

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Mine Facility

Machinery Accident
December 11, 2008

Matrix Design Group, Inc. (L777)
Newburgh, Indiana

at

Warrior Preparation Plant
Warrior Coal, LLC
Madisonville, Hopkins County, KY
ID No. 15-14335

Accident Investigators

Keith Ryan
Mine Safety and Health Coal Mine Inspector (Surface)

Michael Moore
Supervisory CMS&H (Electrical)

Originating Office
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TABLE OF CONTENTS

OVERVIEW.....	2
GENERAL INFORMATION	2
DESCRIPTION OF ACCIDENT.....	2
INVESTIGATION OF ACCIDENT	4
DISCUSSION	4
ROOT CAUSE	9
CONCLUSION.....	10
ENFORCEMENT ACTIONS	11
APPENDIX A - Persons Participating in the Investigation / Interviews	12
APPENDIX B - Machine Controls.....	13
APPENDIX C - Photograph post accident location of platform	15
APPENDIX D - Photograph of task being performed	16
APPENDIX E - Photograph post accident view from inside the plant	17
APPENDIX F - Photograph bottom of the platform	18



Overview of Accident Site

OVERVIEW

On December 11, 2008, at approximately 3:40 p.m., Timothy Albright, a contract electrician helper, received fatal injuries while operating a man-lift between the 4th and 5th floors of the Warrior Preparation Plant. The plant was under construction at the time. The victim had been pulling and strapping metal-clad cable that was to be wired to equipment on the 5th floor. The platform of the lift was positioned between two horizontal beams which placed the platform inside the plant. The platform of the lift became caught on the lower beam. The platform was dislodged when the victim attempted to move the platform. A sudden and violent movement of the platform caused him to strike his head resulting in fatal injuries.

GENERAL INFORMATION

Warrior Preparation Plant is operated by Warrior Coal, LLC. It is located 1.7 miles south of Manitou, Hopkins County, Kentucky, off State Hwy. 630. At the time of the accident, the facility employed 37 surface miners working two production and one maintenance shifts per day; producing 7,500 tons of coal daily.

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

Eric K. Anderson.....General Manager
Kevin Vaughn.....Director of Safety and Training
Frank Roberts.....Preparation Plant Superintendent

The principal officers for the corporate office at the time of the accident were:

Joseph W. Craft III..... President & CEO
Thomas L. Pearson.....Senior VP of Law & Administration Secretary
Charles R. Wesley, III Senior Vice President of Operations
Gary J. RathburnSenior Vice President of Marketing
Dale G. Wilkerson..... Vice President of Controller & Assistant Secretary

A regular safety and health inspection was in progress at the time of the accident by the Mine Safety and Health Administration (MSHA). The total injury incidence rate for the mine in 2008 was 5.58 compared to a national injury incidence rate of 2.79 for preparation plants.

DESCRIPTION OF ACCIDENT

Albright started a normal work shift, which is 7:00 a.m. to 5:00 p.m. Matrix Construction foreman Brian Qualls assigned five men their work duties for the day. Qualls and two other men were assigned tasks at the flex input-output (IO) cabinets

landing that included wiring controls, strapping and running cables. Two men were assigned a welding task on the bottom floor. Albright was assigned the task of pulling and strapping metal clad cable on the 3rd floor and leading up to and including terminating the wiring to the separators located on the 4th floor of the plant. As reported in the interviews, nothing abnormal had occurred at this time and it was a normal day.

Matrix foreman Troy Patterson had not observed Albright's work procedures from the start of the shift. He arrived onsite at approximately 2:30 to 3:00 p.m. from an alternate job site to evaluate work for the next day's activities. While Patterson was on the 3rd floor, he observed Albright with the platform of the Genie S-85 lift stuck between two horizontal beams. Patterson went to Albright and observed the platform located inside the plant wall. Albright told Patterson he was attempting to move the platform out of the plant when it suddenly slid down the beam to the right side approximately 24 inches (direction is determined facing the platform from inside the plant). At this time Albright crouched down in the confines of the platform and stated "I don't know what to do to get out". Patterson stated "see if you can toggle the bucket up and maybe you'll get it off that beam, he (Albright) raised up to look at the controls and I stepped over and placed my hand on the basket to lean over and look at it, that's when it came loose." The platform suddenly and violently exited the building from between the two beams. The platform came to rest approximately six feet outside the plant wall. Patterson observed Albright fall down into the platform and immediately started out of the plant for help.

