

FEBRUARY 21, 2012

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# 2010 ANNUAL REPORT

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## TRACKING WORK-RELATED DEATHS IN MICHIGAN



February 21, 2012

# MICHIGAN



## Prevention through comprehensive research and investigation

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### Michigan State University Department of Medicine

117 West Fee Hall  
East Lansing, MI 48824  
517.353.1846

Kenneth D. Rosenman, MD  
Debra A. Chester, MS

### Michigan Department Licensing and Regulatory Affairs

PO Box 30649  
Lansing, MI 48909  
517.322.1817  
Douglas J. Kalinowski, MS CIH  
Director MIOSHA

### Acronyms

**BLS** Bureau of Labor Statistics

**MDLARA** Michigan Department of Licensing and  
Regulatory Affairs

**MSU OEM** Michigan State University Occupational and  
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 Code

Thanks to the health and safety commitment of those employers, health and safety professionals, and regulatory personnel who appreciate the significance of ensuring a safe workplace, as well as all of the people who took the time to share their thoughts and experience about a work-related death and its impact on their life.

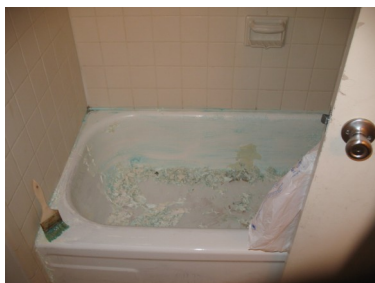
There are many resources available to help employers, employees, safety and health professionals and others understand more about work-related deaths. Links to these resources can be found at: [www.oem.msu.edu](http://www.oem.msu.edu).

This report was funded by NIOSH, under cooperative agreement #1 U60 CC521205-01.

## Summary

This is the 10<sup>th</sup> annual report on acute traumatic work-related (WR) deaths in Michigan. There were **144 WR deaths in 2010**, representing 138 employers and 139 separate incidents. The **number of deaths increased 50.0%** from 2009 when there were 96 WR deaths. Fewer individuals were working in Michigan in 2010 compared to 2009 and the rate of WR death per 100,000 workers increased 54.5% from 2.2 in 2009 to 3.4 in 2010.

## Summary, continued...



*Bathtub refinisher died due to overexposure to methylene chloride*



*Farmer died when non-ROPS-equipped tractor rolled down culvert slope while leveling field*

- ◆ Agriculture had the highest number of WR deaths (25), followed by Construction (22) and then Transportation and Warehousing (20).
- ◆ Agriculture and Transportation and Warehousing had the largest numerical change in the number of deaths—the number of deaths increased by 14 in each industry sector from 2009 to 2010.
- ◆ Agriculture had the highest risk of incurring a WR death per 100,000 workers (29.3) followed by Construction (18.2) and then Transportation and Warehousing (16.8).
- ◆ The most common cause of death was motor vehicle (28), followed by homicide (26), and then falls (24). The number of WR homicides increased by 160% compared to 2009 (26 in 2010 compared to 10 in 2009).
- ◆ Individuals who died were most likely to be men (91%), white (82%), married (64%), and have at least a high school education (84%). The average age was 49 and ranged from 16 to 87.
- ◆ Most WR fatal injuries occurred on a Tuesday (20.1%). August was the month in which most of the WR fatalities occurred (17, 11.8%).
- ◆ Work-related fatal injuries occurred in 43 of Michigan's 83 counties. Wayne County had the highest number (35), followed by Kent (11) and Oakland (10).
- ◆ Of the 144 WR fatalities, 38 (26.4%) were MIOSHA program-related.

## Background

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

The goal of the MIFACE program is to prevent WR deaths by identifying and investigating work situations at high risk for injury and disseminating prevention strategies to those who can intervene in the workplace.

## Sources Used to Identify WR Deaths

- ◆ MIOSHA
- ◆ Death Certificates
- ◆ Newspapers
- ◆ Medical Examiners (ME), Police and Fire Departments
- ◆ Workers' Compensation Agency
- ◆ MSU Agricultural Extension

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

**The toll-free hotline to report a death is:**

**1-800-866-4674**

## WR Deaths Tracking Procedures in Michigan

### IDENTIFY INDIVIDUALS

- ◆ **Receive Report of Death**
- ◆ **Determine if WR Death**
  - 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

### GATHER INFORMATION

- ◆ **Contact**
  - 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**

### CONTACT EMPLOYER/FARM FAMILY

- ◆ **Send Letter and Brochure about MIFACE program**
- ◆ **Follow-up phone contact**
  - 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

### MIFACE SITE VISIT

- ◆ **Explain MIFACE program**
- ◆ **Complete appropriate re-search forms**
- ◆ **Conduct interviews with appropriate personnel**
  - 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

#### Report Includes:

- 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

### FOLLOW UP ACTIVITIES

- ◆ **Identify Stakeholders**
  - Internet search for similar companies and/or trade groups
- ◆ **Update Database**
  - Information collected from each site visit and statewide tracking entered into a database
- ◆ **Analyze Data**
  - Annual Report developed analyzing and discussing data
- ◆ **Educational Outreach**
  - MIFACE Summary of MIOSHA Investigation if MIOSHA investigation takes place
  - Hazard Alert

### FOLLOW UP ACTIVITIES

- ◆ **Educational Outreach**
  - Post on MSU OEM website:
    - 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



*Farmer died due to fall from ladder while fixing cattle pen*

## Results

There were 144 traumatic work-related deaths in 2010. One hundred forty two (98.6%) of the work-related traumatic incidents occurred in 2010. Two individuals died of complications from head injuries that occurred prior to 2010:

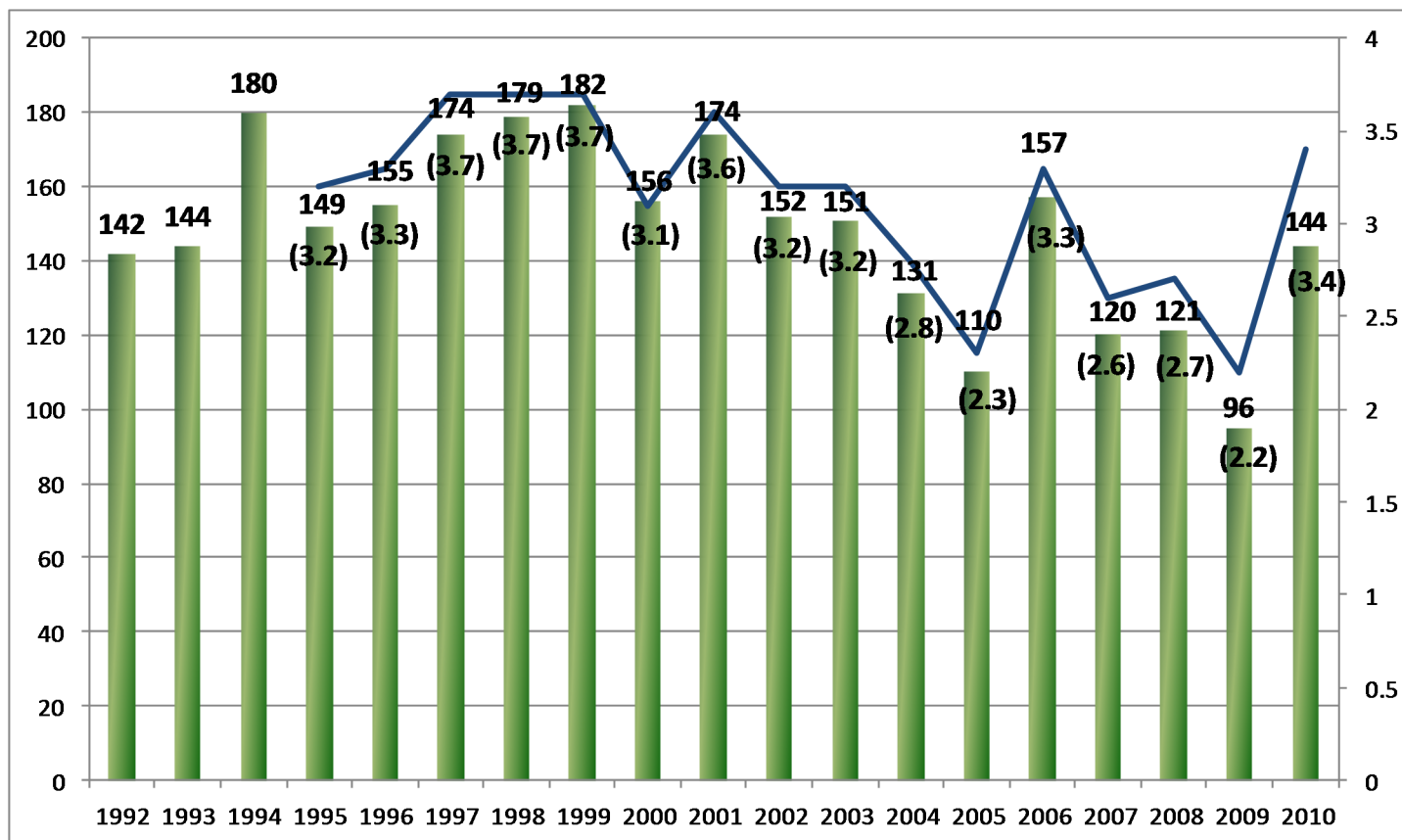
- ♦ 2001: one individual fell from a roof
- ♦ 2009: one individual fell from the cargo box of a Cub Cadet 4x4 utility vehicle



*Township supervisor died due to an explosion from a spark entering a waste barrel*

The number of traumatic work-related deaths per year in Michigan since 1992 is shown in **Figure 1**. Incidence rates (per 100,000 workers) are shown by the **blue line**. Number of work-related deaths per year are shown by the **green columns**. Rates shown from 1995-2000 were provided by the BLS website. Rates shown for 2001-2010 were determined from MIFACE statistics. Incidence rates were not calculated for the years 1992-1994.

**Figure 1. Number of Traumatic Work-Related Fatalities, Michigan 1992-2010**





## Demographics

### Race/Ethnicity

**Table 1** shows the distribution of demographic characteristics of 144 traumatic WR fatalities in Michigan in 2010.

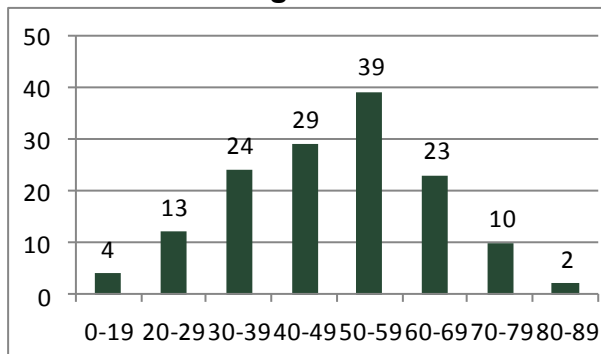
One hundred five (80.2%) of the 131 men were Caucasian, 16 (12.2%) men were African-American, and one (0.8%) man was identified as American Indian/Alaskan Native. One male identified as Caucasian had his ethnicity identified as Hispanic. Nine (6.9%) men were identified as Hispanic for both race and ethnicity. All of the women were Caucasian.

### Age

The age distribution of the 144 individuals who died from a work-related injury is shown in Table 1 and **Figure 2**. The ages ranged from 16 to 87; 2 deaths in youths under 18 years of age and 12 (8.4%) deaths in individuals 70+ years old.

The average age was 49.0 years, which was slightly higher than the average of 47.2 years in 2009.

**Figure 2. Age Distribution of Traumatic Work-Related Fatalities, Michigan 2010**



**Table 1. Demographic Characteristics of Traumatic Work-Related Fatalities, Michigan 2010**

Demographic Characteristics		Number	Percent
<b>Sex</b>			
	Male	131	91.0
	Female	13	9.0
<b>Race</b>			
	White	118	81.9
	Black	16	11.1
	American Indian/Alaskan Native	1	0.7
	Hispanic (as identified on DC)	9	6.3
<b>Age</b>			
	<20	4	2.8
	20-29	13	9.0
	30-39	24	16.7
	40-49	29	20.1
	50-59	39	27.1
	60-69	23	16.0
	70-79	10	6.9
	80-89	2	1.4
<b>Marital Status</b>			
	Never Married	30	21.0
	Married	92	64.3
	Divorced	19	13.3
	Widowed	2	1.4
	Unknown	1	—
<b>Educational Level</b>			
	Less than High School	23	16.3
	High School Graduate	73	51.8
	Some College (1-4 years)	39	27.7
	Post College (5+ years)	6	4.3
	Unknown	3	—
<b>Total</b>		<b>144</b>	

Individuals 50-59 years of age had the greatest number of deaths (39, 27.31), followed by individuals in the age group of 40-49 years (29, 20.1%).

## Demographics, continued...

### Age

**Table 2** shows the age of the individual who died and the industry in which he/she worked. A 16-year-old male worked in Retail Trade (suicide) and a 17-year-old Hispanic male worked in Agriculture (entered a tank containing a feed supplement).

Sixty percent of the individuals aged 70-79 and 50.0% of the individuals older than 80 years of age who died from traumatic WR incidents worked in Agriculture. Four of the seven Agricultural incidents in those over 70 involved non-rollover protected structure (non-ROPS)-equipped tractors (2 rollover incidents and 2 run over incidents).

Approximately 28% of all deaths in the 50-59 year-old age group occurred in the Transportation/Warehousing; these 11 deaths accounted for 55% of all Transportation/Warehousing deaths.

**Table 2. Traumatic Work-Related Fatalities by Age of Victim and Industry Sector, Michigan 2010**

Industry Sector (NAICS Code)	16-19	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	4		4	4	4	6	1	25
Utilities (22)			1		2				3
Construction (23)		1	3	7	6	5			22
Manufacturing (31-33)			1	1	2	2			6
Wholesale Trade (42)					1	2			3
Retail Trade (44-45)	1	2	4	3	4	2			16
Transportation & Warehousing (48-49)	1		1	2	11	3	2		20
Information (51)		1	1	1					3
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	4	1	1				7
Education (61)					1				1
Health Care & Social Assistance (62)			2	3	1	1		1	8
Arts, Entertainment & Recreation (71)		1	1		2				4
Accommodation & Food Services (72)		1	1			1			3
Other Services (except Public Administration) (81)		1	3	4	2	1	2		13
Public Administration (92)		1	1	1	1	1			5
<b>Total</b>	<b>4</b>	<b>13</b>	<b>24</b>	<b>29</b>	<b>39</b>	<b>23</b>	<b>10</b>	<b>2</b>	<b>144</b>

## Demographics, continued...

### Marital Status

Ninety two (64.3%) individuals who died from traumatic WR incidents were married, 30 (21.0%) were never married, 19 (13.3%) were divorced, and 2 (1.4%) were widowed. The marital status was unknown for one male. Eighty five men (65.4%) were married, 28 (21.5%) were never married, 16 (12.3%) were divorced, and 1 (0.8%) was widowed. Of the 13 females, 7 (53.8%) were married, 2 (15.4%) were never married, 3 (23.1%) were divorced and 1 (7.7%) was widowed.

### Educational Level

**Table 3** shows the distribution of educational level by industry.

Overall, 23 (16.3%) individuals had not completed high school, 73 (51.8%) completed high school, 39 (27.7%) completed one to four years of college, and 6 (4.3%) completed 5+ years of college.

Two of the 23 individuals who had not completed high school were high school students at the time of their death.

Educational level was unknown for three individuals.

**Table 3. Traumatic Work-Related Fatalities by Educational Level of Victim and Industry Sector, Michigan 2010**

Industry Sector (NAICS Code)	Did Not Complete High School		Completed High School No College		Some College (1-4 Years)		Post College (5+)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture, Forestry, Fishing & Hunting (11) <sup>ab</sup>	7	29.2	11	45.8	5	20.8	1	4.2
Utilities (22)	-	-	2	66.7	1	33.3	-	-
Construction (23)	3	13.6	12	54.5	7	31.8	-	-
Manufacturing (31-33)	-	-	5	83.3	1	16.7	-	-
Wholesale Trade (42)	-	-	1	33.3	2	66.7	-	-
Retail Trade (44-45) <sup>a</sup>	2	12.5	7	43.8	6	37.5	1	6.3
Transportation & Warehousing (48-49)	3	15.0	15	75.0	2	10.0	-	-
Information (51) <sup>b</sup>	-	-	1	50.0	1	50.0	-	-
Real Estate & Rental & Leasing (53)	-	-	1	50.0	1	50.0	-	-
Professional, Scientific & Technical Services (54)	-	-	1	33.3	1	33.3	1	33.3
Administrative & Support & Waste Management & Remediation Services (56)	1	14.3	3	42.9	3	42.9	-	-
Education (61)	-	-	-	-	1	100.0	-	-
Health Care & Social Assistance (62)	2	25.0	1	12.5	3	37.5	2	25.0
Arts, Entertainment & Recreation (71)	1	25.0	2	50.0	1	25.0	-	-
Accommodation & Food Services (72) <sup>b</sup>	1	50.0	1	50.0	-	-	-	-
Other Services (except Public Administration) (81)	3	23.1	8	61.5	1	7.7	1	7.7
Public Administration (92)	-	-	2	40.0	3	60.0	-	-
<b>Total</b>	<b>23</b>		<b>73</b>		<b>39</b>		<b>6</b>	

<sup>a</sup> One individual was in high school at the time of his death. <sup>b</sup> Education level unknown for one individual.



## Demographics, continued...

**Within industries having 13 or more deaths**, the most common education level among individuals who died was completing high school but no college. Transportation and Warehousing had the *highest percentage* of individuals who were high school graduates but did not attend college (15, 75.0%), followed by Other Services (8, 61.5%). Agriculture and Retail Trade had the lowest percentage (11, 45.8% and 4, 43.8% respectively).

Construction had the *largest number* (7, 31.8%) of individuals with some college who died in a WR incident, followed by Retail Trade (6, 37.5%), and then Agriculture (5, 20.8%).

Agriculture had the largest number of individuals who had not completed high school (7, 29.2%); one of the seven deaths included a 16-year-old youth.

Overall, of the 23 individuals who had not completed high school, two individuals in the age group 16-19 were still in high school, two were 20-29, four were 30-39, three were 40-49, four were 50-59, three were 60-69, four were 70-79 (3 of the 4 worked in agriculture), and one was 80-87. Twenty of the 23 (87.0%) were male and three (13.0%) were female.

Of the 39 individuals who had completed 1-4 years of college, 35 (89.7%) were male and 4 (10.3%) were female. Of the six individuals who had completed post-graduate education, 5 (83.3%) were male and 1 (16.7%) was female.

## Drug/Alcohol/Medication Use

Of the 132 individuals whose death was not a suicide (10 deaths) or a drug overdose (2 deaths), a toxicology screen was performed on 104 (78.8%) individuals for alcohol and for illegal, prescription and non-prescription drugs; 58 (55.8%) individuals had detectable levels of alcohol, illegal, prescription, or non-prescription drugs in their bloodstream, excluding caffeine, nicotine, niacin and naproxen. Thirty of the 104 (28.8%) deaths where alcohol, medication or drug use was assessed or 22.7% of all non-suicide/drug overdose deaths had levels on autopsy that may have been a contributory factor to the fatal incident.

Six individuals had levels of alcohol (at or above 0.08%) and/or drugs in their bloodstream which were felt to be contributory to their death. In addition to the alcohol, three of the six individuals also had other drugs in their bloodstream. One individual had cocaine, one individual had marijuana, and one individual had citalopram in his bloodstream.

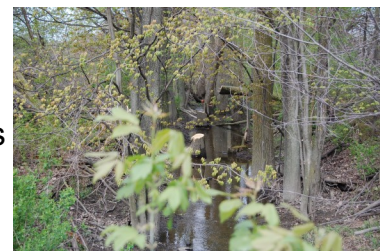
Eight individuals had detectible levels of illegal drugs. Six individuals had marijuana in their bloodstream; one of these six individuals also had morphine in their bloodstream. One individual had methamphetamine, and one had cocaine (also alprazolam, a prescription medication).

Prescription medications that were considered possibly contributory included hydrocodone, midazolam, mirtazapine, lamotrigine, alprazolam, bupropion, venlafaxine, benzodiazepine, citalopram,

## Demographics, continued...

### Drug/Alcohol/Medication Use, continued.

cyclobenzaprine, fentanyl, and fluoxetine. Non-prescription medications included diphenylhydramine.



*Male trustee struck by falling tree while clearing drain*

## Work-Related Event Details

### Day of Injury

Although the 2010 WR fatalities were evenly distributed during the traditional work week, overall, the largest number of work-related fatal injuries occurred on a Tuesday (29, 20.1%), followed by Monday (27, 18.8%), Wednesday (25, 17.4%), and then Friday (22, 15.3%).

**Table 4** shows the day of injury for industries with 13 or more deaths. Agriculture accounted for 50% of the fatal injuries that occurred on a Sunday (5 of 10, 50%). Agriculture had the largest number of fatal injuries occur on a Wednesday. In Construction and Transportation/Warehousing, Monday was the weekday when most fatal injuries occurred. Tuesday was the week day of the largest number of fatal injuries in Other Services, and in Retail Trade, Tuesday and Wednesday had the same number of fatal injuries (4 each).

Friday was the day most likely to have a WR homicide occur (6), followed by Tuesday and Thursday (5 each).

**Table 4. Traumatic Work-Related Fatalities by Day of Injury and Industry Sector, Michigan 2010**

Day of Injury	All Deaths		Agriculture, Forestry, Fishing & Hunting <sup>a</sup> (NAICS 11)		Construction (NAICS 23)		Transportation/Warehouse (NAICS 48-49)		Retail Trade (NAICS 44-45)		Other Services (NAICS 81)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Monday	27	18.8	4	16.0	6	27.3	6	30.0	2	12.5	1	7.7	4	15.4
Tuesday	29	20.1	3	12.0	3	13.6	4	20.0	4	25.0	6	46.2	5	19.2
Wednesday	25	17.4	6	24.0	4	18.2	2	10.0	4	25.0	-	-	3	11.5
Thursday	19	13.2	2	8.0	2	9.1	2	10.0	2	12.5	-	-	5	19.2
Friday	22	15.3	3	12.0	5	22.7	3	15.0	2	12.5	2	15.4	6	23.1
Saturday	12	8.3	2	8.0	1	4.5	3	15.0	1	6.3	2	15.4	2	7.7
Sunday	10	6.9	5	20.0	1	4.5	-	-	1	6.3	2	15.4	1	3.8
<b>Total</b>	<b>144</b>		<b>25</b>		<b>22</b>		<b>20</b>		<b>16</b>		<b>13</b>		<b>26</b>	

<sup>a</sup> Only industries with 13 or more deaths are included in the table.

## Work-Related Event Details, continued...

### Month of Injury

Overall, August had the highest number of injuries resulting in fatalities (17, 11.8%), followed by July and November (16 each, 11.1%), then December (14, 9.7%), then October (13, 9.0%) and then September and March (12, 8.3%). June had 11 (7.6%) injuries, January and May had 9 (6.3%), April had 8 (5.6%) and February had 7 (4.9%) injuries. March was when most homicides occurred (5, 19.2%). Homicides accounted for 41.7% of all WR fatalities that occurred in March. **Table 5** shows the month of injury for industries with 13 or more deaths, and WR homicides, by month.

