

Figure 3 and **Table 8** show the county in which the decedent was working when he/she was fatally injured.

The county of incident was known for 139 fatal WR injuries. The 139 fatal incidents occurred in 50 (60.2%) of Michigan's 83 counties.

Wayne County had the largest number of fatal

injuries (21, 15.1%). The southeast Michigan Counties of Wayne, Oakland, Macomb, Washtenaw and Monroe accounted for 50 (36.0%) of all WR fatal injuries in Michigan in 2011.

Outside of the Metro Detroit area, Berrien, and Calhoun each had 7 WR fatal injuries, and Kent, Kalamazoo and Bay each had 5 WR fatal injuries.

Figure 3. Traumatic Work-Related Fatalities by County of Injury, Michigan, 2011

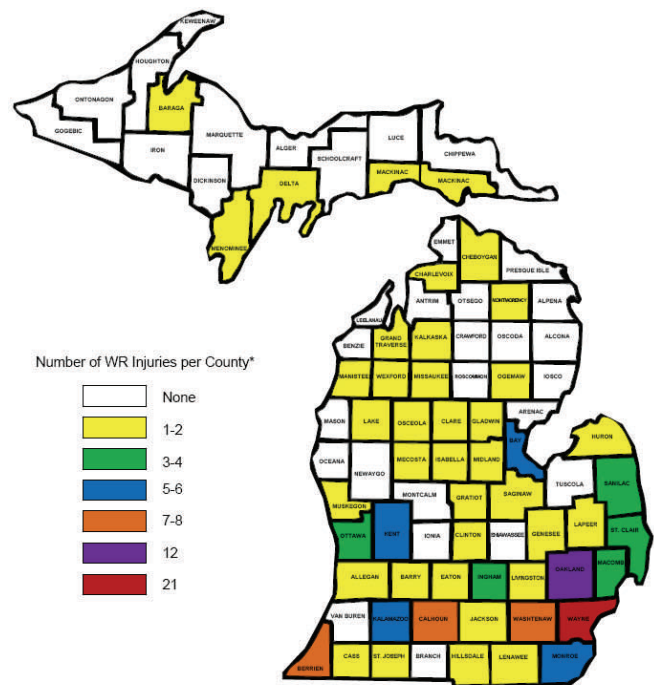


Table 8. Traumatic Work-Related Fatalities by County of Injury, Michigan, 2011

County	Number	Percent	County	Number	Percent	County	Number	Percent
Alcona	—	—	Gratiot	1	0.7	Missaukee	1	0.7
Alger	—	—	Hillsdale	1	0.7	Monroe	5	3.6
Allegan	1	0.7	Houghton	—	—	Montcalm	—	—
Alpena	—	—	Huron	2	1.4	Montmorency	1	0.7
Antrim	—	—	Ingham	4	2.9	Muskegon	2	1.4
Arenac	—	—	Ionia	—	—	Newaygo	—	—
Baraga	1	0.7	Iosco	—	—	Oakland	12	8.6
Barry	1	0.7	Iron	—	—	Oceana	—	—
Bay	5	3.6	Isabella	1	0.7	Ogemaw	1	0.7
Benzie	—	—	Jackson	2	1.4	Ontonagon	—	—
Berrien	7	5.0	Kalamazoo	5	3.6	Osceola	2	1.4
Branch	—	—	Kalkaska	1	0.7	Oscoda	—	—
Calhoun	7	5.0	Kent	5	3.6	Otsego	—	—
Cass	1	0.7	Keweenaw	—	—	Ottawa	4	2.9
Charlevoix	1	0.7	Lake	1	0.7	Presque Isle	—	—
Cheboygan	1	0.7	Lapeer	1	0.7	Roscommon	—	—
Chippewa	—	—	Leelanau	—	—	Saginaw	1	0.7
Clare	1	0.7	Lenawee	2	1.4	St. Clair	3	2.2
Clinton	1	0.7	Livingston	1	0.7	St. Joseph	1	0.7
Crawford	—	—	Luce	—	—	Sanilac	4	2.9
Delta	1	0.7	Mackinac	2	1.4	Schoolcraft	—	—
Dickinson	—	—	Macomb	4	2.9	Shiawassee	—	—
Eaton	1	0.7	Manistee	1	0.7	Tuscola	—	—
Emmet	—	—	Marquette	—	—	Van Buren	—	—
Genesee	2	1.4	Mason	—	—	Washtenaw	8	5.8
Gladwin	2	1.4	Mecosta	1	0.7	Wayne	21	15.1
Gogebic	—	—	Menominee	1	0.7	Wexford	1	0.7
Grand Traverse	1	0.7	Midland	2	1.4	Unknown	1	0.7

* County of injury unknown for one WR death

WORK-RELATED EVENT DETAILS

Industry Highlights, Michigan 2011



Caretaker died in structural fire
in small tool shed

Due to late notifications, the number of WR deaths for 2010 increased from the originally published number of 144 to 147, which increased the WR fatality incidence rate to 3.5. The number of WR deaths in 2011 decreased slightly (5%) from 147 in 2010 to 140 in 2011. The 2011 employment-based incidence rate was down slightly to 3.3/100,000 in 2011 compared to 3.5/100,000 in 2010. **Table 9** shows the number traumatic WR fatalities and Michigan's annual incidence rate by industry sector for number of employees and by hours worked for 2011.

Highlights from the Table 9:

Six industry sectors had a larger number of WR deaths and higher employment-based incidence rate in 2011 compared to 2010:

Industry	Increase in Number of Deaths from 2010	Number 2011 WR Deaths	Incidence Rate 2011	Number 2010 WR Deaths	Incidence Rate 2010
Construction	3	25	20.1	22	18.2
Manufacturing	9	15	2.9	6	1.3
Wholesale Trade	1	4	2.6	3	2.0
Health Care & Social Assistance	5	6	1.0	1	0.2
Arts, Entertainment & Recreation	1	5	10.5	4	7.7
Public Administration	6	11	7.8	5	2.0

MANUFACTURING
HAD 9 MORE WR
DEATHS IN 2011
THAN IN 2010

Five industry sectors had a lower number of WR deaths and lower employment-based incidence rate in 2011 compared to 2010:

Industry	Decrease in Number of Deaths from 2010	Number 2011 WR Deaths	Incidence Rate 2011	Number 2010 WR Deaths	Incidence Rate 2010
Agriculture	2	23	26.5	25	29.3
Utilities	2	1	5.2	3	15.2
Retail Trade	6	10	2.2	16	3.6
Transportation &	6	14	12.0	20	16.8
Information	2	1	1.9	3	5.4
Other Services	8	5	4.1	13	10.7



Press operator died when 1,650-
pound pigment bag fell from
mezzanine onto him

WORK-RELATED EVENT DETAILS

Industry Highlights, Michigan 2011, continued

Two industry sectors had the same number of WR deaths and employment-based incidence rates in 2010 and 2011:

Industry	Number 2010 & 2011 WR Deaths	Incidence Rates 2010 & 2011
Professional/Scientific & Technical Services	3	1.3
Accommodation & Food Services	3	0.9

One industry sector had the same number of WR deaths, but a decrease in the employment-based incidence rate in 2011 compared to 2010:

Industry	Number 2010 & 2011 WR Deaths	Incidence Rate 2011	Incidence Rate 2010
Administrative & Support & Waste Management & Remediation Services	7	2.6	2.9



Field technician electrocuted when he contacted an energized seal-tight conduit and attached load-breakable plug

WORK-RELATED FATALITY INJURY RATES

Employment-based incidence rates measure the risk of fatal injury for those employed during a given period of time, regardless of hours worked.

Hours-based incidence rates measure fatality risk per standardized length of exposure. Hours-based rates use the average number of employees at work and the average hours each employee works (40 hours/week, 50 weeks/year). The BLS uses hours-based incidence rates to measure fatality risk for industry sectors.

The State of Michigan did

not provide the number of hours worked for several industry sectors. When provided, MI-FACE calculated the hours-based WR fatality incidence rate (See **Table 9**).

Employment-based and hours-based incidence rates will be similar for groups of workers who tend to work full-time. However, differences will be observed for worker groups who tend to have a high percentage of part-time workers, such as younger workers.

Michigan data shows that in industry sectors with a large number of part-time workers (30 hours or less), the WR fatality hours-based rate is higher than the employment-based incidence rate, such as in Retail Trade and Accommodation & Food Service. When the number of hours worked is 40 hours or more, the hours-based incidence rate is similar to the employment-based incidence rate, such as in Manufacturing.

INDUSTRY SECTORS WITH PART-TIME WORKERS HAD A HIGHER HOURS-BASED WR FATALITY INCIDENCE RATE COMPARED TO THEIR EMPLOYMENT-BASED INDUSTRY RATE

**Table 9. Traumatic Work-Related Fatalities by Industry Sector by
Number of Employees and Hours Worked, Michigan 2011**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees ^a	Rate ^b	Number Hours ^a	Rate ^d
Agriculture, Forestry, Fishing & Hunting (11)	23	16.4	85,907	26.5	**	--
Crop Production (111)	11	7.9	53,500	20.6	**	--
Animal Production (112)	7	5.0	31,839	22.0	**	--
Forestry & Logging (113)	5	3.6	1,568	318.9	**	--
Utilities (22)	1	0.7	19,247	5.2	**	--
Utilities (221) (Power Generation & Supply)	1	0.7	16,510	6.1	**	--
Construction (23)*	25	17.9	124,356	20.1	40	20.3
Construction of Buildings (236)	5	3.6	26,882	18.6	38	19.6
Heavy & Civil Engineering Construction (237)	4	2.9	13,341	30.0	**	--
Specialty Trade Contractors (238)	15	10.7	84,133	17.8	41	2.7
Manufacturing (31-33)	15	10.7	508,864	2.9	44	2.7
Wood Product (321)	2	1.4	7,926	25.2	**	--
Petroleum and Coal Products (324)	1	0.7	1,328	75.3	**	--
Chemical (325)	2	1.4	27,081	7.4	**	--
Primary Metal (331)	1	0.7	20,785	4.8	**	--
Fabricated Metal Product (332)	4	2.9	71,210	5.6	41	5.5
Machinery (333)	4	2.9	60,756	6.6	46	5.7
Transportation Equipment (336)	1	0.7	142,207	0.7	45	0.6
Wholesale Trade (42)	4	2.9	154,593	2.6	38	2.7
Merchant Wholesalers, Durable Goods (423)	2	1.4	84,609	2.4	38	2.5
Merchant Wholesalers, Nondurable Goods (424)	1	0.7	45,297	2.2	**	--
Wholesale Electronic Markets & Agents & Brokers	1	0.7	24,687	4.1	**	--
Retail Trade (44-45)	10	7.1	446,464	2.2	30	3.0
Motor Vehicle & Parts Dealers (441)	2	1.4	52,311	3.8	37	4.1
Building Material & Garden Equipment & Supplies Dealers (444)	1	0.7	40,427	2.5	**	--
Food & Beverage Stores (445)	1	0.7	74,193	1.3	**	--
Health & Personal Care Stores (446)	1	0.7	30,703	3.3	**	--
Miscellaneous Store Retailers (453)	3	2.1	22,358	13.4	**	--
Nonstore Retailers (454)	2	1.4	8,002	25.0	**	--

**Table 9. Traumatic Work-Related Fatalities by Industry Sector by
Number of Employees and Hours Worked, Michigan 2011**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees ^a	Rate ^b	Number Hours ^a	Rate ^d
Transportation & Warehousing (48-49)	14	10.0	116,319	12.0	**	--
Air Transportation (481)	2	1.4	14,210	14.1	**	--
Truck Transportation (484)	9	6.4	36,573	24.6	**	--
Scenic & Sightseeing Transportation (487)	1	0.7	426	234.7	*	--
Postal Service (491)	1	0.7	21,800	4.6	**	--
Warehousing & Storage (493)	1	0.7	12,595	7.9	**	--
Information (51)	1	0.7	52,765	1.9	33	2.3
Telecommunications (517)	1	0.7	19,484	5.1	**	--
Real Estate & Rental & Leasing (53)	2	1.4	48,790	4.1	**	--
Real Estate (531)	2	1.4	34,988	5.7	**	--
Professional, Scientific, & Technical Services (54)	3	2.1	234,152	1.3	34	1.5
Professional, Scientific, & Technical Services (541)	3	2.1	234,152	1.3	**	--
Administrative & Support & Waste Management & Remediation Services (56)	7	5.0	265,660	2.6	**	--
Administrative & Support Services (561)	7	5.0	254,918	2.7	**	--
Education (61)	4	2.9	501,600	0.8	**	--
Education (611)	4	2.9	501,600	0.8	**	--
Health Care & Social Assistance (62)	6	4.3	574,100	1.0	31	1.3
Ambulatory Health Care Services (621)	3	2.1	188,100	1.6	**	--
Hospitals (622)	1	0.7	221,800	0.5	35	0.5
Nursing & Residential Care Facilities (623)	1	0.7	99,900	1.0	**	--
Social Assistance (624)	1	0.7	64,300	1.6	**	--
Arts, Entertainment, & Recreation (71)	5	3.6	47,435	10.5	23.9	17.6
Performing Arts, Spectator Sports, & Related Industries (711)	5	3.6	8,378	59.7	**	--
Accommodation & Food Services (72)	3	3.6	329,305	0.9	22.6	1.6
Food Services & Drinking Places (722)	3	3.6	291,075	1.0	**	--

**Table 9. Traumatic Work-Related Fatalities by Industry Sector by
Number of Employees and Hours Worked, Michigan 2011**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based	
			Number Employees ^a	Rate ^b	Number Hours ^a	Rate ^d
Other Services (except Public Administration) (81)	5	3.6	123,240	4.1	**	--
Repair & Maintenance (811)	2	1.4	34,843	5.7	**	--
Religious, Grantmaking, Civic, Professional & Similar Organizations (813)	3	2.1	44,367	6.8	**	--
Public Administration (92)	11	7.9	141,500	7.8	**	--
Justice, Public Order, & Safety Activities (922)	7	5.0	**	--	**	--
Administration of Human Resource Programs (923)	1	0.7	**	--	**	--
Administration of Environmental Quality Programs (924)	2	1.4	**	--	**	--
National Security & International Affairs (928)	1	0.7	**	--	**	--
Unknown NAICS	1	0.7	**	--	**	--
Total	140			3.3		

^a Source: Michigan Department of Technology, Management and Budget (DTMB), Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2011. Accessed October 22, 2012. www.milmi.org/cgi/dataAnalysis/

^b Incidence rates calculated per 100,000 workers.

^c Source: Michigan Department of Technology, Management and Budget, Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2011. December 13, 2012. www.milmi.org/cgi/dataAnalysis/

^d Rate represents the number of fatal occupational injuries per 100,000 full time equivalent workers and was calculated as: $(N/EH) \times 200,000,000$ where N= Number of fatal injuries; EH= total hours worked by employees in the industry sector during the calendar year (number of hours x 50 weeks per year); 200,000,000 = base for 100,000 equivalent full-time workers (working 40 hours per week, 50 weeks per year)

^e Source: USDA, National Agricultural Statistics Service. 2007 Census of Agriculture, AC-07-A-51, Issued February 2009, Updated December 2009. Accessed October 23, 2012 www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp.

** No Data provided on DTMB IES or DTMB QCEW-ES202 reports.

WORK RELATED EVENT DETAILS

Table 10 compares the employment-based and hours-based WR fatality incidence rates by industry in Michigan to National hours-based rates for 2011. The overall employment-based fatality rate per 100,000 workers in Michigan for 2011 was lower than the United States hours-based incidence rate (3.3 to 3.5).

Of Michigan industries with a known hours-based incidence rate, only Wholesale Trade had a lower hours-based incidence rate than the US incidence rate (2.7 compared to 4.9). Construction's hours-based and employment-based incidence rates were more than 200% higher than the US incidence rate (20.3 and 20.1 respectively

compared to the US incidence rate of 8.9/100,000 FTE). Michigan's Retail Trade's incidence rate was twice as high as the national incidence rate (3.0 compared to 1.9)



Excavating crew supervisor run over by excavator as he was picking up a rock

Table 10. Traumatic Work-Related Fatalities by Industry Sector Employment-Based and Hours-based WR Fatality Incidence Rates, Michigan 2011

Industry Sector ^a (NAICS Code)	Number of Fatalities	2011 MI Employment- based Rate ^b	2011 MI Hours-Based Rate ^a	2011 US Hours-Based Rate ^c
Agriculture, Forestry, Fishing and Hunting (11)	23	26.5	**	24.4
Utilities (22)	1	5.2	**	4.2
Construction (23)	25	20.1	20.3	8.9
Manufacturing (31-33)	15	2.9	2.7	2.2
Wholesale Trade (42)	4	2.6	2.7	4.9
Retail Trade (44-45)	10	2.2	3.0	1.9
Transportation & Warehousing (48-49)	14	12.0	**	15.0
Information (51)	1	1.9	2.3	2.0
Real Estate and Rental and Leasing (53)	2	4.1	**	***
Professional and Business Services ^d (54, 56)	10	2.0	**	2.9
Educational and Health Services ^d (61, 62)	10	0.9	**	0.8
Leisure and Hospitality ^d (71, 72)	8	2.1	3.7	2.1
Other Services (except Public Administration) (81)	5	4.1	**	2.9
Public Administration (92)	11	7.8	**	2.2
Total	139*	3.3		3.5

^a Sources: USDA, National Agricultural Statistics Service, 2007 Census of Agriculture, AC-02-A-51, Issued February 2009, Updated December 2009, www.nass.usda.gov/census/, Accessed October 23, 2012. Michigan Department of Technology, Management and Budget (DTMB), Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2011, Accessed October 23, 2012, www.milmi.org/cgi/dataAnalysis/, Michigan Department of Technology, Management and Budget, Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2011, Accessed October 23, 2012, www.milmi.org/cgi/dataAnalysis/.

^b Incidence rates calculated per 100,000 full-time equivalent (FTE) workers.

^c Bureau of Labor Statistics News, United States Department of Labor, USDL 10-1142, Release Date: September 20, 2012, Accessed September 24, 2012, <http://www.bls.gov/iif/home.htm>

^d Employment-based rate calculated as $(N+N)/(E+E) \times 100,000$ FTE workers (from Table 9): N=Number fatalities (NAICS+NAICS), E=Number Employees (NAICS+NAICS).

^e NAICS unknown for one individual.

^{**} No data reported on DTMB IES report.

WORK-RELATED EVENT DETAILS

Table 11. Means of Death by Industry Sector, Michigan, 2011

Industry Sector (NAICS Code)	Aircraft (5.0%)	Animal (1.4%)	Asphyxiation (1.4%)	Drowning (0.7%)	Drug Overdose (0.7%)	Electrocution (5.0%)	Fall (14.3%)	Fire/Explosion (2.1%)	Heat/Cold (1.4%)	Homicide (10.7%)	Infectious Disease (0.7%)	Machine (14.3%)	Motor Vehicle (17.9%)	Other (0.7%)	Struck By (8.6%)	Suicide (11.4%)	Toxic Exposure (2.9%)	Unknown (0.7%)	Total
Agriculture, Forestry, Fishing & Hunting (11)		1	1	1			2	1				9	1		6	1			23
Utilities (22)																	1		1
Construction (23)						3	10			1		3	3		1	1	2	1	25
Manufacturing (31-33)	3					1	1	1				5			2	2			15
Wholesale Trade (42)							1					1			1	1			4
Retail Trade (44-45)					1		2			2			3			2			10
Transportation & Warehousing (48-49)	2											1	8		2		1		14
Information (51)																1			1
Real Estate & Rental & Leasing (53)										1						1			2
Professional, Scientific, & Technical Services (54)		1											1			1			3
Administrative & Support & Waste Management & Remediation Services (56)						1	2			1		1	2						7
Education (61)	1						1						1			1			4
Health Care and Social Assistance (62)			1							2	1			1		1			6
Arts, Entertainment, & Recreation (71)	1					1			1				2						5
Accommodation & Food Services (72)									1	2									3
Other Services (ex. Public Administration) (81)						1	1	1					1			1			5
Public Administration (92)										6			3			2			11
Unknown																1			1
Total	7	2	2	1	1	7	20	3	2	15	1	20	25	1	12	16	4	1	140

Table 11 shows the means of death by industry sector. Motor vehicles were the leading cause of a WR death (26 deaths, 18.6%), followed by falls and machines (20 deaths each, 14.3%). WR suicides increased from 10 in 2011 to 16 (11.4%) in 2011. Homicides were the 4th leading cause of a WR death (15 deaths, 10.7%). Struck by incidents accounted for 12 (8.6%) deaths, and aircraft and electrocutions accounted for 7 (5.0%) deaths each. Four (2.9%) deaths were caused by a toxic exposure.