General Mine Contractor (GMC) foreman Dewayne Blain and GMC laborer Mark Richardson were located on the ground preparing the new plant feed belt for installation. Blain and Richardson were approximately 50 feet from the S-85 lift when the accident occurred. Blain heard a loud noise and Patterson yelling. When he looked up he saw the platform of the lift bouncing violently. Blain observed Albright fall down in the platform and a hard hat falling to the ground. Blain immediately went to the Genie lift and began lowering Albright to the ground by using the ground controls of the lift.

During the time the lift was being lowered, key individuals became aware of the accident. Preparation Plant Superintendent, Franklin Roberts, was notified by Warrior electrician Steve Linzy that a serious accident had occurred and to call 911. Surface Operations Manager Brad Taliaferro was present with Roberts and Taliaferro called 911. Once the platform was on the ground, the Mine Emergency Technicians (MET) Franklin Roberts, Dennis Roberts and Steve Linzy (all Warrior employees) were at the accident site and began to provide emergency care until the Regional Medical Ambulance service arrived at 3:58 p.m. Albright arrived at the Regional Medical Center in Madisonville, Kentucky and was admitted at 4:30 p.m. Albright was pronounced dead at 4:41 p.m.

INVESTIGATION OF THE ACCIDENT

On December 11, 2008, Safety Director Jamie Woodruff for Warrior Preparation Plant notified MSHA Supervisor James Hackney at 4:05 p.m. that an employee received potentially life threatening injuries while operating a man-lift at the new preparation plant construction site. Woodruff also contacted the MSHA 1-800 Line at 4:48 p.m. to further report the accident. Assistant District Manager Ted Smith assigned Coal Mine Inspector Keith Ryan as lead investigator and Electrical Supervisor Mike Moore to assist with the technical aspects of the accident. They were dispatched to the accident scene.

The onsite investigation was initiated in conjunction with the Office of Mine Safety and Licensing (OMSL). MSHA issued a 103K order at 4:30 p.m. to assure the safety of all persons at the operation until MSHA conducted an investigation and determined it was safe to resume normal operation in the area. A physical examination of the accident site and equipment involved was conducted. MSHA and OMSL jointly conducted formal interviews of seven miners on December 12, 2008 at the District 10 office. MSHA Technical Support was requested to conduct in-depth testing of the Genie S-85, Serial No. 534, man-lift (see Discussion section for Technical Support inspection of man-lift). This testing was conducted on December 13, 2008, and later again on January 13 and 14, 2009.

DISCUSSION

REPORTING OF THE ACCIDENT

The initial 911 call was made at 3:41 p.m. as verified by the Madisonville Police Department records. The accident occurred at approximately 3:40 p.m. Safety Director Jamie Woodruff for Warrior Preparation Plant notified MSHA supervisor James Hackney at 4:05 p.m. that an employee received potentially life threatening injuries while operating a man-lift at the new preparation plant construction site. Woodruff also contacted the MSHA call center at 4:48 p.m. to further report the accident. This violation was noncontributory to the accident and was cited on a separate inspection.

ACCIDENT SCENE

The accident occurred on the north face of the building between the 3rd and 4th floor, approximately 75 feet above ground level. The plant structure was near completion and the clean coal belt which is located on the ground floor of the structure was in operation (see Appendix C).

MACHINE INFORMATION

The machine involved in the accident was owned by Warrior Coal, LLC. The machine was a Genie Model S-85 Telescopic S Stick Boom four-wheel drive Personnel Lift (Man-lift), Manufacturer's VIN No. 534. This man-lift was manufactured in 1997 and weighed approximately 35,860 lbs. The machine was powered by a 56 horsepower

Deutz Model F4L 1011 Diesel Engine. The self propelled man-lift consisted of a main body, chassis, main boom with jib boom and an attached platform (man basket). The main body (turntable) was mounted on the chassis and could be rotated 360 degrees while the chassis remained stationary. The main boom was attached to the turntable and could be positioned from slightly below the horizontal position to an almost vertical position. The jib boom allowed the platform to be maneuvered into locations that would not be possible if the platform was attached directly to the main boom. The maximum working height of the platform was 85 feet and the maximum horizontal reach was 76 feet and 11 inches. Page 4 of the Operator's Manual for Model S-80 and Model S85 Aerial Platforms, (Second Edition, Fifth Printing, Genie Part No. 43650) had a paragraph discussing the method for freeing a platform that is caught, snagged or otherwise prevented from normal motion by a nearby structure. This paragraph states the platform controls should not be used to free the platform. Instead, the ground controls should be used to free the platform only after personnel are removed from the platform. A warning against using the platform controls to free a struck platform was also included in a list of warnings on the wall of the platform under the platform controls.

