

Case Number

2012-171

Lead Investigator

John W. Steinbach

State Fire Marshal Division

Department of Public Safety
444 Cedar Street, Suite 145
St. Paul, MN 55101-5145

**Investigation Report**Confidentiality: Juvenile: ☐ Homicide: ☐ Confidential: ☐**Property**Name: Verso Paper CorporationAddress: 100 East Sartell StreetCity: Sartell County: Benton State: MN Zip: 56377-Phone: 320-240-7510 Contact Name: Mike Gunderson Contact Phone: 320-250-7597Property Use Code: 700Building Name: Use Code: Alarm Type: Choose Sprinkler: ChooseSection Name: Use code: Alarm Type: Choose Sprinkler: Choose**Incident Detail**Date: 05/28/2012 Time: 1121 Fire Type: Explosion Fire Cause: Appliance Overheated # Injuries: 3Fire Dept.: Sartell FDID: 73121 Req. Agency: Sartell Fire Department Coop. Agency: Sartell Police DepartmentType of Occupancy: Paper Manufacturing Pre Fire Value: \$ Loss: 50,000,000Smoke Detector Performance: Unknown Sprinkler System Performance: Not Operating ProperlyOccupied: Yes: ☒ No: ☐**Disposition**Open: ☐ Closed: ☒ Referred to other agency: ☐ Referral Info:**Note: All fields underlined are required upon initial submission of this report.****Synopsis**

Employees at a paper mill discovered smoke and flames shooting from the top of an air compressor in an air compressor room at the east end of the plant. Employees notified the plant's fire brigade and began exiting the area, when a receiver tank at the north end of the compressor room exploded, causing severe structural damage and fire to occur within the plant's compressor room and paper warehouse. The resulting explosion caused injuries to several employees, including one fatality. Multiple fire departments arrived on scene and battled the flames for days using multiple fire apparatus. Investigation determined a severe reduction of cooling water flow to operating compressors prior to the incident contributed to a compressor overheating, which resulted in a fire and explosion to occur.

Owner 1Check if Occupant: ☒

Last First Middle Fatality DOB Gender
Verso Paper Corporation ☐ / / Choose
Address: 6775 Lenox Center Court, Suite 400 CO: % BAC: Drugs: ☐
City: Memphis State: TN Zip: 38115-
Phone: - - Contact Name: Robert P. Mundy Contact Phone: 901-369-4128
E-mail: School District #: Country:

Blue indicates required fatality information. DOB is optional unless a fatality.

Owner 2Check if Occupant: ☐

Last First Middle Fatality DOB Gender
Address: ☐ / / Choose
City: State: Zip: - CO: % BAC: Drugs: ☐
Phone: - - Contact Name: Contact Phone: - -
E-mail: Country:

Blue indicates required fatality information. DOB is optional unless a fatality.

Occupants

Last	First	Middle	DOB	Fatality	Gender	CO	BAC	Drugs
			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐
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			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐
			/ /	☐	Choose	%		☐

Blue indicates required fatality information. DOB is optional unless a fatality.

Other Fatalities – Fire Fighters and Others

Last	First	Middle	DOB	Gender	FF/Other	CO	BAC	Drugs
			/ /	Choose	Choose	%		☐
			/ /	Choose	Choose	%		☐
			/ /	Choose	Choose	%		☐
			/ /	Choose	Choose	%		☐
			/ /	Choose	Choose	%		☐

CO, BAC and Drugs only required if fatality is not a Fire Fighter

Insurance Record

Insurance Agency: AON Risk Solutions Agent: Phone: 415-486-7000 City:
Insurance Co: FM Global Policy Number: XG935 Inception Date: 8/1/2011 Expiration Date: 8/1/2012
Amount of Policy: Blanket Coverage 5,900,000,000 Building: Contents: Other: Deductible
1,000,000
Claim Number: 411404 Payable to: Adjuster: David Hess Phone: 763-732-4239
Remarks:

Narrative Report

People

Sartell Fire Department – Fire Chief Ken Heim & Fire Marshal James Rieland; 320-253-2171
Sartell Police Department – Detective Tim Broda, Officer Jason Thompson & Officer Rob Lyon; 320-251-8186
Owner – Verso Paper Corporation; 6775 Lenox Center Court, Suite 400, Memphis, TN 38115
Senior Vice President and Chief Financial Officer Robert P. Mundy; 901-369-4128
Verso Paper employee/fatality – Jon Michael Maus, DOB 7/26/1961; 19839 390th Street, Albany, MN 56307
Verso Paper employee/injured – David Sylvester Popp, DOB 10/4/1951; 5599 398th Street, Rice, MN 56367;
320-259-1434 (h), 320-469-8301 (cell)
Verso Paper employee/injured – Dennis Daniel Schneider, DOB 1/8/1967; 3305 12th Avenue North, Sartell, MN
56377; 320-333-7206 (h), 320-241-0331 (cell)
Verso Paper Pulp & Utilities Manager – Robert Edward Bridges, DOB 4/19/1951; 4700 4th Street Loop NE,
St. Cloud, MN; 320-761-1047
Verso Paper Utilities Area Manager – Mark James Wichman, DOB 4/11/1960; 3612 South Oak Circle,
St. Cloud, MN; 320-241-1482
Verso Paper Water Treatment Operator – Randy Donald Roeder, DOB 5/23/1957; 20457 Elmwood Road,
Clearwater, MN 55320; 320-558-6662
Verso Paper Safety Supervisor – Caleb Voigt; 320-309-8145
Verso Boiler Operator – Joseph Edward David, DOB 6/14/1955; 4615 Mink Loop NW, Sauk Rapids, MN
56379; 320-293-8010
Verso Employee Lead Hourly Tech – Eugene Joseph Yasgar, DOB 7/17/1953; 2416 6th Street South, Sartell:
320-492-0463
Verso employees – Glen Schellinger; 320-255-1460
John Haus; 320-260-8325
Bob Heins; 320-252-9157
Marvin Koshiol; 320-493-3394
Paul Plafcan; 320-333-2644
Dale Dirks; 320-333-3181
Byron Birr; 320-363-1215
Duane Albrecht; 320-260-4019

Verso employees – Pete Haus; 320-253-8798

Jerry Schubert; 320-240-7248

John Knese; 320-252-7452

Jerry Bloch; 320-249-6422

Ray Cordie; 320-363-4864

Securitas Security employee – Matt Yager; 320-492-5313

Whitemore Fire Consultants – Bob Whitemore & Brian Haag; 952-461-7000

Background

At 1216 hours on May 28, 2012, I received a phone call from the State Duty Officer informing me the Sartell Fire Department was requesting my assistance for a commercial business fire and explosion involving one fatality at Verso Paper Corporation in Sartell. En-route to the fire scene, I contacted Deputy State Fire Marshal-Investigator Casey Stotts and requested his assistance with this fatal commercial business fire and explosion.

I arrived on scene at 1342 hours and observed many firefighters and fire apparatus battling flames to a fire damaged structural steel building used to manufacture paper. I was met by Sartell Fire Chief Ken Heim and Sartell Police Department Detective Tim Broda, Officer Jason Thompson and Officer Rob Lyon, who provided me with the following background information:

- The fire and explosion was reported by numerous 911 callers at 1121 hours.
- Upon fire department arrival, heavy black smoke was venting from the south end of the paper warehouse; and smoke and flames were shooting through a large gaping hole in the roof above the compressor room.
- Portions of the paper mill's sprinkler system were compromised during the explosion, displacing water lines.
- Exterior steel sheeting along the east wall of the paper warehouse had blown out onto the railroad tracks alongside the building.
- Fire suppression was focused from the south, north and east sides of the building.
- Many aerial fire apparatus were utilized to apply hose streams to the roof of the building, with a large gaping hole along the west side of the warehouse in the area of the plant's air compressor room.
- Firefighters discovered the body of deceased Verso Paper employee Jon Maus at the southern end of the roll wrap room, which is south of an employee break room and air compressor room.
- In addition to the employee fatality, two additional employees, David Popp and Dennis Schneider, were injured during the explosion.
- Prior to the explosion, employees heard a hissing noise and discovered a fire in the air compressor room.
- The plant's Fire Brigade was notified about the smoke and fire in the compressor room.
- Employee Jon Maus attempted to use a portable fire extinguisher on the fire in the compressor room and then he and employee Dennis Schneider decided to retreat. The explosion occurred as Maus and Schneider retreated.
- A water leak had occurred in the plant the morning prior to the explosion.

- The plant was scheduled to shut down at about 10:40 AM to repair the water leak.
- Employees repaired the water leak.
- As employees were bringing the plant back up to operation at approximately 11:00 AM, smoke was discovered in the roll wrap room.

Deputy State Fire Marshal Casey Stotts, Police Detective Broda, Benton County Assistant Medical Examiners and I photographed and documented the location of fire and explosion fatality Jon Maus. The victim's body was then removed from the scene and transported to the Midwest Medical Examiner's Office in Ramsey, MN for an autopsy. According to the Medical Examiner's Office, the victim died as a result of blunt force trauma sustained during the explosion.

I then proceeded to take some initial photographs of the scene and document the fire and explosion damage to the structure. Due to continuing fire suppression activities of burning rolls of paper in the plant's warehouse and severe structural damage, investigation into the origin and cause of the fire and explosion was suspended until extinguishment of the fire and shoring up of the structure was completed for safe entry. I conducted digitally recorded interviews with Verso employees Robert Bridges, Mark Wichman, Randy Roeder and Dave Popp (see Interviews).

On May 30, 2012, I returned to the fire scene where fire suppression activities were continuing to extinguish burning rolls of paper in the paper warehouse. I met with and interviewed Matt Yager from Securitas Security Company, who provides security at Verso Paper. At 0520 hours the morning of the fire, Stearns County Dispatch received a 911 call from a Sartell resident regarding loud banging noises coming from the mill. Yager stated he was doing his rounds in the morning when he heard loud popping noises coming from the North Power Plant. The Power Plant operator told him they were dealing with a leaking steam valve and there was no danger. Yager stated a Sartell Police Officer then arrived on scene to inquire about the noise. Yager informed the officer about the incident and that there was no danger to the public.

On May 31, 2012, I was present for a meeting with the following Verso Paper employees: Electrical Engineer Dave Zimmer, Maintenance Supervisor for Utilities Jerry Schubert, Mechanical Engineer Bob Barr, and Utilities Manager Mark Wichman. Also present for the meeting was Bob Whitemore from Whitemore Fire Consultants, who was retained by FM Global Insurance to investigate the loss. During the meeting, I learned the following:

- Compressors #1 through #4 were installed in 1981. Compressor #5 was installed in 1996.
- The compressors are Gardner Denver rotary screw compressors, 400 horsepower.
- Each compressor has its own heat exchanger to cool compressor oil and air.
- Two times a shift, a water treatment employee records the oil temperature, oil level and operating temperature of each compressor operating. The logs are stored at the South Power Plant.
- The South Power Plant control room contains computer equipment that records the following compressor data: oil temperature, mode of operation, KW usage, air pressure and air pressure for each air tank vessel approximately 18' in height and 84" in diameter.
- One of the air tanks is for instrument air and the other mill air.
- Alarms for compressor high air temperature and low oil are monitored at the South Power Plant.
- Compressor overhauls are completed by an outside vendor.
- Approximately two years ago, the company received a grant to convert the compressors from air-cooled to water-cooled. Several outside vendors were involved with the installation project.