Falls in Construction accounted for 50% of all falls (10 of 20) in 2011 and for 40.0% of all WR Construction deaths.

In Agriculture, machines were the primary cause of death (9, 39.1%). Struck by incidents (6 deaths) accounted for 50% of all struck by deaths in 2011 and 26.1% of all WR deaths in Agriculture. Three of the six struck by incidents occurred in NAICS 113, Logging (struck by falling trees/tree limbs).

Although motor vehicle-related incidents occurred in many industry sectors, Transportation & Warehousing had the largest number (8 of 25, 32.0%); this cause of death comprised 57.1% of all deaths in this industry.

Homicides were the primary cause of death in Public Administration (6 of 11, 54.5% and in Accommodation & Food Services (2 of 3, 66.7%).

Machines were involved in 33.3% of all Manufacturing deaths.

WORK-RELATED EVENT DETAILS

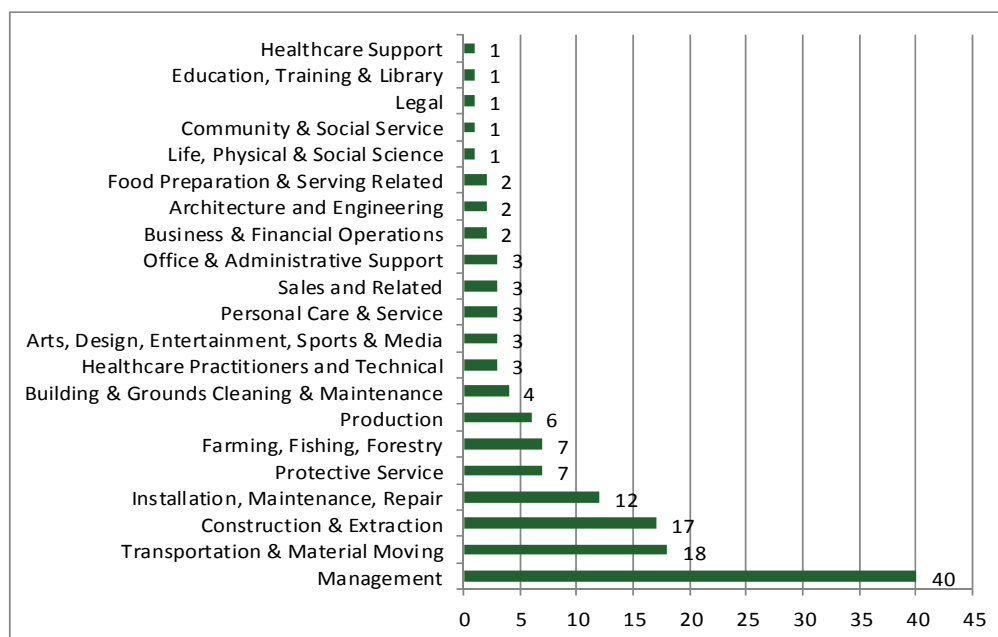
Figure 4 shows the distribution of the 137 WR deaths where the Standard Occupational Classification (SOC) category could be determined from the reporting source data.

MIFACE uses the 2000 Standard Occupational Classification system to categorize occupations of the individuals who died. The 2000 SOC is divided into 23 major groups, which are sometimes called “job families”. The “job families” combine occupations according to the nature of the work performed, placing all people who work together into the same group regardless of their skill level. The 23 “job families” are further subdivided using a 6-digit structure into 821 detailed occupations.

Overall, in 2011, the Management job family had 40 (29.2%) deaths. Of these 40 deaths, 22(55.0%) individuals owned their own business or were self-employed, 15 (37.5%) were farmers and three (7.5%) were directors/managers of an organization.

Of the 18 individuals identified as conducting a work activity in the Transportation & Material Moving job family, 10 (55.6%) were semi-truck drivers and two (11.1%) were pilots. A school bus driver, a valet, a vehicle test driver, a hi-lo driver, a delivery driver, and a scrap collector were also identified in this job family.

Figure 4. Number of Deaths by Standard Occupational Classification, Michigan 2011



Within the Construction & Extraction job family, deaths in the Construction industry accounted for all of the WR deaths. Three (17.6%) individuals were roofers and 3 (17.6%) worked as laborers. The

following construction occupations had two (11.8%) deaths each: carpenter, iron worker, and painter. Two construction site supervisors died while at work. One electrician, one plumber and one truss installer also died.

Four (33.3%) of the 12 individuals who died in the Installation, Maintenance and Repair job family were mechanics.

Six (85.7%) of the seven individuals who died in Protective Service were police officers.

TWO OF THE SIX POLICE OFFICERS WHO DIED WERE KILLED BY GUNFIRE DURING A POLICE RESPONSE.

WORK-RELATED EVENT DETAILS

Working Status of Decedent

One hundred thirty five employers were associated with the 140 individuals who died in 136 separate incidents in 2011.

One employer had three individuals die in the same incident (plane crash), two employers had two individuals die in the same incident (automobile and truck crashes), and one employer had two individuals die in separate incidents (homicide, suicide).

The **employer/employee status** was known for 136 (97.1%) of the 140 individuals. Seventy-nine (58.1%) individuals were employees. Fifty-four (39.7%) individuals who died was either self-employed or the owner/co-owner of the

business, two (1.5%) individuals were volunteers, and one (0.7%) individual was a contract/temporary worker.

The decedent was **working alone** in 81 incidents, or with a coworker in 47 incidents. The work status was unknown for 12 incidents. For homicides, the decedent was working alone in 9 incidents and with a coworker in 5 incidents. The working status is unknown for one homicide.

The **incident location** was identified for 137 of the 140 deaths. The incident location with the largest number of traumatic WR injuries is a street/highway (27, 19.7%), followed by a farm (16, 11.6%). A residence (location where the work was being performed) had 13 (9.5%)

incidents. An office was the location for 11 (8.0%) incidents. A factory and the woods were the locations for 8 (5.8%) fatal WR injury incidents, followed by a construction site or a store (7, 5.1%). Some examples of other locations where a traumatic WR injury occurred: warehouses, fields, parks, parking lots, schools, nightclub, loading dock, hospital, gas station, shed, bus, airfield, amusement park, fast food restaurant, and motocross track.

The **location of death** was known in all incidents. The decedent was declared dead at the incident scene in 72 (51.4%) incidents, at the hospital in 63 (45.0%) incidents, at their home or in a nursing home in 4 (2.9%) incidents and in the ambu-



Tree trimmer died due to a 40-foot fall when the top of the elm tree to which he was tied off broke away from the tree after the tree trunk was struck by a swinging tree branch.

TRAUMATIC
OCCUPATIONAL
DEATHS ARE NOT
RANDOM EVENTS.
INFORMATION
COLLECTED ABOUT
THE SETTINGS AND
CIRCUMSTANCES
IN HIGH WR
DEATHS HAVE
OCCURRED WILL
BE USED TO
PREVENT THEIR
OCCURRENCE IN
THE FUTURE



Logger struck by a tree felled by coworker

MEANS OF WORK-RELATED DEATH

Table 11 summarizes the 140 WR fatalities by means of death and by industry sector. See the Appendix for a detailed description of each death grouped by means of death.

Overall, motor vehicle events accounted for 25 (18.6%) of all WR fatal incidents in 2011. Falls and machines accounted for 20 (14.3%) of the WR deaths, and 16 (11.4%) individuals committed suicide. Homicide was the

cause of death for 15 (10.7%) individuals. Aircraft crashes and electrocutions each had 7 (5.0%) deaths, 4 (2.9%) individuals died from a toxic exposure, and 3 (2.2%) individuals died as a result of a fire/explosion.

MEANS OF WORK-RELATED DEATH

Two (1.4%) individuals each died from injuries sustained from the following causes: animal, asphyxiation, and overexposure to a hot environment. One individual each died from drowning, a drug overdose, an infectious disease, and a heart attack as a result of an altercation with a patient. Additionally, one individual died in 2011 from complications of an injury sustained in 1972; the cause of the injury is unknown.

Aircraft

Seven individuals died in five aircraft incidents. Aircraft crashes accounted for six deaths in four crashes. All of the planes were single-engine aircraft.

One aircraft was towing a glider, one aircraft was carrying three individuals, one aircraft was carrying a passenger to another destination, and one aircraft crash occurred during a flight review for a pilot.

One individual died when he fell from a plane during an airshow.

Animal

Two individuals died as a

result of contact with an animal. One individual was gored by a bull and one individual died of complications after being attacked by a dog.

Asphyxiation

Two individuals died as a result of asphyxiation. One individual died when he was engulfed in corn while in a silo and one individual died when she choked on food while at work.

Drowning

One individual died when he fell into an excavation hole filled with water.

Drug Overdose

One individual died due to a multiple drug intoxication.

Electrocution

Seven individuals died as a result of contact with electricity. Two individuals died as a result of indirect contact with an 4,800-volt overhead power line (metal roofing, carnival ride/notched stick). One individual had indirect contact with an overhead power line of unknown voltage when the tree limb he had cut contacted the power line.

Three individuals directly contacted the electrical source: 227 volts while relocating TV cabling; 120 volts while removing water pipes in a crawl space; and 480 volts while repairing a machine.

One individual was changing out a mercury vapor lamp of unknown voltage when he was electrocuted.

Fall

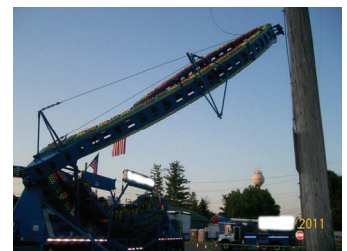
Twenty individuals died in 2011 due to a fall; one individual fell in 1986 and died of medical complications of the head injury sustained at the time of the fall.

The industry in which the fall occurred is identified in **Table 11**. Within Construction, four falls occurred at commercial building sites and three falls occurred at a residential building site. Other locations in which a Construction fall occurred included an agricultural pole barn, a road commission garage while checking fire extinguishers, and changing out a light fixture on the outside of a building.



Gas utility worker died due to asphyxia while repairing a 6-inch cast iron natural gas line

TO PREVENT
INJURY, BE AWARE
OF THE HAZARDS,
USE APPROPRIATE
SAFETY
EQUIPMENT AND
HAVE AN
ATTITUDE OF
SAFETY
MINDEDNESS



Carnival worker electrocuted while disassembling a carnival ride

MEANS OF WORK-RELATED DEATH

Fall, continued

The **distance of the fall** could be ascertained for 16 of the 20 falls. The largest number of individuals died due to falls of 10 feet or less (7, 43.8%). Six (37.5%) individuals died after falling a distance of 21-50 feet. Three fatal falls occurred when the individual fell 11-20 feet.

The **surface from which the individual fell** could be determined for 19 of the 20 falls. Four individuals who fell less than 10 feet were working at ground level. Ladders/scaffolds were involved in 8 (42.1%) of the 19 falls. Two individuals died after a fall from a machine. Other surfaces from which an individual was working and fell causing death were: roof edge while power washing the gutters of a residence, tree, mobile scooter/wheelchair, lawn tractor, stairs, and agricultural pole building truss.

The **surface to which the individual fell** was identified in 15 of the 20 incidents. Seven (46.7%) fell to a concrete/asphalt surface, two individuals fell to packed dirt, and

two individuals fell to a carpeted or tiled floor. One individual fell to a catwalk; one individual fell to a pallet on a forklift; one individual fell, striking a tree stump and then the ground; and one individual's head struck a rock when he fell in the woods.

The **condition of the work surface** was known for 13 fall incidents. The surface was dry in 10 (76.9%) of the 13 fall incidents. The floor was wet in two incidents; slippery because of wax/water and water over splash while cleaning gutters. The work surface was cluttered in one incident. For two of the fall incidents where the work surface was dry, work was being performed in a damaged tree.

The **reason for the fall** was identified for 12 of the 20 fall incidents. The individual slipped/tripped/fell in 7 (58.3%) incidents. Two individuals were trimming/felling trees when the damaged tree broke apart unexpectedly and the decedent fell from/with the tree. In one incident, the individual had a heart attack, but

the medical examiner determined the cause of death as head injuries sustained as a result of the fall. One individual died when a ladder tethered to another ladder came apart while he was on the roof. One individual fell from a ladder while taking down an improperly secured sign.

Fire/Explosion

Three individuals died as a result of a fire/explosion. One individual died while operating a front end loader - the bucket struck a 500-gallon propane cylinder. One individual was transporting burn barrels in his pickup truck when the burn barrels caught fire and ignited the truck. One individual was working in a tool shed when an ignition source was produced - it was postulated that gasoline cans caught fire.

Heat

Two individuals were overcome by heat - a motor cross racer and a restaurant prep cook.



Farmer died in explosion when front end loader bucket struck "empty" propane cylinder

MOST FATAL
FALLS OCCURRED
TO INDIVIDUALS
FALLING 10 FEET
OR LESS



Construction laborer fell from ladder or roof

MEANS OF WORK-RELATED DEATH

Homicide

Fifteen individuals died as a result of a homicide. Six of the 15 homicide deaths occurred in Public Administration; 4 individuals were police officers. Fourteen of the 15 individuals were male. Ten (66.7%) of the 15 individuals who died as a result of a homicide were White, 4 (26.7%) individuals were Black and one (6.7%) individual was Asian.

Eleven of the fifteen homicides (73.3%) were a result of a gunshot wound. Two police officers died when they were intentionally run over by a motor vehicle, and two individuals were intentionally set on fire.

The ages of the victims ranged from 22 to 70 years of age.

The decedent was working alone in 8 (57.1%) incidents and with a co-worker in 6 (42.9%) incidents. The working status was unknown in one incident.

Infectious Disease

One hospital technician died of complications of a Group A strep infection.

Machine

Twenty individuals died as a result of a machine-related incident.

Forty-five percent of all machine-related incidents occurred in Agriculture (9 of 20). Of the 9 incidents, 5 involved tractors. Four of the 5 incidents involved a tractor rollover. In each of the four incidents, the tractor was not equipped with a rollover protection structure (ROPS). One individual died when he was run over by the tractor. The four non-tractor-related incidents in Agriculture involved a log skidder, a corn grinder, a grain drill, and a combine.

Five machine-related WR deaths occurred in Manufacturing. Two individuals were entangled in the machine (clothing entangled in a one-inch-wide nip point between a vertical stationary plate and the bottom/return side of a conveyor belt, clothing on arm became entangled on a part being turned on a lathe). Two individuals were crushed: One individual was crushed against the machine frame by a lowering steel coil belt wrapper arm, and one individual was crushed

between a stacker transfer and a stacker frame while retrieving a piece of lumber. One individual was pinned between a rotating tank and the frame of the feed rollers rotating the tank.

Other machines involved in a 2011 WR death were: excavator, boom lift, backhoe tractor, skid steer (2 incidents), and a forklift.

Motor Vehicle Related Deaths

There were 25 motor vehicle related fatalities in 2011. There were 23 separate motor vehicle crashes.

Much of the crash data regarding two motor vehicle incidents was not able to be obtained; the crashes occurred in 1967 and 1981. Where obtained, the data is included. The medical examiner noted on the death certificate that the cause of death was related to injuries sustained in the crash.

Motor vehicle related crash data will reflect information obtained for 21 separate crashes, except where noted.



Foster care home administrator died in an intentionally set on fire

GUNS WERE
INVOLVED IN
73% OF THE WR
HOMICIDES



Laborer for auto parts company died when the pickup truck left the roadway, became airborne and land in a creek

MEANS OF WORK-RELATED DEATH

Motor Vehicle Crash Terminology

A “**unit**” is identified as a motor vehicle, bicycle, pedestrian or train involved in the crash and individually reported; therefore, a car-animal crash or a car-tree crash is categorized as a single-unit crash

The **crash type** is based on the intended direction of travel, regardless of points of impact or the direction the vehicles ultimately face after the crash.

- ◆ **Single motor vehicle:** cases in which a motor vehicle was (a) the only traffic unit and (b) the only motor vehicle involved collided with a bicyclist, pedestrian, animal, railroad train or any other non-motorized unit.
- ◆ **Head On:** direction of travel of both vehicles must be toward each other.
- ◆ **Rear End:** Vehicles traveling in same direction, one behind the other and no turn is involved.
- ◆ **Angle:** direction of travel is basically perpendicular for both drivers and there is a side impact of approximately 90 degrees.
- ◆ **Sideswipe - Same:** vehicles were traveling in opposite directions and made side contact.

Sequence of Events records step-by-step regarding what happened during the crash. Up to four Sequence of Events may be recorded. The event that was considered most harmful to the human being is identified by the responding police officer. The event that is most harmful is categorized within headings identified as:

- ◆ Non-Collision
- ◆ Collision with Non-Fixed Objects
- ◆ Collision with Fixed Objects

Highlights of 21 Motor Vehicle Incidents

Driver/Passenger/Pedestrian (24 of 25 known)

- ◆ Drivers: 18 (75.0%) individuals
- ◆ Passengers: 3 (12.5%) individuals
- ◆ Pedestrians: 3 (12.5%) individuals

Number of Units

- ◇ 1 unit: 10 (47.6%) incidents
- ◇ 2 units: 8 (38.1%) incidents
- ◇ 3 units: 3 (14.3%) incidents

Crash Type

- ◇ Single motor vehicle: 11 (52.4%) incidents (1 pedestrian involved)
- ◇ Head On: 1 (4.8%) incident (1 pedestrian involved)
- ◇ Angle: 2 (9.5%) incidents
- ◇ Rear End: 6 incidents (1 pedestrian involved)
- ◇ Sideswipe - Same: 1 (4.8%) incident

Number of Roadway Lanes

- ◇ 2 lanes: 15 (71.4%) incidents
- ◇ 3 lanes: 3 (14.3%) incidents
- ◇ 4 lanes: 1 (4.8%) incident
- ◇ 5 lanes: 1 (4.8%) incident
- ◇ 8 lanes: 1 (4.8%) incident

Speed Limit

- ◇ 25 mph: 1 (4.8%) incident
- ◇ 40 mph: 1 (4.8%) incident
- ◇ 45 mph: 1 (4.8%) incident
- ◇ 50 mph: 1 (4.8%) incident
- ◇ 55 mph: 9 (42.9%) incidents
- ◇ 60 mph: 2 (9.6%) incidents
- ◇ 65 mph: 1 (4.8%) incident
- ◇ 70 mph: 5 (23.8%) incidents

Amount of light at time of incident

- ◇ Daylight: 13 (61.9%) incidents
- ◇ Dawn/Dusk: 1 (4.8%) incident
- ◇ Dark - Lighted: 2 (9.5%) incidents
- ◇ Dark - Unlit: 5 (23.8%) incidents

MEANS OF WORK-RELATED DEATH

Highlights of 21 Motor Vehicle Incidents

Weather Conditions

- ◇ Clear: 9 (42.9%) incidents (1 pedestrian involved)
- ◇ Cloudy: 11 (52.4%) incidents (2 pedestrians involved)
- ◇ Rain: 1 (4.8%) incident

Surface Conditions

- ◇ Dry: 19 (90.5%) incidents
- ◇ Wet: 2 (9.5%) incidents

Seat Belt Use was known for 18 of the 22 individuals for whom seat belt use was applicable (not applicable for 3 pedestrians).