**Table 5. Traumatic Work-Related Fatalities by Month of Injury and Industry Sector, Michigan 2010**

Month of Injury	All Deaths		Agriculture, Forestry, Fishing & Hunting <sup>ab</sup> (NAICS 11)		Construction (NAICS 23) <sup>b</sup>		Transportation /Warehouse (NAICS 48-49)		Retail Trade (NAICS 44-45) <sup>c</sup>		Other Services (NAICS 81) <sup>d</sup>		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
January	9	6.3	-	-	1	4.5	1	5.0	2	12.5	2	15.4	2	7.7
February	7	4.9	1	4.0	1	4.5	2	10.0	1	6.3	1	7.7	2	7.7
March	12	8.3	2	8.0	1	4.5	-	-	-	-	3	23.1	5	19.2
April	8	5.6	1	4.0	1	4.5	1	5.0	1	6.3	-	-	2	7.7
May	9	6.3	-	-	1	4.5	2	10.0	-	-	1	7.7	2	7.7
June	11	7.6	3	12.0	2	9.1	1	5.0	1	6.3	3	23.1	2	7.7
July	16	11.1	4	16.0	4	18.2	2	10.0	1	6.3	-	-	3	11.5
August	17	11.8	2	8.0	2	9.1	2	10.0	1	6.3	3	23.1	3	11.5
September	12	8.3	5	20.0	3	13.6	1	5.0	-	-	-	-	-	-
October	13	9.0	3	12.0	1	4.5	3	15.0	2	12.5	-	-	2	7.7
November	16	11.1	4	16.0	4	18.2	2	10.0	3	18.8	-	-	1	3.8
December	14	9.7	-	-	1	4.5	3	15.0	4	25.0	-	-	2	7.7
<b>Total</b>	<b>144</b>		<b>25</b>		<b>22</b>		<b>20</b>		<b>16</b>		<b>13</b>		<b>26</b>	

<sup>a</sup> Only industries with 13 or more deaths are included in the table. <sup>b</sup> One individual was a homicide victim.

<sup>c</sup> Eight individuals were homicide victims. <sup>d</sup> Five individuals were homicide victims.

In Agriculture, the harvest months of September, October and November accounted for almost half of all WR fatal injuries (12 of 25, 48.0%). July had 4 fatal injuries and June had 3 fatal injuries. Three months (January, May and December) did not have a fatal injury.

Construction was the only industry which had at least one fatality per month. Fatalities were evenly distributed throughout the winter and spring months (December-May (1 each, 4.5%). June through November accounted for the nearly 75% of all WR fatal injuries in Construction. The months of July and November had the largest number of fatal injury incidents (4 each, 18.2%), followed by September (3, 13.6%)

## Work-Related Event Details, continued...

### Month of Injury, cont.

In Transportation/Warehousing, only March did not have fatal injury occur. Four months (January, April, June and September) had one fatal injury; five months (February, May, July, August and November) had two fatal injuries, and two months (October and December) had 3 fatal injuries.

In Retail Trade, the winter months of November, December and January had 9 of the 16 (56.3%) WR fatal incidents and no WR fatal incidents in March, May and September. Homicides accounted for 50.0% (8 of 16 fatal incidents) in Retail Trade and 38.5% (5 of 13 fatal incidents) in Other Services. All of the WR homicides occurring in November and December occurred in Retail Trade. **Table 6** shows the month of the fatal injury by cause of death.

**Table 6. Traumatic Work-Related Fatalities by Month of Injury and Cause of Death, Michigan 2010**

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	-	-	-	-	-	-	2	-	-	2	-	-	4
Drowning	-	-	-	-	1	-	-	1	-	-	-	-	2
Drug Overdose	-	-	-	-	1	-	1	-	-	-	-	-	2
Electrocution	-	-	-	1	-	1	1	3	-	1	-	-	7
Fall	4	4	2	-	-	1	-	1	2	2	4	4	24
Fire/Explosion	-	-	-	1	-	-	-	-	-	-	-	2	3
Heat/Cold	-	-	-	-	-	1	-	-	-	-	-	-	1
Homicide	2	2	5	2	2	2	3	3	-	2	1	2	26
Machine	1	-	1	-	1	3	1	2	2	2	2	-	15
Motor Vehicles	2	-	2	2	1	2	2	3	6	-	4	4	28
Other	-	-	-	-	1	-	-	1	-	-	-	-	2
Struck By	-	-	-	1	1	1	3	-	1	2	3	2	14
Suicide	-	-	1	1	1	-	1	2	-	2	2	-	10
Toxic Exposure	-	1	1	-	-	-	2	1	1	-	-	-	6
<b>Total</b>	<b>9</b>	<b>7</b>	<b>12</b>	<b>8</b>	<b>9</b>	<b>11</b>	<b>16</b>	<b>17</b>	<b>12</b>	<b>13</b>	<b>16</b>	<b>14</b>	<b>144</b>

The most common cause of a WR death was due to a motor vehicle; motor vehicle-related deaths most frequently occurred in September (6), followed by November and December (4 each). A WR fatal injury caused by a fall occurred most frequently during late fall and winter (November through February) when 4 fatal injury events occurred each month.

## Work-Related Event Details, continued...

### Time of Injury

The time of the injury could be determined within a 4-hour time period in 135 of the 144 (93.8%) work-related deaths. The 24-hour day was divided into 4-hour time periods: 12:00 a.m. - 3:59 a.m., 4:00 a.m. - 7:59 a.m., 8:00 a.m. - 11:59 a.m., 12:00 p.m. - 3:59 p.m., 4:00 p.m. - 7:59 p.m., and 8:00 p.m. - 11:59 p.m.

Overall,

- ◆ 37 (27.4%) incidents occurred between 8:00 a.m. - 11:59 a.m.,
- ◆ 36 (26.7%) incidents occurred between 12:00 p.m. - 3:59 p.m.,
- ◆ 29 (21.5%) incidents occurred between 4:00 p.m. - 7:59 p.m.,
- ◆ 13 (9.6%) incidents occurred between 12:00 a.m. - 3:59 a.m.
- ◆ 10 incidents each (7.4%) occurred between 4:00 a.m. - 7:59 a.m., and 8:00 p.m. - 11:59 p.m.



*Truck driver died when crushed by rotating excavator*

**Table 7** shows the 4-hour time periods for industries with 13 or more deaths, and for homicides.

**Table 7. Traumatic Work-Related Fatalities by Time of Incident and Industry, Michigan 2010**

Time of Incident	All Deaths		Agriculture, Forestry, Fishing & Hunting <sup>ad</sup> (NAICS 11)		Construction <sup>d</sup> (NAICS 23)		Transportation /Warehouse (NAICS 48-49)		Retail Trade <sup>e</sup> (NAICS 44-45)		Other Services <sup>f</sup> (NAICS 81)		Homicide	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
12am-3:59am	13	9.6	-	-	1	5.0	4	20.0	1	7.1	-	-	6	25.0
4am-7:59am	10	7.4	-	-	2	10.0	5	25.0	1	7.1	-	-	1	4.2
8am-11:59am	37	27.4	6	24.0	6	30.0	5	25.0	3	21.4	5	41.7	4	16.7
12pm-3:59pm	36	26.7	8	32.0	8	40.0	1	5.0	2	14.3	6	50.0	4	16.7
4pm-7:59pm	29	21.5	11	44.0	3	15.0	3	15.0	4	28.6	-	-	6	25.0
8pm-11:59pm	10	7.4	-	-	-	-	2	10.0	3	21.4	1	8.3	3	12.5
<b>Total</b>	<b>135*</b>		<b>25</b>		<b>20<sup>c</sup></b>		<b>20</b>		<b>14<sup>c</sup></b>		<b>12<sup>b</sup></b>		<b>24<sup>c</sup></b>	

\* Time of Injury unknown for 9 individuals. <sup>a</sup> Only industries with 13 or more deaths are included in the table.

<sup>b</sup> Time of Injury was unknown for one individual. <sup>c</sup> Time of Injury unknown for two individuals.

<sup>d</sup> Industry had one homicide. <sup>e</sup> Industry had eight homicides. <sup>f</sup> Industry had five homicides.



## Work-Related Event Details, continued...

### Time of Injury, cont.

In Agriculture, most common time of a WR fatal injury was outside of normal working hours (4:00 p.m. to 7:59 p.m.) when 11 fatal injuries (44.0%) occurred. During the normal working hours of 8:00 a.m. to 3:39 p.m., 14 (56.0%) fatal injuries were sustained. There were no fatal work-related injuries in the 16-hour time period of 8:00 p.m. to 7:59 a.m.

In Construction, the normal work day of 8:00 a.m. to 4:00 p.m. had 14 of the 20 (70.0%) known time periods of a WR fatal injury. The time period of 12:00 p.m. to 3:59 p.m. had the largest number (8).

In Transportation/Warehousing, all 4-hour time periods experienced at least one fatal injury. The time periods of 4:00 a.m. to 7:59 a.m. and 8:00 a.m. to 11:00 a.m. had the largest number of fatal WR incidents (5 each).

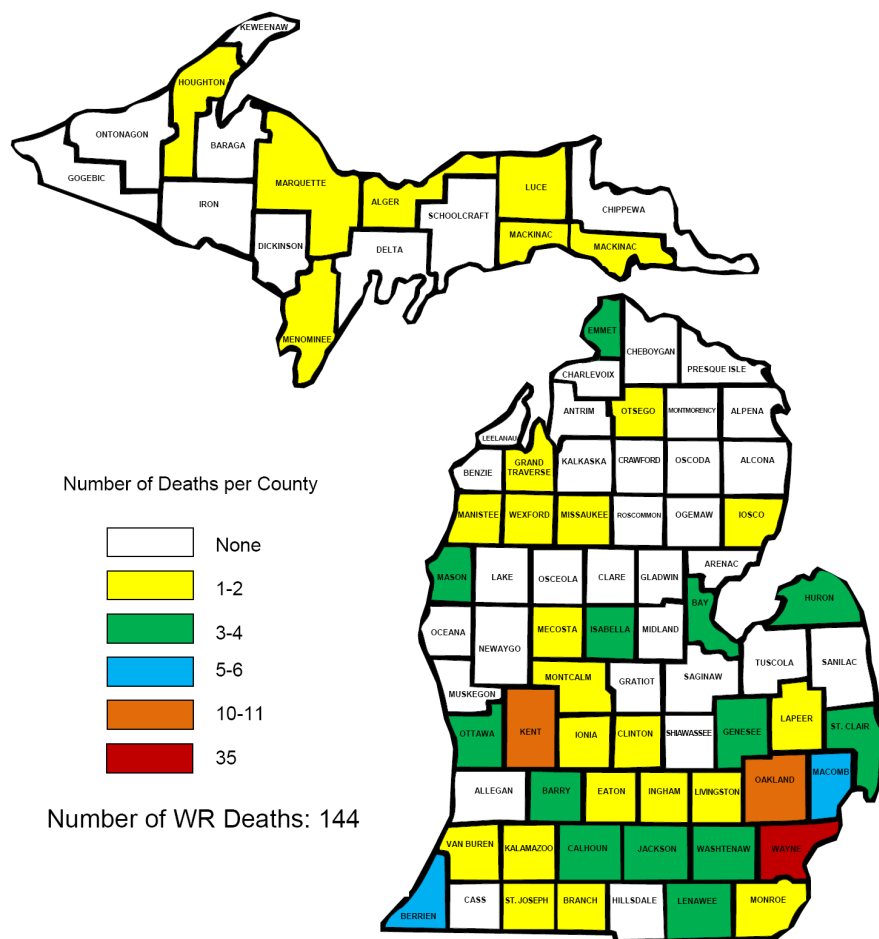
Retail Trade also had WR fatal injuries in all 4-hour time periods. Three of the four deaths that occurred between 4:00 p.m. to 7:59 p.m. and two of the three deaths that occurred between 8:00 p.m. to 11:59 p.m. were homicides.

**Figure 3. Traumatic Work-Related Fatal Injuries by County of Incident, Michigan 2010**

### Location in State

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

The 144 WR fatal injuries occurred in 43 of Michigan's 83 (51.8%) counties. Wayne County had the largest number of fatal injuries, 35 (24.3%). The southeast Michigan counties of Wayne, Oakland, Macomb, Washtenaw and Monroe accounted for 55 (38.2%) of the fatal work-related injuries; Oakland had 10 (6.9%) fatal injuries, Macomb County had 6 (4.2%) fatal injuries, Washtenaw had 3 (2.1%) fatal injuries, and Monroe had 1 (0.7%).



## Work-Related Event Details, continued...

### County of Incident, cont.

Outside of the metro Detroit area, Kent County had the largest number of WR fatal injuries (11, 7.6%) followed by Berrien (5, 3.5%) and then Bay, Genesee, Lenawee, and Ottawa with 4 each (2.8%).

**Table 8. Traumatic Work-Related Fatal Injuries by County of Incident, Michigan 2010**

County	Number	Percent	County	Number	Percent	County	Number	Percent
Alcona	-	-	Gratiot	-	-	Missaukee	2	1.4
Alger	1	0.7	Hillsdale	-	-	Monroe	1	0.7
Allegan	-	-	Houghton	1	0.7	Montcalm	1	0.7
Alpena	-	-	Huron	3	2.1	Montmorency	-	-
Antrim	-	-	Ingham	1	0.7	Muskegon	-	-
Arenac	-	-	Ionia	1	0.7	Newaygo	-	-
Baraga	-	-	Iosco	1	0.7	Oakland	10	6.9
Barry	3	2.1	Iron	-	-	Oceana	-	-
Bay	4	2.8	Isabella	3	2.1	Ogemaw	-	-
Benzie	-	-	Jackson	3	2.1	Ontonagon	-	-
Berrien	5	3.5	Kalamazoo	2	1.4	Osceola	-	-
Branch	1	0.7	Kalkaska	-	-	Oscoda	-	-
Calhoun	3	2.1	Kent	11	7.6	Otsego	1	0.7
Cass	-	-	Keweenaw	-	-	Ottawa	4	2.8
Charlevoix	-	-	Lake	-	-	Presque Isle	-	-
Cheboygan	-	-	Lapeer	2	1.4	Roscommon	-	-
Chippewa	-	-	Leelanau	-	-	Saginaw	-	-
Clare	-	-	Lenawee	4	2.8	St. Clair	3	2.1
Clinton	1	0.7	Livingston	1	0.7	St. Joseph	1	0.7
Crawford	-	-	Luce	2	1.4	Sanilac	-	-
Delta	-	-	Mackinac	1	0.7	Schoolcraft	-	-
Dickinson	-	-	Macomb	6	4.2	Shiawassee	-	-
Eaton	2	1.4	Manistee	2	1.4	Tuscola	-	-
Emmet	3	2.1	Marquette	2	1.4	Van Buren	1	0.7
Genesee	4	2.8	Mason	3	2.1	Washtenaw	3	2.1
Gladwin	-	-	Mecosta	1	0.7	Wayne	35	24.3
Gogebic	-	-	Menominee	1	0.7	Wexford	2	1.4
Grand Traverse	2	1.4	Midland	-	-			

### Place of Injury/Place of Death

The most common places of injury were a street/highway (24, 16.7%), followed by a farm (16, 11.1%), and then a home and/or home garage (both personal residence and group homes) and retail establishments (12 each, 8.3%). A construction site was the injury location for 10 (6.9%) incidents. Seventy four (51.4%) individuals were declared dead at the incident site, 68 (47.2%) individuals at the hospital, and 2 (1.4%) at their personal residence.

## Work-Related Death Details, continued...

### Industry Highlights, Michigan 2010

The number of WR deaths in 2010 rose 50.0% compared to 2009 (144 deaths compared to 96 deaths). The respective employment-based incidence rate increased 54.5%, 3.4 deaths/100,000 compared to 2.2 deaths/100,000.

- ◆ Nine industry sectors had a larger number and rate of WR deaths in 2010 compared to 2009:
  - Agriculture: +14 deaths (25 deaths (29.3/100,000) compared to 11 deaths (12.9/100,000))
  - Transportation & Warehousing: +14 deaths (20 deaths (16.8/100,000) compared to 6 deaths (4.4/100,000))
  - Other Services: +10 deaths (13 deaths (10.7/100,000) compared to 3 deaths (2.5/100,000))
  - Retail Trade: +6 deaths (16 deaths (3.6/100,000) compared to 10 deaths (2.2/100,000))
  - Health Care: +6 deaths (8 deaths (1.4/100,000) compared to 2 deaths (0.4/100,000))
  - Construction: +3 deaths (22 deaths (18.2/100,000) compared to 19 deaths (15.3/100,000))
  - Public Administration: +3 deaths (5 deaths (2.0/100,000) compared to 2 deaths (0.8/100,000))
  - Utilities: +2 deaths (3 deaths (15.2/100,000) compared to 1 death (5.1/100,000))
  - Professional, Scientific & Technical Services: +1 death (3 deaths (1.3/100,000) compared to 2 deaths (0.9/100,000))
  - Education: +1 death (1 death (0.2/100,000) compared to 0 deaths in 2009)
- ◆ Two industry sectors the same number but had a higher of WR deaths in 2010 as in 2009:
  - Real Estate & Rental & Leasing: (2 deaths, 4.2/100,000 compared to 4.1/100,000)
  - Arts, Entertainment & Recreation: (4 deaths, 7.7/100,000 compared to 7.0/100,000)
- ◆ Four industry sectors had fewer WR deaths and a lower rate in 2010 compared to 2009:
  - Administrative & Support & Waste Management & Remediation: -6 deaths (7 deaths (2.9/100,000) compared to 13 deaths (5.6/100,000))
  - Manufacturing: -5 deaths (6 deaths (1.3/100,000) compared to 11 deaths (2.4/100,000))
  - Accommodation & Food Service: -2 deaths (3 deaths (0.9/100,000) compared to 5 deaths (1.6/100,000))
  - Mining: -1 death (0 deaths in 2010 compared to 1 death (18.1/100,000))
- ◆ One industry sector had the same rate and number of deaths in 2010 as in 2009: Wholesale Trade (3 deaths, 2.0/100,000).

## Work-Related Death Details, continued...

### Industry Information

**Table 9** shows the number of work-related fatalities and Michigan's annual incidence rate by industry sector for number of employees and by hours worked for 2010.

**Table 9. Traumatic Work-Related Fatalities and Incidence Rates  
by Industry Sector, Michigan 2010**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based (per 100,000 FTE)	
			Number Employees <sup>a</sup>	Rate <sup>b</sup>	Number Hours <sup>a</sup>	Rate <sup>d</sup>
<b>Agriculture, Forestry, Fishing &amp; Hunting (11)</b>	<b>25</b>	<b>17.4</b>	<b>85,339<sup>e</sup></b>	<b>29.3</b>		
Crop Production (111)	14	9.7	53,500	26.2		
Animal Production (112)	9	6.3	31,839	28.3		
Forestry & Logging (113)	2	1.4	--	--		
<b>Utilities (22)</b>	<b>3</b>	<b>2.1</b>	<b>19,724</b>	<b>15.2</b>		
Utilities (221) (Power Generation & Supply)	3	2.1	19,724	15.2		
<b>Construction (23)</b>	<b>22</b>	<b>15.3</b>	<b>120,858</b>	<b>18.2</b>	<b>39.5</b>	<b>18.4</b>
Construction of Buildings (236)	2	1.4	25,802	7.8	38.1	8.1
Heavy & Civil Engineering Construction (237)	3	2.1	13,880	21.6		
Specialty Trade Contractors (238)	17	11.8	79,987	21.3	40.3	21.1
<b>Manufacturing (31-33)</b>	<b>6</b>	<b>4.2</b>	<b>475,671</b>	<b>1.3</b>	<b>44.0</b>	<b>1.1</b>
Food Manufacturing (311)	1	0.7	34,137	2.9		
Printing & Related Support Activities (323)	1	0.7	14,069	7.1		
Chemical Manufacturing (325)	1	0.7	25,360	3.9		
Fabricated Metal Product Manufacturing (332)	1	0.7	64,357	1.5	42.4	1.5
Machinery Manufacturing (333)	1	0.7	55,295	1.8	43.3	1.7
Miscellaneous Manufacturing (339)	1	0.7	17,614	5.7		
<b>Wholesale Trade (42)</b>	<b>3</b>	<b>2.1</b>	<b>149,712</b>	<b>2.0</b>	<b>37.7</b>	<b>2.1</b>
Merchant Wholesalers, Durable Goods (423)	1	0.7	80,472	1.2	37.4	1.3
Merchant Wholesalers, Nondurable Goods (424)	2	1.4	44,995	4.4		
<b>Retail Trade (44-45)</b>	<b>16</b>	<b>11.1</b>	<b>444,324</b>	<b>3.6</b>	<b>29.3</b>	<b>4.9</b>
Motor Vehicle & Parts Dealers (441)	1	0.7	51,222	2.0	34.0	2.3
Furniture & Home Furnishing Stores (442)	2	1.4	11,873	16.8		
Building Material & Garden Equipment & Supplies Dealers (444)	1	0.7	39,280	2.5		
Food & Beverage Stores (445)	3	2.1	75,497	4.0		
Gasoline Stations (447)	4	2.8	23,736	16.9		
Sporting Goods, Hobby, Book & Music Stores (451)	1	0.7	20,256	4.9		
General Merchandise Stores (452)	3	2.1	109,690	2.7		
Miscellaneous Store Retailers (453)	1	0.7	22,206	4.5		

**Table 9, continued....**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based (per 100,000 FTE)	
			Number Employees <sup>a</sup>	Rate <sup>b</sup>	Number Hours <sup>a</sup>	Rate <sup>d</sup>
<b>Transportation &amp; Warehousing (48-49)</b>	<b>20</b>	<b>13.9</b>	<b>96,448</b>	<b>16.8</b>		
Air Transportation (481)	2	1.4	13,363	15.0		
Truck Transportation (484)	9	6.3	34,456	26.1		
Transit & Ground Passenger Transportation (485)	1	0.7	5,894	17.0		
Scenic & Sightseeing Transportation (487)	1	0.7	463	216.0		
Support Activities for Transportation (488)	3	2.1	11,680	25.7		
Postal Service (491)	1	0.7	22,900 <sup>c</sup>	4.4		
Couriers & Messengers (492)	1	0.7	10,106	9.8		
Warehousing & Storage (493)	2	1.4	11,949	16.7		
<b>Information (51)</b>	<b>3</b>	<b>2.1</b>	<b>55,350</b>	<b>5.4</b>	<b>32.6</b>	<b>6.7</b>
Broadcasting (ex. Internet) (515)	1	0.7	5,542	18.0		
Telecommunications (517)	2	1.4	20,832	9.6		
<b>Real Estate &amp; Rental &amp; Leasing (53)</b>	<b>2</b>	<b>1.4</b>	<b>47,836</b>	<b>4.2</b>		
Real Estate (531)	1	0.7	34,604	2.9		
Rental & Leasing Services (532)	1	0.7	12,402	8.1		
<b>Professional, Scientific, &amp; Technical Services (54)</b>	<b>3</b>	<b>2.1</b>	<b>222,461</b>	<b>1.3</b>	<b>33.6</b>	<b>1.6</b>
Professional, Scientific, & Technical Services (541)	3	2.1	222,461	1.3		
<b>Administrative &amp; Support &amp; Waste Management &amp; Remediation Services (56)</b>	<b>7</b>	<b>4.9</b>	<b>242,689</b>	<b>2.9</b>		
Administrative & Support Services (561)	6	4.2	232,146	2.6		
Security Guards & Patrol Services (562)	1	0.7	10,457	9.6		
<b>Education (61)</b>	<b>1</b>	<b>0.7</b>	<b>413,300<sup>e</sup></b>	<b>0.2</b>		
Education (611)	1	0.7	413,300	0.2		
<b>Health Care &amp; Social Assistance (62)</b>	<b>8</b>	<b>5.6</b>	<b>564,100<sup>e</sup></b>	<b>1.4</b>	<b>31.3</b>	<b>1.8</b>
Ambulatory Health Care Services (621)	3	2.1	184,500	1.6		
Nursing & Residential Care Facilities (623)	4	2.8	98,100	4.1		
Social Assistance (624)	1	0.7	60,700	1.6		

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.