MACHINE EVENTS LEADING UP TO THE ACCIDENT

Prior to the accident, Albright had used the extra maneuverability allowed by the jib boom to maneuver the platform inside the outside wall of the preparation plant to do work between the 3rd and 4th floors. In order to place the platform in the location that the work was being performed, the platform had to be maneuvered between two lateral beams located on the outside wall of the preparation plant. While relocating the platform from the work location to the outside of the preparation plant, the platform became wedged against the lateral beams. After the platform became wedged, the operator remained on the platform and attempted to use the platform controls to loosen the platform. This method of freeing the platform is contrary to the method that is specified by the manufacturer of the man-lift. As the platform was being maneuvered to try and loosen it from the beams, the boom arm was deflected. The deflection caused a considerable amount of energy to be stored in the boom arm. When the platform was freed from the beams, the stored energy caused it to straighten with a violent and sudden movement.

CONTROL LOCATIONS (See Appendix B)

The man-lift has two operator control consoles. The main operator control console was located on the platform at the end of the boom. This control console enabled the man-lift operator to start and drive the machine and control the platform's movements. The machine has a second control console located at the right side of the turntable that could be utilized to override the control console on the platform. The controls installed on the turntable were operated from the ground and could be used in an emergency to lower the aerial platform to the ground if the operator on the platform needed assistance.

The turntable control console did not have controls to move the chassis. The console on the turntable has a key operated switch that determined which console has control of the platform movements. When the switch was turned to the right, the platform movements could be controlled at the turntable control console. When the key was turned to the left, the platform movement control was switched to the control console on the platform.

TURNTABLE CONTROL CONSOLE DESCRIPTION AND TESTING (See Appendix B)

The turntable control console included switches that controlled turntable rotate, main boom up/down and the main boom extend/retract. Control switches were also provided to use the jib boom up/down, platform level, and platform rotate to allow an operator to maneuver the platform into locations that would not be possible using turntable and main boom controls only. Before these controls for the platform movements would operate, the function enable switch located on the bottom left corner of the turntable console has to be pushed to the right or left.

Other controls located at the turntable control console included the engine start switch, emergency stop button, and auxiliary power switch. When activated, the emergency stop button shuts the engine down and disables all of the man-lift functions. The auxiliary power switch is used to operate the platform movement controls when the man-lift engine can not be started. In order for the controls on the turntable console to function with the use of auxiliary power, the auxiliary switch had to be held on while the controls were being activated.

After the accident, the turntable controls were used to lower the platform to the ground in order to remove the victim. During the accident investigation, an experienced operator stood on the ground and used the turntable controls to raise the platform back to the location of the accident (between the third and fourth floors of the plant). As the platform was raised, the controls operated smoothly and no problems were discovered. As the platform was being lowered, a further check was made of all the controls on the turntable console and they all operated smoothly. These controls were checked with the engine running and with auxiliary power and they operated properly in both situations.

The emergency stop button on the turntable control console was also tested. The emergency stop button was pushed to the "off" position and the engine stopped. With the emergency stop button in the off position, the engine would not start and none of the console controlled functions would operate.

PLATFORM CONTROL CONSOLE DESCRIPTION AND TESTING (See Appendix B)

The platform control console was the main control location on the man-lift. This control console enabled the man-lift operator to start and drive the machine and control the platform movements. The man-lift has a foot operated enable switch mounted on the

floor of the platform. The platform control system was designed so the controls that would cause movement of any part of the man-lift could not be activated unless the operator pushed the foot operated enable switch. The platform control console had a start switch to start the man-lift engine. The man-lift engine could not be started if the foot operated enable switch was pushed. This feature was to prevent unexpected movement of any part of the machine when the engine was started while a control was inadvertently activated. The engine RPM was controlled by a three position toggle switch. When the toggle switch was positioned to the right, the engine ran at high RPM. When the RPM control switch was placed in the center position, the engine ran at low RPM. In the left position, the RPM control switch caused the engine to run at low RPM until the foot operated enable switch was pushed. When the foot operated enable switch was pushed with the RPM switch in the left position, the engine would speed up to high RPM.