- ◇ Seat belt used: 10 (55.6%) incidents
- ◇ Seat belt not used: 8 (44.4%) incidents

Driver Condition

- ◇ Alcohol Use Blood alcohol level greater than 0.08% : 1 driver
 - In one motor vehicle crash, the vehicle driver causing the fatal crash had a blood alcohol level greater than 0.08%.
- ◇ Distracted: 1 driver
- ◇ Distracted/Fell Asleep: 1 driver
- ◇ Asleep: 1 driver

Road Construction/Repair

- ◇ Construction zones: 2 incidents. Both involved road construction. One of the two incident sites had a lane closure.

Most Harmful Event (21 incidents)

- ◇ Non collision: 5 incidents
 - Overturn: 3 incidents
 - Ran off roadway - left

- Immersion
- ◇ Collision with Non-Fixed Object: 9 incidents
 - Motor vehicle in transport: 6 incidents
 - Pedestrian: 3 incidents
- ◇ Collision with Fixed Object: 7 incidents
 - Fire hydrant: 1 incident
 - Retaining wall/cement wall: 1 incident
 - Guardrail face: 2 incidents
 - Tree: 3 incidents

Pedestrian Information

- ◇ Ages: 45, 58, 74
- ◇ Gender: All male
- ◇ Incident Summaries

- Farmer struck by a combine head that had been struck by an oncoming vehicle. Incident location was dark. . No outside marking on combine head.
- Business owner struck by pickup truck while picking up debris that had fallen from his vehicle. Incident location dark.
- Landscape supply owner struck by oncoming vehicle while securing forklift to back of truck. Oncoming driver distracted.

- ◇ **Month:** January, May, November
- ◇ **Days:** Sunday, Wednesday, Friday
- ◇ **Time:** 7:20 a.m., 1:24 p.m., 9:23 p.m.



Semi truck driver died when his semi tractor struck another semi-tractor trailer stopped partially in the right hand travel lane and on the road shoulder

MOTOR VEHICLE DEATHS ARE INCIDENTS THAT OCCUR "ON THE ROAD". IF A MOTOR VEHICLE IS INVOLVED IN AN "OFF ROAD", INCIDENT, THE INCIDENT IS CODED AS STRUCK BY.



Building contractor died when his pick up truck was struck by garbage truck which ran an intersection stop sign

MEANS OF WORK-RELATED DEATH

Motor Vehicle Related Deaths

Table 12 shows crash data relating to the different types of vehicles involved in the 20 non pedestrian/1967/1981 crashes. One large truck and one passenger car incident had two deaths where both the driver and passenger died.

Table 12. Crash Data Relating to the Vehicles Causing a WR Death, Michigan 2011

Description	Police Vehicle (N=1)	School Bus (N=1)	Van (N=2)	Car (N=6)	Pickup (N=3)	Large Truck (N=7)
Median Age	43	53	49.5	41.5	49	44
Occupancy Status						
Driver	1	1	2	5	3	6
Passenger				1		1
Seat Belt Use						
Belted			1	3	2	4
Not Belted	1	1		3	1	2
Unknown			1			1
Month of Injury						
Mar-May	1	1	1	3	1	2
June-Aug				2	2	2
Sept-Nov				1		3
Dec-Feb			1			
Day of Week						
Mon-Thurs	1	1	1	5	3	4
Fri-Sun			1	1		3
Time of Day						
12am-3:39am	1					1
4am-7:59am					1	1
8am-11:59am				1	1	3
12pm-3:59pm			2	5		1
4pm-7:59pm		1			1	1
8pm-11:59pm						

MEANS OF WORK RELATED DEATH

Other

One individual died from a heart attack which occurred during an altercation with a patient. The medical examiner determined that the altercation caused the heart attack.

Struck By

Struck by incidents accounted for 12 WR deaths. Six (50.0%) of the 12 fatal struck by incidents occurred in Agriculture. Four individuals died while felling trees, one individual was struck by a water tank while he was under a storage platform which collapsed, and one individual was run over by a wagon when the wooden yoke to his horses broke. .

Two individuals were struck by motor vehicles that were not on a road-

way. One individual was in a driveway removing a chock during the repositioning of a truck when he was struck by the tire and one individual was crushed between a truck and a loading dock.

One individual was struck by a falling pigment bag that fell from a mezzanine, one individual died when he was struck by an exploding rim of a tractor-trailer tire, one individual was struck by a hay bale which fell from a wagon, and one individual was struck by a concrete slab when a porch collapsed.

Suicide

Sixteen individuals committed suicide while at their workplace. Nine (56.3%) individuals died from a self-inflicted gunshot wound. Six (37.5%)

individuals died from a self-inflicted hanging and one (6.3%) individual died from an intentional overdose of prescription medication.

Toxic Exposure

Four individuals died due to a toxic exposure.

Overexposure to carbon monoxide was the cause of one death. One individual died to complications of exposure to a diesel fuel splash. One individual died due to a toxic atmosphere in a sewer manhole and one individual died due to asphyxia while repairing a natural gas line.

Unknown

The medical examiner determined that one individual died due to cerebrovascular disease which was a complication of spinal injuries incurred on a con-



Plumber electrocuted when working in crawl space removing water pipes

ON AVERAGE,
TWO WORKERS
ARE KILLED ON
THE JOB EACH
WEEK IN
MICHIGAN.
WORK-RELATED
DEATHS CAN BE
PREVENTED.

MIOSHA FATALITY INVESTIGATIONS

In 2011, MIOSHA personnel conducted a program-related compliance investigation for 36 (25.7%) of the 140 WR fatalities.

For each company that had a WR fatality, MI-FACE accessed the Federal OSHA Integrated

Management Information System (IMIS) to determine any previous MIOSHA compliance activity at the company. Seven (19.4%) of the 36 employers having a MIOSHA WR fatality compliance inspection in 2011 were identified as

having a MIOSHA compliance inspection prior to 2011.

MIOSHA conducted a WR fatality compliance inspection at six (26.1%) of the 23 Agricultural WR fatalities, 12 (48.0%) of the 25 Construction WR fatalities, 8 (53.3%) of



Press operator died when his clothing became entangled in a one-inch-wide nip point between a vertical stationary plate and the bottom/return side of a conveyor belt

MIOSHA FATALITY INVESTIGATIONS



Logging company owner run over by log skidder

the 15 Manufacturing fatalities, 2 (50.0%) of the 4 Wholesale Trade WR fatalities, 2 (14.3%) of the 14 Transportation & Warehousing WR fatalities, 1 (25.0%) of the 4 Education fatalities, 1 (16.7%) of the 6 Health Care & Social Assistance fatalities, 1 (20.0%) of the 5 Arts & Entertainment fatalities, 1 (33.3%) of the 3 Accommodation & Food Services and 1 (20.0%) of the 5 Other Services WR fatalities.

One of the 36 WR fatality investigated by MIOSHA

was coded to a different NAICS sector by MIFACE. A tree trimming fatality was coded by MIOSHA to be Management of Companies; MIFACE coded the fatality to Administrative & Support & Waste Management & Remediation.

Industry sectors recording a large number of WR fatalities in 2011 which did not receive a MIOSHA fatality compliance inspection because the fatalities were not program related were: Public Administration (11

deaths), Retail Trade (10 deaths), and Administrative & Support & Waste Management & Remediation (7 deaths).

Of the seven companies which had a WR fatality in 2011 and were previously inspected by MIOSHA, five were in Manufacturing, one was in Construction and one was in Transportation & Warehousing.

MIOSHA did not issue a violation citation to the firm at the conclusion of the fatality investigation in 9 (25.0%) of the 36 inves-

MIFACE
SUMMARIES OF
MIOSHA
INVESTIGATIONS
ARE UTILIZED IN
TAILGATE TALKS
AND OTHER
EMPLOYEE
TRAINING

HISPANIC INITIATIVE

The US Department of Labor, Bureau of Labor Statistics (BLS) has analyzed the Census of Fatal Occupational Injury (CFOI) data and reported a higher fatal work injury rate for Hispanic workers than for other racial/ethnic groups.

NIOSH, in partnership with Federal OSHA has added fatalities among foreign-born workers, including Hispanic workers to the list of current targets for investigation for the Federal in-house

FACE program. MIFACE has supported this initiative and gathered additional information about the individual's language, reading skills, time in country, worker status, etc., when an on-site visit was performed.

There were 5 deaths of Hispanic workers in Michigan in 2011, down from 10 Hispanic deaths in 2010. All of the workers who died in 2011 were male. Two individuals were born in Mexico and three were born in

the US. Four of the five Hispanic workers were between the ages of 16 and 65.

The US Census Bureau population estimates for the Caucasian, African-American and Hispanic populations in Michigan (released May, 2012) was utilized to determine the WR fatality incidence rate among these three population groups.

The 2011 rate for acute traumatic WR fatalities for 16- to 65-year old Hispanic workers



Construction superintendent drowned in manhole after he was overcome by the manhole atmosphere while descending a ladder to rescue another worker

HISPANIC INITIATIVE

in Michigan was 1.46/100,000. The incidence rate among Blacks aged 16-65 was 1.28/100,00, and less than the incidence rate (1.96/100,000) for Whites aged 16-65.

The industries in which a Hispanic individual worked and their cause of death is identified below:

Agriculture - 1 death

One laborer died when he was struck by a water tank when the platform on

which the tank was supported collapsed.

Construction - 2 deaths

Both individuals died when they fell from a height; one independent contractor fell from a ladder and one laborer fell from a ladder or the roof edge.

Arts, Entertainment & Recreation - 1 death

A motor cross racer died from complications of heat stroke.

Public Administration

- 1 death

A police officer died due to a gunshot wound.

MIFACE contacted two employers (one in Agriculture and one Construction employer). No contact was initiated with the families of the independent contractor, motor cross racer and police officer. The Agricultural employer agreed to participate in the MIFACE program.



Construction laborer pinned between the boom lift basket in which he was working and a horizontal ceiling beam

NUMBER OF DEATHS FOR 2011 COMPARED TO MICHIGAN CFOI

The Census of Fatal Occupational Injuries (CFOI) is the surveillance system funded in every state by the US Department of Labor, Bureau of Labor Statistics. The Michigan CFOI program reported 139 deaths in 2011 per the BLS website viewed on December 10, 2012.

MIFACE had identified one more death compared to the CFOI number

However, during the writing of this 2011 MIFACE Annual Report, MIFACE was notified of an additional WR death, bringing the total number of acute traumatic WR

deaths to 141.

NEW WR DEATH

A 61-year-old male had an un-witnessed fall from a ladder at a construction site. He fell 8-10 feet and struck his head on a concrete driveway.

ONE
ADDITIONAL
DEATH HAS BEEN
REPORTED
BRINGING THE
TOTAL NUMBER
OF 2011 WR
DEATHS IN
MICHIGAN TO
141



Logger died when tree he fell rotated and struck other trees setting off domino effect with one of the falling trees striking him

A SOLE RELIANCE
ON THE INJURY
AT WORK BOX
ON THE DEATH
CERTIFICATE
WOULD
UNDERCOUNT
THE NUMBER OF
WR DEATHS IN
MICHIGAN



Logger died when a cedar tree fell onto him while he was cutting a felled white ash

SENSITIVITY OF INJURY AT WORK BOX ON DC

If the manner of death (Box 39) on the death certificate indicates accident, suicide, homicide, indeterminate or pending, the injury at work box (41d) is completed by the Medical Examiner with Yes, No, or Unknown. Yes signifies the fatal injury occurred at work, No signifies it did not occur at work and Unknown signifies that the Medical Examiner did not know if the injury occurred at work.

MIFACE determines a

death to be work-related by compiling multiple source documents:

- Workers' Compensation forms,
- Police/Fire/EMT Department reports,
- MIOSHA 24-hour fatality log,
- Hospital records
- Newspaper reports
- family interviews,
- Federal Agencies (OSHA, NTSB, MSHA, etc)

Review of the past 11 years shows that 13.1%-

30.9% of the WR deaths would have been missed if MIFACE had solely relied on the Injury At Work box being completed with Yes. (**Table 13**).

The injury at work box was misidentified most frequently in the designation of an injury at work in the Agricultural industry.

Work related deaths involving motor vehicles incidents (on road) were the cause of death most misidentified as No in the injury at work box.

Table 13. Sensitivity of Death Certificate Injury at Work Box Predicting Fatal Injury at Work, Michigan 2011

Year (# deaths)	DC Coded as WR	%	DC Coded as Not WR or Unknown	%	DC Not Reviewed
2001 (174)	133	79.6	34	20.4	7
2002 (151)	126	86.9	19	13.1	6
2003 (152)	110	74.3	38	25.7	4
2004 (131)	93	74.4	32	25.6	6
2005 (110)	88	83.0	18	17.0	4
2006 (157)	122	79.2	32	20.8	3
2007 (120)	99	85.3	17	14.7	4
2008 (121)	100	84.0	19	16.0	2
2009 (96)	72	75.8	23	24.2	1
2010 (147)	102	70.3	43	29.7	2
2011 (140)	94	69.1	42	30.9	4

CASE NARRATIVES

A narrative summary of each of the 140 WR deaths occurring in 2011 is contained in the Appendix. Each narrative has a case number and is organized alphabetically by means of death.

Copies of completed MIFACE Investigation Reports, MIFACE Summaries of MIOSHA Inspections (MIOSHA Summary) which include the MIOSHA citation(s) issued at the MIOSHA/ employer closing conference can be found on the MSU OEM website: www.oem.msu.edu.

To access MIFACE educational materials, select Traumatic Fatalities on the MSU OEM navigation bar and then select the MIFACE Investigation Report tab or the MIFACE Summaries of MIOSHA Inspections tab.

Table 14 gives the narrative case number and means of death by NAICS code found in the Appendix. When a brand name of equipment was known, MIFACE included this information in the narrative; unless noted, this does not signify that there

Table 14. Case Narrative Number by Means of Death and Industry Sector, Michigan 2011

Industry Sector (NAICS Code)	Narrative Number	Industry Sector (NAICS Code)	Narrative Number	Industry Sector (NAICS Code)	Narrative Number
Agriculture, Forestry, Fishing & Hunting (11)		Transportation & Warehousing (48-49)		Accommodation & Food Service (72)	
Animal	8	Aircraft	4, 5	Heat/Cold	45
Asphyxiation	10	Machine	80	Homicide	53, 54
Drowning	12	Motor Vehicle	89-96	Other Services (81)	
Fall	21, 22	Struck By	117, 118	Electrocution	20
Fire/Explosion	41	Toxic Exposure	138	Fall	40
Machine	62-70	Information (51)		Fire/Explosion	43
Motor Vehicle	82	Suicide	126	Motor Vehicle	103
Struck By	107-112	Real Estate & Rental & Leasing (53)		Suicide	131
Suicide	119	Homicide	49	Public Administration (92)	
Utilities (22)		Suicide	127	Homicide	55-60
Toxic Exposure	135	Professional/Scientific/Technical Services (54)		Motor Vehicle	104-106
Construction (23)		Animal	9	Suicide	132, 133
Electrocution	14-16	Motor Vehicle	97	Unknown NAICS	
Fall	23-32	Suicide	128	Suicide	134
Homicide	46	Administrative & Support & Waste Mgt & Remediation Services (56)			
Machine	71-73	Electrocution	18		
Motor Vehicle	83-85	Fall	37, 38		
Struck By	113	Homicide	50		
Suicide	120	Machine	81		
Toxic Exposure	136, 137	Motor Vehicle	98, 99		
Unknown	140	Education (61)			
Manufacturing (31-33)		Aircraft	6		
Aircraft	1-3	Fall	39		
Electrocution	17	Motor Vehicle	100		
Fall	33	Suicide	129		
Fire/Explosion	42	Health Care/Social Assistance (62)			
Machine	74-78	Asphyxiation	11		
Struck By	114, 115	Homicide	51, 52		
Suicide	121, 122	Infectious Disease	61		
Wholesale Trade (42)		Other	139		
Fall	34	Suicide	130		
Machine	79	Arts/Entertainment/Recreation (71)			
Struck By	116	Aircraft	7		
Suicide	123	Electrocution	19		
Retail Trade (44-45)		Heat/Cold	44		
Drug Overdose	13	Motor Vehicle	101, 102		
Fall	35, 36				
Homicide	47, 48				
Motor Vehicle	86-88				
Suicide	124, 125				

was a defect or other problem with the machine.

Each case narrative reflecting a WR fatality that had a MIOSHA WR fatality compliance investiga-

tion is noted. At the end of the narrative is a MIOSHA Summary Case Number that is hyper-linked to its MIFACE Summary or MIFACE investigation report posted on the MSU OEM website.

DISCUSSION

There were 140 WR fatalities in Michigan in 2011. The 2011 WR fatality rate in Michigan was 3.3/100,000. The number of WR deaths averaged 2.7 fatalities per week. The major sources for identifying a WR death were death certificates, the 24-hour MIOSHA hotline, internet notifications and the Michigan State Police vehicular data reporting system. Since MIFACE began surveillance of all traumatic WR fatalities in 2001, there had been a downward trend. In 2010, the number of WR fatalities rose from 95 in 2009 to a final total number of 147. The number of 2011 WR fatalities decreased by seven deaths to 140 fatalities.

Individuals who died from an acute traumatic fatality were most likely to be men (91%), white (85%), married (57%) and have at least a high school education (92%). The average age was 48 years old and ranged from 14 to 83 years of age.

Construction had the largest number of acute traumatic WR deaths

(25, 17.9%) but the second highest employment-based incidence rate (20.1/100,000)

Agriculture had the second largest number of WR deaths (23, 16.4%) but the highest employment-based incidence rate (26.5/100,000). Manufacturing had the third largest number of WR deaths (15, 10.7%) but due to the number of workers in the industry, an employment based incidence rate of 2.9/100,000 and an hours-based incidence rate of 2.7/100,000 FTE.

Among the non-suicide/non-overdose deaths, 12 individuals had alcohol, illegal drugs or prescription medications in their system at levels that may have been contributory to the occurrence of the traumatic injury.

MIOSHA staff investigated 36 of the 140 deaths. Police investigated 63 deaths (all homicides, suicides, motor vehicle and others), the National Safety Transportation Board (NTSB) investigated 7 deaths. The remaining WR deaths were not in-

vestigated by any regulatory agency other than by the police to exclude a homicide or suicide.

Six industry sectors had an increase in the number of WR deaths, five had a decrease in the number of WR deaths, and three had the same number of WR deaths.

The two industry sectors with the largest increase in the number of deaths compared to 2010 were Manufacturing (+9 deaths) and Public Administration (+6 deaths).

The number of workers in **Manufacturing** increased by 33,193 workers compared to 2010. Where known, the decedent's experience performing the task ranged from 2 months to 34 years. The length of time individuals had been employed at the company ranged from 2 years to 34 years. Four of the WR deaths occurred to individuals who were members of a union. Contributory to the increase in the number of deaths in Manufacturing in 2011 was the increase in the number of deaths in the NAICS 33, which had seven more deaths in 2011 than in 2010 (10 in 2011 compared to 3 in 2010).



Farmer drowned when he fell into an excavation hole



Farm laborer died when struck by water tank when platform collapsed

DISCUSSION

Table 9 shows that the Manufacturing subsectors of NAICS 33 were also the only industry sectors with 40+hour work weeks. Longer work weeks (overtime) have been associated with an increased injury potential. Studies show that working overtime leads to higher injury and illness rates. Higher injury rates may also contribute to a higher number of fatalities.

In **Public Administration**, not only did the number of deaths increase in Justice, Public Order and Safety (7 in 2011 compared to 5 in 2010), four additional subsectors had a WR death which contributed to the additional six deaths.

The industry sectors with the largest decrease in the number of deaths were Other Services (-8 deaths). Retail Trade and Transportation & Warehousing each had a decrease of 6 deaths.

The Other Services subsector with the most dramatic decrease in the number of deaths was Repair and Maintenance (2 deaths in 2011 compared to 9 deaths in 2010).

In Retail Trade in 2011, no Gasoline Stations had a fatality compared to 4 in 2011. In Transportation & Warehousing, the number of deaths in Truck Transportation stayed the same (9 deaths). There were no deaths in 2011 in the Support Activities for Transportation compared to 3 deaths in 2010.

The height of the fatal fall in Michigan most often occurred at heights of 10 feet or less (43%). Nationally, 25% of the fatal falls were from heights of 10 feet or less.