**Table 9, continued....**

Industry Sector (NAICS Code)	Number	Percent	Employment-Based		Hours-Based (per 100,000 FTE)	
			Number Employees <sup>a</sup>	Rate <sup>b</sup>	Number Hours <sup>a</sup>	Rate <sup>d</sup>
<b>Arts, Entertainment, &amp; Recreation (71)</b>	<b>4</b>	<b>2.8</b>	<b>51,674</b>	<b>7.7</b>	<b>22.9</b>	<b>13.5</b>
Performing Arts, Spectator Sports, & Related Industries (711)	2	1.4	8,782	22.8		
Amusement, Gambling & Recreation (713)	2	1.4	38,283	5.2		
<b>Accommodation &amp; Food Services (72)</b>	<b>3</b>	<b>2.1</b>	<b>325,149</b>	<b>0.9</b>	<b>22.8</b>	<b>1.6</b>
Accommodation (721)	1	0.7	34,941	5.7		
Food Services & Drinking Places (722)	1	0.7	287,962	0.3		
<b>Other Services (except Public Administration) (81)</b>	<b>13</b>	<b>9.0</b>	<b>122,057</b>	<b>10.7</b>		
Repair & Maintenance (811)	9	6.3	33,933	26.5		
Personal & Laundry Services (812)	1	0.7	35,877	2.8		
Religious, Grantmaking, Civic, Professional & Similar Organizations (813)	3	2.1	44,659	6.7		
<b>Public Administration (92)</b>	<b>5</b>	<b>3.5</b>	<b>252,500<sup>c</sup></b>	<b>2.0</b>		
Justice, Public Order, & Safety Activities (922)	5	3.5	--	--		
<b>Total</b>	<b>144</b>					

<sup>a</sup> Source: Michigan Department of Energy, Labor and Economic Growth, Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2010. Accessed November 21, 2011. [www.milmi.org/cgi/dataAnalysis/](http://www.milmi.org/cgi/dataAnalysis/)

<sup>b</sup> Incidence rates calculated per 100,000 workers.

<sup>c</sup> Source: Michigan Department of Labor and Economic Growth, Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2010. November 11, 2011. [www.milmi.org/cgi/dataAnalysis/](http://www.milmi.org/cgi/dataAnalysis/)

<sup>d</sup> 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)

<sup>e</sup> Source: USDA, National Agricultural Statistics Service. 2007 Census of Agriculture, AC-07-A-51, Issued February 2009, Updated December 2009. Accessed November 11, 2011

[www.agcensus.usda.gov/Publications/2007/Full\\_Report/index.asp](http://www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp).

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

**Employment-based rates** measured the risk of fatal injury for those employed during a given period of time, regardless of hours worked. **Hours-based 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). Employment- and hours-based 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.

## Work-Related Death Details, continued...

**Table 10** compares the employment-based and hours-based incidence rate by industry in Michigan to national hours-based rates for 2010. The overall employment-based fatality rate per 100,000 workers in Michigan for 2010 was lower than the United States hours-based incidence rate (3.4 compared to 3.5).

**Table 10. Traumatic Work-Related Fatalities by Industry Sector, Michigan  
Rates Compared to US Rates, 2010**

Industry Sector <sup>a</sup> (NAICS Code)	Number of Fatalities	2010 MI Employment- based Rate <sup>b</sup>	2010 MI Hours-Based Rate	2010 US Hours-Based Rate <sup>c</sup>
Agriculture, Forestry, Fishing and Hunting (11)	25	29.3	-	26.8
Utilities (22)	3	15.2	-	2.5
Construction (23)	22	18.2	18.4	9.5
Manufacturing (31-33)	6	1.3	1.1	2.2
Wholesale Trade (42)	3	2.0	2.1	4.8
Retail Trade (44-45)	16	3.6	4.9	2.2
Transportation and Warehousing (48-49)	20	16.8	-	13.1
Information (51)	3	5.4	6.7	1.5
Real Estate and Rental and Leasing (53)	2	4.2	-	-
Professional and Business Services <sup>d</sup> (54, 56)	10	2.1	2.5	2.5
Educational and Health Services (61, 62)	9	0.9	-	0.9
Leisure and Hospitality <sup>d</sup> (71, 72)	7	1.9	3.3	2.2
Other Services (except Public Admini- stration) (81)	13	10.7	-	3.0
Public Administration (92)	5	2.0	-	
Total	144	3.4	-	3.5

<sup>a</sup> 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/](http://www.nass.usda.gov/census/). Accessed November 11, 2011. Michigan Department of Labor and Economic Growth, Office of Labor Market Information, Industry Employment (Establishments-CES) (IES), Michigan, Year: 2010. Accessed November 11, 2011. [www.milmi.org/cgi/dataAnalysis/](http://www.milmi.org/cgi/dataAnalysis/). Michigan Department of Energy, Labor and Economic Growth, Office of Labor Market Information, Industry Census of Employment & Wages (QCEW-ES202), Michigan, Year: 2010. Accessed November 21, 2011. [www.milmi.org/cgi/dataAnalysis/](http://www.milmi.org/cgi/dataAnalysis/)

<sup>b</sup> Incidence rates calculated per 100,000 workers

<sup>c</sup> Bureau of Labor Statistics News, United States Department of Labor, USDL 10-1142, Release Date: August 25, 2010. Accessed November 11, 2011. <http://www.bls.gov/iif/home.htm>

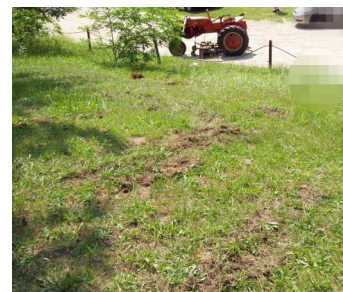
<sup>d</sup> Hours based rate calculated as (N/EH) x 200,000,000 where (from Table 9): N=Number fatalities (NAICS+NAICS), E=Number Employees (NAICS+NAICS), H= Average Hours Worked, 200,000,000=base for 100,000 equivalent full-time workers (working 40 hours per week, 50 weeks per year)

## Work-Related Event Details, continued...

Of Michigan industries with a known hours-based incidence rate, Information, Retail Trade and Construction had markedly higher hours-based rates than the national rate. For Information, the Michigan hours-based rate was 400% higher (6.7 compared to 1.5). Retail Trade was 225% higher (4.9 compared to 2.2) and Construction was nearly 200% higher (18.4 compared to 9.5). Manufacturing was 44% lower than the US rate (2.1 compared to 4.8)

**Table 11** shows the means of death by industry sector. Motor vehicles were the leading cause of a WR fatality (28, 19.4%), followed by homicide (26, 18.1%), falls (24, 16.7%), and then machines (15, 10.4%).

Motor vehicles were the leading cause of death in Transportation and Warehousing (10, 50.0%). Machines were the leading cause of death in Agriculture (10, 40.0%) and falls were the leading cause of death in Construction (7, 31.8%). Homicides were the leading cause of death in Retail Trade (8, 50.0%), Other Services (5, 38.5%), Arts, Entertainment & Recreation (2, 50.0%). Accommodation & Food Services (2, 66.7%) and Public Administration (3, 60.0%).



*Volunteer cutting grass at camp died when tractor over-turned*

**Table 11. Traumatic Work-Related Fatalities by Means of Death and Industry Sector, Michigan 2010**

Industry Sector (NAICS Code)	Aircraft (2.8%)	Drowning (1.4%)	Drug Overdose (1.4%)	Electrocution (4.9%)	Fall (16.7%)	Fire/Explosion (2.1%)	Heat/Cold (0.7%)	Homicide (18.1%)	Machine (10.4%)	Motor Vehicle (19.4%)	Other (1.4%)	Struck By (9.7%)	Suicide (6.9%)	Toxic Exposure (4.2%)	Total
Agriculture, Forestry, Fishing & Hunting (11)	-	1	-	1	2	-	-	1	10	3	-	4	-	3	25
Utilities (22)	-	-	-	1	1	1	-	-	-	-	-	-	-	-	3
Construction (23)	-	-	1	1	7	-	-	1	-	4	-	5	1	2	22
Manufacturing (31-33)	-	-	-	-	2	-	-	-	1	-	-	2	1	-	6
Wholesale Trade (42)	-	-	-	-	-	-	-	-	-	2	-	-	1	-	3
Retail Trade (44-45)	-	-	-	-	1	2	1	8	-	2	-	-	2	-	16
Transportation and Warehousing (48-49)	2	-	-	-	3	-	-	-	-	10	2	2	1	-	20
Information (51)	-	-	-	1	-	-	-	1	-	1	-	-	-	-	3
Real Estate and Rental and Leasing (53)	-	-	-	-	1	-	-	1	-	-	-	-	-	-	2
Professional, Scientific, & Technical Services (54)	-	-	-	-	-	-	-	1	1	-	-	-	1	-	3
Administrative & Support & Waste Management & Remediation Services (56)	-	1	-	1	-	-	-	1	1	2	-	-	1	-	7
Education (61)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Health Care and Social Assistance (62)	1	-	-	1	2	-	-	1	1	1	-	-	1	-	8
Arts, Entertainment, & Recreation (71)	-	-	1	-	2	-	-	1	-	-	-	-	-	-	4
Accommodation & Food Services (72)	-	-	-	-	-	-	-	2	-	1	-	-	-	-	3
Other Services (ex. Public Administration) (81)	-	-	-	1	2	-	-	5	1	1	-	1	1	1	13
Public Administration (92)	-	-	-	-	1	-	-	3	-	1	-	-	-	-	5
<b>Total</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>7</b>	<b>24</b>	<b>3</b>	<b>1</b>	<b>26</b>	<b>15</b>	<b>28</b>	<b>2</b>	<b>14</b>	<b>10</b>	<b>6</b>	<b>144</b>

## Work-Related Event Details, continued...

### Occupations

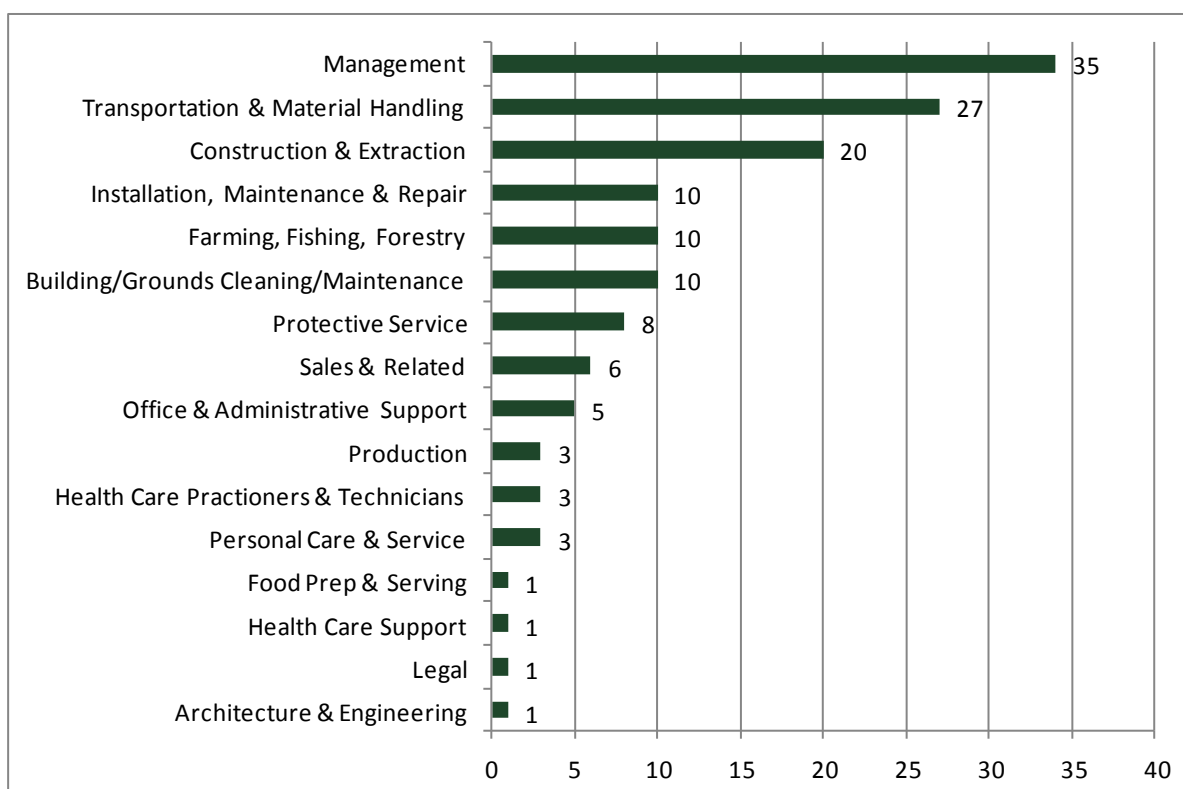
**Figure 4** shows the distribution of the 144 WR deaths among Standard Occupational Classification categories.

The 2000 Standard Occupational Classification<sup>3</sup> (SOC) system is used 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.



*Brick mason died when scaffold collapsed while erecting wind screen*

**Figure 4. Traumatic Work-Related Fatalities by Standard Occupational Code, Michigan 2010**



## Work-Related Event Details, continued...

### Occupations, continued

The occupational category with the highest number of WR deaths was Management Occupations (11-0000) accounting for 35 (24.3%) fatal injuries in 2010. Two occupational groups accounted for 30 (85.7%) of the 35 deaths; Farmers and Ranchers and General and Operations Managers each had 15 WR deaths.

Transportation and Material Moving Occupations (53-0000) had 27 (18.8%) of all fatal injuries in 2010. Within this major grouping, 14 (51.9%) were Motor Vehicle Operators. Of these, 12 (44.4%) were heavy and tractor-trailer truck drivers.

Within Construction and Extraction, Construction Trades Workers accounted for 19 of the 20 (95.0%) deaths. Specifically, carpenters (7 deaths), plumbers (4 deaths), and electricians (3 deaths) accounted for the majority of the occupations within this category.

Three occupational groups each had 10 (7.0%) WR fatalities: Installation/Maintenance/Repair, Farming/Fishing/Forestry, and Building/Ground Cleaning/Maintenance. Within the Installation/Maintenance/Repair occupational group, six (60.0%) were mechanics. All 10 individuals within Farming/Fishing/Forestry were farm laborers. Within the Building Grounds occupational grouping, Grounds Maintenance Workers had 5 (50.0%) fatalities.

Protective Service Occupations (33-0000) had 8 (5.6%) deaths. Four police officers, two security guards, one loss prevention detective and one fire chief died.

### Working Status of Decedent

One hundred thirty eight employers were associated with the 144 individuals who died in 2010. Six employers had a fatal incident where more than one person died as a result of the incident. Five employers had two individuals die as a result of the incident (explosion, homicide, toxic exposure, vehicle crash, airplane crash). One employer had two incidents that resulted in the deaths (homicide, pedestrian struck by vehicle).

The employer/employee status was known for 143 of the 144 individuals who died. Ninety (62.9%) individuals were identified as employees. Forty-six (32.2%) individuals were identified as either self-employed or the business owner. Six (4.2%) individuals were volunteers. One (0.7%) individual was identified as a contract/temporary employee.

### Decedent's Activity at the Time of the Incident

The activity of the decedent at the time of the fatality was identified for 103 (97.2%) of the 106 non-homicide/non-suicide/non-drug overdose related deaths. The activity of the decedent was unknown for three incidents.

The individual was the operator in 64 (62.1%) incidents. The individual was working with a co-worker and was directly involved in the work activity in 3 (32.0%) incidents. Six pedestrians, a store owner, three laborers, a security guard, and a surveyor were struck by a vehicle.

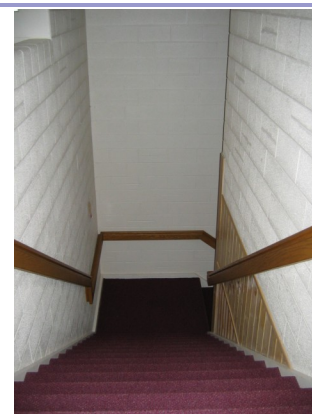
In 38 (27.1%) incidents, the individual was working indoors and outdoors in 102 (72.9%) incidents. The work location of the decedent was unknown for four incidents.



## Work-Related Event Details, continued...

### Working Alone

Whether the decedent was working alone or with a coworker could be identified in 136 of the 144 incidents. The decedent was working alone in 79 (58.1%) incidents and working with a coworker in 57 (41.9%) incidents. For homicides, working alone or with a coworker could be determined for 22 of the 26 incidents. Fourteen (63.6%) individuals were working alone and 8 (36.4%) individuals were working with a coworker.



*Church maintenance worker died due to fall down stairs*

### Means of Work-Related Death

**Table 11** summarizes the 144 work-related fatalities by means of death. See the Appendix for a description of each death grouped by means of death.

Overall, motor vehicle events accounted for 28 (19.4%) work-related fatalities in 2010. Twenty six (18.1%) individuals were victims of a homicide. Twenty four (16.7%) individuals had a fatal fall. Fifteen (10.4%) individuals died as a result of contact with a machine and 14 (9.7%) individuals were struck by an object. Ten (6.9%) individuals committed suicide, 7 (4.9%) individuals were electrocuted, 6 (4.2%) individuals died due to a toxic exposure, and 4 (2.8%) individuals died in an aircraft crash. Three (2.1%) individuals died as a result of a fire/explosion, 2 (1.4%) individuals died as a result of drowning, 2 (1.4%) individuals died due to a drug overdose, and 2 (1.4%) individuals died as a result of complications of surgical intervention treating the work-related injury. One (0.7%) individual died due to overexposure to heat.

#### ***Aircraft***

Four individuals died in two aircraft incidents; all aircraft were single engine planes. Both incidents occurred during the flight. One incident occurred during flight instruction and one incident occurred during a medical transport.

#### ***Drowning***

One individual drowned in a farm pond while he was on a work break and one individual drowned when the mower he was operating overturned into a culvert filled with water.

#### ***Drug Overdose***

Two individuals died as a result of a drug overdose; an electrician (morphine, codeine) and an amusement ride attendant (morphine).

#### ***Electrocution***

Seven individuals were electrocuted. Two deaths occurred while the worker was working on a utility pole. One death occurred during the following listed activities: tree trimming, equipment maintenance, farm field work, heating and ventilation unit repair, and floating dock installation.

## Means of Work-Related Death, continued

### *Electrocution , continued*

Five of the seven electrocutions were a result of direct contact with the energized source. Three individuals had direct contact with an 4,800-volt energized overhead power line; two individuals were on the utility pole when the contact occurred, and one individual contacted an overhead line that had fallen to the ground. Two individuals directly contacted a 480-volt energized source; one individual contacted an energized wire in a cooling unit and one individual contacted an energized farm field irrigation pivot.

One individual had indirect contact with a 4,800-volt energized overhead power line when the truck turret he was greasing contacted the overhead line.

One individual contacted an 120-volt energized source during the installation of a floating dock.

### *Fall*

Twenty four individuals died in 2010 due to a fall; one individual sustained his fall in 2001 and died in 2010 from medical complications of a 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 during commercial construction activities and one fall occurred during residential construction activities. For two falls, the location could not be ascertained.

The distance of the fall could be ascertained for 18 the 24 falls. Ten (55.6%) falls were falls of 10 feet or less, 5 (27.8%) falls were 11-19 feet, and 3 (16.7%) falls were greater than 20 feet (one at nearly 21 feet, one at 45 feet and one at 48 feet).

Nine (39.1%) Individuals fell from ladders or scaffolds, 4 (17.4%) individuals fell while walking on the ground surface, and 2 (8.7%) individuals fell down stairway steps. One individual each fell from the following surfaces: roof edge, unsecured roof opening, truck steps, vehicle, auger tube, stool, half-wall associated with a stairway, tree stand through the trap door, and while working on a railroad car.

The reason for the fall was identified for 14 of the 24 (58.3%) individuals. Most of the individuals slipped or tripped (11 of 14, 78.6%). One individual fell from a moving vehicle. The ladder slipped in one fall event, and in one fall incident, the ladder was struck by a high tension rod that had been cut, causing the ladder to fall.

The surface to which the individual fell was known for 23 of the 24 fall incidents. The decedent fell to a cement/concrete surface in 16 (69.6%) incidents, carpeted/tiled floor in 3 (13.0%) incidents, and packed dirt in 2 (8.7%) incidents. One individual fell to a wood surface, and one individual fell, first striking tanks and then a cement surface.

The condition of the work surface the decedent fell from was known in 18 of the 24 falls. The work surface was dry in 8 (44.4%) events. One of the surfaces identified as dry was also identified to be cluttered, his ladder was not properly secured, and he was working outside in a cold environment. The work surface was icy/snow covered in 6 (42.9%) incidents, wet in 3 (16.7%) incidents, and in one incident, the decedent was using an improper ladder (top part of an extension ladder) that was not properly secured.

## Means of Work-Related Death, continued

### *Fire/Explosion*

Three individuals died as a result of a fire/explosion. One individual was cutting metal rod with a chop saw when a spark entered a 55-gallon drum containing a flammable liquid. One fire/explosion incident claimed the lives of two individuals in a furniture store.

### *Homicide*

There were 26 WR homicides in 2010, an increase of 160% compared to 2009 (26 in 2010 compared to 10 in 2009).

Twenty-four (92.3%) homicide victims were male and two (7.7%) were female. Seventeen of the 24 (70.8%) males were Caucasian and 7 (29.2%) were African-American. Both females were Caucasian.

The ages of the victims ranged from 21 to 75; the average age was 36.4. **Figure 5** shows the age distribution at the time of the homicide.

A gun was used in 23 (88.5%) of the homicides. Vehicles were involved in two homicides, and one individual died as a result of knife-inflicted wounds.

Table 11 shows the industry in which the homicide occurred. Four of the eight Retail Trade homicides occurred at gas stations and three of the five Other Services homicides occurred in automotive repair facilities.

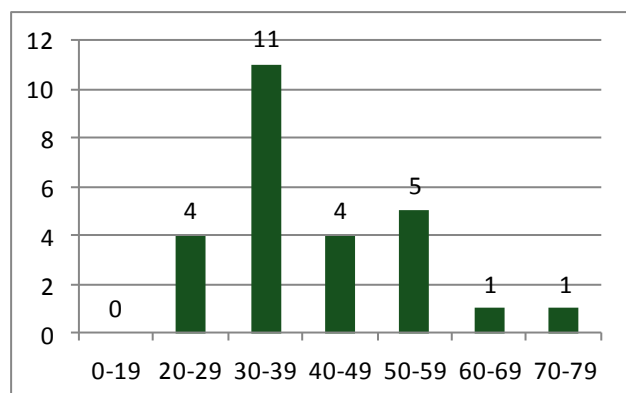
The decedent was working alone in 14 incidents and working with a coworker in 7 incidents. Working status was unknown for 5 incidents

### *Machine*

Ten of the 15 (66.7%) of the machine-related fatalities occurred in Agriculture; seven fatalities involved tractors, two involved hay balers and one involved a corn picker. Four Individuals were run over by the tractor and three individuals were pinned under an overturned tractor. All of the fatal overturns involved tractors that were not equipped with a rollover protective structure (ROPs).