During the accident investigation, the speed of platform movements at full activation of the platform controls was checked with the RPM switch in each of the three positions. The speed of the engine did not have an effect on the maximum speed of the platform movements during most of the testing. Further investigation revealed the maximum speeds of the man-lift movements were controlled by the electrical controls for the hydraulic valves. The occasional difference in platform movement speed between high and low engine RPM was caused by the hydraulic pump not being able to supply sufficient hydraulic flow to move the platform at the speed requested by the electrical control for the hydraulic valve when the engine was run at low engine RPM. The three RPM settings included in the man-lift design allowed the operator to ensure the engine was supplying the power needed for the hydraulic pump to be able to provide the hydraulic pressure and flow needed for proper operation of each of the man-lift functions. The man-lift operators at the mine stated that they normally operated with the switch in the left position and this was also the setting at the time of the accident. In this position the engine ran at high RPM when the enable switch was depressed.

The platform control console had three controls used to drive the man-lift when it was being moved. The console had a control handle to control the direction of machine travel. The top of the directional control handle had a rocker type switch which was used to steer the machine. The third control was a toggle switch that placed the man-lift in low or high drive speed. During the investigation, the man-lift was moved from the accident location to a location more suitable to conduct tests on the platform movement controls. No problems were found with any of the drive controls when the machine was moved.

The platform control console also had two joysticks in the lower left corner to control the movements of the main boom and the turntable rotate. These joysticks were proportional, which allowed the operator to control the speed of the movements by the amount of joystick movement. The left joystick controlled the turntable rotate and the up and down movement of the boom. The right joystick controlled the boom extension and retraction. The platform control panel had additional toggle switch controls that could be used in repositioning the platform which included platform level, platform rotate and jib boom controls.

During the accident investigation, an experienced operator used the controls on the platform console to check each of the functions used in moving the platform. The functions operated smoothly and acted as expected with the exception of the main boom up and down function. When moving up or down, the main boom would continue to travel for several inches after the operator would release the joystick when the boom was traveling at full speed. Man-lift manufacturer representatives stated that the amount of boom travel was controlled by adjustments in the electrical control circuit for the main boom hydraulic controls. These adjustments could be used to set the time allowed from when the joystick was released until the boom movement would stop. These adjustments also change the distance the boom travels after the joystick is released. Man-lift manufacturer representatives indicated that they did not require a specific time for the boom to stop moving, but allowed the man-lift owners to set that time according to their preference. The representatives stated, that in close quarters, the man-lift operator should use the proportional joystick to slow the speed of the boom travel and thus control the distance the boom travels after release of the joystick. During the investigation an operator was able to use the proportional joystick to slow the up and down movement of the boom and thus limit the distance of boom travel when the joystick control was released.

SUMMARY

- Testing of the man-lift functions using the controls located at the platform control console did not reveal any defects.
- Testing of the man-lift functions using the controls located at the turntable control console did not reveal any defects.
- No defects were found in the man-lift when the drive controls were used to move the man-lift.
- Man-lift manufacturer representatives indicated that continued boom movement of several inches after release of the joystick control was normal if the boom was moving at high speed. This was allowed because the amount of boom movement could be controlled using the proportional joystick.
- Tests confirmed that the operator could use the proportional joystick to slow the up

and down movement of the boom to limit the distance the boom traveled when the joystick control was released.

WORK PROCEDURES/TRAINING

Albright had a total of two years mining experience and 18 weeks 2 days experience at the Warrior Plant and Matrix Design Group. Mine Safety and Health Training Specialist Joe R. Fritz conducted an examination of Albrights' training records. All required training records were up to date. The task training was provided by Warrior Coal, LLC. While training was provided with regard to the general operating procedures for the machine, no training was provided to the miner with regard to instruction in the safe operating procedures to be used in the event the platform became caught or entangled on an adjacent structure. This instruction was required to be given by a qualified trainer, or a supervisor experienced in the assigned tasks, or other person experienced in the assigned tasks. The safe procedures to be followed for this condition were listed in the operator's manual and also posted as a warning decal in the operator's platform of the machine.

The plant was under construction; however, the clean coal belt located on the ground level of the plant was in operation. The fact that this belt was operating exposed the contract workers to normal mine hazards, and required the contractors to be trained as miners in accordance with Part 48.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic cause of the accident that was correctable through reasonable management controls. During the analysis, a root cause was identified that, if eliminated, could have either prevented the accident or mitigated its consequences.

The root cause listed below identified during the analysis and the corresponding corrective action implemented to prevent a recurrence of the accident:

Root cause: The operator failed to adequately train man-lift operators in the proper safe operating procedures on how to free the platform once it becomes entangled or caught on an adjacent structure. As a result man-lift operators were unaware of how to perform this procedure safely.

