

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Fall of Roof Accident
June 3, 2008

Gibson Mine
Gibson County Coal, LLC
Princeton, Gibson County, Indiana
I.D. No. 12-02215

Accident Investigators

Dean Cripps
Electrical Engineer

Steven M. Miller
Coal Mine Safety and Health Inspector

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Supervisory Mining Engineer

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Geologist, Technical Support

Originating Office
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District 8
2300 Willow Street
Vincennes, Indiana
Robert L. Phillips, District Manager

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Photograph of accident scene showing Fletcher roof bolter with rock leaning against the ATRS raise cylinder

OVERVIEW

At approximately 7:40 a.m. central daylight time, Justin Wilkin, a 25 year old roof bolter operator with two years of mining experience, was fatally injured at the Gibson County Coal, LLC, Gibson Mine near Princeton, Indiana. Wilkin was installing roof bolts in the #1 entry on the No. 3 Unit when a section of mine roof measuring approximately 10' wide by 5' long and up to 10 inches thick fell from an unsupported area in front of the Automated Temporary Roof Support (ATRS) and struck Wilkin, pinning him against the ATRS raise cylinder.

The accident occurred when Wilkin apparently attempted to cross from the right side of the Fletcher dual boom roof bolting machine to the left side by traveling in front of the machine and under unsupported roof. The accident occurred because of mine management's failure to ensure that employees did not work or travel under unsupported roof.

GENERAL INFORMATION

The Gibson Mine is an underground mine located in Gibson County near Princeton, Indiana. The main portal is approximately two miles north of Princeton and one mile west of US Highway 41. The No. 2 Portal is located approximately two miles northwest of the intersection of Indiana State Highways 64 and 65. The mine is operated by Gibson County Coal, LLC, a subsidiary of Alliance Coal, LLC and began production in the Springfield No. 5 coal seam in November of 2000. The coal seam varies from 5 to 8 feet in thickness. The mine has 314 employees, 253 of whom work underground.

The mine operates on two production shifts and one maintenance shift. The mine produced 3.2 million tons in 2007. The mine has seven mechanized mining units (MMU's), three of which utilize fish-tail or split face ventilation. The coal is mined using Joy continuous mining machines and is transported to the section feeder using Auxier Welding coal transporters. The coal is transported from the sections to the surface preparation plant by conveyor belts.

The principal officers for the mine at the time of the accident were:

Mike Stanley	General Manager
Jim Brown	Superintendent
Mark Kitchen	Director, Health and Safety

An MSHA Safety and Health Inspection (E01) began on March 26, 2008, and was ongoing at the time of the accident. The previous E01 inspection was completed on March 26, 2008. The Non-Fatal Days Lost (NFDL) injury incidence rate for the Gibson Mine in 2007 was 0.75 compared to a National NFDL rate of 4.74.

DESCRIPTION OF ACCIDENT

On Tuesday morning, June 3, 2008, at approximately 5:00 a.m., several day shift employees entered the mine two hours prior to the normal starting time of 7:00 a.m. These employees traveled to various areas of the mine and assisted the maintenance shift in finishing their work and where possible, started loading coal. This is a common practice at the mine and is referred to by mine employees as "going in on early coal." Among the employees going in the mine early were David Worstell, No. 2 Unit outby roof bolter operator, Jesse Fifer, No. 3 Unit continuous miner operator, and Andy Burkett, No. 3 Unit continuous miner operator trainee.

Jesse Fifer and Andy Burkett traveled to the No. 3 Unit and helped the midnight shift crew prepare the unit for production. They then commenced loading coal in the #1 entry. The No. 3 Unit is a ten-entry advancing section that utilizes fish-tail ventilation.

Coal was simultaneously being mined in the #9 entry. Andy Burkett was operating the Joy continuous miner and Jesse Fifer was operating an Auxier Welding coal transporter. A 40-foot cut was made in the #1 entry. Andy Burkett started tramming the continuous miner out of the cut, but turned the remote control over to Jesse Fifer to finish moving the machine to the #4 entry.