Forklifts were involved in two incidents; one worker was struck by a forklift and one worker was crushed between the forklift frame and a stack of containers. The types of equipment involved in the other three incidents include: a loader equipped with a tree spade (individual ejected and run over), an agricultural tractor used to cut grass at a camp (overturn, tractor not equipped with ROPs), and a compact loader (pinned under tire when machine moved forward).

**Figure 5. Number and Age of Homicide Victims, Michigan 2010**



## Means of Work-Related Death, continued

### *Motor Vehicle Related Deaths*

There were 28 motor vehicle related fatalities in 2010. There were 27 separate motor vehicle incidents resulting in a fatality; one crash claimed the lives of two individuals (driver and passenger). The remainder of the deaths were the driver of the vehicle. Six pedestrians were killed when they were struck by a motor vehicle.

### **HIGHLIGHTS OF 27 MOTOR VEHICLE INCIDENTS**

- ◆ **Number of Units**
  - ◆ 1-unit: 11 (40.7%) incidents
  - ◆ 2-unit: 14 (51.9%) incidents
  - ◆ 3-unit: 1 (3.7%) incident
  - ◆ 4-unit: 1 (3.7%) incident
- ◆ **Number of roadway lanes** was identified for all incidents.
  - ◆ 1-lane road: 2 (7.4%) incidents
  - ◆ 2-lane road: 17 (63.0%) incidents
  - ◆ 3-lane road: 4 (14.8%) incidents
  - ◆ 4-lane road: 3 (11.1%) incidents
  - ◆ 7-lane roads: 1 (3.7%) incident
- ◆ **Speed limits** identified for all incidents
  - ◆ 25 mph: 2 (7.4%) incidents
  - ◆ 30 mph: 1 (3.7%) incident
  - ◆ 40 mph: 1 (3.7%) incident
  - ◆ 55 mph: 13 (48.1%) incidents
  - ◆ 60 mph: 3 (11.1%) incidents
  - ◆ 70 mph: 7 (25.9%) incidents
- ◆ **Amount of light** at the time of each crash was identified for all incidents.
  - ◆ Daylight: 17 (63.0%) incidents
  - ◆ Dawn/Dusk: 3 (11.1%) incidents
  - ◆ Dark, Unlit: 5 (18.5%) incidents
  - ◆ Dark, Lit: 2 (7.4%) incident

### **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 incident.

The **crash type** is based on the intended direction of travel, regardless of point(s) 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.
- ◆ **Head On—Left Turn:** two vehicles are approaching head on and at least one is attempting a left turn.
- ◆ **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**

## Means of Work-Related Death, continued

### HIGHLIGHTS OF 27 MOTOR VEHICLE INCIDENTS

- ♦ **Seat Belt Use:** Seat belt use was known for 14 of the 21 (66.7%) individuals for which seat belt use was applicable. Seat belt use was not applicable to the six pedestrian deaths and an individual driving a non-ROPS-equipped tractor. Seat belt use was evenly divided; seven (50.0%) individuals were wearing a seat belt and seven were not wearing their seat belt.
- ♦ **Driver Condition:**
  - ♦ **Alcohol Use** was a contributing factor for one crash; another driver, whose blood alcohol was greater than 0.08%, struck the decedent's vehicle.
  - ♦ A **distracted driver** struck an individual working in the road
  - ♦ One truck driver **fell asleep**.
- ♦ **Most Harmful Event** was identified for all incidents.
  - ♦ **Non-collision: 2 (7.4%) incidents**
    - ♦ Overturn
    - ♦ Cargo loss/shift
  - ♦ **Collision with Non-Fixed Object: 17 (63.0%) incidents**
    - ♦ Railroad train (1)
    - ♦ Pedestrian (6)
    - ♦ Motor vehicle in transport (10)
  - ♦ **Collision with Fixed Object: 8 (29.6%) incidents**
    - ♦ Concrete sound barrier (1)
    - ♦ Bridge/pier/abutment (3)
    - ♦ Guardrail face (2)
    - ♦ Tree (2)

### HIGHLIGHTS OF MOTOR 27 VEHICLE INCIDENTS

- ♦ **Weather Conditions**
  - ♦ Clear: 14 (51.9%) incidents
  - ♦ Cloudy: 10 (37.0%) incidents
  - ♦ Fog/Smoke: 1 (3.7%) incident
  - ♦ Rain: 1 (3.7%) incident
  - ♦ Snow/Blowing Snow: 1 (3.7%) incident
- ♦ **Surface Conditions**
  - ♦ Dry: 22 (81.5%) incidents
  - ♦ Wet: 4 (14.8%) incidents
  - ♦ Icy: 1 (3.7%) incident
- ♦ **Road Construction/Repair Zones** were the location of three fatal incidents—all involved road repair.

**Since 2001, motor vehicle incidents have been the #1 cause of traumatic WR deaths in Michigan.**



*Laborer at towing company died when car fell from tow truck straps*



## Means of Work-Related Death, continued

**Figure 6** shows crash data relating to the different types of vehicles involved in the 22 non-pedestrian motor vehicle related fatalities. One large truck incident had two individuals die in the crash.

<b>Figure 6. Highlights of 22 Non-Pedestrian Motor Vehicle-Related Fatalities, Michigan 2010</b>					
<b>Description</b>	<b>Large Truck (N=8)</b>	<b>Pick-up Truck (N=6)</b>	<b>Van (N=5)</b>	<b>Passenger Car (N=2)</b>	<b>Agricultural Tractor (N=1)</b>
<b>Median Age</b>	57.5 (Range 40-60)	32 (Range 21-49)	53 (Range 31-60)	55.5 (Range 49-62)	22
<b>Occupancy Status</b>					
Driver	7	6	5	2	1
Passenger	1				
<b>Seat Belt Use</b>					
Belted	1	4	2		
Not Belted	3	1	2	1	
Not Equipped					1
Unknown	4	1	1	1	
<b>Month of Injury</b>					
Mar-May (Spring)	1	1	1	1	
June-Aug (Summer)	2	1	1		
Sept-Nov (Fall)	1	4	1	1	1
Dec-Feb (Winter)	4		2		
<b>Day of Week</b>					
Mon-Thurs	7	5	4	2	
Fri-Sun	1	1	1		1
<b>Time of Day</b>					
12am-3:59am	1		1		
4am-7:59am	3	1	1		
8am-11:59pm	2	2		2	1
12pm-3:59pm	1	1	2		
4pm-7:59pm		2	1		
8pm-11:59pm	1				

## Means of Work-Related Death, continued

### HIGHLIGHTS OF MOTOR 27 VEHICLE INCIDENTS

#### ◆ Pedestrian information

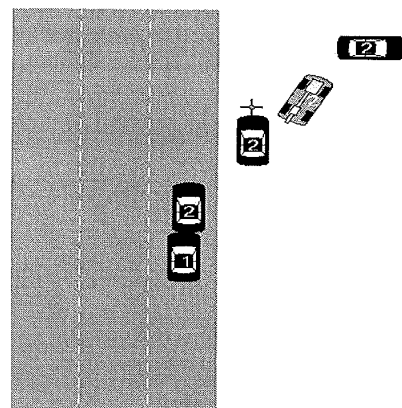
- ◆ Age at time of incident: 30, 54, 58, 59, 61, 65
- ◆ Gender: All male
- ◆ Incident Summaries:
  - ◆ Garbage collector was struck by a small truck as he crossed the road.
  - ◆ Truck driver was struck by a pickup truck as he was walking across an expressway.
  - ◆ Collision shop owner was struck by a passenger car while speaking with a worker in a construction zone.
  - ◆ Casino security guard was struck by an passenger car as he was crossing a highway.
  - ◆ Auxiliary police officer wearing dark clothing was struck by a passenger car travelling at an excessive speed assisting a motorist on an expressway.
  - ◆ Civil engineering firm draftsman was struck by a van driven by a distracted driver while conducting survey work in a road's right of way.
- ◆ Month of Incident: April, June, July, August, September, November
- ◆ Day of Incident
  - ◆ Monday, Thursday, Friday, Saturday: 1 incident
  - ◆ Tuesday: 2 incidents
- ◆ Time of Incident:
  - ◆ 12am-3:59am: 1 incident
  - ◆ 4am-7:59am: 1 incident
  - ◆ 8am-11:59am: 1 incident
  - ◆ 12pm-3:59pm: 2 incidents
  - ◆ 8pm-11:59pm: 1 incident



*Garbage collector struck by a small truck while crossing road*



*Civil engineering draftsman struck by a van during survey work*



*Contract newspaper hauler's van struck from behind*

#### **Struck By**

Fourteen individuals were fatally injured when an object struck them. Four (28.6%) individuals were struck by a tree/tree limb. Trench collapses killed two (14.3%) individuals. The following eight objects each struck one (0.7%) individual: car raised by a tow truck, chain hoist, lumber raised by a forklift, rotating excavator, falling rock wall, sheet metal, backing semi truck on a farm, and a falling scaffold loaded with block.

## Means of Work-Related Death, continued

### ***Suicide***

Ten individuals committed suicide while at their workplace. Seven individuals died from a self-inflicted gunshot wounds. One individual died from a self-inflicted hanging, one individual jumped from an elevation, and one individual lost a great deal of blood from a self-inflicted event.

### ***Toxic Exposure***

Six individuals died due to exposure to a toxic atmosphere. Three of the six deaths occurred on a farm. One incident involved two individuals entering a feed tank that contained a fermented molasses feed supplement; they died due to a lack of oxygen. One individual entered a silo containing silo gas. Two bathtub refinishers died in separate incidents due to overexposure to a methylene chloride stripping agent while stripping a bathtub in a residential bathroom. One individual died due to carbon monoxide poisoning while repairing a vehicle in his garage.



*Carpenter died when a basement's stone wall collapsed*

## MIOSHA Fatality Investigations

In 2010, MIOSHA personnel conducted a program-related compliance investigation for 38 (26.4%) of the 144 WR fatalities, involving 37 (26.8%) of the 138 employers that had a WR fatality in 2010. Two of the 36 employers had a prior WR fatality investigated by MIOSHA; a fall from a ladder or tree (specific location undetermined) and a fall from a transport van.

For each company that had a work-related fatality, the Federal OSHA Integrated Management Information System (IMIS) was accessed to determine the previous MIOSHA compliance activity at the company. Eight of the 38 employers having a MIOSHA WR fatality compliance inspection in 2010 were identified as having a MIOSHA compliance inspection prior to 2010.

Depending upon the work being performed, a company will be inspected by the applicable MIOSHA compliance division.

Prior to October 2003, MIOSHA had 3 compliance divisions; Occupational Health, General Industry Safety, and Construction Safety.

In October 2003, MIOSHA reorganized the compliance divisions to 2 divisions; the General Industry Safety and Health Division and the Construction Safety and Health Division.

## MIOSHA Fatality Investigations, continued

- ♦ One company had a compliance inspection by both the General Industry Safety and Health Division (2009) and Construction Safety and Health Division (2008).
- ♦ The General Industry Safety and Health Division inspected three companies prior to their fatality:
  - ♦ Two companies received a compliance inspection in 2010 prior to the fatality.
  - ♦ One company received the compliance inspection in October 2003.
- ♦ Four companies received a Construction Safety and Health compliance inspection prior to the fatality:
  - ♦ Two companies received a compliance inspection in 2009.
  - ♦ Two companies received a compliance inspection in 2010 prior to the fatality.



*Mechanic died when the truck's extendable conveyor system contacted a 4,800-volt overhead power line*

## Hispanic Initiative

The U.S. 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. As a result, Federal OSHA is currently collecting additional information during all investigations that includes the primary language and country of origin of the decedent. OSHA has also formed the Hispanic Worker Task Force that includes hazard awareness and workplace rights.

In partnership with Federal OSHA, NIOSH has added fatalities among foreign-born workers, including Hispanic workers to the list of current targets for the Federal in-house FACE program. Information gathered will be made available to the OSHA Hispanic Worker Task Force. The MIFACE program has supported this initiative and has utilized an Immigrant Workers/Limited English Speakers Workers investigation guide, which was developed in conjunction with the other FACE states.

There were 10 deaths of Hispanic workers in Michigan in 2010. Eight Hispanic workers were born in Mexico and two were born in the U.S. All ten individuals were between the ages of 16 and 65. The U.S. Census Bureau population estimates for the Caucasian, African-American, and Hispanic populations in Michigan for 2010 was not available at the date of this annual report issue. An estimate has been developed using the 2009 population figures. The 2010 rate for acute traumatic WR fatalities for 16- to 65-year-old Hispanic workers in Michigan was 3.8/100,000, twice the rate of 1.9/100,000 for 16- to 65-year-old Caucasians and over twice the rate 1.5/100,000 for 16- to 65-year-old African-Americans.



## Hispanic Initiative, continued

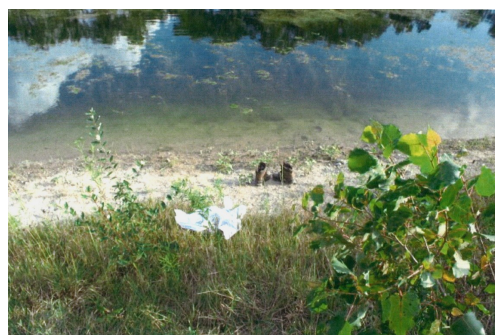
Industries in which a Hispanic individual worked and their cause of death in 2010:

- ◆ Agriculture: 6 deaths
  - ◆ Toxic Exposure: silo, feed tank (2)
  - ◆ Electrocution (contact with irrigator pivot)
  - ◆ Motor Vehicle Crash
  - ◆ Drowning (pond)
- ◆ Construction: 2 deaths
  - ◆ Fell from ladder
  - ◆ Fell from a roof
- ◆ Retail Trade: 1 death
  - ◆ Suicide
- ◆ Administrative & Support & Waste Management & Remediation: 1 death
  - ◆ Drowning (culvert) mowing grass

MIFACE contacted seven of the nine companies employing a Hispanic laborer; no contact was initiated with the company involving the Hispanic worker who committed suicide or the Hispanic worker who died in the motor vehicle crash. Two employers agreed to participate in the MIFACE research program.



*Two Hispanic youths died after entering tank containing fermented feed mixture*



*Hispanic youth drowned in farm pond*

## Number of Deaths for 2010 Compared to the Michigan Census of Fatal Occupational Injuries (CFOI) Data

The Census of Fatal Occupational Injuries (CFOI) is the surveillance system funded in every state by the United States Department of Labor Bureau of Labor Statistics (BLS). CFOI reported 143 deaths in 2010 per the BLS website viewed on November 11, 2011 which matched the original total identified by MIFACE on that date. However, during the writing of this 2010 MIFACE Annual Report, MIFACE was notified of an additional WR homicide bringing the total to 144 in 2010.

## Case Narratives

For 2010, MIFACE requested, received permission, and conducted a work-related fatality investigation at 19 facilities. Copies of completed MIFACE Investigation Reports and 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/](http://www.oem.msu.edu/). Select Traumatic Fatalities on the navigation bar, and then select the MIFACE Investigation Report tab or the MIFACE Summaries of MIOSHA Inspections tab.

## Case Narratives, continued

A brief narrative summary of each of the 144 work-related deaths occurring in 2010 is contained in the Appendix. Each narrative has a case number and is organized alphabetically by means of death. **Table 12** 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 was a defect or other problem with the machine.

**Table 12. Case Narrative Number by Means of Death and Industry Sector, Michigan 2010**

Industry Sector (NAICS Code)	Narrative Case Number	Industry Sector (NAICS Code)	Narrative Case Number	Industry Sector (NAICS Code)	Narrative Case Number
<b>Agriculture/Forestry/Fishing/Hunting (11)</b>		<b>Retail Trade (44-45)</b>		<b>Health Care/Social Assistance (62)</b>	
Drowning	5	Fall	28	Aircraft	2
Electrocution	9	Fire Explosion	41, 42	Electrocution	14
Fall	16, 17	Heat/Cold	43	Fall	33, 34
Homicide	44	Homicide	46-53	Homicide	58
Machine	70-79	Motor Vehicle	94, 95	Machine	83
Motor Vehicle	85-87	Suicide	132, 133	Motor Vehicle	109
Struck By	115-118			Suicide	137
Toxic Exposure	139-141				
<b>Utilities (22)</b>		<b>Transportation/Warehousing (48-49)</b>		<b>Arts/Entertainment/Recreation (71)</b>	
Electrocution	10	Aircraft	1, 3, 4	Drug Overdose	8
Fall	18	Fall	29-31	Fall	35, 36
Fire/Explosion	40	Motor Vehicle	96-105	Homicide	59
		Other	113, 114		
<b>Construction (23)</b>		Struck By	126, 127	<b>Accommodation/Food Service (72)</b>	
Drug Overdose	7	Suicide	134	Homicide	60, 61
Electrocution	11			Motor Vehicle	110
Fall	19-25	<b>Information (51)</b>		<b>Other Services (81)</b>	
Homicide	45	Electrocution	12	Electrocution	15
Motor Vehicle	88-91	Homicide	54	Fall	37, 38
Struck By	119-123	Motor Vehicle	106	Homicide	62-66
Suicide	129			Machine	84
Toxic Exposure	142, 143	<b>Real Estate/Rental/Leasing (53)</b>		Motor Vehicle	111
<b>Manufacturing (31-33)</b>		Fall	32	Struck By	128
Fall	26, 27	Homicide	55	Suicide	138
Machine	80			Toxic Exposure	144
Struck By	124, 125	<b>Professional/Scientific/Technical Services (54)</b>		<b>Public Administration (92)</b>	
Suicide	130	Homicide	56	Fall	39
<b>Wholesale Trade (42)</b>		Machine	81	Homicide	67-69
Motor Vehicle	92, 93	Suicide	135		
Suicide	131	<b>Administrative/Support/Waste Management/Remediation Services (56)</b>		Motor Vehicle	112
		Drowning	6		
		Electrocution	13		
		Homicide	57		
		Machine	82		
		Motor Vehicle	107, 108		
		Suicide	136		



## Discussion

There were 144 traumatic WR fatalities in Michigan in the year 2010. The 2010 Michigan fatality rate per 100,000 workers was 3.4 per the MIFACE statistics. The number of WR deaths averaged 2.8 fatalities per week. The major sources for identifying the deaths were death certificates, the 24-hour MIOSHA hotline, a newspaper clipping service, and the State Police vehicular data reporting system. Since MIFACE began surveillance of all traumatic work-related fatalities in 2001, there had been a downward trend; the trend was dramatically reversed in 2010, as the number of WR rose by **50.0%**, from 96 deaths in 2009 to 144 deaths in 2010.

Individuals who died from a traumatic WR fatality were most likely to be men (91%), white (82%), married (64%), and have at least a high school education (84%). The average age was 49 and ranged from 16 to 87.

Agriculture had both largest number of traumatic WR deaths (25, 17.4%) and the highest risk of a traumatic WR fatality (29.3/100,000). Construction had the second largest number of traumatic WR deaths (22, 15.3%), but because of the number of workers in this industry, had the third highest risk (18.2/100,000). Transportation and Warehousing had the third largest number of deaths (20, 13.9%) but had the second highest risk of traumatic WR fatality (16.8/100,000). (See Table 9).

Among the non-suicide/non-overdose deaths, thirty individuals had alcohol, illegal drugs, or prescription medications in their system at levels that may have been a risk factor for the occurrence of the traumatic injury.

MIOSHA staff investigated 38 of the 144 deaths at 37 employers, the police investigated 68 of the deaths (motor vehicle, homicides, suicides, drug overdose) at 64 different employers. The National Transportation Safety Board investigated 4 deaths at 3 employers. The remaining 34 work-related fatalities were not investigated by any regulatory agency as to cause of death other than by the police to exclude a homicide or suicide.

There was an increase of 48 traumatic WR deaths in 2010 compared to 2009. Ten industry sectors had an increase in the number of deaths, four had a decrease in the number of deaths, and the number of deaths remained unchanged for two industry sectors. One industry sector, Mining, had a WR death in 2009 but did not have a death in 2010 (See Table 9).

**Traumatic occupational fatalities are an important public health issue in Michigan .**

**Identifying underlying causes of WR fatalities and the detection of common patterns of fatal injuries will increase the understanding of specific workplace safety issues in Michigan.**

**Sharing lessons learned and prevention efforts with stakeholders is critical to prevent another death.**

**If what we learn from any of these deaths prevents another death, then the surveillance program has been successful in its goal..**



*Hispanic roofer fell through improperly protected roof curb*

## Discussion, continued

Two industries, Agriculture and Transportation/Warehousing, each had the largest increase in the number of deaths - 14 deaths - compared to 2009.

In Agriculture, two of the twenty five deaths occurred in logging activities. The remaining 23 Agricultural WR deaths occurred in Crop Production (14 deaths) and Animal Production (9 deaths). The dramatic increase in the number of deaths in Agriculture may be attributable to a smaller number of available hired laborers. This reduced pool of workers led to farm owners to work longer hours (increasing fatigue levels) and performing work they usually assigned to their hired labor (not as familiar with the work hazards).

Although the number of Truck Transportation (NAICS 484) WR deaths increased by six deaths compared to 2009, the increase in the number of deaths in Transportation/Warehousing is partially explained by the increase in the number of deaths in industry sectors other than Truck Transportation. In 2009, three of the six Transportation/Warehousing sector deaths occurred in the non-Truck-Transportation sectors (one in Ground Passenger Transportation and two in Warehousing (NAICS 49)). In 2010, eleven non-Truck Transportation deaths, an increase of eight deaths occurred; three in Support Activities, two in Air Transportation, one each in Scenic and Sightseeing Transportation and Transit and Ground Passenger Transportation, and four in the Warehousing (NAICS 49) industry sector. Additionally, one 2010 Transportation incident led to the deaths of two individuals.

The industry with the most dramatic decline in the number of deaths compared to 2009 was Administrative and Support and Waste Management and Remediation Services; 7 deaths in 2010 compared to 13 deaths in 2009. Landscaping Services and Janitorial Services each had a decrease of two deaths in 2010 compared to 2009.

Although the number of workplace homicides decreased by 7% nationally, there was a dramatic increase (160%) in the number of WR homicides in Michigan. Seven of the twenty six homicides occurred within Michigan's immigrant population; three individuals were from Iraq, three individuals were from Lebanon and one individual was from Liberia. Six of the seven individuals were owners or workers at retail businesses; four gas stations, a beer/wine store, and a dollar store. One immigrant WR death occurred at a automotive repair shop. Seven African American males died due to a WR homicide.

**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.**



*Tractor operator turning into driveway died when non-ROPS-equipped tractor without a SMV sign was struck by mini-van traveling in same direction*

## Discussion, continued

The number of fatal injuries in Construction rose 4% in Michigan, but declined 10% nationally. Falls continued to be the primary cause of death in Construction. Six (27.3%) of the 22 WR Construction deaths occurred among carpenters. Three WR deaths occurred among plumbers and two among electricians.