Corrective Action: All company and contractor employees that are subject to operate the man-lifts were trained on December 18, 2008 in the safe operating procedures to be followed in the event the platform becomes entangled or caught on an adjacent structure.

CONCLUSION

Miners were not trained adequately in the safe operating procedures to be followed in the event the platform of the man-lift becomes caught or entangled with an adjacent structure. Once the platform became caught, neither Albright nor his foreman knew the proper actions to take to safely remove the platform from the structure. This lack of knowledge to take the appropriate actions resulted in the accident.

Approved By:



Carl E. Boone II
District Manager



Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, No. 8489949, was issued to Warrior Preparation Plant, ID 15-14335 stating "A fatal accident has occurred at the Warrior Coal, LLC; Warrior's new preparation plant under construction at this operation, Mine ID 15-14335. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the new construction of the preparation plant until MSHA has determined it is safe to resume normal operation in the area. The mine operator will obtain prior approval from MSHA for all actions to recover and/or restore operations to the affected area."
2. A 104(a) Citation, No. 6694186, was issued citing 30 CFR Section 48.27(a)(1) to Warrior Preparation Plant, ID 15-14335 stating "Two contractors, General Mine Contracting and Matrix Design Group, were not adequately task trained in the operation of aerial lifts. The training did not include safe operating procedures to be followed in the event the platform becomes caught, snagged or otherwise prevented from normal motion by an adjacent structure. The manufacturers' operator manual for the Genie S-85 man-lift states "Do not use the platform controls to free a platform that is caught, snagged or otherwise prevented from normal motion by an adjacent structure. All personnel must be removed from the platform before attempting to free the platform using ground controls. It is the Mine Operators' responsibility to ensure all contractors on mine property have adequate training. On December 11, 2008, a miner received fatal injuries while attempting to free the platform, which had become caught between two beams of the Warrior Preparation Plant under construction, by operating the platform controls." **Moderate, Occurred, Fatal, 1 Person**
3. A 104 (a) Citation, No. 6694187, was issued citing 30 CFR Section 48.27(a)(1) to Matrix Design Group ID L777 stating "The task training for the operation of aerial lifts was not adequate. The training did not include safe operating procedures to be followed in the event the platform becomes caught, snagged or otherwise prevented from normal motion by an adjacent structure. The manufacturers' operator manual for the Genie S-85 man-lift states "Do not use the platform controls to free a platform that is caught, snagged or otherwise prevented from normal motion by an adjacent structure. All personnel must be removed from the platform before attempting to free the platform using ground controls". This statement is also posted as a warning decal in the platform of the machine. On December 11, 2008, a miner received fatal injuries while attempting to free the platform, which had become caught between two beams of the Warrior Preparation Plant under construction, by operating the platform controls." **Moderate, Occurred, Fatal, 1 Person**

Appendix A
Persons Participating in the Investigation
Persons Interviewed

Warrior Coal, LLC

Brad Taliafera Surface Manager / Project Manager
Kevin Vaughn.....Director of Safety and Training
Franklin Roberts Preparation Plant Superintendent
Steve Linzy Preparation Plant Electrician

Matrix Design Group

David Brown Manager of Electrical Construction Services
Troy Patterson Foreman
Brian Qualls Foreman

General Mine Contracting (GMC)