At approximately 6:30 a.m., the remainder of the day shift crew entered the mine. The No. 3 Unit crew, including section foreman Travis Burkett and roof bolting machine operator Justin Wilkin (victim), traveled to the unit. Wilkin normally operated the left boom of the roof bolting machine on the right side of the No. 3 Unit. The second operator of the roof bolting machine was absent. David Worstell was contacted by the outby lead man and instructed to travel from the No. 2 Unit to No. 3 Unit to fill in on the right side bolter. Travis Burkett checked the section power center and feeder. He then checked all of the faces beginning on the left side of the unit in #10 entry. Burkett finished examining the faces in #1 entry at about 7:30 a.m. Jesse Fifer was moving the continuous miner out of the #1 entry at this time. Travis Burkett traveled outby and encountered Justin Wilkin at his roof bolting machine in #4 entry. Wilkin told Burkett that he was going to set the bolter up in #1 entry. Burkett continued outby to the section power center area to update the section escapeway map. Worstell arrived on the unit, encountering Burkett at the power center. Burkett told Worstell he would be operating the roof bolting machine on the right side of the unit.

Worstell proceeded to the #1 entry where Wilkin was operating the Fletcher Roof Ranger double-boom roof bolter alone. He had installed two roof bolts on the left side of the entry and was in the process of installing the roof bolt closest to the rib on the right side of the entry. Wilkin finished installing the bolt nearest to the rib on the right side and swung the roof bolting machine boom inward. Worstell thought that Wilkin was going to install the center roof bolt. Worstell was standing on the right side near the middle of the machine cutting the wires from bundles of roof bolts and bearing plates. Very shortly after Wilkin swung the boom in, Worstell heard a rock fall. He looked toward the front of the machine and did not see Wilkin's light. Worstell ran to the front of the roof bolter and observed Wilkin pinned by a rock against the ATRS raise cylinder. Worstell attempted to lift the rock off of Wilkin, but could not. Worstell ran from the #1 entry to #2 entry and shouted to several crew members standing in the #4 entry that Wilkin was covered up and he needed help. Coal transporter operator Chris Richardson retrieved his walkie-talkie from his coal transporter and informed Travis Burkett about the accident. Burkett traveled from the power center area to #1 entry. As Burkett arrived at the roof bolter, he met Fifer running from the #1 entry. Fifer said he was going to get more help to move the rock. Fifer proceeded to the #9 entry and obtained the unit's left side crew members for assistance. The crew members were finally able to lift the rock enough for Burkett to pull Wilkin free. Wilkin (victim) was unresponsive and did not have a pulse. The victim was placed on a backboard and carried around the left side of the roof bolter where he was placed on a stretcher. The

stretcher was carried to the rear of the roof bolter. Fifer and continuous miner operator Adam Harvey began CPR on the victim. The victim was placed on a battery golf cart and transported to the mine haul road. The mine's underground ambulance met the golf cart two crosscuts outby the unit. The victim was transferred to the ambulance and transported to the surface, arriving outside at 8:09 a.m. Gibson County, Indiana EMS transported the victim to the Gibson County Hospital where he was pronounced dead at 8:34 a.m.

INVESTIGATION OF THE ACCIDENT

The Mine Safety and Health Administration (MSHA) was notified of the accident at 8:02 a.m. on June 3, 2008 when Gary Timmons, Assistant Safety Director at Gibson Mine, telephoned the MSHA Hotline. MSHA personnel from the Vincennes, Indiana and Benton, Illinois field offices were immediately dispatched to the mine. A 103(k) Order was issued to ensure the safety of any person in the mine and to secure the accident scene while the investigation was conducted.

The accident investigation was conducted in cooperation with the Indiana Department of Labor, Bureau of Mines. Investigation team members traveled underground on June 3rd where measurements, photographs, and other information were gathered. The training program and records for the victim were also reviewed. Interviews of nine miners and management officials were conducted at the mine site on June 3 and 4, 2008. Additional interviews were conducted at the mine site on June 17, 2008. A list of those persons who participated in the investigation is shown in Appendix B of this report.