The number of WR homicides decreased by 58% (11 deaths from 26 in 2010 to 15 in 2011), a trend mirrored nationally. Similar to national data, shootings were the most frequent manner of death in the 15 homicide and 16 suicides.

Nationally, the fatality rate for Loggers was 102.4/100,000 FTE, the second highest fatality rate in the nation (Fishers and related fishing workers was first with a fatal injury rate of 121.2/100,000 FTE. In Michigan the Forestry and Logging subsector had an increase in the number of deaths (5 in

2011 compared to 2 in 2010) and an employment-based fatality rate of 318.9/100,000. The employment-based fatality rate in Agriculture was 26.5, in Crop Production 20.6 and in Animal Production 22.0. These rates are similar to the national hours-based rate of 25.3/100,000 FTE.

Contrary to national data, the number of fatal injuries among Hispanic or Latino workers decreased in Michigan in 2011. Additionally, contrary to national data, sixty percent of the Hispanic workers who died in Michigan were born in the US, not foreign born.

Ten foreign-born workers died in Michigan as a result of a traumatic work-related incident. Four (40%) died as a result of a homicide and 2 (20%) died in a motor vehicle related incident. One individual died as a result of a fall, one died due to a suicide, one was struck by an object and one was involved in a fire/explosion.

Foreign born workers were employed in the following industries: Agriculture (2 individuals),



Hospital technician contracted Strep A and died of infection complications

MICHIGAN WAS
ONE OF 25
STATES WHICH
HAD FEWER
FATAL
WORKPLACE
INJURIES
COMPARED TO
2010



Farmer pinned between tongue of grain drill and support brace for the drill arm

DISCUSSION



Machine operator died when the clothing on his right arm became entangled on a part being turned on a lathe.

DESPITE THE HIGH FATALITY RATE IN AGRICULTURE, FARMS WITH FEWER THAN 11 EMPLOYEES ARE EXEMPTED FROM ROUTINE MIOSHA INSPECTIONS. SINCE 2001, AGRICULTURE HAS RANKED AS ONE OF MICHIGAN'S MOST HAZARDOUS INDUSTRIES.



Building contractor died from 30-foot fall when an 82-foot long truss collapsed

Retail Trade (two individuals) and one each worked in Wholesale Trade, Construction, Transportation & Warehousing, Real Estate & Rental & Leasing and one worked in Arts, Entertainment & Recreation.

BLS uses the number of hours worked in an industry and profession to calculate an hours-based fatality incidence rate. The 2011 annual national fatality rate was 3.5/100,000 FTE. MIFACE could not calculate an hours-based rate for Michigan for 2011 due to insufficient data from the Michigan Office of Labor Market Information. In 2010, the hours-based national fatality rate and Michigan's rate were both 3.6/100,000 FTE.

Importance of Using Multiple Data Sources

MIFACE uses many data sources to ascertain if a fatal injury occurs "on the job". Accurate reporting of work-related deaths in Michigan depends upon the completeness of the data. Reliance on just the information in the Injury at Work box on the individual's death certificate would have missed 42 (30.9%) of WR deaths in

Michigan in 2011.

MIFACE Contact with Employers and Families

The MIFACE research program relies on the voluntary cooperation of employers, the self-employed and family members. In 2011, MIFACE requested to conduct and MIFACE site visit at 48 companies. MIFACE is waiting on a decision for participation from nine companies. Thirty two companies declined to participate. Although contact was attempted, MIFACE could not reach 4 employers. MIFACE received permission and conducted a site visit at four facilities.

Prevention Material Dissemination

On the MSU OEM website (www.msu.oem.edu/) are copies of the completed MIFACE Investigation Reports, Hazard Alerts, and MIFACE Summaries of investigations conducted by the MIOSHA program.

In 2011, 11 Investigation Reports, 35 MIFACE Summaries of MIOSHA Investigations and 4 Hazard Alerts were posted on the MSU OEM website and distributed to stakeholders.

Hazard Alerts are 1-page

documents that review WR fatalities and provide prevention recommendations that target specific industrial sectors or repeated WR fatality incidents (such as trench wall collapse).

MIFACE Summaries of MIOSHA Investigations include a summary of the WR fatality AND the citations issued to the employer by MIOSHA compliance personnel at the conclusion of the fatality investigation.

For each MIFACE Investigation Report and Hazard Alert there is a dissemination plan to maximize awareness of the Report and Alert. Investigation Reports and Hazard Alerts are sent to appropriate trade associations, unions, trade journals, employers who do the same type of work, and to employers who have expressed interest in receiving the reports.

A special effort in conjunction with the Michigan Farm Bureau to provide educational safety sessions to farmers is ongoing. In 2011, more than 700 individuals attended the training sessions.

DISCUSSION

Examples of MIFACE Intervention

Methylene Chloride and Bathtub Refinishing

In 2010, we conducted an onsite investigation after notification that a co-owner of a bathtub refinishing firm died while refinishing a bathtub located in a small bathroom in an apartment and using methylene chloride as a bathtub stripping agent.

This MIFACE investigation led to a state educational outreach activity by both MIFACE and MIOSHA. MIFACE developed and distributed the [Investigation Report](#) of this incident and [Hazard](#)

[Alert](#) specific to the use of methylene chloride in bathtub refinishing activities.

MIOSHA developed a [Fact Sheet](#) utilizing their list serve of more than 4000 subscribers, distributed the MIFACE materials to alert subscribers of this hazard. MIOSHA also posted the MIFACE information to their website.

Additional educational outreach in Michigan was provided by newspaper articles, insurance company outreach in publications and presentations.

On a national level, Federal OSHA and NIOSH initiated a national educa-

tional outreach to the bathtub refinishing industry, by beginning development of a Hazard Alert.

MIFACE, Federal OSHA and NIOSH collaborated on an article [Fatal Exposure to Methylene Chloride Among Bathtub Refinishers - United States, 2001-2011](#) which was published in 2012 in the Morbidity and Mortality Weekly Report (MMWR), February 24, 2012/61(07);119-122.



Farm youth died when caught up in corn grinder belt

ACKNOWLEDGEMENT

We are extremely appreciative of the support of the Department of Licensing and Regulatory Affairs MIOSHA Safety and Health personnel, the employers, the families and the experts who have worked with us to im-

prove work conditions in Michigan.

We are also appreciative of our Advisory Board who provide constructive comments on each MIFACE Report and Hazard Alert, who assist us in provide thoughts on de-

veloping MIFACE policies and educational outreach activities, and their promotion of the MIFACE program to their employees/constituents.



Farmer pinned under overturned tractor while transporting hay bales

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Farmer pinned under overturned tractor while cutting embankment

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ACRONYMS

BLS: Bureau of Labor Statistics

LARA: Michigan Department of Licensing and Regulatory Affairs

MSU OEM: Michigan State University Occupational & Environmental Medicine Division

MIFACE: Michigan Fatality Assessment and Control Evaluation

MIOSHA: Michigan Occupational Safety & Health Administration

NAICS: North American Industrial Classification System

NIOSH: National Institute for Occupational Safety & Health

OSHA: Occupational Safety & Health Administration

SOC: Standard Occupational Classification System



Farmer died when yolk broke causing the buggy he was driving to overturn

APPENDIX

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2011 WR Fatality Case Narratives by Means of Death

A case narrative may reference (REFERENCE) a MIFACE Investigation Report (MIFACE Investigation Report) or Summaries of MIOSHA Inspections (MIOSHA Summary) posted on the MSU OEM website. Each (REFERENCE) is hyper-linked to the web document.

To access the referenced MIFACE Investigation Report or MIOSHA Summary, click on the Traumatic Fatalities link on the navigation bar on the MSU OEM website homepage. Click on the MIFACE Investigation or Summaries of MIOSHA Inspections tab.

The Industry Type drop down menu lists all of the NAICS industry sectors. Select the appropriate industry. The Fatality Type drop down menu lists all of the means of death. Select the appropriate fatality type. After selecting the appropriate industry and fatality type, click the Search button, and then scroll down the page to the appropriate REFERENCE number.

MICHIGAN



Prevention through comprehensive research and investigation

AIRCRAFT (7)**Cases 1-7***Cases 1-3*

A male parts manufacturing company CEO in his 50s and two company employees, a male design engineer in his 30s and a male sales representative in his 40s died when the aircraft crashed in a park, approximately 1 1/2-mile from the destination airport's runway. The CEO was the pilot of the Piper PA46-350P single-engine aircraft. Visual meteorological conditions prevailed and a flight plan had been filed. The National Transportation Safety Board (NTSB) final report stated "a witness reported that the airplane was unusually low and still flying at a high rate of speed with its landing gear retracted when it flew over a road near the destination airport. The airplane continued at a high rate of speed as it crossed over the trees adjacent to the runway. Radar data indicated that the airplane's ground speed was 132 knots, at an altitude of 800 feet when it was about 0.5 miles from the runway, which was 4,997 feet by 100 feet and composed of grooved asphalt. Another witness reported in the NTSB report that he saw the airplane in a turn with "little speed." The airplane then "just dropped." After impact, the plane burst into flames. Examination of the wreckage by NTSB personnel revealed that the landing gear and flaps were in the retracted position, and no mechanical anomalies were present that would have precluded normal operation.

Case 4

A male pilot in his 50s died when the 1968 Aero Commander Callair A-9B towplane he was piloting crashed following the separation of the glider being towed. The NTSB final report of the incident includes the following information: "The pilot of the glider being towed by the airplane (towplane) reported that the aerotow takeoff was normal with the exception of some gusty winds. Beginning about 15 seconds into the flight, the glider's airspeed began to repeatedly increase and decrease, with the airspeed oscillations increasing in amplitude as they progressed. During the third or fourth airspeed cycle, he encountered a high intensity thermal. He lost sight of the towplane briefly, relocating it below and slightly to the right of the glider. Tension on the tow rope was high and he elected to release from the tow. At that time the towplane wings were level and it appeared to be stable. He subsequently returned for a landing. A witness stated that the takeoff appeared to be normal, but the towplane and glider encountered some turbulence near the end of the runway. He commented that the glider pilot appeared to be having some difficulty staying in position behind the towplane. At one point, the glider was subjected to a tugging motion, which appeared to be due slack being taken out of the tow rope. The glider subsequently separated from the tow. The towplane turned right, while the glider continued straight ahead briefly. The towplane was approximately 350 feet above ground level when the right wing dropped and it entered a 60 to 70-degree nose down attitude. The towplane completed about one-half of a rotation before the witness lost sight of it behind trees. The airplane impacted an open field about 1/2 mile west of the departure end of the runway." The decedent's pilot certificate included a glider rating. The pilot of the glider being towed held a private pilot certificate with a single-engine land airplane rating. He was not glider rated. The FAA Glider Flying Handbook (FAA-H-8083-13) provides information and guidance related to glider operations. Regarding launch procedures, the handbook notes "that once airborne and climbing, the glider can fly one of two tow positions. High tow is aerotow flight with the glider positioned above the wake of the towplane and is preferred for climbing out. However, the handbook cautions that "one of the most dangerous occurrences during the aerotow is allowing the glider to rise high above and losing sight of the towplane." The tension on the tow rope by the glider may ultimately limit the towplane elevator authority. Additionally, the towplane pilot may not be able to release the tow

rope." This situation can be critical if it occurs at altitudes below 500 feet agl. Upon losing sight of the tow-plane, the glider pilot must release immediately." The pilot was transported to a local hospital where he died later that day.

Case 5

A male pilot in his teens died when his Piper PA-32-260 single-engine aircraft crashed into a wooded area. Instrument meteorological conditions prevailed and no flight plan was filed. The pilot was flying a passenger to another airport. When the pilot did not return home, his family became concerned and began making phone calls to ascertain his location. A search was initiated. The aircraft was found approximately 1.6 miles north of the airport from which he took off. At the time of the writing of this report, the NTSB had not issued a final report of the incident.

Case 6

A male flight instructor in his 70s died when an experimental amateur-built Bosonetto model Thorp T-18 aircraft piloted by another individual crashed into the side of a home. The purpose of the flight was for the pilot to obtain a flight review. The pilot also died but he was not working and his death is not included in this report. The NTSB provided the following summary of the incident: "A witness to the accident reported seeing the airplane in the traffic pattern for the runway. He reported that after the airplane had turned onto the final approach, it was higher than the typical glide path for the runway and appeared to be traveling at a slow airspeed in a forward-slip maneuver. The witness stated that while the airplane was in a forward-slip, losing altitude, it suddenly entered a spin to the right and descended out of his view. The airplane subsequently impacted a residential front yard and house." At the time of the writing of this report, the NTSB had not issued a final report of the incident.

Case 7

A male wing walker in his 40s died when he fell 150 feet after unsuccessfully completing an aerial transfer from a WW II Boeing A7N1 Stearman airplane to a Hughes 269C helicopter during a performance at an air show. The NTSB final report of this incident contains the following information "The airplane pilot stated that the wing walker fell during their third pass along the air show line. He reported that the wing walker was to wait for a cue from the helicopter pilot when both aircraft were in position for the transfer. He stated that the wing walker jumped to reach the skid on the helicopter before it was in position, letting go of the handle on the airplane. The wing walker was unable to regain a hold of the handle on the airplane and fell. The airplane pilot noted that the wing walker did not normally let go of the handle on the airplane until his arm was wrapped around the skid on the helicopter. The helicopter pilot reported that the aerial transfer was planned to occur on the third pass along the air show line. The initial passes went according to their plan. However, on the third pass, the wing walker attempted to grab the helicopter skid prior to the briefed transfer point. The helicopter pilot stated that the wing walker released his hold on the airplane handle and lunged with both hands for the helicopter skid before the aircraft were in position. He reported that the wing walker attempted to go back to the airplane, but was unable to grab on to anything. The wing walker subsequently fell approximately 150 feet to the ground." Both pilots held current Statement of Aerobatic Competency (SAC) authorizations with aerial transfer endorsements. The airplane pilot's authorization also included a wing walking endorsement. Both pilots and the decedent had performed the aerial transfer act for many years as a team. The decedent was transported to a local hospital where he died later that day.

ANIMAL (2)**Cases 8-9****Case 8**

A male farmer in his 60s died from injuries sustained in an un-witnessed incident when he was gored by a bull (s) in a fenced pen/coral. There were five bulls in the pen. During the police investigation of the incident, several of the bulls charged toward the responding police officers.

Case 9

A male accountant in his 80s died as a result of complications of a dog attack. The decedent was delivering paperwork at the place of business when the business owner's dog bit his forearm. Due to the extensive damage to his arm, the decedent was taken by ambulance to a nearby hospital for treatment. After surgical repair of his forearm, the decedent developed multiple complications and died three weeks after the surgery.

Asphyxiation (1)**Case 10**

An male farm hand in his teens died when he was engulfed in corn in a 20-foot wide by 64-foot high poured concrete silo. The silo contained approximately fifteen feet of multi-year corn (2009 and 2010). The decedent was a member of a two-person crew. The grain handling equipment (augers) that would normally make silo entry unnecessary was not operational at the time of the incident. Due to the corn's condition, the corn clumped up and did not flow well and required employees to enter the silo to break up some of the clumps to keep the corn moving. The entry of the silo had been a routine part of the operation for at least 30 days as a result of the broken auger equipment. The employer was aware that the entry presented a respiratory hazard; he required the employees to open the top hatch of the silo and to keep the bottom hatch open for ventilation. The employees were given bars to move the grain from the outside of the silo when possible. While his coworker was working by a 24-inch by 18-inch clean out outside of and at the bottom of the silo shoveling the corn into a feed grinder, the decedent entered the side of the silo through an opening located 10 feet above the floor. The decedent stood on the corn which was at the same level as the entry door. The corn level on the wall opposite the door was higher by at least five feet. It is unknown if the corn gave way while he was standing on it or if he was engulfed by the corn he may have been knocking down from the silo's walls. The decedent's coworker noticed that the corn was exiting the clean out opening more quickly and then the bar that the decedent had been using exited the clean out. His coworker climbed the fixed ladder to the side entry opening and could not see the decedent. He returned to floor level and went to the access door and started digging in the pile of corn which had come through the clean out. He found the decedent's feet in the corn pile. Due to the weight of the corn, the configuration of the silo cleanout, and the orientation of the decedent, his coworker could not free him. His coworker called the farm owner and informed him of the incident. The farm owner called for emergency response. While waiting for emergency response to arrive, his coworker and the farm owner, who had arrived at the scene, continued to try to free him. The decedent was not responsive when the volunteer fire department arrived on the scene. Additional resources including a confined space rescue team were called for assistance. Recovery efforts were hampered by the silo construction at the clean out. The silo consisted of hardened concrete up to 10 inches thick with rebar every few inches above the clean out. After several hours, the decedent was recovered and declared dead at

the scene. ([MIFACE Summary 294](#))

Case 11

A developmentally disabled female in her 40s died due to complications of choking on a piece of food while at work.

Drowning

Case 12

A male farmer in his 70s drowned when he fell into an excavation hole filled with several feet of water. The decedent was found lying face down in the hole with his left arm over the drain tile at the base of the hole. Responding police noted one excavation wall that appeared to have dirt moved like the decedent had fallen down that wall.

Drug Overdose

Case 13

A 56-year-old male lived and worked at a retail shop. He died due to multiple drug intoxication.