DeWayne Blain Foreman
Mark Richardson Laborer

Kentucky Office of Mine Safety & Licensing

Greg Goins Inspector Principle
Kenny Mitchell OSML
Michael Todd OSML

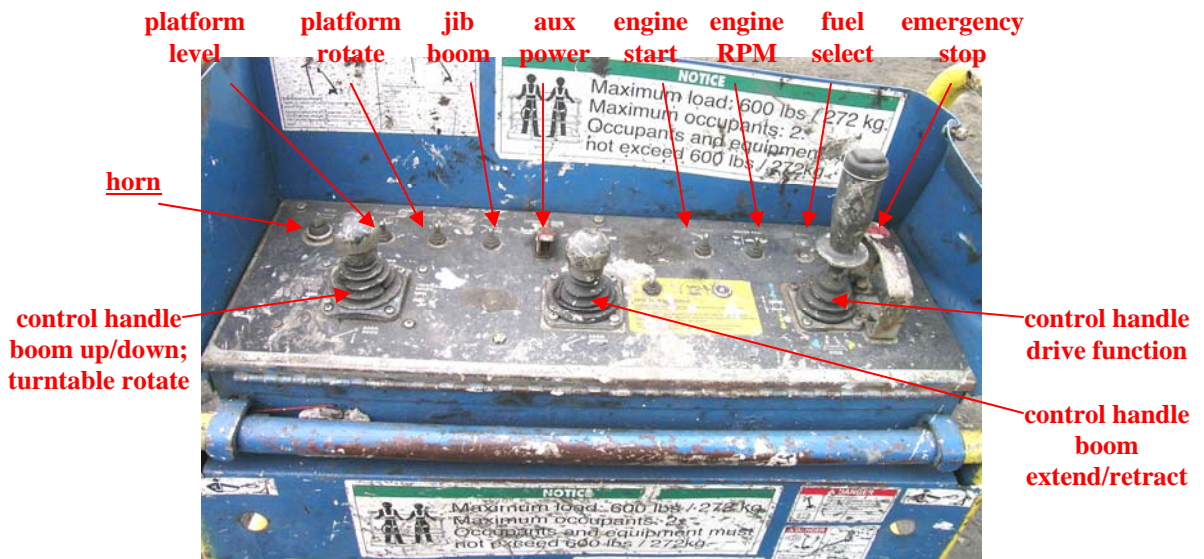
Mine Safety and Health Administration

Keith Ryan Coal Mine Safety and Health Inspector (Surface)
Micheal Moore Supervisory CMS&H (Electrical)
Troy Davis Staff Assistant & Accident Coordinator
Eugene D. Hennen Mechanical Engineer, Approval and Certification Center