DISCUSSION

Accident Scene

The accident occurred in the #1 entry approximately 60 feet inby Spad 24107. The rock that struck the victim fell from near the center of the entry at the inby edge of the ATRS support beam and rotated in the outby direction. It pinned the victim against the ATRS raise cylinder. The rock did not fall far enough outby to reach either of the drill stations. The mine floor around the right side drill station where Wilkin had been working was free of any rock or debris and the coal rib was intact. There was not a section of drill steel inserted in the drill pot and no indications on the mine roof that the hole for the right side center bolt had been started. Evidence indicates that the victim attempted to travel from the right side of the machine to the left side by walking in front of the roof bolter. Measurements taken on the roof bolting machine (Appendix C) reveal that the area between the front of the ATRS support beam and the ATRS raise

cylinder is very narrow. In addition, the ATRS foot actually extends beyond the ATRS support beam. It is unlikely that a person could travel in front of the machine without being in front of the ATRS support and under unsupported roof.

Roof Control

Primary roof support on the section consisted of 6-foot, mechanically anchored, resin assisted Grade 75, 3/4-inch SRD bolts installed four across, four feet between rows. In intersections, eight 10-foot mechanically anchored, resin assisted bolts, consisting of two 5-foot, 7/8-inch diameter lengths connected with a coupler, were installed in a star pattern as required by the approved roof control plan. Both bolts are installed with a single 40-inch resin cartridge. Bolts are installed in conjunction with 6 x 16-inch embossed bearing plates. At the accident site, the mining height was 6.8 feet, and included only coal. Mining width at and outby the fatality location was 18.7 feet, as measured with a laser range finder. An extended cut was being bolted at the time of the accident. The laser range finder also indicated that the face was located 41.8 feet from the last row of bolts installed prior to the cut being taken. A non-contributory citation was issued for the depth of the cut exceeding 40 feet, as specified by the roof control plan.

Geologic Conditions

The immediate roof consists of 1/2- to 3/4-inch thick beds of fine-to medium-grained, gray sandstone to a height of at least 8 inches that hosted 1/16-inch thick, diffuse laminations of alternating light and dark gray shale. More prominent bedding planes are spaced 2-3 inches apart. The sandstone hosts abundant muscovite flakes and abundant carbonized plant fossil debris. Sandstone partings are bounded by higher concentrations of carbonized debris. The sandstone is well indurated, but edges can be broken off by hand.

In front of the ATRS, a linear series of three shallow cavities oriented along a trend of N 50° W were defined where large pieces of sandstone had dropped out of the unbolted cut. The linear trend touched the inby edge of the right side of the ATRS bar, and trended inby toward the left rib. The ATRS bar had broken off the outby piece of sandstone. The cavities were slightly undulatory, defining hump-backs that were bounded by thin, black shale partings and concentrated fossil debris in sandstone. The fatal rock was one of three that defined what may have originally been a single, long, flattened cigar-shaped cantilever of 4- to 6-inch thick sandstone. The individual pieces of layered sandstone broke from the original single piece along black shale partings and diffuse zones with high concentrations of carbonized plant debris. The dimensions of the original single piece were estimated with a laser range finder as 18.6 feet long x 3-4 feet wide x 4-6 inches thick. The entire original length of sandstone is estimated to have

weighed approximately 2 tons, while the single piece of rock involved in the fatality, which pinned the victim to the vertical hydraulic support cylinder of the ATRS, is estimated to be approximately 8 feet long x 4 feet wide x 6-8 inches thick and weigh approximately $\frac{3}{4}$ ton.

Following the initial fall of unbolted ground, a broad, shallow pot-out formed inby the N 50° W trend in the immediate roof. The secondary pot-out represented failure of the thin beam of unbolted, thinly bedded sandstone and was 4-6 inches deep. The pot-out extended from rib to rib all the way inby to the face. A traverse across the section indicated that these shallow development pot-outs were present in almost every entry since encountering the thinly bedded sandstone in the immediate roof. The thinly bedded sandstone appears to have been encountered within approximately three crosscuts outby the site of the fatality location. A review of drilling logs for holes within 3,500 feet of the accident site indicated that the thinly bedded sandstone had not been encountered outside that area.