- Approximately three to six months ago, #4 compressor was switched out with a rebuilt air compressor.
- #4 compressor had an oil leak and oil consumption issue. The compressor also had a vibration issue. Verso addressed a filter problem and made changes. #4 compressor was then installed in the #1 compressor position, and #1 compressor was taken out and used as a spare compressor.
- There are no vibration alarms for compressors.

On June 1, 2012, I returned to the fire scene to supervise the removal of charred rolls of paper from the southwest corner of the warehouse adjacent to the compressor room where the fire and explosion occurred. Rolls of paper were removed to access the blast area along the west wall of the warehouse. Through a laser imaging process, engineers from Clark Engineering, retained by Whitmore Fire Consultants, digitally photographed the compressor room and north end of the roll wrap room directly south of the computer room. The roll wrap room and area east of the compressor room into the paper warehouse were secured with orange snow fence and/or fire line tape and traffic cones.

On June 4, 2012, I returned to the fire scene to resume debris removal from the southwest quadrant of the warehouse and north end of the roll wrap room. During debris removal, potential artifacts were discovered among debris. The artifacts were collected and secured in a secured area. Prior to debris removal, Verso Paper Corporation Senior Vice President of Manufacturing Lyle Fellows signed a consent form for this fire investigation (see attachment).

On June 5, 2012, I returned to the fire scene, where I observed heavy equipment contractors install steel I-beams beneath the mezzanine above the north end of the compressor room in order to shore-up unstable steel and the poured concrete floor of the mezzanine above the compressor room. I also traveled to the residence of injured Verso employee Dennis Schneider to possibly interview Schneider. There was no response at the residence. I left phone messages on both Schneider's cell and home phone for him to contact me. I then traveled to the work place of Schneider's wife, Kim Schneider, and left my business card with Kim Schneider instructing her to have Dennis contact me.

On June 6, 2012, I returned to the fire scene, where I observed heavy equipment contractors resume operations to shore up the unstable mezzanine area above the north end of compressor room. I also met with and conducted a digitally recorded interview with Verso employee Dennis Schneider (see Interviews). Also present during the interview were Bob Darling from Minnesota Department of OSHA, Brian Haag from Whitmore Fire Consultants, and legal counsel from Verso Paper.

Deputy State Fire Marshal Casey Stotts turned the fire scene over to Bob Whitmore from Whitmore Fire Consultants on Friday June 8, 2012. Whitmore Fire Consultants represents FM Global, who insures Verso Paper.

On June 11, 2012, I returned to the fire scene for a scheduled inspection of the scene with Bob Whitmore from Whitmore Fire Consultants and involved parties (see sign-in sheet). During the inspection, I noted the ruptured receiver tank at the north end of the compressor room had been removed from the compressor room and placed inside the paper warehouse for inspection purposes. The top and base sections of the affected receiver tank were also removed from the compressor room and placed alongside the ruptured receiver tank. Involved parties photographed and documented the fire and explosion scene.

On June 12, 2012, I returned to the fire scene, where I was present for debris removal from the north end of the compressor room. Artifacts discovered among debris were collected and placed in a secure area. I also conducted a digitally recorded interview with Verso employee Lead Hourly Tech Eugene Yasgar (see Interviews).

On June 13, 2012, I returned to the fire scene, where I was present for debris removal from the compressor room. Artifacts discovered among debris were collected and placed in a secure area. I also received a 4-GB jump drive from Verso Legal Counsel containing proprietary information pertaining to mill operations and instrumentation data for compressor data, i.e. air compressor oil temperature, electrical power usage, air pressure and on/off operation (see signed confidentiality agreement Deputy State Fire Marshal James Iammatteo signed for the MN State Fire Marshal Division).

On June 14, 2012, I returned to the fire scene, where I was present for debris removal from the compressor room and north end of roll wrap room. Artifacts discovered among debris were collected and placed in a secure area.

On June 15, 2012, I returned to the fire scene, where I was present for debris removal from the employee break room inside the roll wrap room. Artifacts discovered among debris were collected and placed in a secure area.