Overall, there were 20 (14.0%) fatal work injuries involving foreign-born workers in Michigan in 2010. The countries of origin included Canada (1 death), Iraq (4 deaths), Lebanon (4 deaths), Liberia (1 death), Republic of Macedonia (1 death), Mexico (8 deaths), Sierra Leone (1 death). The number of WR deaths occurring in the Hispanic population in Michigan rose by 250% compared to 2009. There were 10 WR fatal injuries occurring among Hispanics in 2010 compared to 4 WR fatal injuries in 2009. This increase is not reflected in the national statistics; nationally, Hispanics had 4% decrease in the number of WR fatal injuries. In Michigan, of the 10 fatal work injuries involving Hispanic or Latino workers, 80% were foreign-born (Mexico). Nationally, 63% of the Hispanic workers were foreign-born.

Nationally, a preliminary total of 4,547 fatal work injuries were recorded in the United States in 2010, about the same as the final count of 4,551 WR fatal injuries in 2009<sup>2</sup>. Michigan was one of twenty seven states and the District of Columbia that reported higher numbers of WR fatal injuries in 2010 compared to 2009.

BLS uses the number of hours worked in an industry and profession to calculate an hours-based fatality incidence rate. The 2010 annual national fatality rate, 3.5 deaths/100,000 *full-time equivalent workers*, was the same as the final rate of 3.5 in 2009. MIFACE could not calculate an hours-based rate for Michigan for 2010 due to insufficient data from the Michigan Office of Labor Market Information. The 2010 employment-based fatality rate in Michigan was 3.4 deaths/100,000 workers. BLS cautions that hours-based fatality rates should not be directly compared to employment-based rates because of the differences in the numerators and denominators in the calculation.

### MIFACE Contact with Employers and Families

The MIFACE research program relies on the voluntary cooperation of employers, the self-employed, and family members. MIFACE contacted 59 employers asking for their participation in the MIFACE program. Sixteen employers agreed to participate and had a MIFACE site visit. Thirty six employers declined to participate and seven employers have currently agreed to participate but have requested MIFACE to re-contact them in 2012.

MIFACE contacted 34 of the 37 employers whose work-related fatality was investigated by MIOSHA staff. Two employers not contacted by MIFACE involved business owners who died; the businesses closed after their deaths. One of the employers not contacted by MIFACE involved an out-of-state employer. Of these 34 employers, 23 declined to participate, 9 agreed to participate, and 2 employers asked MIFACE to contact them in 2012.



## Discussion, continued

### Prevention Material Dissemination

On the MSU OEM web site, ([www.oem.msu.edu/](http://www.oem.msu.edu/)) are copies of the completed MIFACE Investigation Reports, Hazard Alerts, and MIFACE summaries of investigations conducted by the MIOSHA program.

Hazard Alerts are 1-page documents that review WR fatalities and provide prevention recommendations that target specific industrial sectors or repeated work-related fatality incidents (e.g. trench wall cave-ins).

MIFACE summaries of investigations conducted by the MIOSHA program include a summary of the work-related fatality incident and the citations issued to the employer by MIOSHA 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 Hazard Alert. Investigation Reports and Hazard Alerts are sent to appropriate trade associations, unions, trade journals and in some cases other employers doing the same type of work.

A special effort in conjunction with the Michigan Farm Bureau to provide educational sessions to farmers is ongoing. In 2010, more than 700 individuals attended the training sessions.



#### INVESTIGATION/RESEARCH Methylene Chloride Causes Death of Three MI Bathtub Refinishers

Since 2006, three bathtub refinishers have died in Michigan and since 2000 at least 13 refinishers have died nationwide due to overexposure to methylene chloride-based strippers. In Michigan, two refinishers were using Tal-Strip II Aircraft Coating Remover and one refinisher was using Klean-Strip Premium Stripper. Tal-Strip II contains 60%-100% methylene chloride (MC), and Klean-Strip contains 80%-90% MC. *None of the Michigan refinishers used appropriate respirators, eye or hand protection or local exhaust ventilation.* The two refinishers using Tal-Strip II painted the tub and the refinisher using Klean-Strip sprayed the tub. All refinishers were found dead in the bathroom, leaning over the tub. The bathroom doors were closed.



Tub painted with Tal-Strip II

#### IN ORDER TO PREVENT SIMILAR INCIDENTS IN THE FUTURE

Do not use MC-based strippers. Use alternative stripping methods, such as sanding or substitute non-MC-based strippers (e.g. [www.removepaints.com/OxyStrip\\_paintstripper.aspx](http://www.removepaints.com/OxyStrip_paintstripper.aspx), [www.ecoprocoat.com/www.m-lc.com/index.cfm](http://www.ecoprocoat.com/www.m-lc.com/index.cfm)). Non-MC-based strippers have hazards. Read and follow MSCSs.

Typical bathtub refinishing work practices using a MC-based stripper will result in MC airborne levels that greatly exceed the allowable OSHA/MIOSHA methylene chloride air levels. If you are inspected, you will be cited for violation of the standard.

If using a MC-based stripper, at a minimum you must do the following to protect yourself from being overcome by the vapors - these actions may not be enough to protect you from MC's long-term health effects:

- Establish fresh makeup air and local exhaust ventilation. Fresh air: Place a fan in a window or doorway. Local Exhaust: Attach ductwork to another fan. Place the ductwork in the tub. Place fan end at window or door to exhaust MC vapors to the outside of building. Ceiling fans alone are insufficient.
- Wear a tight-fitting pressure-demand full-face air supplied respirator when applying and removing the MC-based stripper. Dust masks and cartridge respirators DO NOT protect you.
- Leave the room after MC stripper application. Keep fresh air and local exhaust fans running and windows and doors open.
- Use butyl rubber or polyvinyl alcohol (PVA) gloves. Latex or nitrile gloves DO NOT protect you.
- Implement safe work practices such as: add a tool handle extender to minimize leaning into the tub.

#### DID YOU KNOW?

- MC is considered a cancer-causing chemical.
- An 8-hour permissible exposure to MC is 25 ppm. For 15 minutes, permissible exposure is 125 ppm. You are likely exposed to levels in the thousands!
- MC is heavier than air. When not exhausted, vapors will be highest in the tub area but also throughout the bathroom, potentially reaching deadly levels.
- MC can be absorbed through your skin.
- You are overexposed to MC before you can smell it.
- In addition to a direct toxic effect, MC is changed in your body to carbon monoxide which can kill you.
- You may be exposed to other harmful substances needing control, including diisocyanates, epoxy components, organic solvents, and acids. Control ignition sources if using flammable solvents.
- You must comply with all OSHA/MIOSHA standards for MC, Hazard Communication, Respiratory Protection and Personal Protective Equipment.

MSU Occupational and Environmental Medicine: [www.oem.msu.edu/](http://www.oem.msu.edu/)  
MIOSHA Standards: [www.michigan.gov/mioshastandards](http://www.michigan.gov/mioshastandards)  
MIOSHA Consultation, Education and Training Division: Phone (517) 322-1809  
NTP: 12<sup>th</sup> Report on Carcinogens: <http://ntp.niehs.nih.gov/>  
OSHA Safety and Health Topics: Methylene Chloride. <http://www.osha.gov/SLTC/methylenechloride/>

HA #14

#### TO REPORT A NEW WORKPLACE FATALITY TO MIOSHA

**1.800.858.0397**

MICHIGAN FATALITY ASSESSMENT & CONTROL EVALUATION

INFORMATION: 1.517.353.1846  
E-MAIL: [debra.chester@ht.msu.edu](mailto:debra.chester@ht.msu.edu)

Many of the 144 WR deaths in this report could have been prevented. An awareness of the hazards of one's job, the provision of safe equipment, and an attitude of safety-mindedness on the part of labor and management are critical to prevent future fatal incidents

## Discussion, continued

### Example of MIFACE Intervention

In 2008, we conducted an onsite investigation after notification that a young waitress died from an acute asthma attack while working in a bar/restaurant. We found inadequate ventilation and the absence of a plan to respond to medical emergencies. We attributed her death from asthma to exposure to second hand smoke at the bar where she worked. MIFACE personnel have provided information and copies of the report of the investigation and a peer reviewed publication (Stanbury et al, 2008), to public health groups, and the State's chief medical office. The information was used as part of the effort to educate Michigan residents of the benefits of smoke-free legislation in the for Michigan workplaces. This legislation went into effect on 5/1/2010.

Traumatic occupational deaths are not random events. Information collected about the settings and circumstances in which work-related deaths have occurred will be used to prevent their occurrence in the future.

At the 2010 Michigan Safety Conference, two MIFACE presentations were made; one presentation to Public Employers section and one presentation to the Michigan Chapter of the American Society of Safety Engineers.

## Acknowledgement

We are extremely appreciative of the support of the MDLARA MIOSHA Safety and Health officers, the employers, the families and the experts who have worked with us to improve work conditions in Michigan.

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## APPENDIX

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### ***2010 Work-Related 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.

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. If viewing this report on the MSU OEM webpage, click on the link provided to view the document.

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.



*Hunt club worker died from fall through chute at top of bird release tower*



## **Aircraft (4)**

### **Cases 1-4**

#### *Cases 1-2*

A 70-year-old male copilot and a 67-year-old male physician died in a personal aircraft crash over water. The Cessna 206 single engine aircraft was carrying five individuals, three passengers, the pilot, and the copilot. The pilot reported that he was crossing Lake Michigan at 10,000 feet above mean sea level when the engine lost power. He was near the mid-point (about 24 miles from the shoreline) of the lake with a 40-knot headwind, so he turned the aircraft around to return to shore. He attempted to restart the engine but was unsuccessful. The pilot landed the airplane about 5 miles from shore and it quickly sank. Post-accident inspection of the airplane revealed that the firewall fuel strainer gasket did not provide a complete seal between the fuel screen and the fuel strainer's upper body. A portion of the gasket was positioned over the exit port, which created a gap. This allowed debris in the fuel to migrate to the engine's fuel inlet filter screen in the fuel metering assembly. The inspection of the fuel inlet filter screen revealed that it was partially obstructed with debris. The orifice of the fuel inlet passage contained the same debris that obstructed the flow of fuel through the orifice to the fuel screen. The airplane had undergone an annual maintenance inspection about 7.5 hours prior to the accident. The mechanic, who had an inspection authorization, reported that he did not inspect the gasket on the firewall fuel strainer, nor did he remove and inspect the fuel inlet filter screen as required by the manufacturer's service manual. The debris was composed of materials similar to wood chips, sawdust, paint, varnish, cloth, glass fibers, metal shavings, sand, and soil. The source of the contaminants was not determined. The National Transportation Safety Board determined the probable cause(s) of this accident was: the total loss of engine power due to fuel starvation as a result of accumulated debris in the fuel system from an undetermined source. Also causal was the inadequate annual maintenance inspection that did not include inspection of the firewall fuel strainer and the fuel inlet screen.

#### *Cases 3-4*

A 53-year-old male certified flight instructor was conducting a flight review with a 54-year-old male private pilot when the single engine, fixed wing aircraft being flown crashed in a cornfield and then burst into flames. One witness, who was a pilot, observed the takeoff and reported that the engine sounded normal. Another witness, who lived near the accident site, observed the airplane takeoff and fly above power lines that were south of the departure end of the runway. The witness reported that the airplane's engine "sputtered" and the airplane banked to the left. The airplane then turned back toward the airport and the engine lost power completely. The airplane subsequently nose dived into a cornfield and a post-crash fire ensued. The NTSB investigation determined that the probable cause of the crash was the pilot's failure to maintain airspeed and aircraft control following a loss of engine power after takeoff.

## **Drowning (2)**

### **Cases 5-6**

#### *Case 5*

A 25-year-old Hispanic male farm laborer died when he drowned in a 2-acre, 16-foot-deep farm pond. The decedent and a coworker were on break and swam in the pond to cool off. Weed growth

extended into the pond approximately 15 feet from the pond shoreline. The two individuals began to swim across the pond from the north to south shoreline. When the coworker reached the south side of the pond, he got out and looked back and noticed the decedent went under the water approximately 15 feet from the shore. The decedent never came back to the surface. His coworker notified some coworkers nearby, and together they searched for the decedent. After searching for five minutes, they called the foreman and the foreman called for emergency response. Divers found the decedent in approximately 10 feet of water entangled in the undergrowth.

#### *Case 6*

A 33-year-old male landscape worker drowned when the Toro Z Master riding lawnmower he was using to cut grass on a 24-27 degree culvert slope overturned into a water-filled ditch. The culvert grass was very wet. The decedent was a member of a five-person work crew. When the crew arrived at the incident site, they phoned the employer to indicate that due to the previous amount of rain, the grass was too wet to cut. The crew proceeded to cut another property. While the crew was performing the work at the second property, a representative of the first property contacted them and instructed them to perform the scheduled lawn maintenance. After finishing the second property, the crew returned to the incident property. It appeared that while making a pass with the mower near the culvert, the mower lost traction on the grade and slipped and rolled over into the ditch, trapping the decedent under the mower. The upper bar of the mower's roll over protection device had been removed. REFERENCE: [MIOSHA Summary, Case 240](#).

### **Drug Overdose (2) Cases 7-8**

#### *Case 7*

A 24-year-old male electrician died of a drug overdose while working at a construction site.

#### *Case 8*

A 54-year-old male carnival attendant died due to multiple drug intoxication.

### **Electrocution (7) Cases 9-15**

#### *Case 9*

A 28-year-old Hispanic male farm hand was electrocuted in a potato field when he leaned on the axle of a running irrigation pivot while pulling "volunteer" corn. The decedent and two coworkers approached and passed under an operating, self-propelled irrigation system, apparently electrified with 480 volts. He was standing in pooled water. One of the two coworkers heard the decedent yelling – they thought he was singing. The coworker looked back and saw the decedent leaning with his left arm on the cross brace between the tires. The decedent then fell to the ground. The coworkers called their supervisor at the farm. The farm office called for emergency response. After the incident, the sprinkler unit and wiring were examined by the sprinkler's installation and maintenance firm, an electric company and an electrical consulting firm working for the owner's insurance company. The system was turned off and could not be restarted for inspection. The electric company conducted tests and found that either prior to or at the time of restarting the equipment the underground wires

burned off in four places consistent with a lightning strike. A definitive determination could not be made as to how the sprinkler became energized. One possible scenario was that underground wire carried power for a short time after being damaged by lightning before failing.

#### Case 10

A 54-year-old male lineman was electrocuted when he contacted a 4,800-volt overhead electrical line during the replacement of an antiquated cross arm with associated dowel pins and insulators. The work task consisted of changing the cross arm and removing and installing four phases of primary. The decedent climbed the pole, secured his hand line, put up a rubber drill hole, had the cross arm sent up to him on the hand line, landed the cross arm, lagged the braces, and started transferring conductors. The live line tools were rated but his hand tools were not. The decedent was wearing cargo type pants, tee shirt, hard hat, glasses, gloves, sleeves, leather work boots, belt and hooks. Before completing the connection of the conductors, insulators and cross arms, the decedent removed his insulating and shielding materials (gloves and rubber line hose) from the 4,800-volt conductor wire cable and threw them to the ground while using the unrated hand tools. The decedent's shoulder contacted the electrical current causing his fatal injury. His coworkers initiated CPR as emergency response was called. The decedent was transported to a local hospital where he was declared dead. REFERENCE: [MIOSHA Summary Case 246](#).

#### Case 11

A 49-year-old male welder for a boardwalk construction firm died from a probable electrocution due to contact with 120 volts while preparing to conduct a shielded metal arc weld on a guardrail system for a floating dock. MIOSHA inspection of the welding-related equipment identified that a new 6013 welding rod was present in the stinger and had not yet been utilized, and that one side of the stinger jaws was missing its insulator cover. The welding cables were in good condition. Both MIOSHA and the decedent's coworkers could not identify the area on the metal railing or brackets along the length of the dock system where the ground clamp may have been installed. The gas-powered Miller arc welder approximately 20-25 feet away from the decedent's location was running at the time of the incident. It appeared that the decedent may have been reaching between the railing sections to complete the weld at the bottom of the railing to perform the weld when the probable electrocution took place. A coworker nearby heard a groan/grunt and turned to see decedent slumped over between the railing sections. The coworker immediately yelled to another coworker (Coworker 2) that something was wrong and ran to the decedent's location to pull him back onto the deck of the dock. The decedent's welding hood and the electrode holder/stinger were in the water. Coworker #2 turned the welder off and ran to the decedent and began CPR. Emergency response was called, and after performing further resuscitation, the decedent was declared dead at the scene. The medical examiner did not note obvious entry or exit sites usually found with effects of being electrocuted. REFERENCE: [MIOSHA Summary Case 242](#).

#### Case 12

A 41-year-old male lineman for a telecommunications company died while he was servicing and connecting a U-Verse cable system on a 40-foot utility pole located in a residential neighborhood. The decedent was working from a 24-foot fiberglass extension ladder. The ladder was leaning at an approximate 75-degree angle against the midsection of the pole he was working from and the lad-

der's attached hooks were tied off and engaged to the strand terminal. The ladder's safety feet were deployed into the ground surface. The ladder was in good condition. The decedent was wearing all of the required safety equipment and had secured his fall protection appropriately. Prior to starting work, employees were required to perform a safety check of the pole, visually check electrical equipment above them from ground level to determine if any issues are detected, and clear foliage if necessary before working from the ladder. It is unknown if the decedent checked the incident pole, but had been observed by coworkers to have checked other poles earlier in the day as required by company protocol. Dowel pins threaded on both ends were used to mount the ceramic insulator fixture to the cross arm. One end of the dowel pin was screwed into the cross arm. The ceramic insulator fixture was mounted (screwed on) to the other end of the dowel pin. There had been a storm in the area and a tree had fallen on the leg of cable and electrical lines involved in the incident. This force sustained on the leg caused by the falling tree may have jarred loose the insulator fixture from the dowel pin or broken the dowel pin resulting in the insulator resting on the cross arm. It appears that as the decedent was ascending the ladder, the live 4800 V primary wire and ceramic insulator fixture came loose and fell from the overhead cross arm, contacting the decedent and resulting in his electrocution. The primary wire was still attached from the two adjacent poles in a swaying or swinging manner approximately 8-feet below the cross member and 4-feet above the terminal the decedent would have been working on. There was no breakage of the 4800-volt line. A coworker was working on an adjacent pole approximately 75-100 feet away. The coworker indicated the residents heard three loud "bangs". He climbed down from his ladder and ran over to the decedent's location and found him hanging upside down. The MIOSHA Safety Officer observed that the incident pole's wooden cross arms were rotted and the wooden dowel pins onto which the ceramic insulator fixtures were mounted (screwed) were defective. The top of the dowel pin was worn away (instead of a cylinder shape with spiral grooves to mount the insulator, the end of the pin was "pointed", similar to a pencil shape). Other poles in the area were found to be in a similar condition. REFERENCE: [MIOSHA Summary Case 239](#).

#### *Case 13*

A 36-year-old male foreman for a tree trimming service was electrocuted when he contacted a live, 4,800-volt power line that had fallen to the ground. The decedent and his coworker were dispatched to the site to clear a path for the electric company to perform repairs. The 4,800-volt line and its neutral had fallen due to a damaged tree that had fallen on it during a wind storm. The decedent and his coworker conducted a job briefing after assessing the area. The decedent used the chain saw to cut up the downed tree. The workers pulled the neutral from under the tree and rolled it up next to a pole located approximately 15 feet away. The decedent indicated to his coworker he believed the primary line was dead and grabbed the line with both hands. He was not wearing protective gloves. The ground was wet. His coworker ran to the work truck and called for emergency response. The coworker was instructed to stay away from the decedent. He took a fire extinguisher from the truck and attempted to use it on the decedent from a distance without success. Emergency response arrived and placed a call to the electric company to disconnect the power to the live line. REFERENCE: [MIOSHA Summary Case 236](#).

#### *Case 14*

A 33-year-old male who performed heating, ventilation and air conditioning (HVAC) maintenance at

a nursing home was electrocuted during repair of a rooftop make-up air unit. The decedent was instructed by his supervisor to troubleshoot the make-up air unit because it was not working properly. He was working by himself and was not using insulated tools or insulated work gloves. The decedent had removed the covers to the unit, the motor belts, and one motor lead wire. It appeared the decedent was testing the voltage of the wires on the motor when he came into contact with 480 volts of electricity. He was found the next morning by a coworker who was asked to inform the decedent of his job tasks for the day because the decedent did not attend the required morning meeting. The coworker looked for his coworker and then thought to look on the roof. The coworker found the decedent on the roof in front of the unit he had been working on, leaning backward with his body between two smaller air conditioning units with the voltage tester in his hand. The power switch to the unit was in the ON position when the responding police agency arrived. The decedent had received Type I Type II EPA certification to handle refrigerants, by an outside firm. The EPA certification does not apply to electrical maintenance work activities. REFERENCE: [MIOSHA Summary Case 235](#).

### *Case 15*

A 46-year-old male mechanic was electrocuted while greasing a turret bearing on a 1997 Osh Kosh pumper truck when the truck's raised extendable conveyor system, which is operated by a wireless remote, came in contact with a live, 4,800 volt power line. There were two deactivated power lines above the live power line involved in the incident. The power lines ran on an angle from the building; the angle from the south was closer to the building than from the north of the building. After the incident, the power company measured the height of the incident power line. The line ranged from 30 feet 7 inches to 30 feet 10 inches above the ground. The decedent's coworker drove the pumper truck, with the extendable conveyor lying on the cab, to the incident site so it could be power washed and the turret bearing could be greased. He parked the truck so it was pointing north, approximately 12 feet away and parallel to the building. He downed the truck's outriggers. The coworker lifted the conveyor up off the cab and ran it clockwise and under the power lines. After going under the power lines, he raised the end of the conveyor into the air so it could be moved over the building. The conveyor could be extended 30 to 80 feet. It is unknown exactly how far he extended the conveyor. He left the truck and conveyor in this position and found the decedent who was to grease the turret bearing. The decedent hooked up a portable 35-gallon pneumatic grease gun that had a 25-foot-long steel braided hose. The decedent climbed onto the vehicle and stood on the driver's side of the truck; this placed him approximately 50 inches above the ground. His coworker stood on the ground on the passenger side of the truck. As the coworker moved the conveyor up and over the building, the decedent greased the bearing. The coworker moved the conveyor under the live power line and then up and back to the starting position over the building to enable the decedent to grease all sides of the bearing. This entire activity was repeated a second time. The coworker moved the conveyor to and under the power line for a third time. As he was moving the conveyor back to the building, the conveyor contacted the live, 4,800-volt power line. The coworker saw the decedent fall from the truck. He ran to the decedent, who was on his back on the ground, and told him to lie still and he would get help. The coworker summoned help from other employees and emergency response was called. CPR was performed by his coworkers. Emergency response was called and the decedent was transported to a local hospital. He died several days later. MIOSHA observed electrical burn marks on the hose to the grease gun and on the cement. A tire on the driver's side was also marked from starting to burn. The power company noted a four-foot arc mark on the incident power line.



**Fall (24)****Cases 16-39*****Agriculture Cases 16-17******Case 16***

A 74-year-old male farm laborer died when he fell 8 to 10 feet from a round auger tube on a grain wagon to a cement floor in a barn. The decedent was in the process of greasing the moving parts on the 10- to 12-inch auger tube. He climbed up on the front of the wagon onto the auger tube and sat on the auger tube, which was in a folded position. He moved out towards the end of it and began to grease the parts on the auger shaft powered by the PTO. The decedent was at the end of the tube and was greasing the head of the auger shaft when he leaned forward. The squared off chute connected to the tip of the auger tube moved slightly. The decedent lost his balance and fell to the floor striking his head. Witnesses to the fall called for emergency response and provided care until EMS arrived. The decedent was transported to a local hospital, where he died the following day.