Electrocution

Cases 14-20

Case 14

A male telecommunications company data technician/field operations supervisor/safety officer in his 40s was electrocuted when he contacted 277 volts of electricity while relocating television monitors and associated cabling. When the television monitor installation project was concluded, the decedent's employer was informed by the site owner that several television monitors were not in their proper location, thus requiring a relocation of the monitors and their associated cabling. Per company procedure, a licensed electrician was the only individual permitted to work with electrical connections and wiring, and only after the electricity was locked out per the company lockout procedure. There was no licensed electrician on the site. Company policy permitted a licensed electrician to work on live electrical components only after a hot-work permit was granted and all of the personal protective equipment was ready for use. The technicians involved in this incident were allowed, per company policy, to work under the supervision of a licensed electrician and install these monitors and associated equipment if it was de-energized. The decedent and his coworker disconnected the wiring from the television monitors and began the relocation process. The decedent was working in a mezzanine area while his coworker worked nearby in a scissors lift. The decedent stood with one foot on a metal desk and his other foot on a four-foot ladder as he pulled a live, three-phase, 277-volt metal clad wire to the new location. The metal clad cable insulation had a 1/8-inch to 1/4-inch area where the insulation was damaged permitting the decedent to directly contact the live wires. He was not wearing appropriate gloves. Another individual, who worked for the site owner was in the mezzanine. He and the decedent's coworker heard the decedent cry out. Both looked over toward the decedent's location and saw him lying on the floor holding the wire with both hands. The decedent's coworker jumped from the scissor lift to the mezzanine area, yelled for help and began to administer CPR while the second individual called for emergency response. Emergency response arrived and transported the decedent to a nearby hospital where he was declared dead. ([MIFACE Summary 264](#))

Case 15

A male carpenter in his 30s who worked for a roofing company died when the 18-foot-long metal piece of roofing material he was holding contacted an energized 4,800-volt overhead power line. The decedent was standing on the 4/12 pitched roof that was 10 feet high at its edge and 15 feet 6 inches high at the peak. The overhead power line had a neutral line (closest to the building) and the 4,800-volt energized line. The energized line was 17 feet above the ground. MIOSHA measured the distance from the building edge (not the roof edge) to the energized line; the distance was 4 feet 3 inches. The decedent was a member of a three-person work crew reroofing a pole barn. One crew member was on the opposite side of the roof performing another task. One crew member was on the ground. The MIOSHA compliance officer indicated that the company owner stated he told the employees about the line and to be careful when working in the area. The owner did not try to have the power line removed, raised or de-energized while employees were working in the area. The decedent was in the process of installing new corner trim on the building side near the power line. The corner was made of 29-gauge steel and was approximately 18 feet 6 inches long. After getting it to the roof, it appeared that it was “backwards” and the decedent was required to turn the corner trim end for end. Instead of flipping it horizontally, it appears he turned it vertically, and the corner trim contacted the energized line. The coworker on the roof heard a buzzing noise and went to investigate. He found the decedent lying on the ground. The workers called for emergency response. EMS transported the decedent to a local hospital where he was declared dead. ([MIFACE Summary 286](#))

Case 16

A male plumber in his 60s was electrocuted when he contacted a 120-volt energized electrical source while removing existing water pipes in the crawl space of a single-family residence. The decedent was a member of a two-person crew. He was using a Porter Cable Model 737 variable speed saw to cut piping in the crawl space, which had wet, damp sand. MIOSHA determined that an extension cord and portable GFCI in use appeared to be functional and in good condition; no defects were noted. MIOSHA photos taken in the crawl space show multiple locations of damaged NM/Romex style wiring. MIOSHA noted that it appeared that the electrical service was not grounded. The grounding electrode conductor was associated with the meter socket on west end of home, entered the crawl space, and was fastened to a 3/4-inch galvanized water pipe. The piping system was interrupted by plastic bends and piping. The entry point of the 3/4-inch PVC pipe water service was at the east end of home. One ground rod was driven at the east end of the home for grounding of the cable TV system and was not connected to the electrical service. The responding police officer, who was also a licensed plumber, speculated that the decedent was killed while reaching across energized wiring to cut out existing water pipes extending down through the floor. The incident occurred west of a transition piece of PVC piping. The decedent had burn marks across his upper left shoulder and across his face and mouth area, consistent with contact with a wire or something in a generally linear direction. There were no exit or burn marks noted on his hands, feet or any other body part. The decedent’s coworker had left the crawl space to remove pipe, and when he returned, he noted the decedent was not moving. His coworker yelled at him, crawled closer and noticed the saw was running in the dirt with the decedent’s hand still on it. His coworker exited the crawl space and yelled to the homeowner to call 911. The coworker shut off all the breakers in the electrical panel located on the porch. A neighbor and the decedent’s coworker went into the crawl space and pulled decedent out of the space. EMS arrived and the decedent was transported to a local hospital where he was declared dead. ([MIFACE Summary 267](#))

Case 17

A male field technician in his 20s died when he contacted an energized seal-tight conduit and attached load-breakable disconnect plug. The decedent was one of a five-person crew to set up a custom built machine with multiple units that the decedent's company had manufactured for a client. The decedent and his co-worker were assigned to set up the cyclone unit. During set-up, power to the cyclone was turned off. Suspended approximately 12 feet above the floor was a flexible 480-volt power supply seal-tight conduit and plug end cord to the cyclone motor. The decedent used a forklift to remove a 150 pound, 14-foot-long, 7-inch diameter product transfer tube, which was located above the power supply. The product transfer tube fell from the forks and landed on the power supply seal-tight conduit and plug end cabling, stretching it taut. His coworker was getting ready to run a test and so turned power on to the machine. One of the machine components was not functional. He asked the decedent to check on this situation. He then heard the decedent scream. It appears the decedent contacted the seal-tight conduit and plug end cord with his right hand. His coworker found the decedent lying on the floor underneath the electrical power seal tight conduit and plug end cord. After the incident, it was found that in the male plug end, all four connectors were pulled from their set-screw terminals. There was evidence of two phase conductors cross-phasing. There was no sign of arcing between the third phase and the grounding conductors. It appears that the conductors were removed from the plug due to being stretched by the fallen product transfer tube, which caused a short and energized the power seal-tight conduit and plug end cord. When the decedent contacted the cord, he became a path to ground and was electrocuted. Emergency response was summoned, and the decedent transported to a local hospital where he was declared deceased. ([MIFACE Summary 295](#))

Case 18

A male tree trimming/stump removal business owner in his 40s died when he contacted an energized overhead power line of unknown voltage. The work crew included the decedent and two coworkers. The decedent, who was wearing a climbing harness and using a safety line, was aloft in the tree and his coworkers were on the ground. The crown of the tree at its greatest dimension was 11 feet away from the power line. The crew had been working most of the day. It was beginning to rain. The police report indicated that one of his coworkers stated that the decedent wanted to cut two more small limbs before quitting for the day. The police report stated that his coworkers indicated that as he was cutting these limbs, the rain became heavy and the wind "picked up". The limb involved in the incident was cut. The limb slid down into a V shaped area between the remaining tree branches and tree and his body in the harness. The tree limb then fell sideways, and contacted the power lines located approximately 11 feet away from the side of the tree. Another coworker indicated that when the decedent cut into the small limb, it "just flipped funny" and then hit the power lines. The two coworkers attempted to use the limb's guide rope to pull the limb away from the power line but were unsuccessful. Emergency response was called and found the decedent in his climbing harness hanging from the tree. Emergency responders declared the decedent dead at the scene. ([MIFACE Summary 284](#))

Case 19

A male carnival worker in his 40s contacted a 4800-volt overhead power line while disassembling a carnival ride. The decedent was on an extended arm of the ride frame that measured approximately 1½-feet wide. The ride frame was approximately 35-40 feet above the ground. The ride was a vertical loop 58 feet 9 inches high with five cars that travelled around the inside of the loop. When the ride was taken down for transport,

the loop separated at the top middle, and then each half folded half again while it lowered and swung out and around to come back in against the trailer. When the ride section folded and swung out, it reached 24 feet 8 inches from the side of the trailer. The operation of the ride folding up was controlled with hydraulic control levers mounted on the left front corner of the ride. The decedent called the site manager and asked him to help him lower the ride to make sure the ride section would clear the power line. When the site manager arrived, the decedent was up on the ride section. The site manager was positioned at the hydraulic ride controls lowering the ride frame and could see the decedent. The power line had two 4,800 volt conductors located approximately 24 feet away from the trailer and approximately 36 feet 6 inches above the ground. The decedent used a 42-inch long notched wooden stick that was wrapped with approximately six to eight inches of electrical tape at the end of the stick. Holding the stick at the end wrapped with electrical tape, the notched end of the stick was used to hold the electrical line away from the lowering frame of the ride. This same work practice was used during the ride assembly. The sequence of events is unknown. Several possible incident scenarios have been developed. While the frame was being lowered, the decedent may have slipped on the frame or the frame may have bounced. The decedent may have received an electrical shock through the stick (a handprint was noted by responding police on the electrical tape). Another scenario would be that at some point, the energized 4,800-volt line came clear of the notch in the stick. The line may have swung away, and then back toward the ride frame and the decedent. He was unable to “catch” the line in the notch, and the energized line contacted the ride frame, and most likely, based on the pattern of electrical burn sustained by the decedent, contacted his upper body (40% body surface area). The electrical shock caused the decedent to be blown away from the ride frame and fall approximately 35-40 feet to the pavement below. The power line burnt through where it contacted the frame and broke into two sections that hung from nearby poles. There were burn and arc marks on the ride frame. The decedent was not using electrically rated personal protective equipment and was not wearing a fall protection harness. The decedent was declared dead at the scene. ([MIFACE Summary 275](#))

Case 20

A male social service organization volunteer in his 70s died due to an electrocution while changing a mercury vapor light fixture. The decedent was on a metal extension ladder which was leaning against a light pole and held by a coworker on the ground. The police report states that the coworker heard the electricity arching and witnessed the decedent fall from the ladder.

Fall

Cases 21-40

Case 21

A male in his 60s was in the woods cutting down trees. His spouse found him and ran to a neighbor's home to call emergency response. There was logging debris (multiple raised logs, limbs and sticks) on the ground at the incident location. It is unclear whether the decedent tripped and fell, striking his head on a rock that was mostly submerged in the soil or if an overhead branch fell and struck his head. The decedent was found lying on the ground with a head wound.

Case 22

A male farmer in his 60s died due to complications of head injuries sustained in a fall from a powered mobility chair. It appears that the decedent struck his head on a pallet when he fell from the chair.

Case 23

A male fire extinguisher service technician in his 60s died as a result of a head injuries sustained when his head struck the concrete floor as he fell backwards. The decedent was inspecting the building's fire extinguishers, and after inspection, initialed the inspection tag. He had completed the fire extinguisher inspection in several areas of the building. While in one of the building areas in the presence of an individual who worked in the building, the decedent called his service coordinator, stating he had fallen and had broken his phone. The decedent indicated that when he fell, the phone hit him in the ribs. After the phone call, the decedent continued his inspection of the facility. He was in the process of inspecting the fire extinguishers in the vehicles in the truck parking garage when the incident occurred. The decedent had opened the passenger side door of one of the tandem axial dump trucks. The truck door was approximately 55½ inches from the floor. The second step was approximately 39 inches from the floor and 35 inches wide and the first step was approximately 18½ inches from the floor and approximately 31½ inches wide. Entangled cable-type tire chains were located on the passenger side floor boards in the truck cab. The chain pile stood approximately seven inches off the floor and covered approximately 12 inches of the floor. The truck's fire extinguisher was mounted on the floor between the driver and passenger seat frames near the control levers for the vehicle. The sequence of events involved in the fall is unknown. It is unknown if he was exiting the passenger side of the truck, standing on the steps or if he was standing on the floor when he fell backwards striking his head on the cement floor. A facility employee found the decedent on his back on the floor with an obvious head injury. The employee ran for help and to call for emergency response. The truck's fire extinguisher had been serviced and placed back in the holder but had not been strapped down. The tag did not have his initials. The truck door was open when the facility employee found him. He died several days later from the injuries sustained at the time of the fall. ([MIFACE Summary 293](#))

Case 24

A male iron worker in his 50s died of complications of a head injury sustained in 1986 after falling from scaffolding three-stories high at a construction site.

Case 25

A male roofer in his 30s died when the ladder he had tethered to another ladder to access a leak near a chimney on a two-story home came apart causing him to slide down and fall from the roof edge. The base ladder was a 40-foot aluminum extension ladder and the second ladder was the lower half of a 20-foot fiberglass extension ladder. The base 40-foot ladder was leaning against a dry, shingled roof with a slope of 16/12. The base 40-foot ladder was placed with one safety foot on brick pavers and one safety foot in landscaped soil near a bush. The decedent set the base ladder against the roof eave, at an angle where nine rungs of the extension ladder were laying on the roof. The decedent climbed the base ladder while holding the fiberglass ladder and then tethered the 20-foot lower half of the fiberglass ladder section to the base ladder using a two-inch nylon strap. The fiberglass ladder was placed on the roof shingles and against the chimney. The decedent's coworker was holding the base ladder. Witness statements place the decedent approximately halfway up the fiberglass ladder when the fiberglass ladder shifted and the tether gave way. The decedent, who was not wearing fall protection equipment, fell to his left and slid down the roof. Both the decedent and fiberglass ladder fell approximately 49 feet to the brick pavers below. The decedent sustained fatal traumatic head and chest injuries. ([MIFACE Summary 288](#))

Case 26

A Hispanic male laborer in his 40s died as a result of a fall from either a ladder or a roof edge. The decedent was a member of a three-person work crew. The crew was installing shingles on a three story, 48-unit apartment building's 6/12-pitched roof. The roof was approximately 36-feet high and had a 24-foot eave height. An extension ladder was in place – the top of the ladder extended approximately 2 ½ feet above the roof-line. The event was unwitnessed. The first person on scene stated that they found the decedent on the ground lying face down on the right side (east side) of the ladder approximately two feet southeast of the ladder, body in a north-south orientation. The decedent was wearing a safety harness. The coworker called the company owner and stated that the decedent fell from the ladder. While en-route to the site, the owner called both the construction site's general contractor and emergency response (911). MIOSHA indicated that the owner stated he was in another city at the time of receiving the call from the coworker. When he made the 911 call, the call was picked up by this city's dispatcher. The incident occurred in another city, which resulted in the owner calling 911 several times before he was able to notify the appropriate first responders. When found by his coworkers, the decedent was conscious and indicated his leg and arm hurt and that he needed help. The decedent was rolled to his left side. His coworkers moved him to another location to make him more comfortable until emergency response arrived. His coworkers did not provide any first aid measures prior to the emergency response arrival. The decedent was transported to a local hospital. He died on complications of the injuries approximately two weeks later. ([MIFACE Summary 274](#))

Case 27

A Hispanic male independent contractor in his 40s died as a result of a fall of unknown height from a 20-foot fiberglass extension ladder equipped with safety feet while checking an outside light located approximately 21 feet above the ground for a loading dock truck bay. He was instructed to check the light for power by covering the photo eye with his glove. The decedent fell to concrete pavement and struck his head. A police interview statement from his coworker indicated that the decedent had a habit of moving his ladder while still on it to move to another location. The coworker assumed that the decedent had attempted to do that this time causing him to fall. Responding police found the extension ladder laying flat on the ground next to the building. A broken light housing, light bulb and voltmeter was lying near the decedent. A cordless drill/screwgun was wedged between a conduit pipe and the back wall of the building near the light fixture the decedent was apparently working on. Two wires that spanned the rear of the building were partially pulled away from their attachment points on the building. ([MIFACE Summary 268](#))

Case 28

A male in his 50s was power washing gutters while standing on a roof when he fell approximately 12 feet headfirst onto a concrete driveway. He died three weeks later in the hospital from complications of the fall.

Case 29

A male truck driver in his 60s was changing lights while standing on a step ladder. He fell eight feet from the step ladder to the concrete floor below.

Case 30

A male dump truck driver in his 50s fell from his truck. He died one month after the fall from complications of craniocerebral injuries.

Case 31

A male self-employed remodeling subcontractor in his 50s died as a result of a fall of unknown height from a ladder while working on a sign for a business. The decedent was on the ladder removing the top bolts of the sign while his coworker was standing on the ground. The coworker indicated to the responding police department that the decedent thought the bottom bolts of the sign were still connected to the sign supports. The bottom bolts were fake bolts and as the decedent undid the last top bolt, the sign fell down, knocking him off the ladder. He struck his head on the cement below. His coworker called for emergency response. Emergency response transported him to a nearby hospital where he died the following day.

Case 32

A male self-employed building contractor in his 50s died as a result of a 30-foot fall when a truss collapsed. The decedent was a member of a work crew setting 82-foot-long trusses for an agricultural pole barn. The trusses were lifted and set in place using a truck-mounted crane. Several workers were on the truss/building frame tying the truss and nailing it into position. The north side of the truss involved in the incident had been tied and nailed into a 4x6 vertical framing member. The south side of the truss had not been tied and nailed. The truss was missing a truss plate on the south side of the truss. When the crane released the truss, the truss pulled to the west approximately four feet, which created stress on the truss. The truss folded in and buckled, causing the decedent and two coworkers to fall 30 feet to the ground. ([MIFACE Summary 265](#))

Case 33

A male head operator in his 40s at a chemical manufacturing facility died when he fell approximately 30 feet to a lower level steel platform. The decedent was ascending a caged ladder for a second time to take measurements for a confined space entry that was to be performed by an outside contractor. MIOSHA personnel noted the caged ladder was adequately constructed and that it had no observed defects. The decedent experienced a heart attack which caused him to suddenly collapse. The medical examiner report indicated that the cause of death was body injury due to the 30-foot fall. ([MIFACE Summary 296](#))

Case 34

A male automobile catalytic converter recycling company owner in his 50s died when he fell from the top of a 12-filter dust collector while preparing the collector to be transported by a forklift. The forklift tines were not long enough to fully support the dust collector. The dust collector's legs had been removed. The decedent climbed onto the top of the 10-foot wide 6½-foot tall, 6-foot 11-inch deep dust collector to adjust tie down straps which had been secured to a forklift. He fell forward off the collector and landed on the concrete floor, striking his head. The decedent was transported by emergency response to a local hospital, where he died a week later from the head injuries sustained at the time of the fall. ([MIFACE Summary 276](#))

Case 35

A male auto mechanic in his 30s died as a result of a fall of an unknown height to a concrete floor.

Case 36

A male antiques dealer in his 60s died due to complications sustained when he fell from a lawnmower during mowing activities around his business.

Case 37

A male tree service co-owner in his 40s died due to a 40-foot fall when the top of the elm tree to which he was tied off broke away from the tree after the tree trunk was struck by a swinging tree branch. The tree had an approximate diameter of 36 inches at its base. The decedent was wearing his full fall protection and personal protective equipment – helmet, safety glasses, hearing protection, Weaver Model 1033 safety belt/saddle with a steel-lined safety rope/lifeline, and tree climbing spurs on his boots. He was tied in at the crotch of the tree. The decedent was cutting the remaining branch, which was approximately 14-16 inches in diameter and approximately 25 feet in length. The branch he was cutting was controlled by his coworker. The rope ran from the branch through steel guides/loops at the point where the decedent was tied in and then down to the coworker on the ground. The decedent made his final cut. As the cut was finished the branch swung slightly, the base of the branch slid back into the trunk of the tree and the ends of the branch became entangled in a neighbor's tree. The decedent asked his coworker to give more slack on the rope. When the coworker allowed for more slack, the branch fell and swung again back into the tree trunk. This shock of the quick stop snapped the tree trunk approximately 15 feet below where the decedent was tied in, causing both the top portion of the tree and the deceased to fall 40 feet to the ground. His coworker attended to the decedent while another individual called for emergency response. The decedent was transported to a local hospital where he died later in the day. The firm did not have a bucket truck. ([MIFACE Summary 285](#))

Case 38

A male concrete construction owner in his 30s fell 30 feet from a tree he was trimming prior to felling. The tree had been damaged in a storm. He rented a scaffold and erected it around the tree to trim the lower branches with a chainsaw. Up beyond the scaffolding, nailed to the tree trunk were 2x4-inch pieces of lumber that functioned as a ladder to reach the higher branches. The police report indicated that a witness to the incident stated that the decedent's harness "gave way" and he fell to the ground, landing on a tree stump, and then rolling onto the ground next to the stump. The decedent was declared dead at the scene.

Case 39

A male school custodian in his 50s died due to a slip and fall from an eight-inch laminate tile band room riser, which had floor wax stripping agent and removed wax overflowing to a lower riser. The band room was approximately 46 feet by 36 feet by 17 feet high. It had five risers/levels approximately eight inches high by five feet wide in a curved configuration. Room ventilation consisted of two non-industrial fans mounted on two different walls and a small squirrel cage fan on the floor. The stripping agent was diluted in a mop bucket and poured onto the band room floor using a one gallon can. The crew began work on the fifth riser. They had applied approximately two gallons of the stripping agent on the fifth riser. The stripping agent ran over the edge to the fourth riser. The decedent's coworker used a floor scrubber to help remove the wax and the decedent, wearing winter work boots, used a vacuum to clean up the excess. They had completed the fifth riser and had started work on the fourth riser. It was near break time and the decedent and his coworker were preparing for their break. The decedent picked up the one gallon can and was taking it to a work cart in the hallway near the band room. He stepped near the edge of the fourth riser where some of the wax stripping material and emulsified wax were overflowing down to the third riser. He slipped and fell sideways eight inches to the third riser, striking his head. He laid on the floor/riser for approximately 20 seconds, and then his coworker helped him up. The decedent reported the incident to manage-

ment, and then he drove to a local hospital, where he died later that day. ([MIFACE Summary 279](#))

Case 40

A female director of a volunteer organization in her 40s died from complications of an ankle injury that occurred due to a fall at the organization's headquarters.

Fire/Explosion

Cases 41-43

A male dairy farm owner in his 50s died when the bucket of the front-end loader he was using to clear snow from a driveway struck a 500-gallon propane cylinder, causing an explosion that engulfed the front end loader. Approximately six to eight months prior to the incident, the farm initiated a change in propane suppliers. The original propane supplier (Supplier 1) disconnected the tanks, including the incident tank, but did not pick them up from the property. The cylinder had been moved from its original location behind the home to the driveway's turnaround area by the new propane supplier (Supplier 2) to provide easy access for Supplier 1 to haul away. The day and night prior to the incident, approximately 14 inches of snow fell. The decedent was either unaware of or forgot that the cylinder was on the driveway turnaround. It was dark when the incident occurred and the drifted snow hid the tank. The decedent made several passes with the loader. He struck the propane cylinder resulting in an 8-inch tall by 1-1 1/2-inch wide gash opening. It appears that releasing propane created a cloud which was ignited by either the heat of the front-end loader motor or a spark created by the metal on metal contact when the cylinder was struck by the bucket. The front-end loader was engulfed in flames from the resulting explosion. Emergency response was called and the decedent was transported to a nearby hospital where he died the next day from complications of the burn injuries sustained at the time of the incident.