On June 18, 2012, I returned to the fire scene, where I was present for debris removal along the west wall of the compressor room. Artifacts discovered among debris were collected and placed in a secure area. The west wall of the compressor room was shored-up to stabilize the precast concrete walls above.

On June 19, 2012, I returned to the fire scene, where I was present for a tour of the raw water pump house at the north end of the mill. Mill water to the plant was shut-off in the pump house at a shut-off valve the morning of the incident to repair a leaking water valve beneath paper machine #3. The tour, escorted by Verso Paper employees and Verso Legal Counsel, continued to the leaking water valve beneath paper machine #3 that was replaced the morning of the incident. The tour then continued to a corridor immediately adjacent to the compressor room, where the mill water shut-off valve for cooling compressors is located. The mill water shut-off valve is in the closed position. Also located in this corridor outside the compressor room is a well water shut-off valve also used for cooling compressors. The well water shut-off valve is in the open position. The tour then continued to the South Power Plant control room, where I observed a series of control panels that monitor various plant operations. During the tour, I approached a Verso employee sitting at a control panel and began asking questions regarding monitoring operations. Verso legal counsel present terminated any further questions.

On June 21, 2012, I returned to Verso Paper in Sartell, where Bob Whitemore and I conducted digitally recorded interviews with the following Verso employees: Glen Schellinger, John Haus, Bob Heins, Marvin Koshiol, Paul Plafcan, Dale Dirks and Byron Birr (see Interviews). Also present during employee interviews were mill union representatives and legal counsel for Verso Paper.

On July 9, 2012, I returned to Verso Paper in Sartell, where Bob Whitemore and I conducted digitally recorded interviews with the following Verso employees: Duane Albrecht, Pete Haus, Jerry Schubert, Mark Wichman, John Knese, Jerry Bloch and Ray Cordie (see Interviews). Also present during employee interviews were mill union representatives and legal counsel for Verso Paper.

Property Description

This structure was originally built in 1905 and has several additions. It varies in height from one to six stories and is a masonry and structural steel building used to manufacture various types of coated paper from raw materials. The paper mill, which employs approximately 260 employees, includes two separate electrical generating power plants. The paper mill produces rolls of coated paper weighing approximately one to four tons each and measuring approximately three to four feet in diameter and approximately four to six feet in height. The mill is a fully sprinkled building with its own in-house fire brigade that responds to emergencies at the plant. The paper mill is located along the banks of the Mississippi River in the city of Sartell in central Minnesota.

The portion of the building involved in the fire and explosion is a structural steel building with metal clad exterior walls and flat rubber membrane roof. The interior walls are metal clad, which includes concrete block walls and poured concrete fire walls. This affected area of the building at the east end of the plant is occupied by the mill's warehouse, roll wrap room, compressor room, and portion of the plant's electrical distribution center.

Scene Examination

I began my investigation in the roll wrap room where firefighters discovered the deceased body of mill employee Jon Maus. The roll wrap room with conveyor system is used to wrap rolls of finished paper for transport to the warehouse. There are fractured pieces of concrete blocks and debris scattered throughout the roll wrap room. Many damaged and/or overturned steel dumpsters are lying about the roll wrap room.

The victim's body is lying on the concrete floor at the southern end of the roll wrap room. The victim is lying on his left side, with his upper back against a steel pipe. There is blood on the floor in the area of the victim's head, and the body is lying partially inside an overturned steel dumpster. The body has sustained numerous blunt force injuries. The victim's body was photographed, documented and transported to the Midwest Medical Examiner's Office in Ramsey for an autopsy. According to the Medical Examiner, the victim died of blunt force trauma injuries sustained during the fire and explosion.