Appendix B Machine Controls



Turntable Controls

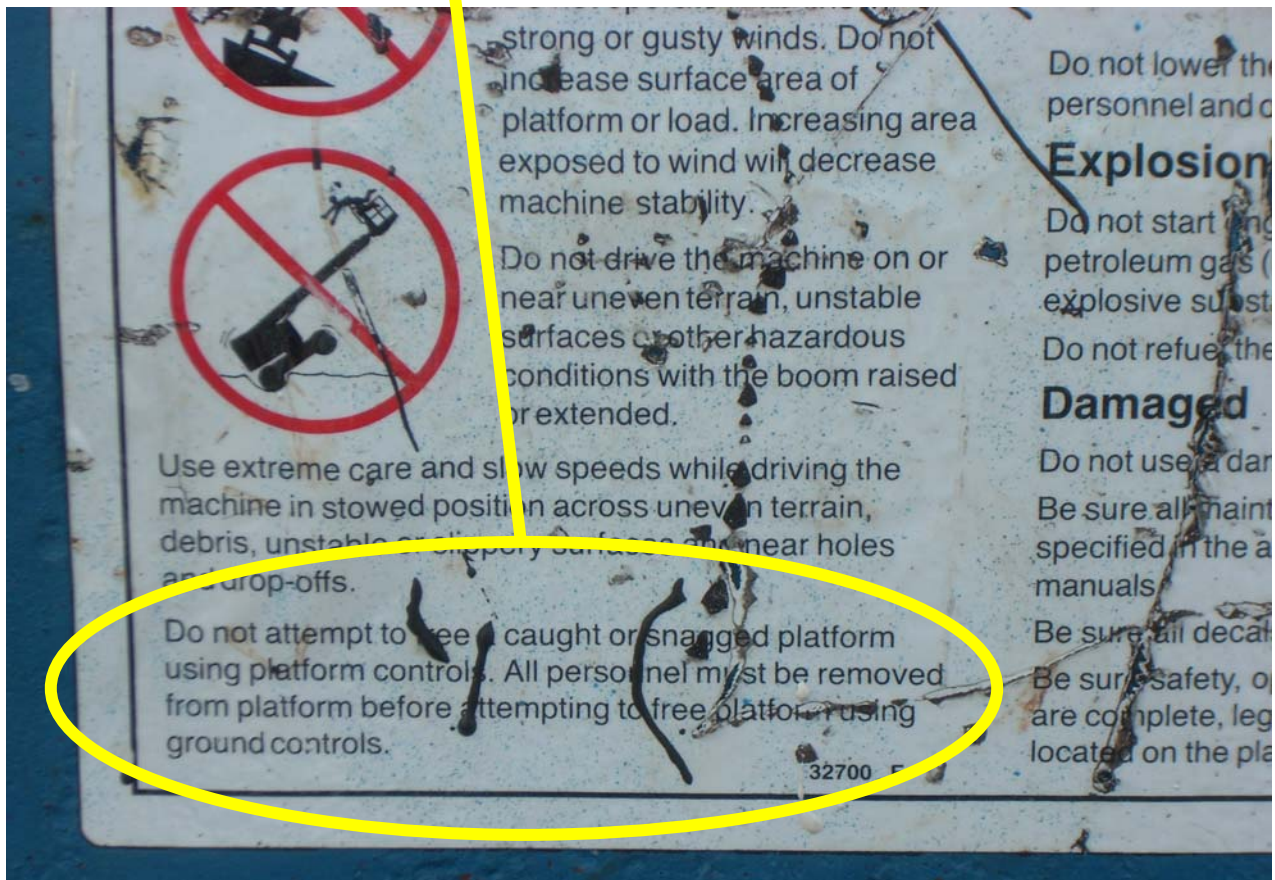


Platform Controls

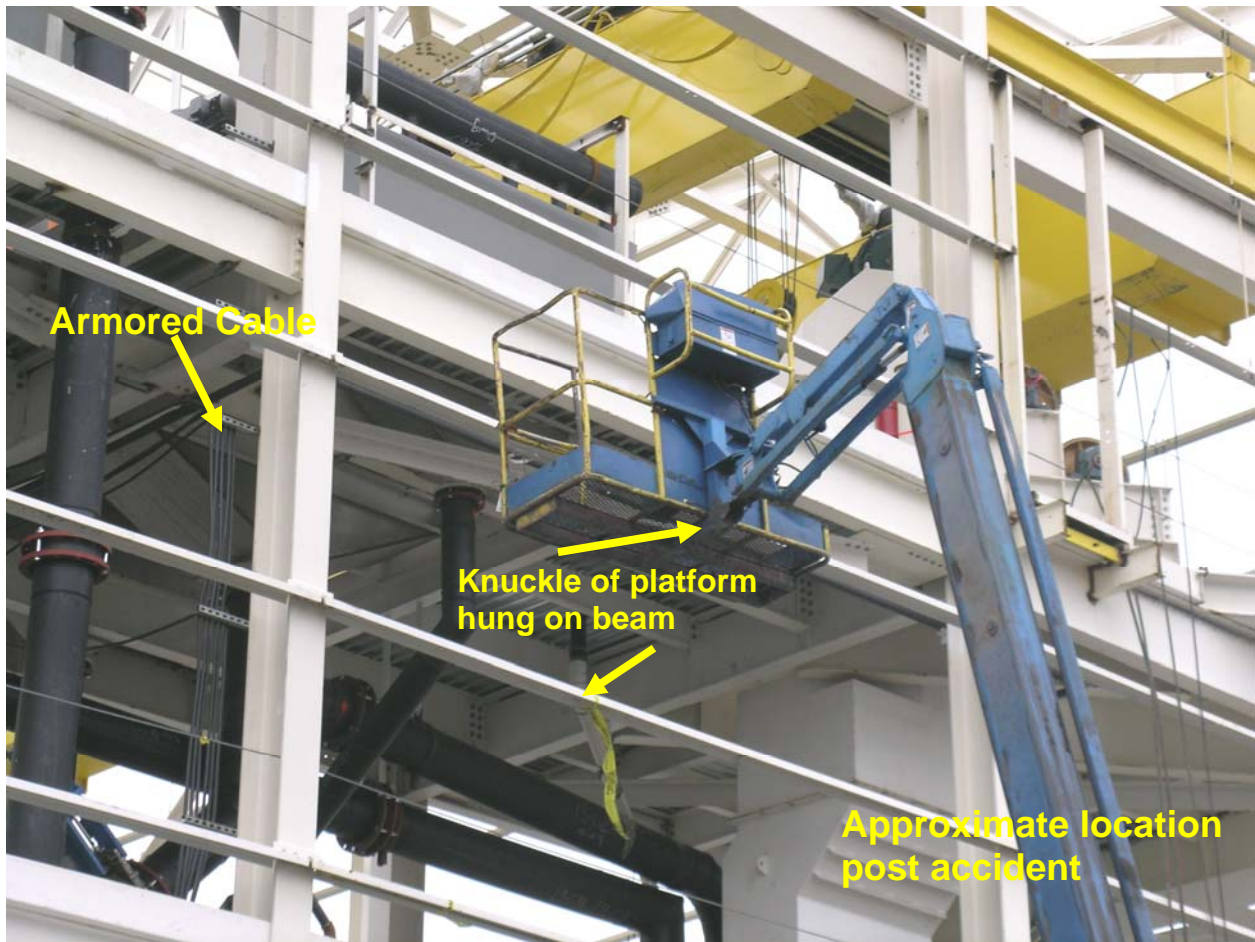
Appendix B Continued
Warning Label on Platform