Training

The training program and records were reviewed and no deficiencies were identified that would have contributed to the accident. A portion of the training for the miners addressed not working or traveling inby unsupported roof.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the underlying cause of the accident that was correctable through reasonable management controls. Listed below is the root cause identified during the analysis and the corresponding corrective action implemented to prevent a recurrence of the accident:

Root Cause: The standards, policies, and administrative controls in use at this mine did not ensure that persons would not position themselves or travel inby permanent or temporary roof support. The victim traveled under unsupported roof in front of the ATRS support beam to cross from the right side of the roof bolting machine to the left.

Corrective Action: The mine operator submitted a revision to the roof control plan to the District Manager. The revision requires: 1) During bolting operations, when the Automatic Temporary Roof Support is pressurized against unsupported roof, operators will not travel between the left and right booms except by walking behind the machine; 2) Two operators will be present on dual boom roof bolters while installing primary support; 3) Miners, except examiners and roof bolters, will not travel or work inby the 2nd row of bolts outby unsupported roof; 4) All underground MMU workers were trained regarding the hazards related to the revised company policy and the related mine roof hazards.

CONCLUSION

The accident occurred because of mine management's failure to ensure that employees did not work or travel under unsupported roof. Based on the physical evidence, measurements, and interviews, it is apparent to the investigators that the victim attempted to travel from the right side of the roof bolting machine to the left side by walking in front of the machine. The victim traveled beyond the ATRS support in an area of unsupported roof. A section of mine roof measuring approximately 10' wide by 5' long and up to 10 inches thick fell from the unsupported area in front of the ATRS and struck the victim, pinning him against the ATRS raise cylinder and causing fatal crushing injuries.

Approved By:



for Robert L. Phillips
District Manager



Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, No. 6677707, was issued to ensure the safety of the miners until the investigation could be completed.
2. A 104(a) Citation, No. xxxxxxx, was issued citing 30 CFR Section 75.202(b), and stating that the operator failed to ensure that employees would not work or travel under unsupported roof. The victim, Justin Wilkin, was found pinned between a rock measuring approximately 10 feet by 5 feet by 0 to 10 inches thick and the ATRS raise cylinder on the roof bolting machine. Evidence gathered during the investigation indicates that the victim attempted to travel from the right side of the machine to the left side by traveling in front of the ATRS support device and under unsupported roof. The rock, weighing approximately 1500 pounds, fell from the roof in front of the ATRS support and struck the victim, causing fatal crushing injuries.
3. An E01 inspection was conducted in conjunction with the fatal accident investigation. Several non-contributory citations were issued on the E01 inspection.

Appendix A

Persons Participating in the Investigation

Mine Safety and Health Administration

Dean Cripps	Electrical Engineer, Accident Investigator
Steven Miller	CMS&H Inspector, Accident Investigator
Mark Odum	Supervisory Mining Engineer, Roof Control
James Hackney	Supervisory CMS&H Inspector, District 10, Roof Control
Jeff Williams	Mining Engineer
Sandin Phillipson	Geologist, Pittsburgh Safety & Health Technology Center
Johnny Moore	CMS&H Inspector
Sylvester DiLorenzo	CMS&H Inspector, Roof Control Specialist
Leland Payne	Training Specialist (EFS)