At the northwest corner of the roll wrap room is an employee break room with concrete block walls. North and east of the employee break room is a compressor room which houses five (5) 400-horsepower air compressors and two (2) 7,500-gallon receiver air tanks. The south concrete block walls of the compressor room and the employee break room have blown out into the roll wrap room. There are fractured pieces of concrete blocks and debris scattered about the floors of the employee break room and roll wrap room. Explosion damage to the roll wrap room clearly reveals the blast originated from the north end of the compressor room.

Inside the compressor room are concrete blocks and debris littering the floors. Overhead mechanical and electrical distribution systems, including water lines originally suspended from steel I-beams above in the compressor room, have partially collapsed, obstructing a clear path to the north end of the compressor room. There are five (5) 400-horsepower rotary screw air compressors along the west wall of the compressor room, beginning with #5 compressor at the south end and #1 compressor at the north end. Compressors #1 through #4 are Gardner Denver, installed in approximately 1981. Compressor #5, also a Gardner Denver, was installed in approximately 1996. The compressors contain two heat exchangers, one for cooling air and the other for cooling compressor oil. In 2010, through a federal grant, Verso converted compressors from air cooled to water cooled, which significantly reduced compressors from tripping out on hi air temperature. Compressors are cooled primarily by mill water also know as (river water). Compressors can also be cooled

by well water and/or by city water. Water-cooled air compressors supply compressed air to operate various types of valves and instruments throughout the plant.

At the north end of the compressor room (with mezzanine above) is the location of two (2) vertical 7,500-gallon receiver tanks, one for mill air and the other instrument air. The mill air receiver tank is along the west wall of the compressor room and the instrument air receiver tank is along the east wall of the compressor room. The mill air receiver tank is 84" in diameter and has exploded and/or ruptured. The ½" thick steel receiver tank is ripped apart, and the welded dome and base of the tank have blown off. The ruptured tank is lying atop compressor #1, which has been displaced from its elevated concrete pad to the south. The interior of the ruptured mill air receiver tank is coated with a thick layer of oil and black soot. In a bottom section of the receiver tank I observed a large pool of oil. Examination of the dislocated 6" in diameter stainless steel compressed air piping from the ruptured receiver tank also revealed heavy black oily soot deposits within the piping.

The second receiver tank, although intact, is lying on its side along the north blown out wall of the compressor room. The west concrete block wall of the compressor room has blown out, causing precast concrete walls above to partially collapse downward. The north and east concrete block walls at the north end of the compressor room have also blown out. Steel I-beams supporting the concrete floor above are hanging down. Stainless steel pipes for air and water supply have been displaced and hang precariously above. The east concrete block wall of the compressor room has blown out into the paper warehouse, and shattered pieces of cinder block are lying all over the southwest corner of the warehouse among charred rolls of paper. The structural steel roof assembly of the southwest quadrant of the paper warehouse is partially collapsed and resting on charred rolls of paper. The fire in the warehouse and explosion at the mill air receiver tank in the compressor room ensued due to a fire that occurred at compressor #3, based on eye-witness observations and heat patterns observed at #3 air compressor.

A cable tray is suspended from the compressor room ceiling routed directly above air compressors in a north-south direction. The cable tray supports various electrical conduits and electrical cables for electrical equipment in the plant. Wiring insulation on the electrical cables directly above compressor #3 are blackened and/or charred due to external heating from compressor #3 below. Painted steel enclosure panels for compressor #3 are heavily discolored due to thermal heating from within the compressor unit. Electrical control panels at the front and/or east side of the compressor are severely compromised due to the explosion damage.

I observed the compressor's relief valve at the top southeast corner of the compressor cabinet. I observed plumbers wire used to secure the relief valves manual release handle to the relief valve body. Examination of relief valves on compressors #1, #2, #4 and #5 revealed no plumbers wire securing the manual release handles to the relief valve bodies. According to compressor experts present, the plumbers wire securing the handle to the relief valve does not affect the operation of the relief valve.