Platform
Controls

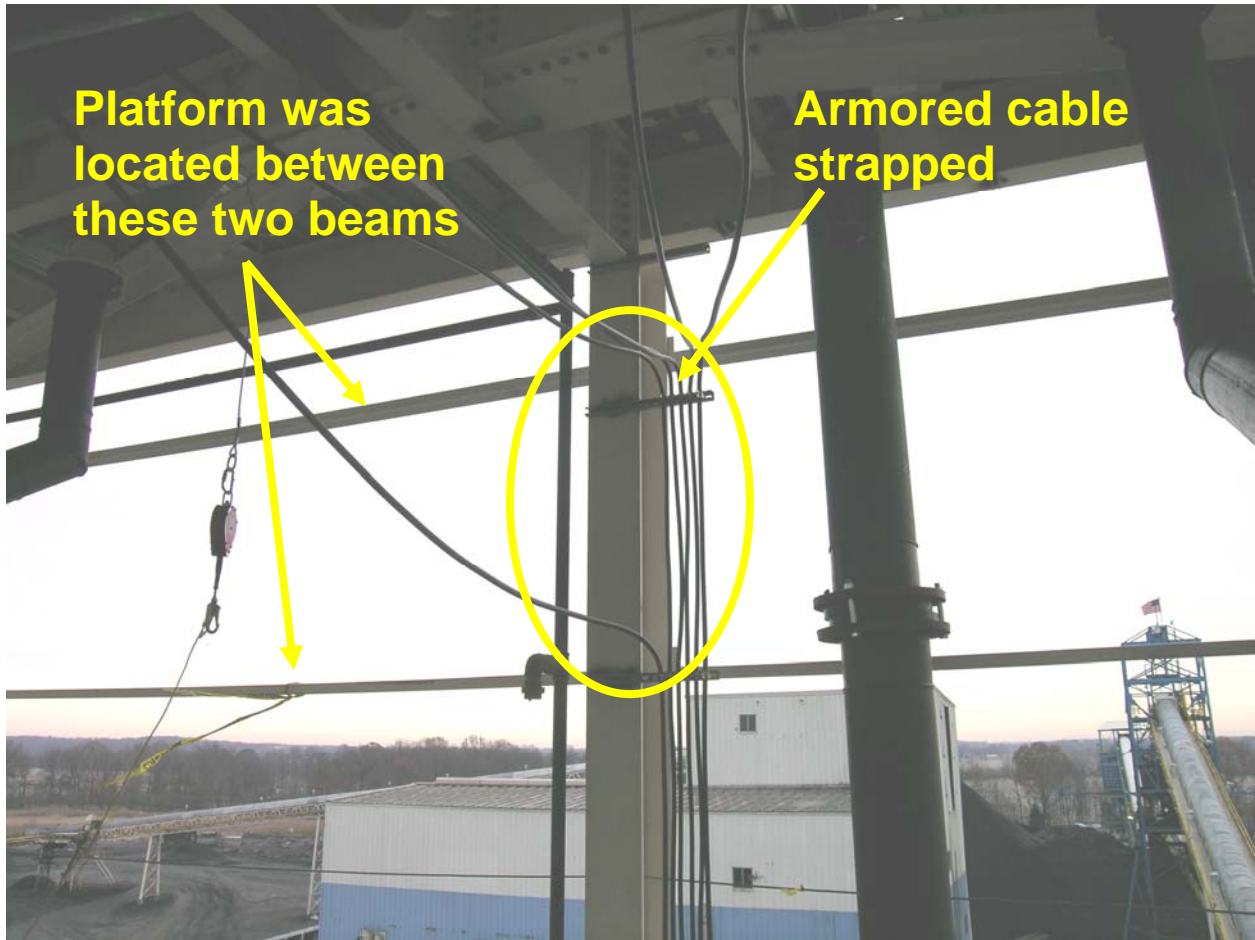


Appendix C
Accident Site



Photograph depicts approximate post accident location of the platform

Appendix D
Accident Site



Photograph depicts the immediate work area

Appendix E
Accident Site



View from inside of the plant approximate post accident position of platform.

The total height of the platform from the knuckle to the top of the platform measured 54 inches. The vertical opening between the beams measured 58 inches.

Appendix F
Accident Site



Photograph depicts white paint from the beam on the knuckle of the platform