Case 42

A male co-owner of a tool and die company in his 60s was transporting 55-gallon drums used as burn barrels from his home to the business when the burn barrels caught fire and ignited the pickup truck he was driving, causing him to crash the vehicle into a parked car and then a building. The burn barrels were used by the business to burn off wooden pallets which were no longer needed by the business. The pallets were broken down and placed into the barrels. The barrels were then transported by the decedent back to his home to burn the contents. It appears that the ashes in the barrels began to burn again as he was traveling down the roadway. Flames from the drums began curling over the truck cab as the decedent was traveling at a high rate of speed on the roadway, in an attempt to get the vehicle to the business so the fire could be extinguished. After the crash, the vehicle became engulfed in flames. The decedent died from the burns received in the incident.

Case 43

A male sports club caretaker of a sports club in his 50s was overcome in a structural fire of a small tool shed. A member of the sports club who was approximately 200 feet away heard a muffled explosion. He stepped out from between two buildings and saw the shed and decedent engulfed in flames. The witness was unable to render assistance due to the heat generated by the fire. The ignition source was unidentified. Five gasoline cans were stored inside of the building. It was postulated that the decedent had been working on a chain saw at a workbench when the explosion occurred. ([MIFACE Summary 292](#))

Heat (2)

Case 44

A male professional motor cross racer in his 20s died from complications of heat stroke. The temperature on race day was in the low 90s. The decedent, according to a family member, began to show signs that something was wrong toward the conclusion of the race. The decedent fainted at the track. Emergency response was summoned, and the decedent was transported to a local hospital, where he died several days later due to complications of heat stroke.

Case 45

A male restaurant prep cook in his 30s died from complications of heat stress. The decedent's work hours were from 9:00 a.m. and until either 2:00 p.m. or 4:00 p.m., depending upon the day and the lunch crowd. Before lunch, he would chop food, prepare soups and sauces and baked bread. He was not directly over the grill, but would stir sauces and soups during the lunch hours. There was an exhaust fan over the grill. The kitchen was not air conditioned. During the lunch hour, employees were not permitted to take a break. Health rules do not permit water "on the line" – it can be kept a specified distance away, but not right next to them. The restaurant had an air conditioned room where employees could go on break, wrap napkins around eating utensils, etc. At work, he wore cotton clothing; he did not wear a chef's jacket over his clothes. His work shift on the day of the incident was 8:50 a.m. to 12:20 p.m. because he complained to his supervisor of not feeling well and was sent home. When he went home, he went to his garage where his "man-cave" was located. Neither his home nor the garage was air conditioned. The garage had a fan. He was found dead on his couch in the garage in the late afternoon. The outside temperatures the week prior to his death ranged from 89°F – 98°F. MIOSHA conducted wet bulb globe temperature (WBGT) measurements during their inspection. In the afternoon kitchen temperatures reached 83°F, when breaks were required. The WBGT is an index of the heat stress in humans when work is being performed in a hot environment. The dry bulb temperature was measured at 87°F. During the MIOSHA investigation, the compliance officer noted:

- a. Employees were exposed to radiant heat during the cooking process at the oven and at the simmering pots in prep cook, at the pizza oven, and the oven, fryer, stove, and steam table at the cooking station.
- b. Breaks were not taken by employees according to the ACGIH® recommendations for frequency found in Table 2 of the Heat Stress section of the Threshold Limit Values (TLV) booklet. Employees were not allowed sufficient recovery time for heat exposure. The employer did not establish a break schedule for kitchen employees.
- c. Neither management nor employees had received training on the signs of symptoms of heat stress.
- d. The employer did not screen employees to identify those employees more susceptible to heat.

([MIFACE Summary 277](#))

Homicide (15)

Cases 46-60

Case 46

A male carpenter in his 60s died due to a gunshot wound while repairing and restoring an office building.

Case 47

A male co-owner of a liquor store in his 50s died due to a gunshot wound during a robbery attempt.

Case 48

A male beauty store owner in his 60s died due to a gunshot wound incurred during a robbery.

Case 49

A male landlord in his 40s died as a result of a gunshot wound.

Case 50

A male security guard in his 20s died due to multiple gunshot wounds.

Case 51

A male business owner in his 40s died due to a gunshot wound to the head.

Case 52

A male adult foster care home administrator in his 70s died as a result of smoke inhalation and complications that were due to an intentionally set fire in the group home set in 2010.

Case 53

A male fast food worker in his 20s died due to a gunshot wound during a robbery attempt.

Case 54

A male valet in his 30s was working at a bar when he died due to a gunshot wound.

Case 55

A male police officer in his 40s died due to multiple gunshot wounds.

Case 56

A male police officer in his 30s died due to multiple gunshot wounds.

Case 57

A male police officer in his 40s died from complications of the injuries sustained when he was intentionally struck by a motor vehicle.

Case 58

A male city water department director in his 30s died after he was intentionally set on fire by another individual.

Case 59

A male police officer in his 40s died when he was struck by the vehicle driven by a fleeing felon.

Case 60

A female state government employee in her 40s died from a gunshot wound.

Infectious Disease

Case 61

A female unit hospital technician in her 50s died from complications of a Group A strep infection. Three weeks prior to her death, a patient with an infected wound was admitted to the ICU. Samples were collected from the patient and given to the hospital lab for analysis. The patient stayed at the hospital for 36 hours. During that time, the decedent provided comfort care during at least one shift. After the patient had transferred to another healthcare facility, the lab results determined that the patient had a Group A streptococcus infection. Approximately 3 weeks later, the decedent had flu-like symptoms, and was admitted to the hospital. Lab test results revealed that the decedent had the same strain of Group A strep as the admitted patient. Her death was due to cardiac arrest secondary to nonischemic cardiomyopathy from septic shock due to Group A Strep infection. ([MIFACE Summary 263](#))

Machine (20)

Case 62

A logging company owner in his 60s died when he was run over by the John Deere 648GIII log skidder he was operating. The decedent went to the logging site to check on the equipment and to level out the brush and chip piles left by the logging activity. The decedent, according to interview statements, was very meticulous about equipment maintenance. A possible scenario was developed. The decedent checked the transmission oil before he turned on the skidder per the equipment manual instruction. The decedent entered the cab and turned on the equipment and began to work. At some point, he noticed that he had not fully inserted the transmission dip stick. The transmission dip stick was located on the right side of the skidder between the front and rear tires under the operator's cab. Placing the skidder in neutral, he exited the cab and accidentally activated the gear shift placing the machine in reverse. The decedent was run over and the skidder continued in reverse approximately 270 feet until it was stopped by a tree. The individual who found the decedent heard the machine running and went to investigate. He found the decedent lying on the ground on a leveled out wood chip pile. He then walked to the skidder and turned it off. Responding police found the access door to the transmission dip stick on the skidder open and the stick pulled out approximately 18 inches. The shift lever does not lock in Neutral but it does take a double action to get the shift out of Park. Park and Neutral were located next to each other; the machine will go into Park without a double action. ([MIFACE Summary 270](#))

Case 63

A male farmer in his 50s died when the tractor he was operating overturned and he was pinned under the tractor. The decedent and two coworkers were transporting hay bales. The bales had been placed on a full-size hay trailer to be transported to the horse barn. The decedent was operating a Kubota L185 DT model farm tractor equipped with a front end loader. The tractor was not equipped with a rollover protection structure (ROPS). The two coworkers climbed on to the hay bales and the decedent began driving the tractor to the barn. To get to the barn, the decedent had to drive the tractor down a hill. An embankment was on his right side. The police investigation found that the rear of the tractor broke traction and slid to the right, causing the trailer to lose control. The downward pressure of the trailer caused the tractor to tip over (front to back), pinning the decedent under the tractor on the embankment. The trailer remained on the hill.

Case 64

A teenaged male farm family member died while assisting his father in unwinding a six-inch wide 3/8-inch thick rubber belt for a corn grinder. It appeared that the belt was wrapped around the decedent's arm when he activated the machine. His father, who was in the barn, heard the belt "flap" and exited the barn to investigate the noise. It is unknown if the belt hit the decedent causing his head to strike the metal wheel of the machine or if the belt pulled him into the machine, causing his head to strike the metal wheel. Emergency response was called from a neighbor's phone. The decedent was transported to a local hospital and then transferred via Life Flight to a nearby hospital where he died later that day.

Case 65

An male farmer in his 80s died when he was pinned under an International 5088 farm tractor tire. After dinner, the decedent traveled by tractor with an attached haybine to a field to mow. His spouse fell asleep, and when she woke up after midnight, discovered that he had not returned home. Family members were called, and they searched for the decedent in the surrounding fields using a "Gator". They eventually found the tractor when the Gator's lights reflected on the attached slow moving vehicle sign. The tractor lights were off. The tractor was in Neutral and idling, and the PTO and parking brakes were disengaged. The tractor was positioned at the base of a hill. It appeared that the tractor rolled downhill approximately eight feet. Family members postulated that the decedent dismounted the tractor, but did not shut it off or apply the parking brake as was his usual work practice. After dismounting, he shut the cab door and may have been attempting to clean the gear box of the haybine when the tractor rolled, pinning him under the tire.

Case 66

A male farmer/butcher shop owner in his 70s died when the John Deere Model 3020 tractor and brushhog he was using to brush hog a lane in a wooded area rolled over down a 20- to 30-foot embankment. The decedent was backing the tractor and the rear wheel slid down the embankment causing the tractor to roll. The tractor was not equipped with a ROPS.

Case 67

A male farmer in his 50s died when the tractor he was operating overturned. He had attached a chain to the brush from around a tree. As he was attempting to jerk the brush from the ground, the tractor rolled over, pinning the decedent. His back was against the ground and his body was folded over with his knees in his face. The tractor was not equipped with a ROPS.

Case 68

A male farmer in his 70s died when he was pinned between the tongue of a Great Plains grain drill and the support brace for the arm on the passenger side. The decedent had driven a Case IH 7120 tractor and the attached grain drill to the farm field. The decedent parked the tractor on a slight incline facing north with the grain drill behind the tractor. He exited the tractor and left the tractor running. When the decedent was found, the left drill arm section was partially folded out and the right passenger side was retracted inward, crushing him. It is unknown if the decedent placed the tractor in Park or Neutral when he exited the tractor. The tractor was found by the police department jackknifed toward the right side, but it was unknown to the police department personnel if that was the position it was moved into to free the decedent. If the tractor was in Neutral, it may have rolled backward, pinning the decedent in the position found.

Case 69

A male farmer in his 80s died when the tractor equipped with a front end loader attachment and brush hog he was operating rolled sideways to the right down an approximately six-foot deep embankment crushing his head under the tractor's fender. The decedent was mowing the shoulder of the roadway with his brush hog when the rear wheels slipped and the tractor overturned. The tractor was not equipped with a ROPS.

Case 70

A male farmer in his 70s died when he became entangled in a combine. Due to the outside temperature, the decedent was dressed in layers with many shirts on. The responding police department noted that the decedent's hand and clothing were caught in a sprocket/gear located on the right side of the machine. The sprocket guard was removed to provide access to the decedent.

Case 71

A male excavating crew supervisor in his 50s died when he was crushed by a moving Volvo EC 360 excavator. The operator of the excavator had been moving dirt and rocks restoring a creek bed. The excavator cab was facing south while the engine/crawler was moving back and forth grading the area (tracks were oriented to move east and west). The decedent had been standing to the north of the excavator. He left this area while the excavator was moving and positioned himself near the excavator's northernmost track to retrieve a basketball size rock, which had been uncovered in the construction process. The rocks were being saved to be used for remediation of the creek bed at a later time in the construction. The decedent was positioned in the operator's blind spot. The excavator operator began to move the excavator to the west. A coworker, who was acting as a spotter on the north side of the excavator and was a substantial distance away from the incident area, witnessed the incident. He yelled to the decedent to get out of the way. The decedent was apparently unable to hear him and was knocked to the ground and run over by the excavator track. The excavator operator observed the spotter waving to him and the operator stopped the excavator's movement. A coworker called for emergency response. The decedent was transported to a nearby hospital where he died. MIOSHA found that the excavator had multiple defects, such as leaking hydraulic/oil fluids under the body, missing mirrors, broken horn, broken proximity alarm, obscured right side window and a missing front window. The right side window was constructed of Plexiglas, not safety glass and had been held in place by duct tape. ([MIFACE Summary 289](#))

Case 72

A male construction worker in his 30s died when he was pinned between the basket of the boom lift in which he was working and a horizontal ceiling beam. The decedent was in the process of painting the ceiling beams. Without permission, he borrowed another contractor's JLG B450AJ lift. The decedent had received lift training from his employer regarding the safe use of a Genie S40 lift – he had not received additional training on the differences in the controls of the JLG lift. When the boom of the lift was positioned over the steer wheels, the steering and drive controls moved in opposite directions to the machine's motion. The JLG did not have a drive enable light or switch, as did the Genie S40, to indicate or remind the operator the basket was rotated. The JLG lift was found positioned over the front axle, thus the drive control function was reversed. It appeared that the victim tried to drive forward and, because of the position of the boom and platform over the front axle, the lift traveled backward. The decedent was found pinned between the I-beam

at his back and the upper controls between his stomach and chest. It is unknown how long he was pinned before another contractor employee noticed him and notified the decedent's coworkers. Coworkers, using the ground controls, lowered him 39 feet to the ground. When he was at ground level, coworkers lifted him from the basket and began CPR while awaiting emergency response arrival. The decedent was declared dead at the scene. ([MIFACE Summary 273](#))

Case 73

A male farm hand in his 30s died when he was run over by a Model 555 Ford backhoe tractor while installing agricultural drain tiles in a field. The decedent was working alone and had completed four of six trenches. It is unknown how the decedent was run over by the backhoe. After being run over, he called a co-worker indicating he was badly hurt and needed an ambulance. The owner called for emergency response while he was on the way to the incident site. When the owner arrived, he found the backhoe running, in gear, with its outriggers in the up position, front bucket up and rear bucket touching the ground in a small ravine approximately 44 feet past the decedent. The owner administered first aid to the decedent while awaiting the arrival of emergency response. The condition of the backhoe may have been a factor in this incident. The MIOSHA compliance officer noted that the left front tie rod was broken off of the backhoe with no remnants of a ball joint attached to the main tie rod or found at the scene. MIOSHA also noted a pry bar approximately three feet long sticking in the ground approximately six feet behind where the decedent was laying. The farm owner indicated the pry bar was sometimes used to pry the pin on the rear bucket into place. The farm owner explained black tape used near the rear bucket pivot pin was present to keep a snap ring in place so the pin did not come out. MIOSHA noted excessive wear to the right front tie rod on the backhoe and on the tie rod of the right front hydrostatic steering connection. A bungee cord on the steering column was present to keep the gear shift lever in road gear. MIOSHA construed that steady pressure was needed to keep the backhoe in a higher gear. The MIOSHA compliance officer could not dismiss the probability that the transmission may have had problems in more gears than road gear. The owner indicated he repaired a front pivot pin and did not note any issues with the tie rod. The police noted that when the employer drove the backhoe after the incident, he could not keep a straight path and could not keep its right tire from turning to a 90-degree angle due to its broken tie rod. This condition led the police to believe the tie rod did not come off until the backhoe hit a large rut in the ground which would have happened approximately 42 feet after the decedent had been run over. Police investigation determined that if the tie rod had come off directly after or before the decedent was run over, the backhoe would have had its wheel cocked and could have ended up in a different path of travel. Evidence at the scene led the responding police department to the conclusion that the incident may have occurred while the decedent was getting on or off of the backhoe. The backhoe had a shuttle shift that allowed the backhoe to go into gear without a clutch. The decedent could have engaged the shuttle shift while entering or exiting the backhoe. ([MIFACE Summary 280](#))

Case 74

A male steel plant press operator in his 40s died when his clothing became entangled in a one-inch-wide nip point between a vertical stationary plate and the bottom/return side of a conveyor belt. The stationary plate was positioned just under the discharge end of the belt conveyor. A parts washer fed the washed parts to a belt conveyor that angled slightly upward and then the parts fell to a shaker table located 57 inches above the ground. The end of the conveyor belt was located approximately one to three inches above the shaker table. The parts, after falling from the conveyor, traveled by vibration the length of the table and fell into a tote at

the discharge end. The decedent, who was wearing a hard hat, was working at the shaker table. The decedent's job task was to remove any parts from the shaker table that were dirty or unwanted. An in-running nip point hazard was exposed in the opening on the bottom or return portion of the v-belt at the conveyor roller and the stationary plate. The nip point was not accessible when standing on the floor due to installed side plates on both sides. The decedent did not shut down the table as he climbed up/reached in toward the conveyor belt. It is unknown why the decedent climbed onto the table. He was found lying on the shaker table with his head wedged under the end of the belt conveyor with his clothing wrapped around his upper body and neck. Coworkers shut off the conveyor and lifted it from the decedent to free him. Emergency response was called and transported the decedent to a nearby hospital where he was declared dead. Company procedures required the shaker table to be shut down during cleaning. ([MIFACE Summary 262](#))

Case 75

A male maintenance worker in his 30s died when he was crushed against the machine frame by a lowering a steel coil belt wrapper arm as he was adjusting its belt. The belt, as steel coils were wrapped, becomes off-center and must be readjusted. The line operator worked in an elevated control room. The decedent contacted the line operator by radio and informed him that he was at the machine and planning to enter the work area through its inter-locked gate. It was thought that the gate provided lockout capabilities and that the activation of the machine and its belt wrapper arm could not occur from the operator's control room. The line operator was distracted by another operation and upon looking out the window of his control room he did not observe the decedent. Believing the adjustment had been completed the line operator pressed the appropriate button and lowered the belt wrapper arm. The decedent was positioned between the raised arm and the machine frame while aligning the belt and was crushed when the arm lowered. The line operator did not confirm by radio that the decedent had cleared the area. Another employee heard the decedent scream and radioed the line operator to lift the belt wrapper arm. Emergency response was contacted and the decedent was transported to a local hospital where he died. After the incident, it was found that the interlocked gate did not de-energize the machine/belt wrapper control panel button in the operator control room. The MIOSHA compliance officer found that the firm had a procedure for this task, however the energy source evaluation was inadequate as the procedure did not identify that the lowering of the belt wrapper arm was not controlled by the interlock safety on the entry gate. Following the fatality, the firm has modified the procedure and the belt realignment is performed outside of the interlocked gate using an extended hand tool. ([MIFACE Summary 290](#))

Case 76

A 44-year-old male laborer died when he was crushed between stacker transfer and stacker frame while retrieving a piece of lumber that had fallen to the floor. Lumber from an upstream bin was placed on a roller transfer to be stacked and bundled on a pallet. The roller transfer started in the UP position and as lumber was delivered, stickers were placed on each row. The decedent was working with another employee placing four stickers (wood pieces with dimensions of 1/2-3/4" x 1 1/2-2 inches wide and 4 feet long) to separate the layers of lumber before entering the kiln for drying. Each employee placed two stickers on each row of lumber. The roller transfer lowered with each lumber piece to a predetermined height for the bundle of lumber. Once the predetermined height had been reached, the roller transfer dropped down slightly to match the height of the exit rollers. The rollers on the transfer activated and the bundle of lumber exited the stacking area past two photo eyes. After the lumber passed the photo eyes, the roller transfer automatically rose to the UP position and the process repeated. Sometimes there was a delay in the stacking operation to permit

the upstream bins to be filled with the proper amount of lumber boards before the bins were emptied on the transfer to the stacker line. The stacked lumber remained on the transfer station until the upstream bins were filled. The delay allowed employees time to do other activities, such as cleaning up floor areas. The incident occurred during one of these delays. During the delay, the decedent's coworker left the workstation to use the rest room and apparently the decedent went to retrieve a 2-x4-x8-foot long piece of lumber from under the balcony where he and his coworker stood while the equipment was running. The incident area had standard barriers and a gate that had a sign at one time (DANGER-Lockout). The sign was missing. Similar gates in the area had the DANGER-Lockout sign. After entering through the gate, as the decedent leaned over to pick up the lumber, the transfer roller activated. The stacked bundle moved through the photo eyes, and the roller transfer returned to the UP position. He was trapped between the roller transfer and the stationary frame. The operator of the feeding line to the stacker thought he heard something, turned around and observed the decedent trapped between the two frames. The operator lowered the roller transfer and the decedent fell out of the line and onto the floor. One of the employees ran to the foreman's office to notify the supervisor and to call 911. One of the supervisors ran to his aid to check for a pulse and start CPR until police and EMS arrived. ([MIFACE Summary 266](#))

Case 77

A male machine operator in his 50s died when his clothing on his right arm became entangled on a part being turned on an American Pacemaker lathe. The valve stem (part being turned) that was approximately 57 inches in length and 1½ inches in diameter was being turned at approximately 415 rpm. The incident was unwitnessed. A possible scenario was developed. To prevent the part from wobbling, the decedent, who was wearing two long sleeve shirts and jersey gloves, reached over the valve stem while it was rotating to adjust a steady rest. One of the decedent's coworkers walked past just as decedent was starting the machine after lunch. The coworker heard a noise and when he turned to see what caused the noise he saw decedent entangled by his shirt sleeve around the part and drawn down tight to the part and cutting tool post. His coworker turned off lathe and summoned help. Coworkers removed him prior to emergency response personnel arrival. ([MIFACE Summary 269](#))

Case 78

A male welder in his 50s died when he was pinned between a slowly revolving 30-foot long by 12-foot diameter cylindrical tank and the frame of the feed rollers rotating the tank as he was exiting feet first through a 24-inch diameter manhole opening. Two powered feed rollers at ground level rotated the tank. To control the tank rotation, the decedent had possession of a pendant control with unlabeled buttons inside the tank. The buttons on the pendant are the constant pressure type that required them to be pressed for the rollers to turn. Once released, the rollers coast to a stop and the tank will roll for an additional six inches of revolution. The decedent had completed his welding of the head or the end piece inside the steel tank. Forced air ventilation was in place. The decedent handed the pendant control to the attendant positioned outside through the 24-inch diameter access opening. While the tank was still revolving, the decedent exited the tank feet first. The attendant attempted to stop the revolving tank by pushing the pendant control buttons, but the tank continued to roll. The decedent's lower body was pinned between the roller and the tank at the bottom near floor level. A crane was used to lift the tank off from the decedent. He was declared dead at the scene.