Indiana Department of Labor, Bureau of Mines

Don McCorkle	Deputy Commissioner
Steve Riley	Chief Mine Inspector

Gibson County Coal, LLC, Alliance Coal, LLC

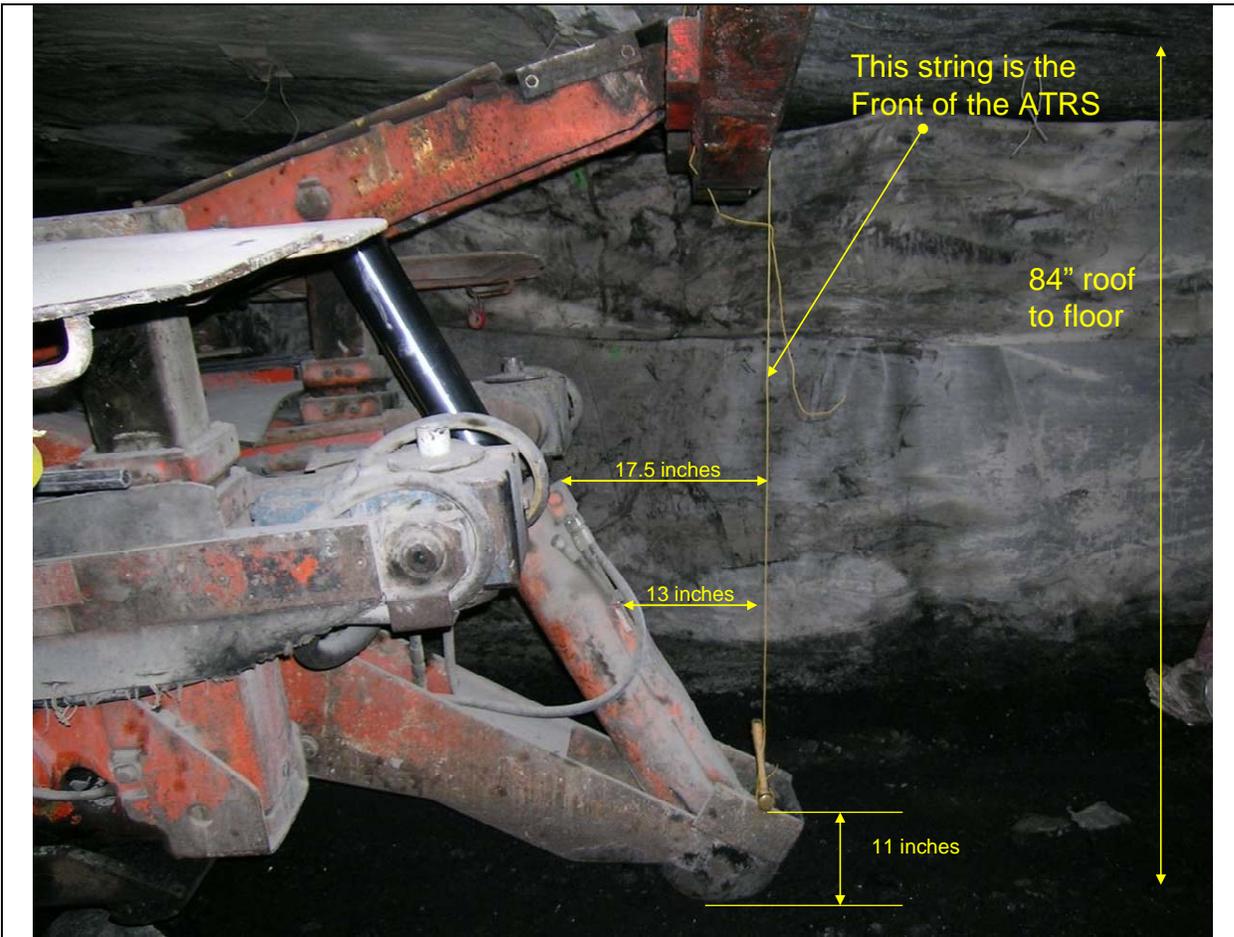
Maynard St. John	Vice President
Mike Stanley	General Manager
Jim Brown	Superintendent
Mark Kitchen	Director, Health and Safety
Gary Timmons	Assistant Safety Director
Phillip Kittinger	Director, Health and Safety, Pattiki Mine
Chris Hopple	Engineer

Appendix B

Persons Interviewed

Travis Burkett	Section Foreman
David H. Worstell	Roof Bolter
Chris Richerson	Coal Transporter Operator
Dannie Smith	Scoop Operator
Dames Daily	Roof Bolter
Ryan Alvey	Roof Bolter
Andy Burkett	Miner Operator, Trainee
Jesse Fifer	Miner Operator
Eric Thompson	Roof Bolter