***Case 17***

An 83-year-old male farmer died when he fell from a ladder in a cattle pen while he was replacing boards for a heifer pen. The decedent had noted that the nominal dimension oak lumber (2x4s, 2x6s) boards on the fence between the concrete cattle courtyard and the heifer pen “gave way” when pushed against. The fence was located on the north side of the heifer pen. The event was unwitnessed. Cattle were in the courtyard. The decedent disassembled an extension ladder and was using the 12-foot fly section (the ladder section that can be extended upward) to gain access to the fence boards. It appears he was using a battery operated drill, described as fairly new, to drill pilot holes for additional fasteners. When the decedent did not come back for dinner, his spouse looked for him. She found him lying on his side on the ground, unconscious but breathing. The ladder had fallen to the east. The drill bit had broken. His wife tried to use her cell phone to call a friend and emergency response, but her cell phone would not place the call. Finally, she was able to contact 911. A helicopter was summoned and the decedent was taken to a nearby hospital. He died the next day as a result of the injuries sustained. REFERENCE: [MIFACE Investigation Report #10MI019](#).

***Case 18***

A 33-year-old male township laborer died from complications sustained from a fall from the cargo box of a Cub Cadet 4x4 utility vehicle. The decedent was a member of a three-person crew. The crew had been working on a piece of equipment in Building 1. The work crew walked to Building 2 and took a lunch break. Having finished lunch, they boarded a Cub Cadet 4x4 utility vehicle parked in the maintenance garage of Building 2. The Cub Cadet had a hydraulic tilt cargo box and an enclosed cab. The crew was using the Cub Cadet to transport them approximately 100 yards back to Building 1. One of the decedent's coworkers drove, one coworker sat in the passenger seat, and the decedent sat on the lowered tail gate of the cargo box. The cargo box was not enclosed and not equipped with a passenger seat belt. The tailgate height was 2 feet 9 inches above the ground. The vehicle was backed approximately 10-15 feet out of the garage onto a wet asphalt roadway/parking area. The driver then proceeded forward and to the left. The vehicle traveled approximately 10-20 yards, and then made a left turn onto the asphalt roadway that would take them back to Building 1. After driving a short distance, his coworkers noted that the decedent had fallen from the tailgate and



onto the roadway. His coworkers stopped the vehicle and went back to the decedent. They found him unconscious. As they spoke to him, he began to respond and he indicated his head hurt. One of his coworkers called for emergency response and the decedent was transported to a local hospital. He died from complications of the head injury sustained approximately two weeks after the incident. The employer had placed the Cub Cadet into service several months prior to the incident. No training had been given to the operators on the hazards and safeguards of the equipment including the Operator Manual instruction: "Never carry more than one passenger – This vehicle is designed to carry the driver and one passenger only – NO riders are allowed in cargo box or anywhere else on vehicle." REFERENCE: [MIOSHA Summary Case 231](#).

### **Construction Cases 19-25**

#### **Case 19**

A 54-year-old male carpenter for a home restoration company died when he fell from an unknown height from a 20-foot aluminum extension ladder to a concrete driveway. The decedent was performing window repairs at a residence. His scope of work included repairing or replacing damaged latches and storm windows, re-caulking sashes, and ensuring casement windows could close properly. The decedent used a neighbor's ladder instead of a company issued 28-foot fiberglass ladder located on the work truck. A cable TV line was entering the home at this work location. He placed the ladder against the outside of the home, under the cable line, to reach a second story window located 19 feet 7 inches above the ground. The ladder was extended to its working height of 17 feet and positioned 4 feet 6 inches from the wall. The ladder was rated for a 200 pound individual; the decedent weighed 231 pounds. The decedent had an unwitnessed fall. The decedent lived directly next door to the jobsite. The decedent was scheduled to have computer work done at his home on the day of the fatal incident. When the computer repair person arrived and did not find the decedent at home, he called his cell phone. The repairman heard the decedent's cell phone ringing and followed the sound to the neighbor's driveway. The computer repair person found the decedent on the driveway and called for emergency response. The ladder was still propped against the home when he was found. The decedent was declared dead at the scene. After the incident, an insurance company examined the ladder and determined that it was in good condition; safety feet intact, latches and rungs not cracked, etc. REFERENCE: [MIOSHA Summary Case 259](#).

#### **Case 20**

A 61-year-old male construction laborer fell from an unknown height from a ladder while remodeling a store.

#### **Case 21**

A 31-year-old Hispanic male roofer died when he fell 48 feet through a 4-foot by 4-foot roof curb improperly covered and secured with 60-inch by 60-inch 22-gauge corrugated sheet metal. He was assisting the foreman in moving insulation. The curb and cover had been installed by another contractor. The decedent may have lost his footing and stepped onto the cover and it gave way. Both the cover and the decedent fell to the concrete floor below. The cover involved in the incident did not appear to have any type of fastener installed. The cover had no tears or other abrasions as a result of the decedent's fall. Upon examination of the sheet metal located on the ground level of the building after the fall, no fasteners were found. Emergency response was called. The decedent was declared

dead at the scene. At the conclusion of its investigation, MIOSHA cited four contractors, including the decedent's employer at the multi-employer worksite. REFERENCE: [MIOSHA Case Summary 258](#).

#### Case 22

A 47-year-old Hispanic male construction laborer died as a result of an 11 to 12 foot fall from a ladder during demolition activities on the east side of a damaged abandoned building. The building had six roof bays; the roof area between bays two and three had fallen in. The decedent's employer intended to save a commonly shared wall. The employer shored the roof with 6-inch by 6-inch vertical wood columns under the existing horizontal wood beams and was planning to sever/disconnect the roof decking with a chain saw. With his coworker standing nearby, the decedent was working at a height of 11 to 12 feet on an extension ladder at the southwest corner of bay 4. He was using a cutting torch to disconnect 1¼ -1½ inch diameter, 16-foot-long tension rod(s) from the shared wall. The tension rods were located at a height of approximately 16 feet from the ground. When the cutting torch cut through the tension rods, one or both of the tension rods swung down/out striking the ladder he was utilizing. The roof section between bays 4 and 5 fell down to the floor; the roof section did not strike either employee. The decedent fell to the south and landed on an acetylene/oxygen tank and then onto ground debris, causing his fatal injuries. The ladder fell to the ground. The owner returned to site by chance within a few minutes of incident. The owner found the decedent's coworker, who could not speak English, attempting to contact help. The owner called for emergency response. Emergency response arrived and the decedent was declared dead at the scene. The decedent had a blood alcohol level greater than 0.08%. The owner could not communicate with the surviving coworker. REFERENCE: [MIOSHA Case Summary 243](#).

#### Case 23

A 62-year-old male construction laborer died when he fell an unknown distance from an extended extension ladder to a cement floor. The decedent and his coworker were performing repairs on a sprinkler system. His coworker stated to the responding police that just prior to the fall the decedent was moving the ladder to a different position. The cause of the fall is unknown.

#### Case 24

A 62-year-old male carpenter died from complication of a head injury sustained in 2001 as a result of a fall from a roof.

#### Case 25

A 54-year-old male drywall finisher died from complications of a fall from an unknown height from scaffolding at a construction site.

### **Manufacturing Cases 26-27**

#### Case 26

A 51-year-old male bakery owner died when he fell 20 feet from an extension ladder to a concrete floor. The roof was leaking and there was a large amount of water on the floor. The decedent propped the extension ladder inside of the building against the rafters near the roof to provide access to perform repairs to the leaking roof. It appears that the ladder slipped out from underneath

him causing his fall.

#### *Case 27*

A 62-year-old male sales manager slipped on ice and struck the back of his head on a sidewalk connected to a loading dock. He died of complications of the injury 11 days later.

#### *Case 28*

A 57-year-old male general manager of a restaurant in a retail store died from complications of a fall from a stool. The decedent had been conducting product inventory when, to take a break, he sat down on a stool. The stool slipped and fell from under him. As he fell, his left side struck the metal legs of the stool, breaking several ribs. The decedent died approximately one week later from complications of the rib injury.

### ***Transportation/Warehousing Cases 29-31***

#### *Case 29*

A 47-year-old male automobile loader was installing the second of two bridge plates between two railroad cars. The bridge plates connected the “decks” of railroad cars to allow vehicles to be driven between rail cars. The lower deck was 45 inches from the ground. The two decks were spaced 87 inches apart (from the bottom of the lower deck to the bottom of the upper deck). The distance between the rail cars was 50 inches. On the rail car he was working from was a fixed ladder. The ladder’s lower rung was 21 inches wide and 24 inches above the ground. The distance between the first rung and the second rung was 20 inches, and then the rungs were spaced 17 inches apart. Snow and ice were present on the ground and ladder rungs. A coworker, who was returning to the work van, observed the decedent standing on the lower deck and pinning the second bridge plate. When the decedent did not return to the work van, his coworkers drove the van to his last known location to look for him. The decedent was found lying on the ground next to the railcar where he had been previously observed working. The sequence of events leading to his fall from the rail car is unknown. Emergency response was called while his coworkers administered first aid. The decedent was transported to a local hospital by emergency personnel where he was declared dead. REFERENCE: [MIOSHA Case Summary 234](#).

#### *Case 30*

A 63-year-old female bus aide fell on an icy sidewalk while walking a student to his/her home. She died of complications of the fall.

#### *Case 31*

A 74-year-old male supervisor for a distribution warehouse had an unwitnessed fall from a ladder stand as he was taking down an 8-foot long, cord and plug fluorescent light fixture located over a shelving rack. The exact height of the light fixture was unknown, but it was indicated to the MIOSHA compliance officer that the 11-foot portable ladder stand could move under it. The shelving rack’s top shelf was 71 inches from the floor. The ladder stand met MIOSHA requirements, was in good condition with operational wheel locks. The light fixture was to the left of the decedent. Workers in the other areas of the warehouse heard a loud crash and ran to the area. Coworkers found the decedent on the concrete floor next to a pallet with an attached box and called for emergency re-

sponse. Coworkers found that the portable ladder stand was leaning against the pallet's box about 30 degrees to the left of vertical. The box on the pallet had two indentation marks, one round and one flat, on the right side that were made by the back and middle rails of the ladder stand. One side of the light was hanging from a chain and the other side of the chain was on the floor. There was broken glass on the floor. The decedent was taken to a local hospital where he died the next day. REFERENCE: [MIOSHA Case Summary 247](#).

#### Case 32

A 41-year-old male semi-truck driver died from complications of a head injury due to a fall from a semi/trailer bed. The semi tractor had an attached flat-bed trailer upon which were items to be delivered. The decedent had made his last delivery and noted a mechanical issue with his truck. The decedent called the firm's maintenance department and the mechanic drove another tractor (Tractor #2) to the scene and together the decedent and mechanic loaded and secured the decedent's tractor on the trailer. As the two workers were driving back to the firm's office they stopped for snacks. The decedent indicated to the mechanic that he wanted to retrieve items from his tractor. As his coworker was checking securement on the passenger side, the decedent climbed onto the trailer. His coworker heard a sound on the driver's side of the truck. His coworker investigated and found the decedent on the ground. The ground surface consisted of hard gravel. The decedent indicated he fell from the top step of the towed tractor. MIOSHA measured the distance of the fall – 6¼ feet (the flat bed trailer bed was 39 inches above the ground and the top step of the tractor was 37 inches above the flat bed). The coworker drove the decedent to the hospital in the same city as the firm's office location. The decedent was evaluated and released several hours later. The firm's owner picked up the decedent from the hospital and took him to the firm's office so he could get his personal vehicle. The decedent wanted to retrieve the items from Tractor #2. At approximately 7:00 am the next morning, the decedent was found by a coworker unconscious on the ground on the passenger side of Tractor #2. Emergency response was called and the decedent was transported to a local hospital, where he died after further resuscitative efforts. REFERENCE: [MIOSHA Case Summary 248](#).

### **Health Care/Social Assistance Cases 33-34**

#### Case 33

A 41-year-old female dining room server who worked at a nursing home died as a result of complications of a surgical procedure to repair a fractured ankle sustained at work as a result of a fall on black ice as she was taking a bag of garbage to a dumpster. The dumpster was located at the back of the building near a parking area that sloped toward the dumpster. A wood fence had been erected around the dumpster. The incident occurred at night. The lighting did not adequately illuminate the dumpster area. Snow piles had begun to melt and the water accumulated and then froze around the dumpster as the temperature dropped at night. Salt had been utilized earlier in the day, but was stored in a locked maintenance shed. Only maintenance personnel had keys to access the shed. After the decedent slipped, she used her cell phone to call the facility. EMS was summoned and had difficulty retaining their footing due to the slippery conditions. REFERENCE: [MIOSHA Case Summary 238](#).

**Case 34**

A 87-year-old female adult foster care provider died after she fell down 15 to 18 steps to a concrete floor. The stairway was described as steep by emergency responders.

**Arts/Entertainment/Recreation Cases 35-36****Case 35**

A 26-year-old male laborer/hunt guide/dog trainer at a hunt club died when he fell approximately 40 feet through an open 45-inch by 30-inch trap door/chute in a bird release tower. The tower had four flights of stairs and a fixed ladder by the chute/trap door opening. A rope mechanism was used to raise birds up and through the chute opening to the tower's base platform. The top of the tower had two levels; the platform floor containing the trap door and a ledge located approximately three feet above the base platform. His coworker was shoveling snow on the platform floor and the decedent was standing on the ledge scraping ice. The decedent slipped and fell backwards through the chute opening to the ground below. His coworker heard swearing, and saw the decedent fall through the chute opening folded at the waist. The decedent landed on the snow covered ground, on his right side, and then rolled onto his stomach. His coworker descended from the platform. When reaching the ground, the decedent indicated he was having trouble breathing. His coworker called 911 and the son of the owner cleared a path for emergency responders with a backhoe, who arrived and transported the decedent to a local hospital. REFERENCE: [MIOSHA Case Summary 255](#).

**Case 36**

A 52-year-old female janitor/housekeeper at a recreational fitness club fell down 20 steps while carrying a vacuum either up or down the stairway.

**Other Services Cases 37-38****Case 37**

A 66-year-old male maintenance supervisor for a church fell down a stairway while changing a burnt-out light bulb. The burned out light to be changed out was at the top of unlit, L-shaped stairway. He placed an 8-foot step ladder (in a closed position) on the second floor landing against a 9-foot long by 42-inch high by 7-inch wide cinder block knee wall. He had an unwitnessed fall. Possible scenarios include an unintentional fall from the second floor landing or a fall from the top of the knee wall as he was attempting to unscrew the fixture's set screws. He was found by an individual walking past the first set of stairs lying on the 5-foot by 5-foot landing. The individual who discovered the decedent indicated the decedent was unconscious, lying on his back and appeared to be breathing. This individual ran to a nearby office to call for emergency response. Emergency response arrived and the decedent was transported to a local hospital where he was pronounced dead. REFERENCE: [MIFACE Investigation Report #10MI006](#).

**Case 38**

A 48-year-old male church volunteer died after falling approximately 15 feet from a ladder as he was removing icicles from a church roof. It appears that the ladder slipped to the side, causing his fall. He was transported to a local hospital, where he died several days later as a result of the injuries sustained in the fall.

**Case 39**

A 68-year-old male Fire Chief died when he fell and struck his head on the concrete fire station floor. He had returned to the fire station after fighting a fire at a single family home. The decedent and other fire fighters were cleaning and preparing the equipment for the next fire run. The decedent was working alone. He went to an air fill station for the SCBA tanks when he apparently fell backwards to the floor. Coworkers heard a noise and an assistant chief found him alert in the center of the aisle on the floor between a hose rack and a fire truck. He was bleeding from the back of his head. He later became non-responsive and unable to answer questions. There was no known reason for his fall, although contributory medical conditions were identified as coronary artery atherosclerosis, hypertension and pulmonary emphysema. EMS was called and he was transported to a nearby hospital and then to another hospital. He died one week after the fall. Coworkers did not observe any items in the hose rack disturbed or any marks on the apparatus. The air fill station appeared to be intact and there was no physical or electrical damage to the unit. His coworkers informed MIOSHA that the floor was dry and did not have any slip/trip hazards. REFERENCE: [MIOSHA Case Summary 260](#).

**Fire (3)****Cases 40-42****Case 40**

A 59-year-old male township sewer administrator died when a spark from a 14-inch chop saw entered a funnel that was used to pour waste oil and other liquids into a 55-gallon drum, causing the vapors in the drum to ignite and the drum to explode. The chop saw the decedent was using to cut re-rod was located approximately two feet from the 55-gallon drum and was within 10 feet of a parts washer that contained lacquer thinner. The waste drum and another 55-gallon drum containing new motor oil were on a rack adjacent to the chop saw. Both barrels were lying horizontally on the rack, approximately 2-1/2 feet above the floor. The waste oil drum had a facet in one bung hole and the other larger hole had a firm-made two-inch diameter spout which came out approximately two inches and turned upward at a 90 degree angle for approximately eight inches. At the end of the spout there was an open funnel used for pouring liquids into the drum. The funnel height was approximately at the same level as the saw. The decedent had cut a piece of re-bar and had placed it on the ground against the building's overhead door rail track when the explosion occurred. Another employee had just arrived, and was burned as a result of the explosion. Nearby businesses heard the explosion and saw the fire and called for emergency response. Emergency response arrived and transported the decedent to a nearby hospital where he died later that day. REFERENCE: [MIFACE Investigation Report #10MI032](#).

**Case 41-42**

A 54-year-old female secretary and 64-year-old male salesman at a furniture store died as a result of a gas leak causing an explosion at the store.

**Heat (1)****Case 43**

A 39-year-old male paint store manager died due to hyperthermia while in the driver's seat of his ve-



hicle, which was parked in the business's parking lot. The day was hot and the vehicle's windows were up. It appeared he went to his vehicle during lunch. He had an elevated blood alcohol level. The outside temperature was 86<sup>0</sup> degrees Fahrenheit.

**Homicide (26)****Cases 44-69***Case 44*

A 50-year-old male apple farmer died due to a gunshot wound.

*Case 45*

A 52-year-old male plumber died due to a gunshot wound.

***Retail Trade Cases 46-53****Case 46*

A 51-year-old male manager of a gas station was shot and killed during a robbery.

*Case 47*

A 33-year-old male gas station owner was shot and killed by a family member.

*Case 48*

A 41-year-old male gas station attendant died as a result of multiple gunshot wounds.

*Case 49*

A 48-year-old male liquor store owner died due to multiple gunshot wounds.

*Case 50*

A 36-year-old male loss prevention detective for a department store died as a result of being dragged by a motor vehicle while attempting to apprehend a shoplifter.

*Case 51*

A 27-year-old male gun store owner was shot and killed during a robbery.

*Case 52*

A 64-year-old male discount store owner died due to multiple gunshot wounds.

*Case 53*

A 38-year-old male laborer at an automobile glass replacement store died due to a gunshot wound.

*Case 54*

A 31-year-old male telecommunications technician died when he was stabbed at the hotel at which he was staying while in the State on a business trip.

**Case 55**

A 51-year-old male property manager died due to multiple gunshot wounds.

**Case 56**

A 35-year-old female customer support specialist died due to multiple gunshot wounds.

**Case 57**

A 53-year-old male security officer at an apartment complex died due to a gunshot wound.

**Case 58**

A 39-year-old female registered nurse died due to a gunshot wound.

**Case 59**

A 36-year-old male valet died after a customer deliberately ran over him with a vehicle after an argument.

***Accommodation and Food Services Cases 60-61*****Case 60**

A 33-year-old male delivering pizzas was shot and killed during a robbery.

**Case 61**

A 21-year-old male CEO of a nightclub was shot and killed while he was distributing promotional materials.

***Other Services Cases 62-66*****Case 62**

A 28-year-old male automotive manager was shot and killed during a robbery.

**Cases 63-64**

A 43-year-old male auto repair shop owner and a 36-year-old male auto mechanic at the shop were shot and killed by a disgruntled customer.

**Case 65**

A 75-year-old male collision shop owner was shot and killed during a robbery.

**Case 66**

A 32-year-old male barber died due to multiple gunshot wounds.

***Public Administration Cases 67-69*****Case 67**

A 26-year-old male police officer died from multiple gunshot wounds while responding to a domestic disturbance.

**Case 68**

A 42-year-old male police officer died due to multiple gunshot wounds sustained when he was responding to a report of shots fired/breaking and entering at a residence.

**Case 69**

A 31-year-old male police officer was shot and killed when responding to a breaking and entering at a residence.

**Machine (15)****Cases 70-84*****Agriculture Cases 70-79*****Case 70**

A 71-year-old male farmer died when the 1940 Allis Chalmers narrow front tractor equipped with a homemade plow overturned into a ditch. The decedent was pushing dirt along a ditch bank at the edge of his field. It appears the tractor's front wheels began to slide into the ditch. The tractor overturned and pinned the decedent under the machine. The tractor was not equipped with a rollover protective structure (ROPS) and seat belt.

**Case 71**

A 52-year-old male farmer died when the John Deere 2510 tractor and brush cutter he was driving overturned pinning him in a drainage ditch. The decedent was using the tractor to cut thistle. The tractor had been traveling east in the field when its tracks, according to the responding police, drifted north toward the ditch. When he did not return home as expected, a family member checked the two farm locations and did not find him. When the family member did not see a tractor, the ditches adjacent to the farm fields were checked. The decedent was found pinned under the overturned tractor. After calling for emergency response, the family member used another tractor and chain to lift the tractor from the decedent. The tractor was not equipped with a ROPS and seat belt.

**Case 72**

A 77-year-old male farmer died when he was pinned under a tractor when it overturned to the side. The 1974 Ford 7000 was equipped with a loader, which had an attached farm-made hay spear unit in the front. Attached to the "sway bar" was a Krone Model #KR151 round hay baler. The decedent was traversing the side of a hill with the tractor/baler. The responding police officer noted that no pins were used to hold the sway bar straight on the tractor. The responding police officer postulated that the sway bar moved to the right causing the weight of the baler to shift, causing the tractor to overturn. The tractor was not equipped with a ROPS and seat belt.

**Case 73**

A 45-year-old male farmer died when he was run over by a John Deere 4430 tractor to which he was adjusting the idle. The decedent was working in a barn; the north wall of the barn faced the road and the south wall faced a large cornfield. The tractor was facing south. The throttle and gear shift controls were both located on the right side of the tractor. When the operator was in the driver's seat, the operator pushed the throttle lever forward (away from the driver) and the gear lever backwards

(toward the driver). Both levers were accessible while standing on the ground, and the lever activation reversed. The decedent was standing on the ground facing the tractor on the tractor's right side, which placed the engine area in front of him with the small front tire to his right and the large right rear tire to his left. It appears that he reached up and in an attempt to activate the throttle (pulling it toward him) he contacted the gear shift lever, pushing it back which placed the tractor into gear. Because the tractor engine was operating at a high rpm, when placed into gear, the tractor went forward at a high rate of speed. The rear tractor tires left spin marks on the concrete floor of the barn. The tractor continued out the south barn door and arced to the north, crossing the road and continuing into a field. The tractor continued its arced path of travel through the field, and then passed between two houses, crossed a north-south road, and finally came to rest against a tree approximately one-third of a mile from the barn. Several of the decedent's family members saw the tractor traveling without the operator and investigated. Seeing the decedent on the floor, they went to the house and notified another family member, who investigated and called for emergency response. Emergency response arrived and declared the decedent dead at the scene. REFERENCE: [MIFACE Investigation Report #10MI075](#).