MIOSHA found the following deficiencies of the pendant control:

- Four buttons on the pendant control were not identified as to function

- Cord at pendant was disconnected from the fitting – no strain relief
- No stop device on the pendant or anywhere near the roller
- Cord to pendant was damaged – cut and taped in 2 spots and severely kinked in one.

In addition, MIOSHA found the firm's confined space procedures inadequate in the following areas:

- Atmosphere within the tank was not tested prior to entering that day. Both testers in for repair.
- Inadequate communication between employee within the tank and the attendant. Employer using strobe light/buzzer in the event of an emergency. Neither the strobe light nor buzzer was in place or used this day.
- The decedent had not completed an entry permit. ([MIFACE Summary 272](#))

Case 79

A male scrap material collector in his 60s died when he was pinned between a skid steer bucket and the skid steer frame. The skid steer was positioned perpendicular to the pickup truck the decedent had driven to the site. The hood was up on the pickup truck and there were jumper cables attached running from the pickup to the skid steer. When the decedent did not return home, the decedent's spouse called a family member, who went looking for him. The family member found the decedent and called the decedent's spouse telling her to call for emergency response. Emergency response arrived and the decedent was declared dead at the scene.

Case 80

A male forklift operator in his 40s died of complications due to being pinned between a parked forklift and a forklift transporting a load of parts. The decedent was standing at the back and next to his south-facing Toyota forklift, facing south and using the engine cover as a desk. Another forklift operator was traveling southbound, transporting his load in a forward (not trailing) position. The forklift was carrying two 4-foot by 4-foot nested dunnage racks containing parts which were spaced 1-foot-11-inches apart. The space between the dunnage racks obstructed the operator's vision. The load weighed approximately 2,400 pounds. The forklift operator transporting the parts travelled forward approximately 100 feet when he felt the forklift hit something. He heard the decedent scream. He saw the decedent on the floor, with his left leg/foot pinned either under or stuck in the racks. The forklift operator lifted the rack off of his leg and ran for help. The decedent was conscious, but then became unresponsive. The decedent's coworkers provided resuscitative measures while awaiting EMS arrival. Emergency response was briefly delayed at the security guard station because the guard did not know where to direct the ambulance. EMS arrived at the scene and continued resuscitative measures while transporting the decedent to a local hospital, where he died. ([MIFACE Summary 271](#))

Case 81

A male in his 50s was self-employed mechanic/director of maintenance for a tree service company. He died when he was pinned between the lowering arm and the frame of a skid steer loader he was attempting to repair. The owner of the skid steer contacted the decedent because the skid steer arms/bucket raised and lowered slowly. The day prior to the incident, the decedent looked at the loader and determined there was a hydraulic issue with the loader's arms. On the day of the incident, the decedent arrived, and another employee unloaded the skid steer from a trailer. This employee heard the bucket fall and saw the decedent's

head and torso pinned by the loader's arms and the front frame of the skid steer. He notified the owner of the skid steer, who then called for emergency response. The owner asked a newly arriving employee to use another skid steer in an attempt to raise the skid steer loader's bucket support arm from the decedent. The fire department arrived and the decedent was declared dead at the scene. The police report indicated that the loader was still running and that the loader bucket was could not be raised when they arrived.

Motor Vehicle (25)

Cases 82-106

Case 82

A male farmer in his 50s died when he was struck by an International 1460 combine head that had been struck by an oncoming vehicle and was subsequently dislodged from the combine. The decedent was escorting the combine on a dark, unlit, two-lane paved roadway with a posted speed limit of 55 mph at approximately four hours after sunset. The decedent was driving a pickup truck westbound ahead of the combine. The decedent parked his pickup truck, still facing westbound, with the driver's side tires approximately five inches left of the center line. He exited the pickup truck leaving the headlights on high beam and the emergency flashers operational. He walked back to the combine and stood next to the combine's left front tire to speak with the combine operator. The combine header was 20'6" wide. The combine's headlights were on, as were the yellow solid running lights. The clear lights at the very top of the combine were not on. Two of three clear lower lights were operational. There were no outside marker lights on either end of the combine head. An oncoming eastbound vehicle driver, observing the yellow solid running lights and assuming the vehicle was a tractor, moved to the right (south) side of the eastbound lane. The vehicle struck the left side of the header, causing it to dislodge from the combine and subsequently strike the decedent. The decedent was transported to a nearby hospital where he was declared dead.

Case 83

A male owner of an excavating firm in his 80s died from complications of a closed head injury sustained in a motor vehicle crash that occurred in 1967. It appears that the truck he was driving left the roadway. He was ejected from the vehicle and struck his head.

Case 84

A male builder in his 40s died when the pickup he was driving was struck by a garbage truck that entered an intersection. The decedent was traveling southbound and had the right of way on a dry, two lane road with a posted speed limit of 50 mph. It was the garbage truck driver's first day on the job and that he did not notice the Stop sign on the westbound road he was traveling upon at approximately 25 mph. When the garbage truck entered the intersection, the truck struck the driver's side of the decedent's vehicle, causing it to overturn and land on its roof. The decedent was wearing a seatbelt/shoulder harness. The pickup truck's airbags deployed.

Case 85

A male construction business owner in his 70s died when he was struck by a pickup truck as he was picking up cargo that had fallen from his vehicle. The incident occurred on a dark, unlit, five-lane roadway with a posted speed limit of 45 mph. The decedent was traveling southbound. He had stacked some boxes above

the tailgate. As he accelerated, some of the boxes fell from his vehicle. The decedent noted the boxes fell from the vehicle, made a u-turn, and positioned the vehicle in a left-turn, northbound lane. He parked the vehicle, and left it running with the head lights on and the four-way emergency flashers activated. He exited the vehicle and while picking up the debris in the southbound lane, he was struck by the southbound oncoming pickup truck. Emergency response was called and transported the decedent to a local hospital where he was declared dead.

Case 86

A male laborer in his 50s for an auto parts company died when the pickup truck he was driving ultimately came to rest in a creek. The decedent was delivering automobile parts to a repair shop when the incident occurred. The wet, two-lane paved roadway had a posted speed limit of 40 mph. The responding police determined that the decedent was traveling approximately 80 mph. The pickup truck was in the eastbound lanes. The decedent lost control of the truck and it crossed the curbed median and traveled briefly in the west bound lanes, losing control and crossing back into the east bound lanes near an exit ramp. The decedent crossed in front of the ramp striking the curb and guardrail. This caused the vehicle to become airborne and strike a utility pole, causing the light pole and traffic signals to crash to the ground. The pickup continued traveling east through several trees and then landed in a creek. The cab of the truck was approximately 2/3 full of water with the driver's side fully submerged. Due to the high waters, witnesses were unable to access the vehicle. The decedent was wearing a lapbelt/shoulder harness. The vehicle's airbags did not deploy.

Cases 87 & 88

Two male marketing salespersons for an outsourcing sales and marketing firm, both in their 20s, died when the rear of their passenger car was struck by a pickup truck driven by an individual traveling at a high rate of speed. The two-lane roadway had an unposted speed limit of 55 mph. After the decedent's vehicle was struck, it left the roadway to the left, slid sideways onto the shoulder of the road, rolled forward (end-over-end), entered a ditch and became airborne. While airborne, the car struck a tree approximately 10-15 feet above the ground. Both decedents were wearing a seatbelt/shoulder harness. The vehicle's driver was declared dead at the scene. The decedent's coworker died several days later. The driver of the pickup had a blood alcohol level above 0.08%.

Case 89

A male owner/operator of a landscape supply company in his 50s died when he was struck by an oncoming motorist as he was re-securing a forklift to the back of a flatbed trailer. The two-lane roadway was dry and had an un-posted speed limit of 55 mph. Responding police described the incident roadway as "primarily straight/flat with a measured straight away for westbound vehicles of 1,647 feet" from a house at the intersection of the road the oncoming car had turned from to drive westbound on the incident roadway. The decedent had parked the tractor trailer partially on the roadway due to the space limitations of the site. The semi and trailer were facing westbound. The decedent had used the forklift to unload pallets of brick/brick pavers. The unloading had been completed. The decedent was working at the rear of the flatbed trailer when the westbound driver, who indicated to responding police that he looked down briefly, came upon the semi trailer and decedent. When he looked up, he was unable to stop and struck the decedent and the trailer. Police indicated there were no signs of pre-impact skidding of the striking vehicle. The decedent was not wearing a safety vest and had not marked the roadway indicating that the truck was partially in the roadway. Police found a safety vest in the tractor cab between the seats on the floor. Safety triangles were found in the

lower right outer storage compartment under spare glad hands. The decedent was declared dead at the scene.

Cases 90 & 91

A female truck driver in her 30s and a male truck driver in his 40s who was a passenger in a semi-truck died when the semi driver lost control while braking to avoid a collision. The incident occurred on a dry, two-lane freeway with a posted speed limit of 70 mph. Witnesses stated that another vehicle was tailgating the semi as it was traveling in the left lane of the freeway. The tailgating vehicle moved to the right lane at the same time as the semi-tractor trailer. Both vehicles braked hard and swerved left to avoid a collision in the right lane. The semi began to fishtail and was not able to regain control. The truck then swerved back into the right lane and then into the guard rail and retaining wall. The semi driver was ejected from the semi cab and died. The passenger was wearing a seatbelt/shoulder harness. The semi was not equipped with an airbag.

Case 92

A male semi truck driver in his 40s died when he lost control of his semi-tractor and trailer after it was struck by another vehicle (Vehicle 1). Vehicle 1 was racing another vehicle at a high rate of speed on a dry, three-lane highway with a posted speed limit of 55 mph. The decedent's semi tractor trailer (Vehicle #2) was traveling in the center lane at the posted speed. Vehicle #1 struck the trailer, causing the decedent to lose control of the truck. The truck crossed the right lane of traffic and went up a steep grassy embankment, crashed through a fence and then struck a building and burst into flames. It is unknown if the decedent wore a seatbelt. The semi tractor was not equipped with airbags.

Case 93

A male semi-truck driver in his 50s died when his semi-tractor struck another semi-tractor trailer (Vehicle 1) that was stopped partially in the right-hand travel lane and on the road shoulder. The dry, two-lane expressway had a posted speed limit of 70 mph. It was very early morning, but in the area of the crash, the roadway was lit. Driver of Vehicle 1 had not placed warning triangles behind his trailer warning of the hazard of his parked vehicle. Additionally, the lights and flashers on Vehicle 1 were not operational. The decedent's semi-tractor was unable to avoid the trailer of Vehicle 1 and struck it on the left rear side. Police investigation found that on Vehicle 1, a power wire from the battery to the ignition was broken, which caused Vehicle 1 to stall and lose electrical power. The decedent was not wearing a seatbelt/shoulder harness. The semi-tractor was not equipped with an airbag.

Case 94

A male semi-truck driver in his 30s hauling dry wheat died when he swerved to avoid a semi-trailer that was standing in the right lane. It was raining as the decedent was travelling westbound on a three-lane expressway with a posted speed limit of 70 mph. When he swerved, he lost control of his semi-tractor/trailer. His vehicle struck the standing trailer, and then struck a guardrail. The decedent's semi overturned and blocked all expressway lanes. The decedent was wearing his seatbelt. The semi's airbag did not deploy.

Case 95

A male semi-truck driver in his 50s hauling lumber died when his vehicle left the right side of a two-lane expressway, struck several trees causing the tractor to burst into flames. The posted 70 mph expressway was

dry as he was traveling southbound. It appears the semi began to gradually move from the right travel lane to the paved shoulder. When the tractor tires contacted the grooved warning cuts on the shoulder, the decedent applied the brakes as the semi traveled across the paved shoulder. The vehicle entered a grassy area and then traveled down an embankment. The semi-tractor struck a large tree, and then continued in the same line of travel striking a large group of trees and then caught fire. When it came to rest, the lumber shifted forward and also caught fire, engulfing the cab. The decedent was wearing his seat belt. The tractor cab was not equipped with an airbag.

Case 96

A male semi truck driver in his 60s died when the semi-tractor trailer (Vehicle 2) he was driving struck a disabled semi-tractor trailer (Vehicle 1) with its four-way flashers activated. The incident occurred at dawn on a dry, four-lane expressway with a posted speed limit of 60 mph. The area where the incident took place was in a construction zone that was appropriately marked. The construction activity was off of the road and there was not a lane closure. Both semis had been traveling eastbound. Vehicle 1 was traveling in the left lane of the roadway. The driver reported to the responding police department that he began to have a mechanical issue with the trailer brakes causing the semi to slow down. As the semi was slowing down, the driver activated the four-way flashers and then the semi came to a stop. The decedent's semi was unable to stop in time and crashed into the trailer of Vehicle 1. The decedent was wearing his seatbelt/shoulder harness. The decedent's semi tractor was not equipped with an airbag.

Case 97

A female human resource professional in her 40s died when the car (Vehicle #1) she was driving entered an intersection and was struck by an oncoming vehicle (Vehicle #2) with the right of way. The decedent was traveling east at approximately 28 mph on a two-lane roadway, which had a Stop sign at the intersection. The decedent did not stop at the sign and entered the intersection. Vehicle #2 was southbound travelling at approximately 64 mph. Vehicle #2 struck the driver's side door of the decedent's car. After leaving the roadway, the decedent's vehicle struck a utility pole. The decedent was wearing a seatbelt/shoulder harness. The vehicle's airbags deployed.

Case 98

A female employment staffing firm office manager in her 40s died when she was ejected from her SUV following a loss of vehicle control. While driving northbound in a construction zone with a lane closure and a posted speed limit of 60 mph, the decedent's vehicle left the roadway to the right. As she re-entered the highway, she over-corrected and lost control and slid sideways. The vehicle then rolled several times on the dry, concrete pavement. She was not wearing a seatbelt/shoulder harness. The vehicle's airbag deployed. Post-mortem toxicology indicated a blood alcohol level of 0.22%.

Case 99

A male cleaning company janitor in his 40s drowned when his work van left the road, went down an embankment, and into a retention pond. Passersby saw damage to a fence near the road and investigated. They noted tire tracks down an embankment and the decedent floating in the water approximately 15 feet from shore and the vehicle he was driving submerged in the water approximately 20 feet from him. The accident reconstructionist determined that the decedent travelled a total distance of 169 feet to the water after leaving the roadway. The car travelled 90 feet before striking the first fence and 151 feet before striking another

the fence. The vehicle then changed direction and travelled 17 feet into the water. Published data for reaction times state that a drowsy person may take five seconds to perceive and react to a stimulus while driving. If the decedent had been travelling the posted speed limit of 25 mph he would have been traveling 36.75 feet per second. In five seconds, he would have travelled 183.75 feet, more than the total distance to the water. The roadway in the area of the crash is curved. The accident reconstructionist drew a straight line on a scale diagram from the straight portion of the roadway towards the curve. The straight line matched up with the tire marks off the roadway exactly, meaning that the vehicle was in line with the roadway prior to the curve. The reconstructionist stated that this was consistent with the driver falling asleep prior to the curve in the roadway and failing to negotiate the curve. There was no evidence of braking or driver steering in the tire marks present at the scene. There were no other tire marks present at the scene and vehicle damage was consistent with the impact with the fence and the submersion of the vehicle. Family members stated that the decedent did not know how to swim. The distances at the scene indicated that there was a strong possibility that the decedent may have fallen asleep and did not have had time to react after he ran off the roadway to the left.

Case 100

A female school bus driver in her 50s died as a result of falling into and becoming wedged in the stairwell of a school bus that had left the roadway and tipped onto its side in a ditch. The only passenger who was on the bus indicated that the decedent was distracted by placing a lid on a drink. As the front bus wheels left the roadway and entered the ditch, the decedent bounced out of her seat and fell into the bus stairwell. The decedent landed on her back in the stairwell facing the driver's seat with her head and neck flexed forward against her chest. The bus passenger attempted to help her up from this position, but was unsuccessful. The decedent instructed the bus passenger use the decedent's phone to call her employer. The passenger did as instructed, and gave the location of the bus to the decedent's employer. The employer contacted emergency response. The decedent's position in the bus stairwell caused her to have difficulty breathing. When emergency response arrived, the decedent was unresponsive and was not breathing. Emergency response initiated resuscitative measures and transported her to a local hospital, where she died the following day.

Case 101

A male horse trainer/harness driver in his 20s died when the pickup truck he was driving left the right side of a two-lane roadway and struck a mailbox and then struck a large oak tree head-on. The roadway was dry and had a speed limit of 55 mph. A witness to the incident indicated that the vehicle appeared to accelerate as it left the roadway. The decedent had experienced seizures in the past which was thought to be contributory to this incident. The decedent was wearing his seatbelt/shoulder harness. The pickup's airbags deployed.

Case 102

A male performing arts company owner in his 50s died when he was ejected from a SUV that left the roadway and rolled. The decedent was seated in the left rear passenger positioned directly behind the SUV driver. The incident occurred on a dry, paved, two-lane expressway with a posted speed limit of 70 mph. The SUV was traveling in the passing lane. Witnesses described the SUV as traveling at a high rate of speed. The vehicle then left the roadway to the right, and once off of the roadway, rolled over several times. One of the vehicle's passengers and the vehicle's driver stated to police that a vehicle they were passing began to drift toward the centerline. The driver of the SUV swerved to the left to keep the vehicle from striking

them. The SUV crossed over the rumble strips and onto the dirt edge. The SUV driver overcorrected and the vehicle crossed both travel lanes and then overturned. The decedent was not wearing his seat belt/shoulder harness. The vehicle airbags did not deploy.

Case 103

A male forklift mechanic in his 50s died when the cargo van he was driving struck the rear of a semi-tractor trailer. The two-lane roadway was dry with a posted speed of 70 mph. The two vehicles were traveling eastbound in the right lane. The semi was having mechanical issues. It was unclear if the semi was traveling 30-35 mph or was stopped in the right lane. The semi's four-way flashers were operational. The decedent's vehicle struck the trailer and then went off of the roadway to the right, entered a ditch, struck a tree and then caught fire. The decedent was wearing a seatbelt/shoulder harness. The cargo van's airbags deployed.