Appendix C



Appendix D

Accident Investigation Data - Victim Information

U.S. Department of Labor
Mine Safety and Health Administration



Event Number: 4 2 4 5 3 4 0

Victim Information: 1												
1. Name of Injured/III Employee: <i>Justin M. Wilkin</i>			2. Sex: <i>M</i>	3. Victim's Age: <i>25</i>		4. Last Four Digits of SSN:			5. Degree of Injury: <i>01 Fatal</i>			
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 06/03/2008 b. Time: 8:34</i>						7. Date and Time Started: <i>a. Date: 06/03/2008 b. Time: 6:30</i>						
8. Regular Job Title: <i>014 Roof Bolter twin head left side</i>				9. Work Activity when Injured: <i>080 Roof Bolter</i>				10. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
11. Experience a. This			b. Regular			c. This			d. Total			
Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	
Work Activity: <i>1</i>	<i>12</i>	<i>0</i>	Job Title: <i>1</i>	<i>12</i>	<i>0</i>	Mine: <i>2</i>	<i>3</i>	<i>0</i>	Mining: <i>2</i>	<i>3</i>	<i>0</i>	
12. What Directly Inflicted Injury or Illness? <i>124 Underground</i>						13. Nature of Injury or Illness: <i>170 Crushing</i>						
14. Training Deficiencies: Hazard: _____ New/Newly-Employed Experienced Miner: _____ Annual: _____ Task: _____												
15. Company of Employment:(If different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)												
16. On-site Emergency Medical Treatment: Not Applicable: _____ First-Aid: _____ CPR: <input checked="" type="checkbox"/> EMT: _____ Medical Professional: _____ None: _____												
17. Part 50 Document Control Number: (form 7000-1) <i>220081610019</i>						18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>						

Victim Information:												
1. Name of Injured/III Employee:			2. Sex:	3. Victim's Age:		4. Last Four Digits of SSN:			5. Degree of Injury:			
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:						7. Date and Time Started:						
8. Regular Job Title:				9. Work Activity when Injured:				10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>				
11. Experience: a. This			b. Regular			c. This			d. Total			
Years	Weeks	Days	Years	Weeks	Days	Years	Week	Days	Years	Weeks	Days	
Work Activity:			Job Title:			Mine:			Mining:			
12. What Directly Inflicted Injury or Illness?						13. Nature of Injury or Illness:						
14. Training Deficiencies: Hazard: _____ New/Newly-Employed Experienced Miner: _____ Annual: _____ Task: _____												
15. Company of Employment: (If different from production operator) Independent Contractor ID: (if applicable)												
16. On-site Emergency Medical Treatment: Not Applicable: _____ First-Aid: _____ CPR: _____ EMT: _____ Medical Professional: _____ None: _____												
17. Part 50 Document Control Number: (form 7000-1)						18. Union Affiliation of Victim:						

Victim Information:												
1. Name of Injured/III Employee:			2. Sex:	3. Victim's Age:		4. Last Four Digits of SSN:			5. Degree of Injury:			
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:						7. Date and Time Started:						
8. Regular Job Title:				9. Work Activity when Injured:				10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>				
11. Experience: a. This			b. Regular			c. This			d. Total			
Years	Weeks	Days	Years	Weeks	Days	Years	Week	Days	Years	Weeks	Days	
Work Activity:			Job Title:			Mine:			Mining:			
12. What Directly Inflicted Injury or Illness?						13. Nature of Injury or Illness:						
14. Training Deficiencies: Hazard: _____ New/Newly-Employed Experienced Miner: _____ Annual: _____ Task: _____												
15. Company of Employment: (If different from production operator) Independent Contractor ID: (if applicable)												
16. On-site Emergency Medical Treatment: Not Applicable: _____ First-Aid: _____ CPR: _____ EMT: _____ Medical Professional: _____ None: _____												
17. Part 50 Document Control Number: (form 7000-1)						18. Union Affiliation of Victim:						