#### Case 74

A 60-year-old male farmer died while cleaning hay from a New Holland hay baler. Earlier in the day, the decedent and a family member had cleaned the baler using an air compressor/hose to blow out the dust, etc. The family member indicated the hopper was up and the locks were in place. The tractor was running. The family member left the area. The sequence of events that resulted in the decedent being pinned is unknown. The family member arrived back at the work area and found the decedent pinned. The family member did not know how to raise the hopper and called emergency response and a business partner of the deceased. EMS arrived and attempted to open the baler, but was unsuccessful. One individual who arrived turned the tractor off and tried to pry open the baler but was also unsuccessful. The business partner arrived and opened the hopper by using the appropriate lever.

#### Case 75

A 75-year-old male farmer died when he attempted to climb into the cab of his moving 1993 John Deere 7600 farm tractor. The decedent drove the tractor, which hauled two gravity wagons filled with corn to an elevator. He parked the tractor inside the building where the grain was being dumped. The building floor was concrete. The decedent had placed the tractor into Neutral (not Park) after entering the building. While unloading the second wagon of corn, the tractor began to move forward. The decedent attempted to climb into the cab, but was unable to do so and was run over by the dual rear wheels of the tractor. The tractor continued onward and came to rest against some trees. Individuals at the elevator pulled the tractor/wagons away from the trees and noted that the tractor was in Neutral.

#### Case 76

A 69-year-old male farmer died when the tractor he was using to support a tree that he was cutting down with a chain saw slid onto him after the tree was cut down. The tree was located on a drop off to the north of a driveway. The tractor was equipped with a bucket, and was facing north with the bucket against the tree to keep it from falling. When the tree was cut, it appears that the tractor

rolled forward over the edge of the drop off. The decedent did not have time to react and was struck and pinned under the left front tractor tire. The front of the tractor struck and was held in place by the tree stump. He was found with the chain saw in his hand.

#### Case 77

A 65-year-old male farmer died when he became entangled in the moving parts of an Avco New Idea corn picker. The picker was connected to a tractor power take off (PTO) shaft. The tractor was running and powering the PTO and picker at the time of the incident. It appeared that the decedent was attempting to clear the picker of corn cobs and other debris when his gloved hands were caught by the revolving rollers and he was pulled into the machine. When he did not return home for dinner, his wife looked for him. After finding him, she called emergency response.

#### Case 78

A 75-year-old male farmer died when he was run over by his tractor. The decedent drove the tractor, which was hauling a fertilizer tank mounted on a trailer and containing liquid fertilizer, to a nearby farm. The decedent planned to transfer the fertilizer from the tank to another container, and store it at this location for the winter. The decedent backed the trailer to the container and shut the tractor off. He got off the tractor, and determined that the tractor had to be running to unload the fertilizer from the tank to the container. While standing on the ground, he stood in front of the right rear tire and reached up with one hand to push in the clutch and with the other hand turn the ignition key to start the tractor. The tractor started and jumped forward, running him over. The tractor continued to move forward until another individual climbed on the moving tractor and turned it off.

#### Case 79

A 49-year-old male farmer died from complications of an arm injury sustained when his arm became caught in a belt for a hay baler.

#### Case 80

A 52-year-old male forklift operator died due to crush injuries sustained while transporting a pallet of containers on the forks of a Crown Model 540 electric stand-up forklift. The containers were located in a storage area in palletized stacks that varied in height (12-20 feet). The container stacks were arranged in aisle ways approximately 14 feet wide. It appeared that the decedent, who was licensed to operate the truck, lifted a pallet of plastic containers from the top of an 18-foot-high palletized stack. After lifting container pallet, he backed away from the pallet stack. As he was backing, he may have been leaning outside of the forklift frame. The decedent had approximately four feet to maneuver the forklift between the stack he was lifting from to another stack directly behind the forklift. It appeared as he was backing away from the stack he simultaneously turned the forklift and lowered the forks. The forklift backed approximately 8 to 12 feet from the stack at an angle. The decedent's head and body were caught between the forklift frame and another stack of containers. The decedent released the forklift control levers and the truck then rolled forward a couple of inches. The forklift did not have a safety belt or harness. A coworker heard a sound described as "plastic containers falling." He ran to the area and observed the decedent slumping down from the forklift. Several containers were still on the forks and containers were strewn about on the floor. The coworker ran to the forklift and placed his foot on the foot pedal brake so the truck would not continue to move and called for help.



When additional coworkers arrived, they used another fork truck to lift the forklift from the decedent. Emergency response was called and the decedent was declared dead at the scene. REFERENCE: [MIOSHA Case Summary 232](#).

#### Case 81

A 49-year-old male mechanic died when the Terex PT 5000 machine he was repairing rolled forward and pinned him under the right rear tire. The machine was running and the parking brake activated, but was not fully engaged. The decedent was working on an injection pump. It appeared the decedent reached up toward the steering column and either bumped or pushed the gear selector into the forward position, causing the machine to roll forward. The decedent attempted to stop the movement by reaching for the gear lever and became wedged under the right rear tire. REFERENCE: [MIOSHA Case Summary 250](#).

#### Case 82

A 39-year-old male heavy equipment operator died when he was ejected from the driver's seat of the Daewoo loader equipped with a tree fork and then pinned under the driver's side rear tire. The decedent, who was an authorized operator of the loader, fueled the loader at the fueling station located at the top of a hill. After fueling, he proceeded down the steep hill's logging road to begin work at the bottom of the hill. It is unknown if, at the fueling station, he attached his seat belt. It appears that at one point during his descent, the decedent either lost control of the loader or attempted to apply the brakes, which were non-functional. The loader began to gather speed and began to "bunny hop" or "buck" after it struck a dirt berm. The loader's fork marks were found on the path of his descent. Witnesses observed the decedent "bouncing around" in the operator cab as the loader proceeded down the slope. When the decedent and the machine reached the bottom of the hill, the decedent was ejected either through the front windshield or the operator door. The loader struck an excavator parked at the base of the hill, rolled back, and came to rest. The decedent was pinned under the driver's side rear tire. The front windshield came to rest behind and to the left of the loader. The investigating MIOSHA compliance officer did not note hydraulic fluid on the hill along the path of the loader. Another contractor, a few days later, moved the loader. He found that the brake hydraulic sight gauge did not show any fluid in the reservoir. No hydraulic fluid was found under the machine. He started the loader and the machine made a noise described as the hydraulic pump lacking oil. This contractor added five gallons of hydraulic fluid to the reservoir. The fluid was retained within the reservoir, but the brakes still did not work as he moved the machine. In addition, the loader as it was moved after the addition of the hydraulic fluid, continued to make the same sound. Investigation found that the front left brake line had been brazed several months to a year prior to the incident. REFERENCE: [MIOSHA Case Summary 261](#).

#### Case 83

A 52-year-old female worker died when she was struck by a forklift transporting a six-yard dumpster in a recycling center parking lot. The dumpster was 71 inches wide by 58 inches tall by 66 inches deep. It was filled to overflowing; the dumpster flaps were hanging on the front (not on top of the load). The forklift driver was traveling forward (not trailing the load). The decedent was walking behind a coworker as they were returning to the worksite after leaving the office area. After the decedent was struck, her coworker contacted their supervisor and the supervisor ran to the incident loca-

tion. The forklift driver backed off of the decedent. The supervisor applied a tourniquet to the leg injury sustained. Emergency response was called and the decedent was airlifted to a hospital for surgical intervention. She died in the hospital several hours later. REFERENCE: [MIOSHA Summary Case 254](#).

#### **Case 84**

A 78-year-old male volunteer was killed while mowing grass for a youth organization's camp using a tricycle-type Allis Chalmers Model L59AC farm tractor retrofitted with an after-market, home-installed underbelly power rotary mower attachment. The tractor overturned to the side on an approximately 30-degree hill and pinned him beneath it. The tractor was not equipped with a rollover protection structure (ROPS) and seat belt. The decedent had mowed the property for over 30 years. The following scenario has been developed since his death was not witnessed. The decedent arrived at the camp and drove the tractor to the top of the hill behind the building. Starting from the top of the hill, he drove the tractor downhill between the two trees and then turned north toward the bottom stairs leading to the building. He then ascended the 30-degree hill and as he was turning the tractor southbound at the top of the hill, the outside wheel lost its traction and the tractor overturned to the side. His tractor, according to his family members was in first gear. His tractor speed was unknown. A neighbor found him pinned under the overturned tractor's seat. The neighbor ran to the nearest residence where emergency response was called. The homeowner and neighbor ran back to the incident scene and attempted to render aid. The fire department arrived, removed the tractor from the decedent, and performed resuscitative measures. He was pronounced dead at the scene. REFERENCE: [MIFACE Investigation Report #10MI067](#).

#### **MVA (28)**

#### **Cases 85-112**

#### ***Agriculture Cases 85-87***

##### **Case 85**

A 59-year-old male farmer died when the stake truck filled with sawdust he was driving overturned as he was turning at a T-intersection. The dry, two-lane roadway had a non-posted speed limit of 55 mph. The decedent's vehicle was traveling eastbound. The decedent attempted to make a wide left turn at the intersection, but the vehicle overturned. The truck then slid on its side toward a ditch at the side of the road, and then rolled onto its roof. The decedent was not wearing a seat belt/shoulder harness. The truck was not equipped with an airbag. The police investigation found that brake fluid was leaking as the vehicle approached the intersection and determined that the truck brakes were not functional. Police also found several pieces of the clutch assembly on the eastbound roadway prior to the intersection.

##### **Case 86**

A 22-year-old male farm family member died when his 30 horsepower Farmall field tractor with a narrow front was struck by a minivan. The tractor and minivan were traveling westbound on a dry, two-lane roadway with a posted speed limit of 55 mph. The minivan driver sounded the vehicle's horn, and entered the eastbound lane to overtake and pass the tractor. The decedent made a left turn to enter a driveway turning into the path of the minivan. The minivan struck the tractor's left rear

tire and caused the tractor to overturn. The tractor was not equipped with a roll-over protective structure, seatbelt, turn signals, or a slow moving vehicle sign. The decedent was ejected into the path of the overturning tractor.

#### **Case 87**

A 47-year-old Hispanic male farm worker died when the pickup he was driving was struck by a stake truck at an intersection. The decedent was traveling northbound and had stopped his vehicle at the intersection. The east-west roadway had the right of way. The stake truck was traveling eastbound on a dry, two-lane roadway with an unposted speed limit of 55mph. The stake truck attempted to avoid the collision when the decedent proceeded into the intersection to make a left turn (to travel westbound), but was unsuccessful. The truck struck the decedent's vehicle on the driver's side, causing the pickup to leave the roadway and overturn. The decedent was wearing a seatbelt/shoulder belt. The vehicle's airbags deployed.

### **Construction Cases 88-91**

#### **Case 88**

A 49-year-old male carpenter died when the pickup truck he was driving struck various sized trees after leaving the roadway. The decedent was traveling eastbound on the dry, two-lane asphalt roadway with a posted speed limit of 55 mph. The road way had a narrow paved shoulder that transitioned to gravel and then into a vegetated ditch. The decedent's pickup truck crossed the centerline as it exited a curve in the roadway, entering the ditch and striking a large tree on the driver's side. The responding police agency report indicated that there were no obvious signs of vehicle braking and that the decedent may have fallen asleep. After striking the tree, the vehicle continued eastward, and struck several smaller trees, causing it to come to rest perpendicular to the roadway. The decedent was wearing a lap/shoulder belt. The vehicle's airbags did not deploy.

#### **Case 89**

A 61-year-old male draftsman for a civil engineering firm was conducting survey work in a road's right of way when he was struck and killed by an oncoming vehicle. The decedent and his coworker were taking measurements and making sketches of sewer pipe locations from outside of the roadway's manholes. At the time of the incident, they were measuring the depth of sewer pipe from the top of the manhole. The two-lane, north-south roadway had a posted speed limit of 25mph. The roadway had an unobstructed, uphill grade. The traffic volume was moderate to heavy. The pickup truck used by the crew to travel to the site did not have a rotating light on the roof. The work was performed in the southbound lane. The pickup was parked to the side of the road and south of the incident manhole (manhole was north of the vehicle) to enable easier access to the tools located in the pickup bed. The manhole was to east of the pickup. The crew, wearing reflective safety vests, placed four orange traffic cones (per the police report) to use as warning devices and activated the vehicle's emergency hazard lights. They had not placed any advanced warning signs. The driver of the vehicle was traveling southbound when it struck the workers. The driver was identified on the police report as distracted at the time of the crash. REFERENCE: [MIOSHA Summary Case 237](#).

**Case 90**

A 31-year-old male plumber died when the work van (Vehicle #2) he was driving was involved in a two-car crash. Both vehicles were traveling northbound on a dry, three-lane expressway with a posted speed limit of 70 mph. Vehicle #1 was traveling in the left lane of traffic when the driver changed lanes to the middle lane. The driver thought something was in the middle lane and overcorrected as she moved back into the left lane. She lost control of the vehicle, left the roadway driving onto the left shoulder, and then re-entered the roadway and struck the decedent's vehicle traveling in the middle lane of traffic. Both vehicles lost then control and entered the right ditch and rolled over. The decedent was not wearing his seat belt and was partially ejected. The van's final resting position was on the driver's side. The vehicle's airbag did not deploy.

**Case 91**

A 32-year-old male carpenter died when the pickup truck he was driving struck a fixed object and overturned into the lanes of traffic. The wet, unlit, three-lane roadway had a posted speed limit of 70 mph. The decedent's vehicle was traveling northbound in the right lane when the decedent lost control and struck a cement bridge abutment. Striking the abutment caused the passenger side of the vehicle to ride up the abutment and overturn onto the driver's side of the vehicle. The vehicle slid to the left lane, headlights pointing west and tail lights pointing east. The decedent's vehicle was struck by an oncoming vehicle. The decedent's restraint use was unknown. The pickup truck's airbags deployed.

**Wholesale Trade Cases 92-93****Case 92**

A 62-year-old male collections/sales representative for a newspaper agency died when the car he was driving was struck by a train. The railroad crossing had functional warning signals, bells and lights, which were activated at the time of the incident. The crossing did not have gates. Witnesses indicate that the train horn was being sounded as it approached the crossing, traveling approximately 38 mph in a 40 mph track rated area. The train applied its emergency brakes but was unable to avoid striking the driver's side of the vehicle. The decedent was not wearing a seat belt/shoulder harness. The airbags deployed.

**Case 93**

A 53-year-old male salesperson died when the van he was driving rear-ended the trailer of a semi truck that had stopped for traffic that was backed up due to an unrelated crash. The incident occurred during a medium to heavy rainstorm causing reduced visibility. The two-lane eastbound roadway had a posted speed limit of 70 mph. The semi driver indicated that he had been stopped for approximately five seconds; his foot was depressing the brake pedal, which was determined by responding police to be functional. Due to the wet roadway, responding police could not determine if the decedent had applied the van's brakes prior to the collision. The decedent was wearing his lap/shoulder belt. The van's airbags did not deploy.

**Retail Trade Cases 94-95****Case 94**

A 43-year-old male tire salesman died when the van he was driving struck a school bus. The de-

dent was traveling on a two-lane country road with a speed limit of 55 mph. The roadway was damp. The responding police department noted that the van's light switch was on the "parking light/running light setting". The bus driver did not note any oncoming traffic as the bus started back onto the roadway after picking up a student. The bus was traveling less than 30 mph when it was struck in the rear by the decedent's vehicle. There was no evidence that the decedent applied the vehicle brakes. The decedent was not wearing a seatbelt. The van's airbag deployed.

#### **Case 95**

A 58-year-old male florist died when the delivery van he was driving rear-ended a flatbed wrecker that had stopped in the roadway to make a left turn. The incident occurred on a four-lane, paved asphalt roadway with two eastbound and two westbound lanes divided by a double yellow line. The posted speed limit was 35 mph. The wrecker was stopped in the left lane of the westbound lanes waiting for eastbound traffic so he could complete a left turn onto another road. The street light that illuminated this intersection was not functional. Witnesses indicated that the wrecker's left turn signal was activated and that its overhead light bar was flashing. The decedent attempted to swerve to the right lane, but was not able to avoid the collision with the wrecker. The decedent was not wearing a seatbelt/shoulder harness. The van's airbags deployed.

### ***Transportation/Warehousing Cases 96-105***

#### **Case 96**

A 56-year-old male semi truck driver died when he was ejected from his semi-truck cab after striking an expressway guardrail. The dry, two-lane expressway had a posted speed limit of 60 mph. The decedent was traveling eastbound. For reasons unknown, the semi drove off of the expressway onto the right shoulder of the roadway. Both the semi cab and trailer began to overturn to the right (passenger side) and began to slide down the guardrail. The decedent was ejected from the cab, struck the guardrail, and was run over by the semi trailer. The responding police department did not find any signs of braking by the decedent. The tractor cab was not equipped with airbags.

#### **Case 97**

A 59-year-old male semi truck driver died when he was struck by a pickup truck as he was crossing an expressway under construction. The posted speed limit was 60 mph. The northbound three-lane expressway was reduced to one traffic lane; the far left lane was the only open traveling lane. Barrels separated the travel lane from the two lanes under construction. The decedent had parked his semi truck and trailer on the left shoulder of the expressway, exited his truck and crossed all of the traffic lanes into the construction area. The incident occurred at dawn. The semi truck's hazard lights were on and the cooler unit was running. The pickup truck was traveling northbound. The decedent was walking from the east side of the expressway back to the west side to get to his parked semi truck. While crossing into the left lane of travel he was struck by the pickup truck passenger side. The pickup truck had its headlights on.

#### **Case 98**

A 40-year-old male semi truck driver died when he was ejected from the cab of his semi truck when the truck struck the elevated expressway exit ramp retaining wall. The asphalt ramp curved to the west. The decedent was traveling faster than the advisory speed of 30 mph. Tire marks and scrapes



indicate the semi was on the left side of the ramp when the trailer went over the retaining wall. The decedent had been restrained, but the upper part of the belt was ripped open during the incident. A witness indicated that the trailer just started to tip over, probably due to higher than reasonable speed into the turn. The decedent was ejected from the semi cab and landed next to the retaining wall.

#### *Case 99*

A 58-year-old male semi truck driver died when the semi tractor and trailer he was driving ran off of the dry, two-lane expressway, struck a highway sign and then struck a concrete sound barrier wall. The posted speed limit in the construction zone was 60 mph. The vehicle caught on fire after impact. It is unknown whether the decedent was using restraints, but he was found outside of the semi cab. The semi cab was not equipped with airbags.

#### *Case 100*

A 60-year-old male semi truck driver died when his semi with two trailers overturned. The decedent was traveling westbound in the right lane of a dry, three-lane expressway with a posted speed limit of 70 mph. Witnesses stated in the police report that the driver side front tire blew out causing the truck/trailer to jackknife into the left lane. The semi then flipped over onto the left shoulder and guardrail, causing one of the two trailers to break loose, and the remaining trailer and cab to continue on and strike an overhead road sign. The decedent was not wearing a lap/shoulder belt and was ejected from the cab. The cab was not equipped with an airbag.

#### *Cases 101-102*

A 57-year-old male and 54-year-old female, husband/wife team drivers for a semi-truck/trailer hauling engine blocks died when the truck struck a concrete bridge pillar. At the time of the crash, the 57-year-old man was driving the truck; the female driver was on her mandated rest period. The driver was traveling north on a four-lane expressway with a posted speed limit of 70 mph. The four lanes consisted of three northbound lanes and an exit lane to another expressway. The responding police indicated the roadway was clear at the scene; however, there was snow covering the white line that indicated the gore location (triangular piece of land where the road split) between the right northbound lane and the exit lane. The fog line for the northbound lanes on the west side of the gore was visible, but snow and slush covered the fog line on the eastside of the gore that led to the ramp for the other expressway. The truck was in the exit lane when the driver did not continue onto the exit ramp but drove straight ahead. No signs of pre-impact braking or any evasive actions taken by the driver were noted by the responding police. After striking the bridge pillar, the semi tractor burst into flames. Responding police indicated that although the condition of the driver cannot be definitively determined, it was more than likely that the driver fell asleep. Restraint use for both individuals was unknown. The semi tractor was not equipped with airbags.

#### *Case 103*

A 38-year-old female owner/operator of a pilot car service died in a collision with a tree. The decedent was driving a pickup truck, which was the lead vehicle in a three-vehicle caravan. She was ahead of a large transport vehicle pulling a flat bed trailer with a boat on it. The caravan was driving in a blowing snow on an icy, two-lane roadway with a posted speed limit of 55 mph. It appeared the

decedent, who was traveling approximately 40 mph, lost control of the vehicle. The vehicle slid to the right side of the road. The decedent corrected, but the rear of the vehicle then slid to the left, and then fully sideways on the roadway. The vehicle left the roadway on the right side of the roadway and struck a tree. The decedent was wearing a seatbelt/shoulder harness. The pickup truck's airbag did not deploy.

#### *Case 104*

A 59-year-old male truck driver died when the semi truck he was driving drifted off of the roadway into a ditch and then struck several trees. The dry, two-lane highway had a posted speed limit of 55 mph. The weather was identified as foggy. The semi and trailer loaded with pine logs were traveling westbound. When the semi collided with the trees, the logs came loose and struck and crushed the semi cab. The cab overturned. Restraint use was identified by responding police as unknown. The semi cab was not equipped with an airbag.

#### *Case 105*

A 60-year-old male contract newspaper hauler died when the van he was driving was hit from behind by a vehicle driven by an individual with an elevated alcohol level. The three-lane dry expressway had a posted speed limit of 70 mph. Both vehicles were traveling in the eastbound lane. The investigating police department personnel estimated decedent's vehicle was traveling approximately 60 mph and the vehicle which struck it was traveling approximately 80 mph. When the decedent's vehicle was struck, it caused the vehicle to exit the expressway, strike a sign, and roll several times. It is unknown if the decedent was wearing a lap/shoulder belt. The vehicle's airbag did not deploy.

#### *Case 106*

A 21-year-old male cable technician died as a result of a motor vehicle crash. The decedent was driving a utility-type pickup truck on a dry, two-lane roadway with a posted speed limit of 55 mph. The crash occurred on a hill at a curve section of the roadway. The decedent's vehicle, which was travelling east crossed the centerline and struck a semi-truck head-on in the westbound lane. The decedent was not wearing a shoulder harness/seatbelt. The vehicle's airbag deployed.

### ***Administrative/Support/Waste Management/Remediation Services Cases 107-108***

#### *Case 107*

A 30-year-old male garbage collector died when he was struck by an oncoming small truck as he crossed the roadway. The decedent had been traveling eastbound on a dry, two-lane roadway with a posted speed limit of 55 mph. The decedent stopped the garbage truck in the eastbound lane. The decedent exited the truck and started across the roadway. The westbound oncoming vehicle crested a hill and struck the decedent as he entered the westbound lane.

#### *Case 108*

A 27-year-old landscaping technician died when the pickup truck he was driving (Pickup #1) struck the rear of a trailer hauled by another pickup truck (Pickup #2) that had stopped or slowed to make a left turn. The speed limit on the dry, two-lane roadway was posted at 55 mph. Both vehicles were eastbound. A witness noted that the Pickup #2 trailer brake lights were on and the left turn signal was flashing. The witness noted that Pickup #1 did not slow down and, in attempt to avoid the colli-

sion, swerved to the right. Pickup #1 struck the right rear corner of the trailer, and then left the roadway, coming to a final rest in a field. The decedent was wearing a seatbelt/shoulder harness. The airbag did not deploy.