Case 104

A male police officer in his 40s died when he was ejected from his police cruiser following a loss of vehicle control while assisting in a vehicle pursuit. The decedent was traveling westbound, on a dry, dark, unlit, two-lane roadway with a posted speed limit of 55 mph. For reasons unknown, the decedent's vehicle ran off the south shoulder of the roadway, and then traveled west along the ditch bank. The vehicle rolled over several times and then struck a fire hydrant crushing the driver's side roof and ejecting the officer through the open passenger side window. The decedent was not wearing a seatbelt/shoulder harness. The vehicle's airbag deployed.

Case 105

A female nurse aid in her 40s died when she was ejected from her vehicle in a motor vehicle crash. The dry, two-lane roadway had a posted speed limit of 55 mph. The decedent's vehicle crossed the centerline and left the roadway. On the roadway shoulder, she applied the brakes as the vehicle struck the end of a guardrail. The vehicle continued to travel into a ravine, coming to rest against a tree. The decedent was not wearing a seatbelt/shoulder harness. The vehicle's airbags did not deploy. It appeared to the responding sheriff that the decedent was distracted or fell asleep when the incident occurred.

Case 106

A male social service organization executive in his 50s died from kidney complications caused by a spinal cord injury and paraplegia from a motor vehicle crash, which occurred while on military maneuvers in Michigan 30 years ago.

Struck By(12)

Cases 107-118

Case 107

A male dairy farmer in his 20s died when a tree being felled struck him. The police report indicated that the large, dead tree took an unpredictable fall. Emergency response was summoned and the decedent was transported to a local hospital, and then transported to another hospital for treatment. He died the next day from the injuries sustained at the time of the incident.

Case 108

A male logger in his 50s died when he was struck by a falling hardwood tree approximately 75 feet tall and 20 inches in diameter at its base. Approximately 50 feet up the tree, it branched into two sections. The decedent and a coworker were hand felling a clump of three hardwood trees (trees with a common base) that could not be felled by mechanical means using the firm's processor. Two of the three trees in the clump had been felled without incident. The incident tree was the last tree of the clump to be felled. A coworker (Coworker 1) was nearby operating a skidder to remove a lodged tree. The terrain was snow covered and the tops from other trees felled previously by mechanical means were present. The ground was mostly flat with small mounds making walking or running difficult. The decedent's coworker (Coworker 2), after notching the tree and before beginning the back cut, checked the area for the location of the decedent and the skidder operator. At this time, the decedent was located behind him. After observing that all coworkers were not in the fall path of the tree, Coworker 2 began the back cut. As the tree began to fall, both of the coworkers observed the decedent in the direction of the fall of the tree. Coworker 2 yelled out to deceased to warn him of the falling tree while Coworker 1 attempted to drive the skidder under the falling tree to keep it from striking the decedent. The decedent was located approximately 50 feet from the base of the tree. As he was diving to a nearby tree top to get out of the way, he was struck in his back and head by one of the branched sections. The decedent was not wearing head protection. His coworkers used a chainsaw to cut the tree away from the decedent. When emergency response arrived, the decedent was declared dead.

Case 109

A male logger in his 50s died when a cedar tree fell onto him while he was cutting up a felled white ash laying on the ground into seven to eight foot pieces. The decedent was using a chainsaw to fell trees and his coworker was using a skidder to move the trees. The decedent, who was wearing a hard hat, felled the white ash and the ash got hung up in a nearby cedar tree. The coworker used the skidder to pull the ash down to the ground. As the decedent was cutting up the ash tree, the cedar tree in which the ash had been hung up fell onto him. The responding police agency noted a ten- to twelve-foot cedar stump and that it was apparent the cedar had snapped and fallen. His coworker did not witness the incident. He noticed the decedent under the cedar tree and used the chainsaw to cut the cedar to free the decedent. He then called for emergency response. Emergency responders transported the decedent to the hospital where he later died from the injuries sustained.

Case 110

A Hispanic male farm worker in his 60s died when an elevated wooden structure with a 5½-foot round by 3½-foot tall plastic, almost full, 550-gallon water tank gave way causing the water tank to land on the decedent. The decedent and the owner were at the incident site working independently. The tank was located on top of a storage platform built by the decedent approximately three years ago. The storage platform was constructed of 4x6 corner posts that were 52 inches tall with 2x6 wood planks across the top for the tank to sit upon. A bottom platform was constructed of 2x6 lumber to provide storage off of the ground. A plastic cover had been installed to cover three sides to create a small storage area underneath the upper platform/tank. The storage area housed material such as plastic binding strap and several shovels used in the farm activities. Most of platform wood was not wolmanized for outdoor use. The nails used for assembly were standard nails not galvanized nails. It is postulated that the decedent was under the tank in the storage area retrieving tools when the wooden structure collapsed. The owner heard the sound of the crash and went to the incident scene. He found the decedent under the tank and called a neighbor who called for emergency response.

Case 111

A male logging firm co-owner in his 40s died when he was struck by a falling tree. The incident occurred in a heavily wooded area of private property. Cherry trees to be felled and removed from the site had been marked. One of the decedent's coworkers was nearby spotting the operation and another coworker was in the staging area where he was piling logs for shipping. The decedent made a proper notch and back cut in the cherry tree and it fell in the direction intended. While falling, it appeared that the tree rotated 180 degrees as demonstrated by the orientation of the notch; the notch was facing up rather than facing the ground or fall line. As the cherry tree fell, it struck smaller trees, bending them backwards. When the trees snapped back, they struck surrounding dead trees and limbs, setting off a domino falling of the dead trees. The domino effect came around to the side and circled back to the decedent's position as he was moving away from the fall line toward the next tree to be cut. A tree that was falling back towards him struck another dead tree, causing a six-inch diameter by six-foot-long upper section of this tree to break off. The decedent was in the appropriate retreat path twelve to fifteen feet behind where the selected cherry tree was felled when he was struck on the right side of his head by the broken section of tree. The decedent was wearing head, eye and hearing protection during the cutting process. The spotter ran to the staging area and contacted his coworker. Because the crew did not have cell phones, one of the workers ran to a nearby home. The homeowner contacted emergency response. CPR was given to the decedent while awaiting emergency response arrival. He was declared dead at the scene. ([MIFACE Summary 281](#))

Case 112

A male farmer in his 30s was sitting in a horse-drawn buggy connected to a wagon carrying eight round hay bales. The wooden yoke between the horses broke as he was traveling downhill on the road. When the yoke broke, it caused the wagon tongue to drop down, come loose, and break. The now out-of-control wagon began to travel down a 20-foot embankment on the side of the road. The decedent either jumped or fell from the buggy. The wagon ran over him as it traveled to a stop on the embankment.

Case 113

A male well and pump servicing company owner in his 40s died when he was run over by a well drilling truck at a residential home. The truck had been backed up the inclined driveway to the residence. The decedent had placed a wooden block in front of the first rear tire on the driver's side of the truck. The truck was being repositioned in the driveway when the incident occurred. The owner of the well drilling truck entered the driver's seat and "pushed off" the air brake. The decedent, who was wearing gloves, got down on his knees on the driver's side of the truck and grabbed the wooden block with his left hand. The truck rolled forward, and his gloved hand was caught between the block and the tire. The decedent's left arm was pinned under the truck, and then the truck rolled onto the decedent's head. The truck driver then placed the truck into reverse, and the decedent was thrown from beneath the rotating tire. Emergency response was called. The decedent was declared dead on arrival at the hospital.

Case 114

A male certified diesel mechanic in his 20s died when he was struck by an exploding rim of a tractor-trailer tire. A customer brought in a tractor trailer unit which had a flat tire. After removing the tire, the decedent obtained a replacement tire that was mounted on a three-piece rim manufactured in 1960 and set it against an overhead door frame. With the driver observing the decedent, the decedent checked the air pressure of

the replacement tire. The driver informed the MIOSHA compliance officer that the tire had approximately 70 psi and that the decedent indicated the tire needed a little more air pressure. The MIOSHA compliance officer noted that the air pressure on the gauge from the air compressor was approximately 190 psi. The decedent was kneeling down in the path of trajectory in front of the tire and rim adding a couple of pounds of pressure at a time. He was using an air gauge with a magnifying lens and short hose, not a clip-on chuck with a sufficient hose length or an inline regulator with a preset desired tire pressure. The truck driver was looking away when he heard a loud explosion. The driver looked back and saw the decedent approximately five feet away from the tire, lying on the floor unresponsive. The decedent's head was struck by the exploding rim; the tire was still intact. The rim had split into two pieces. The driver went to the office and informed them of the incident. Office personnel called for emergency response. The decedent was declared dead at the scene. ([MIFACE Summary 282](#))

Case 115

A male press operator in his 50s was walking beneath a mezzanine when he was struck by a 1,650 pound bag of pressed pigment that fell from the mezzanine. The mezzanine barrier had gates that opened and closed to permit the loading of palletized material. Under the mezzanine was a strobe light that flashed erratically (between 1 and 20 seconds) indicating that loading activities were in process and that employees/fork trucks were not permitted in the area. The mezzanine, which was approximately fifteen feet above the plant floor, was a "holding area" for further processing of the pressed pigment. A forklift operator (Operator #1) on the first floor placed a pallet with an unsecured bag of pressed pigment on the mezzanine landing. Operator #1 then placed a second pallet with an unsecured bag of pressed pigment on the mezzanine and used the second pallet to push the first pallet back, away from the mezzanine edge. This action caused the second pallet to "ride up" and partially rest on the first pallet, rendering the second pallet unstable. Operator #1 left the area to obtain another pallet of material while a forklift operator (Operator #2) working on the mezzanine was moving the first pallet of material for further processing. When Operator #2 lifted the first pallet, the 1,650 pound bag of pressed pigment on the second pallet shifted, "rolled" off the pallet and fell from the mezzanine to the floor. The decedent was walking to his workstation and was struck by the falling bag of material. The area where the decedent was walking was not a designated walkway. Operator #2 was unaware that the bag of material struck the decedent. Operator #2 came down from the mezzanine and was in the process of finding another bag which could be used to hold the spilled pigment when she noted that the decedent was under the spilled material. Operator #2 summoned help and arriving employees attempted to clear the material from the decedent and to pull the bag off of him. The bag was too heavy for them to move, so Operator #1, who had arrived at the incident scene and had activated the firm's emergency response team, used a forklift to move the bag from the decedent. His coworkers provided first aid while awaiting the arrival of emergency response. Emergency response transported the decedent to a local hospital where he died several days later from complications of the injuries sustained. ([MIFACE Summary 287](#))

Case 116

A male food distributor truck driver in his 50s died when he was crushed by a backing vehicle against a loading dock door. The decedent had returned to the warehouse from his delivery route with his semi-truck. He backed and parked his truck at a loading dock and entered the warehouse. Another semi-truck and trailer arrived and backed into an adjacent loading dock. The driver exited his truck and headed to-

ward the building when the decedent told the driver that the dock lock did not engage and he needed to pull forward. The driver returned to his truck and pulled forward and stopped his truck. The driver exited his truck, and began to walk towards the rear of the trailer to inspect the dock lock when he made it half way back. The decedent made the comment that the dock lock engaged and the driver was good to bring it back. The driver re-entered his cab to back up the trailer the remainder of the way, finish paperwork and unload the trailers contents. The decedent was found by a warehouse worker a short time later pinned between the warehouse loading dock wall and the backing semi's trailer. Emergency response was called and the decedent transported to a local hospital where he was declared deceased. ([MIFACE Summary 291](#))

Case 117

A male horse and carriage owner/operator in his 60s died when a 500-600 pound oblong hay bale fell onto him. The bale measured approximately eight feet long by three feet wide. It appeared the decedent stacked two of the bales on top of one another in the back of his pickup truck. The decedent backed the vehicle near a tree. He placed a strap around the bottom bale and the tree, entered the pickup, and pulled forward. The bales exited the rear of the truck and landed on two boards that were placed two to three feet apart perpendicular to one another. The bales upon exiting the truck may not have been stable. Hay was found on the tree, indicating that the bale may have been resting upon the tree trunk. It appears that the decedent may have been trying to pull the bale and dislodge it from the tree when the bale fell onto him. He was found lying on his right side with the hay bale lying on his left side.

Case 118

A female mail carrier in her 40s died when she was pinned by an eight-inch thick slab of concrete from a collapsed porch. The decedent was standing on the ten-foot by ten-foot concrete porch when it collapsed. Under the porch was a ten-foot-deep root cellar. The porch broke into two large pieces. Both the decedent and the broken concrete porch slabs fell to the bottom of the root cellar. The decedent was pinned under the concrete slabs. The decedent was able to notify a coworker via cell phone of the incident. The coworker called for emergency response and the postal office. Emergency response arrived, and the decedent was declared dead at the scene.

Suicide (16)

Cases 119-134

Case 119

A male farmer in his 60s died from a self-inflicted gunshot wound.

Case 120

A male foundation repair owner in his 50s died from a self-inflicted hanging.

Case 121

A male building supply store worker in his 70s died due to a self-inflicted gunshot wound

Case 122

A male automobile parts manufacturing worker in his 40s died due to a self-inflicted gunshot wound.

Case 123

A male automobile broker/owner in his 30s died from a self-inflicted gunshot wound.

Case 124

A male warehouse worker in his 30s died from a self-inflicted hanging.

Case 125

A female retail store owner in her 40s died due to an intentional overdose of prescription medication.

Case 126

A male telecommunications service technician in his 40s died due to a self-inflicted hanging.

Case 127

A male real estate firm owner in his 50s died from a self-inflicted gunshot wound.

Case 128

A male attorney in his 60s died from a self-inflicted gunshot wound.

Case 129

A male school performing arts assistant director in his teens died from a self-inflicted hanging.

Case 130

A male surgeon in his 60s died due to a self-inflicted hanging.

Case 131

A male auto detailing firm owner in his 30s died from a self-inflicted hanging.

Case 132

A male parole agent in his 60s died from a self-inflicted gunshot wound.

Case 133

A male sheriff deputy in his 60s died from a self-inflicted gunshot wound.

Case 134

A male consulting business owner in his 40s died from a self-inflicted gunshot wound.

Toxic Exposure (4)**Cases 135-138****Case 135**

A male gas utility worker in his 50s died due to asphyxia while repairing a 6-inch, cast iron natural gas line. The decedent was a member of a two-person work crew. After determining the location of the leak, an eight-foot long by four-foot wide by six-foot deep excavation was dug and the main exposed. The decedent donned his airline respirator and entered the excavation. After examining the leak, he determined it

was a leak that could be repaired with a full seal gasket clamp. His coworker was at the top of the excavation and gathered supplies for the decedent. After installing the clamp to a point where the leak was stopped and while wrapping the clamp with the approved corrosion protection coating, he removed his airline respirator, which was in compliance with company procedure (company procedure indicated that if no gas was flowing, a respirator need not be used). While the decedent was wrapping the clamp, his coworker went to the truck to get the additional materials. His coworker heard the sound of gas blowing and immediately went back to the excavation. The decedent was on his knees slumped over the pipe and did not respond to his coworker. His coworker attempted to reach in and grab the decedent but could not reach him. The coworker called for emergency response. Police were first on the scene. One of the responding officers donned a self contained breathing apparatus and took a tow strap from his vehicle. Asking the decedent's coworker for a ladder, the police officer entered the excavation and placed the tow strap around the decedent and then threw the end of the tow strap to the surface. While in the excavation, the police officer assisted other police officers in pulling the decedent from the excavation. The gas leak was still occurring during this rescue operation. The decedent was transported by ambulance to a nearby hospital where he was declared dead. Another repair crew was dispatched to the scene and noted a softball size hole in the bottom of the pipe, and in the side of the pipe between the main and the street. He also noticed that there was a crack that propagated in both directions as a result of the failure.

Case 136

A male construction superintendent in his 40s drowned in a manhole after he was overcome by the manhole atmosphere while descending a ladder to rescue another worker who had been overcome by the atmosphere. The decedent's employer was overseeing a construction project. A subcontractor with two employees was digging a trench to connect a six-inch sewer lead from a newly constructed building to a sewer line. The subcontractor employees and another of the decedent's coworkers walked to the manhole to determine the necessary path of the sewer lead. As they were walking to the manhole, the decedent asked one of the subcontractor employees if they were going to enter the manhole, to which they responded no entry was to take place. One of the two subcontractors went to his truck to retrieve a flashlight. One of the individuals removed the manhole cover, and one stood by the manhole. The subcontractors were planning to measure the manhole height. One of the subcontractors was kneeling down or on his stomach leaning into the manhole with a tape measure checking the manhole depth and stated the tape was too short. The subcontractor's coworker witnessed him lose consciousness and fall into the 21-foot deep manhole. As the decedent's coworker was walking to the manhole, he heard one of the subcontractor employees yelling that his coworker had fallen into the manhole. This worker landed at the base of the manhole face up; his head was above the liquid at the bottom of the manhole. The decedent's coworker ran to his truck to retrieve a rope. The decedent ran to the manhole and entered the manhole via the ladder rungs affixed to the inside of the manhole. The subcontractor stated to the decedent's coworker when he arrived with the rope that the decedent stated he couldn't breathe as he was climbing down the ladder. He was overcome when his head was approximately four feet below the ground surface. His hands released from the ladder rungs and he fell backwards into the manhole, head first, face down in the water. Emergency response was called. When the police arrived, the officer, wearing respiratory protection, entered the manhole and was lowered via the rope by the subcontractor employee and the decedent's coworker. After being lowered, a food delivery truck driver arrived, and stating he was ex-military, wrapped a shirt around his face and he entered the manhole. After a few minutes, the police officer yelled

that he needed to come up and he climbed out of the manhole via the ladder rungs. The officer took off his mask, and the decedent's coworker threw it down to the food delivery driver. The food delivery driver tried to tie a strap around the decedent so that he could be pulled out, but was unsuccessful. The decedent's coworker brought another strap to the incident scene - a heavy duty tow strap with an eyelet. Soon other departments arrived. The excavating machine was used to lift the decedent out of the manhole using a combination of ropes and tow straps. The decedent was transported to a nearby hospital where he was declared dead. The individual he was attempting to rescue survived. ([MIFACE Summary 278](#))

Case 137

A male automobile mechanic in his 30s died due to carbon monoxide poisoning. The decedent was painting a room in a home utilizing a portable generator for power and was overcome by the carbon monoxide emitted by the generator. Laboratory tests post mortem indicated a carbon monoxide level of 72% in his blood.

Case 138

A female semi-truck driver in her 50s died due to complications of exposure to a diesel fuel splash. The decedent was dispensing diesel into a semi-truck fuel tank at a fuel aisle. The fuel nozzle had an automatic shut-off system that detected the amount of diesel in the tank and stopped the fuel flow when the tank was full. It appeared that the decedent thought the nozzle had clicked off indicating the tank was full. The nozzle had not clicked off, and when she removed the nozzle, she was splashed with diesel fuel on her face, body, and clothing. She entered the facility and went to the bathroom where she washed her face. The supervisor obtained a change of clothes for her. The clothes change occurred approximately five to ten minutes after the incident. The union steward asked if she would like to go to the medical clinic; she stated no. After approximately fifteen minutes, the decedent changed her mind and a taxi was summoned to take her to the medical clinic. The decedent showered at the clinic and was evaluated by the clinic nurse. The decedent became agitated because the clinic nurse could not authorize her to go home. The decedent began to hyperventilate. She developed shortness of breath so the nurse called for an ambulance. The ambulance transported the decedent to a nearby hospital, where her condition deteriorated. She was then transferred to another hospital where she died the next day of acute respiratory distress syndrome/diffuse alveolar damage. ([MIFACE Summary 283](#))

Other

Case 139

A male emergency medical technician in his 40s died due to a heart attack after attempting to restrain a psychiatric patient.

Unknown

Case 140

A male ironworker in his 70s died from cerebrovascular disease which was a complication of spinal injuries sustained at a construction site in 1972.