#### *Case 109*

A 49-year-old female adult foster home manager died when she disregarded a stop sign at an intersection and her car was struck by a semi truck. The decedent was traveling northbound on a two-lane roadway with a posted speed limit of 55 mph. A semi truck traveling westbound with the right of way was unable to avoid the collision and struck the decedent's vehicle on the passenger side. Both the decedent and her passenger were killed in the crash. The decedent's vehicle was not equipped with airbags. Both the decedent and her passenger restraint use were unknown.

#### *Case 110*

A 65-year-old male casino security guard died when he was struck by an oncoming vehicle as he was crossing a dry, unlit, two-lane highway to assist a patron. The posted speed limit was 55 mph. The decedent was dropped off at a gas station driveway on the south side of the highway by a casino bus (facing eastward) after noting the location of the patron, who was apparently intoxicated, walking on the north side of the highway. The decedent exited the bus and crossed the highway. The driver of the vehicle travelling westbound at 50-55 mph did not see the decedent in the westbound lane. The decedent was struck by the oncoming vehicle and thrown to the side. Police noted two factors that may have contributed to the fatal incident: 1) the decedent was wearing dark clothing, and 2) the casino bus, with its lights on was facing eastward and the lights could have contributed to a decreased visibility for the westbound vehicle which struck the decedent.

#### *Case 111*

A 56-year-old male collision shop owner died when he was struck by a passing motorist. Several blocks away from this business was a roadway construction zone. One of the contractors had parked their vehicle approximately one block away from the decedent's business. The decedent, noting this vehicle, left the business and walked to the parked vehicle. Standing on the driver's side of the vehicle next to the active lane of traffic, the decedent inquired about paving the street/business parking lot. The decedent was struck and killed by a passing motorist.

#### *Case 112*

A 54-year-old male auxiliary police officer was killed when he was struck by an oncoming vehicle while assisting a motorist on an expressway. The decedent had activated the emergency lights on his vehicle. The motorist he was assisting had pulled off onto the right shoulder of the dry, three-lane expressway, with a posted speed limit of 70 mph. The decedent was standing next to the motorist's vehicle on the driver's side of the vehicle when a driver, traveling in the right lane and at a speed greater than 70 mph struck him.

**Other (2)****Cases 113-114*****Transportation/Warehousing Cases 113-114******Case 113***

A 55-year-old male first mate on a charter fishing boat died when he was thrown to the floor when the boat struck a pier. The boat had been traveling approximately 20-25 mph. The decedent had been standing on the deck. When the boat struck the pier, the momentum caused by the impact caused the decedent to be thrown partially into the hatch opening to the lower deck causing his fatal injuries. The boat hull sustained damage and water began to enter the craft. The captain and passengers placed a life jacket on the decedent and all exited the craft. The individuals were rescued from the water by another boat. The decedent, who had sustained multiple blunt force injuries, was transported to a local hospital, where he died.

***Case 114***

A 55-year-old male mail carrier injured his ankle while walking on a sidewalk delivering mail. He subsequently had surgery on his ankle. Post-surgery he developed a blood clot in his leg. Two weeks after the incident, the blood clot “broke loose” and traveled to his lungs, resulting in his death.

**Struck By (14)****Cases 115-128*****Agriculture Cases 115-118******Case 115***

A 55-year-old male farmer died when he was pinned against an animal loading/unloading chute and a backing semi-trailer. The loading/unloading chute floor could be raised and lowered via a home-made pipe crank located to the side of the chute; the crank was not between the backing trailer and the chute opening. The trailer transporting the pigs was constructed so as to permit the pigs to unload single file into the loading/unloading chute. Due to layout of the farm’s driveways, the semi could not back straight to the chute area; the semi had to back in on an angle, which made it more difficult to be in alignment with the chute. It appeared that the decedent, after conversing with the semi driver, went back to the loading chute and placed himself in the path of the backing truck. The truck was backing to the east. The decedent was on the driver’s side. It was early morning. A possible scenario was developed: The decedent was not wearing a high visibility vest. The sun was in the driver’s side mirror. The decedent placed his head at the approximate height of the unloading chute to determine if the chute height matched the trailer height. The backing semi-trailer crushed the decedent’s head and neck against the loading chute. The decedent was declared dead at the scene.

***Case 116***

A 73-year-old retired male died when a tree he was cutting kicked back and pinned him between two trees. The decedent was volunteering and assisting a three-person worker crew, who were employed by the property owner to fell trees. The decedent was working alone using a chain saw. One of his coworkers was rotating between cutting down trees, working with his crew at the chipper located approximately 100 to 150 yards from the decedent, and checking on the decedent. The co-

worker indicated after approximately 10 minutes he went to check on the decedent but did not hear the chain saw running. When he came upon the decedent, the decedent was pinned between the 14 - to 15- inch diameter tree he was cutting down and another smaller tree. The coworker ran back to the chipper, and together, the work crew used chainsaws to cut the tree that fell on the decedent. After removing the tree, the crew began CPR and called for emergency response. The decedent was declared dead at the scene.

#### *Case 117*

A 46-year-old male commercial logger died when a branch from a 50-foot tall tree that the decedent felled sheared from the tree and struck his head. The decedent and a coworker, who was working nearby, were felling trees. Another individual at the site, who was not assigned a task, witnessed the incident. The witness indicated that the decedent cut down the 50-foot tall tree. As it was falling, a very large branch sheared off from the tree and struck another tree, causing the branch to swing back and strike the decedent's head. As the witness ran to the decedent, emergency response was summoned. The decedent was declared dead at the scene.

#### *Case 118*

A 66-year-old male farmer died when he was struck and pinned by a falling tree while using a back hoe to remove the tree. The decedent had extended the outriggers. He was using the back hoe to push over a large rotten poplar tree. Several large branches from the rotten tree fell onto the tractor. A 10-inch diameter branch struck the decedent, pinning him under the backhoe. The backhoe attachment was still extended straight out behind the tractor.

### **Construction Cases 119-123**

#### *Case 119*

A 42-year-old male trustee from a county jail died when he was struck by a rotted elm tree that fell as part of a chain reaction resulting from another tree falling to the ground. The decedent was a member of a five-person crew consisting of jail trustees and a county employee employed by the county drain commissioner. The crew was clearing the drain of trees. All workers were on the same side of the bank. When a 24-inch diameter, 40-foot tall cottonwood that was growing in the drain was felled, it hit the ground on the opposite side of the bank. The ground shook, and then 10 seconds later, an eight-inch diameter, 20- foot tall elm tree fell back across the drain and struck the decedent.

#### *Case 120*

A 40-year-old male owner of a plumbing, heating and cooling company died when the 18-foot deep excavation he was working in collapsed and buried him. The decedent and a coworker were removing and replacing an eight-inch cast iron pipe with a PVC pipe from the home to the alley behind the home. Two excavations had been dug; one excavation was near the home and the other excavation was adjacent to the alley behind the home. The excavation adjacent to the alley was the incident site. The crew had utilized a backhoe to dig both excavations. The excavation adjacent to the alley was approximately 10 feet long and 12 feet deep. The width at the bottom was approximately six feet and the width at the top was approximately 10 feet. All sides of the excavation were cut at an approximate 80 degree angle. The soil consisted of clay. It was estimated that approximately three cubic yards of clay fell on him. REFERENCE: [MIOSHA Summary Case 244](#).



### Case 121

A 58-year-old male equipment operator/laborer for an excavating and construction company was crushed when the walls of a trench collapsed while he was installing a sewer line to a home under construction. The trench was approximately 20 feet long, 8 ½ feet deep and approximately 3 feet wide at the location where the decedent was working. His coworker was standing at the top of the trench observing the decedent prime and glue together the 10-foot sections of pipe. The homeowner was nearby. The coworker noted the walls collapsing and yelled a warning to the decedent to quickly get out of the trench. The decedent attempted to run to the ladder, but was engulfed by the falling soil, which consisted of sand and clay. The homeowner heard the warning and ran to the scene. Both the coworker and homeowner entered the trench to try to save the decedent. Additional contractors heard the warning and ran to the site; they also entered the trench. They removed approximately one foot of soil to reach the decedent's head, and then continued to dig around the decedent until emergency response arrived. When emergency response arrived all the individuals in the trench were ordered to get out of the trench. The emergency responder entered the trench and noted no vital signs. Emergency responders placed temporary walls to support the trench and then recovered the decedent. REFERENCE: [MIOSHA Summary Case 257](#).

### Case 122

A 50-year-old male carpenter for a home renovation company died when a 6-foot-long by 9-foot-high by 20-inch-wide masonry wall located in the basement of a 100-year-old home collapsed and fell onto him. The masonry wall consisted of large boulders and fieldstone. The decedent and his coworkers were restoring the home's foundation. The corner of the home was being supported by one steel beam (an engineer specified two beams). The crew had previously removed the basement's concrete floor and approximately eight inches of sand to permit concrete forms to be placed under the masonry walls. Earlier in the day, the decedent and his two coworkers had placed two plywood forms under other basement walls. During their work activities, the crew noted that one of the other stone basement walls had a ¼-inch crack. The workers measured the crack and reported it to the site superintendent who indicated the workers should monitor the wall's condition to determine if the crack dimension changed. The workers checked on the crack several times during the morning and the crack's dimension did not change. Also that morning, a bottom section of an interior wall had broken loose and fell as they were forming a footing. The crew moved to the wall involved in the incident to place a new form. They pounded a 28-inch-wide by 64-inch-long piece of plywood approximately four inches deep into the sand next to the wall. The decedent began to dig the sand away so they could place the foundation form under the wall. As he was digging the sand away, the wall collapsed and buried him under its broken pieces. The wall also struck another employee causing an ankle injury. Other individuals on-site heard the crash of the wall falling and assisted in removing the wall pieces from the decedent. CPR was not initiated because no one knew CPR. Approximately five minutes later, emergency response arrived. The decedent was transported to a local hospital where he was declared dead. The wall was not braced while the decedent and his coworkers were working near it. REFERENCE: [MIOSHA Summary Case 249](#).

### Case 123

A 61-year-old male brick mason died when he was struck by a collapsing 38-foot-high, 100-foot-long tubular welded frame scaffold that was overloaded with block as it was being enclosed with a plastic

wind enclosure. The wall footing only had been poured. The scaffold had 18 towers three frames wide and had a single bar between each tower and each level. There was approximately seven feet between each tower. Each level was fully planked. Hilti pins, penetrating 1/2-inch into the footing, held some of the northernmost scaffold base plates of the stocked scaffold sections. On the north side of where the block wall was going to be built, there were three separate scaffold set ups to brace the main scaffold; one section at each end and one in the middle. The north sections were three frames wide and three jacks high and were tied to the south section with pipe clamps at each end of the frames. Some but not all of the east and middle section base plates were fastened to the footing with Hilti pins. After stocking the scaffold, the crew began to install the plastic wind enclosure. After lunch, the crew continued to install the enclosure. After the enclosure was installed around the entire scaffold, the wind caused the scaffold to move back and forth, causing the mud sills to bend and the scaffold to fall from the west to the east in a northerly direction. The decedent was struck by the falling scaffold and block. Emergency response was called and he was transported to a local hospital where he was declared dead. REFERENCE: [MIOSHA Summary Case 256](#).

### ***Manufacturing Cases 124-125***

#### ***Case 124***

A 65-year-old male truck driver died when he was crushed between a rotating Cat 322L excavator and a semi-tractor trailer with 9-foot walls. The bottom of the trailer was approximately 51 inches from the uneven ground. The excavator tracks were approximately 55 inches away from the truck, so when the excavator rotated and was positioned 90 degrees to the track, the counterweight was six to seven inches from the truck. The incident occurred at a property that was being cleaned up through a State of Michigan funded Tire Grant to clean up old dump sites. The work crew from the dump site property consisted of one excavator operator and four laborers. Two laborers filled the excavator bucket with tires, and two individuals were on the trailer unloading the bucket. The decedent worked for a company that was a licensed scrap tire hauler. The decedent backed the trailer into the site. While the trailer was being loaded, the decedent waited in his truck cab. The truck was approximately 85% full when it was time for lunch. The decedent left his truck to have lunch with the crew loading the truck. After lunch, the decedent spoke with the excavator operator and thanked him for the food provided. On the way back to his truck cab, the decedent walked between the excavator and the trailer and was crushed when the counterweight of the excavator rotated as it loaded the trailer with tires. REFERENCE: [MIOSHA Summary Case 251](#).

#### ***Case 125***

A 44-year-old male cabinet maker died when he was crushed by a load of loosely stacked lumber that fell from a Clark Model C55-S100 powered industrial truck's forks that were positioned approximately four feet above the floor. The decedent and his coworker were in the process of obtaining a piece of lumber from a pile of lumber approximately eight feet high. The lumber pile was loosely stacked (not bound) and divided into "stacks" separated by 4x4 pieces of lumber. The powered industrial truck was rated to lift 10,000 pounds at the lower mast position and 5,725 pounds at the upper mast position. The decedent's coworker drove the truck to the pile, lifted two stacks calculated to weigh approximately 13,400 pounds, and backed away approximately six feet. The driver parked the truck against a nearby lumber pile. He turned the truck engine off and left the forks in a raised position approximately four feet above the floor. The decedent and his coworker went in front of the

raised lumber to obtain the piece of lumber needed from the remaining three-foot high stack on the floor. After removing the needed piece of lumber, they were in the process of placing 4x4 stacking spacers on top of the stack so they could replace the stacks that were on the forklift forks. They heard the forklift begin to “click.” The clicking sound, based on past worker experience, was thought to have meant that the forklift mast was beginning to tilt toward them. The coworker yelled to get out of the way. The coworker was able to get to the edge of the three-foot high stack and was pinned against it by the falling lumber. He was able to somewhat protect himself with one of the 4x4 spacers. The decedent was unable to get to the edge of the stack and was pinned in the center of and against the stack by the falling lumber. The coworker yelled for help, but his coworkers in the shop could not hear him. Approximately 10 minutes after the incident, a delivery driver arrived, heard the cry for help, and saw the scattered lumber that had fallen from the forklift. The delivery driver ran to the shop and informed them of the situation. The decedent’s coworkers arrived, called for emergency response, and began to remove the lumber from the decedent and his trapped coworker. The lumber was removed from the decedent and he was declared dead at the scene. When police arrived, they found that the rear wheels of the Clark forklift were raised approximately six inches above the floor. REFERENCE: [MIOSHA Summary Case 233](#).

### ***Transportation/Warehousing Cases 126-127***

#### ***Case 126***

A 19-year-old male worker at a towing and junk car removal firm died when a car slipped or fell off of a tow truck’s boom arm tow straps while he was underneath the car. The night prior to the incident, one of the firm’s tow truck drivers, using an extendable boom hook and chain (also known as a sling or belt lift) truck, delivered to the firm’s staging area a heavily damaged 1996 Chrysler LHS, weighing approximately 3,500 pounds. The vehicle had been totaled in a motor vehicle accident. The damaged car had been towed to the staging area and lowered to the ground. The tow truck and car were positioned on an approximate three to five degree downward slope, on very uneven, rutted asphalt. When the decedent arrived at work the following day, the shop supervisor directed him to dismantle the vehicle (drain fluid, remove the catalytic converter and other under-components, the tires, etc). The incident was unwitnessed. A coworker was sitting in the tow truck cab. The decedent started the tow truck to activate the hydraulic boom arm so he could raise the car approximately three to five feet above the ground. The decedent was positioned near the front the driver’s side wheel of the raised vehicle. The decedent’s position indicated that he may have been sitting on his haunches looking under the car when the car slipped or fell from the tow straps and struck his head/neck/back, pinning him to the ground. Witnesses stated they remembered one tow chain attached to the car. It is unknown if the decedent had hooked a second chain to the car – a second chain was found lying near the car. The decedent did not use any secondary support, such as a safety stand prior to looking under the vehicle. The coworker sitting in the tow truck cab heard a loud noise and exited the truck. He saw the decedent pinned under the vehicle and screamed for help. The decedent’s coworkers lifted the vehicle using a floor jack and then removed the decedent from under the vehicle. Emergency response was called and transported the decedent to a local hospital where he was declared dead. REFERENCE: [MIFACE Investigation Report #10MI082](#).

#### ***Case 127***

A 56-year-old male truck driver sustained a fatal crush injury to his chest. The decedent had deliv-

ered a flatbed trailer load of coiled steel to a warehouse. While the steel coils were being unloaded from the trailer with an overhead crane, the decedent was witnessed to collapse. The sequence of events leading to the injury was unknown. REFERENCE: [MIOSHA Summary Case 253](#).

#### *Case 128*

A 55-year-old male mechanic died when a chain hoist structure he was attempting to move with a backhoe fell on him. The chain hoist, with an I-beam and hoist mechanism, was located outside of a garage. When the chain hoist structure fell, the hoist structure landed on the tractor fenders and slid down the backhoe, striking the decedent. The decedent attempted to jump from the operator's seat as the hoist began to slide down the backhoe. He was unable to avoid being struck by the falling structure. The chain hoist beam bent the backhoe steering wheel and dented the operator's seat.

### **Suicide (10)**

#### **Cases 129-138**

#### *Case 129*

A 48-year-old male electrician died due to a self-inflicted hanging.

#### *Case 130*

A 37-year-old male toolmaker died when he jumped 65-70 feet from an electrical tower.

#### *Case 131*

A 65-year-old male steel company owner died from a self-inflicted gunshot wound.

### **Retail Trade Cases 132-133**

#### *Case 132*

A 16-year-old Hispanic male grocery store stock person died from a self-inflicted gunshot wound.

#### *Case 133*

A 28-year-old male convenience store manager died from a self inflicted gunshot wound.

#### *Case 134*

A 50-year-old truck driver died from a self inflicted gunshot wound in the sleeping berth of his semi-tractor.

#### *Case 135*

A 69-year-old male lawyer died from a self inflicted gunshot wound.

#### *Case 136*

A 46-year-old male co-owner of a landscaping firm died from a self-inflicted gunshot wound.

#### *Case 137*

A 45-year-old female surgeon died from a self-inflicted action that caused her to bleed to death.

**Case 138**

A 33-year-old male automotive mechanic died from a self-inflicted gunshot wound.

**Toxic Exposure (6)****Cases 139-144*****Agriculture Cases 139-141******Cases 139-140***

An 18-year-old Hispanic male farm hand and a 17-year-old Hispanic male farm hand were asphyxiated in a 3,000 gallon polyethylene feed tank. The tank dimensions were 90 inches wide by 120 inches high with a 16-inch inside diameter tank opening located at the top of the tank. The tank contained six to eight inches of feed material that had fermented resulting in a non-respirable atmosphere. Approximately one to two weeks prior to the incident, the tank lid had been removed. On the day of the incident, the two workers power washed another feed tank. They were observed inside this tank three times and, through interview statements, were told to exit the tank. Later that day, the workers had been observed power washing the outside of the incident tank. One of the workers placed a ladder outside of the tank and another ladder into the tank through the tank opening. The ladder did not reach to the bottom of the tank. It is unclear why the decedents entered the tank. A coworker noted the power washer was running but did not see the decedents. He climbed a ladder located outside the tank and looked through the tank opening. Seeing both decedents inside the tank, the coworker ran for help. Emergency response arrived and it was decided to use a forklift to tip the tank to its side to recover the decedents. REFERENCE: [MIOSHA Summary Case 241](#).

***Case 141***

A 26-year-old male farm hand was leveling corn inside of a 4,000-5,000 bushel concrete stave silo when he was found gasping for breath by a farm family member. Corn had been placed in the 80-foot tall by 20-foot diameter silo the day before the incident. The corn loading system used air to push the corn up to the top of the silo then a mechanical unloader augured the corn into the discharge chute. The silo was approximately 75% full; the corn was located approximately 20 feet down from the top of the silo. The decedent entered the silo through the 27" by 24" hatch opening. The decedent had been working in the silo for approximately 10 minutes when he was found by the family member. The family member called another family member and together, they were able to lift the decedent from inside of the silo and carry him to the ground. Emergency response was called. The responding fire department checked the air inside of the silo on the incident date using a multi-gas direct-reading instrument typically used in confined space entry operations. The readings were purportedly within the acceptable ranges of the instrument. MIOSHA was not notified of the silo incident until four days had elapsed. The top hatches on the silo the decedent entered were in the open position. A MIOSHA General Industry Safety and Health Division representative collected screening samples during the initial site visit and found the following:

Exterior air temperature: 56.20F

Silo air temperature: 73.50F

At approximately three meters below the open hatch;

20.8% oxygen

1.5-3.0 ppm carbon monoxide



885-950 ppm carbon dioxide

Non-detectable levels of nitrogen dioxide, sulfur dioxide and hydrogen sulfide.

Initial and subsequent physical examinations and toxicological testing found no indication that the deceased had an allergic reaction to dust or biological materials from inside of the silo. REFERENCE: [MIOSHA Summary Case 252](#).

### **Construction Cases 142-143**

#### **Case 142**

A 52-year-old male tub re-glazer died due to overexposure to methylene chloride (MC) vapor while stripping a bathtub in an apartment bathroom using Tal-Strip® II Aircraft Coating Remover (Tal-Strip® II). The primary ingredient of the aircraft-grade Tal-Strip® II was MC (60%-100%). The work process involved pouring Tal-Strip® II directly from the container onto the tub surface and using a 4-inch paintbrush to spread the product. At approximately 9:30 a.m., the decedent arrived at the apartment complex. At approximately 11:10 a.m., one of the apartment maintenance personnel attempted to contact the decedent via cell phone. The decedent did not answer his phone, so the maintenance person went to the apartment to talk with him. The maintenance person found the decedent slumped over the tub on his knees with his face in the tub. The maintenance person called 911 and then called another maintenance person and instructed him to tell the property manager about the decedent's situation. After speaking with the property manager, the second maintenance person went to the apartment. When he arrived, he checked the decedent's pulse. Finding no pulse, the apartment employees pulled the decedent out of the tub and laid him on the bathroom floor. The second maintenance person checked the decedent's pulse again and also checked his airway for any blockage; he found no pulse or blockage. The second individual, a certified EMT, started CPR which lasted approximately two minutes. Emergency response arrived and transported the decedent to a nearby hospital where he was declared dead. The high concentration of MC in the product, the room configuration, the nature of the work, the lack of ventilation, and lack of proper respiratory protection contributed to his excessive exposure and subsequent death. REFERENCE: [MIFACE Investigation Report #10MI013](#).

#### **Case 143**

A 41-year-old male bathroom refinisher died due to overexposure to methylene chloride (MC) vapor while re-glazing bathroom tile in a small bathroom of a residential home using Tal-Strip® II Aircraft Coating Remover. The police report indicated that the chemical fumes were entering the rest of the home. The bathroom door was closed and the decedent opened the bathroom window as far as it would open. Approximately two hours later, one of the home's residents checked on the decedent and found him unresponsive and face down in the bathtub with his knees on the floor next to the tub. The decedent was not wearing a respirator. A half-face piece, air purifying respirator was found by the responding police department hanging on the door knob inside of the bathroom.

#### **Case 144**

A 48-year-old male mechanic died as a result of carbon monoxide poisoning. The decedent was using an air compressor in his detached garage while repairing another individual's car. The owner of the vehicle came to pick up the car. The owner opened the side door to the garage and observed the decedent lying on the cement garage floor next to the vehicle. The decedent's blood carboxyhemoglobin level was greater than 70%.

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