I then examined the interior of the compressor unit, where I observed significant fire damage. The interior steel enclosure of the compressor unit is blackened and covered with soot. Air filters at the backside of the compressor unit for air intake are consumed by fire. Six-inch rubber couplings between the steel air intake cabinet and the compressors air intake heads are destroyed by fire. There is extensive thermal damage to the compressor unit itself. The painted cast iron compressor, oil separator and 100-gallon oil tank below the oil separator are blackened and discolored due to internal heating from the compressor. The compressor oil used in the compressors is Aeon 2000 or 4000 Rotary Screw Compressor, Petroleum Based Lubricant. According to MSDS Sheets, the flash point for Aeon 4000 is 410 degrees F. and the flash point for Aeon 2000 is 388 degrees F. A warning label affixed to either the Aeon 2000 or 4000 oil drums reads Attention: Empty

containers may contain product residue, including flammable or explosive vapors. Do not cut, puncture or weld on or near container.

According to pi data retrieved from the south power plant control room, the compressor oil temperature at compressor #3 at the time of the explosion (11:17 AM) was 308 degrees F. The normal operating temperature for compressor oil is approximately 150 degrees F., according to pi data. Compressor #3 operated at or above 300 degrees F. from approximately 10:30 AM until the time of the explosion at 11:17 AM. Compressor instrumentation used for measuring oil temperature measures from 50 degrees F. minimum to 300 degrees F. maximum. Review of a computer-generated pi graph of time and temperature for compressor #3 at the time of the incident was potentially approximately 484 degrees F.

Also according to pi data, compressor #4 stopped running at 10:06 hours with an oil temperature of 200 degrees F. Compressor #5 stopped running at 10:07 AM with an oil temperature of 205 degrees F. The compressors are designed to shut off when the compressor air temperature reaches approximately 230 degrees F. The compressors are also designed to shut off due to low oil pressure. When compressors #4 and #5 shut off due to high air temperature, compressors #1 and #2 were started by a Verso employee. Compressor #1, only to be used in an emergency, was started at 10:16 AM and compressor #2 was started at 10:07 AM. Also, according to pi data on the day of the incident, compressor cooling water flow was approximately 215 gallons per minute until 7:54 AM, when cooling water flow dropped to an average of approximately 78 gallons per minute. Also according to pi data, from approximately 10:05 AM until about 10:14 AM, cooling water flow fluctuated between 19 gallons of water per minute to as low as 3 gallons of water per minute. Severe reduction of compressor cooling water flow continued up until the time of the incident at 11:17 AM.

Compressor cooling water is normally supplied by mill water from the plant's raw water pump house. At approximately 7:00 AM the morning of the incident, a mill water leak was detected beneath paper machine #3, which required mill water at the plant to be shut off in order to make repairs. Prior to shutting off mill water at the plant well, water to the compressor room for compressor cooling was turned on by opening a gate valve in a corridor west of the compressor room. During my scene examination, I noted the mill water shut-off valve to the compressor room for cooling water was closed and the well water shut-off valve open. As cooling water supply to the compressor room was significantly reduced, compressor oil temperatures at compressors #3, #4 and #5 continued to elevate until compressors #4 and #5 tripped out due to high temperature. Compressor #3 continued operating with an elevated oil temperature until the time of the incident. Compressors #1 and #2 also operated until the time of the incident, with oil temperatures at the time of the incident for #1 compressor at 158 degrees F. and #2 compressor at 178 degrees F.

Examination of thermal patterns to the compressor room clearly show the fire originated at compressor #3. Compressor #3 overheated internally and igniting compressor oil vapors on fire, which communicated through compressed air piping to the mill air receiver tank where explosive compressor oil vapors were ignited, causing the mill air receiver tank to explode. Flames from the mill air tank explosion communicated to the southwest quadrant of the paper warehouse, igniting rolls of stored paper on fire. The explanation for why compressor #3 didn't shut down due to overheating is unknown, but possible scenarios are failure of a thermal protection device and/or devices at the compressor and/or in-house maintenance issues. In my opinion, severe reduction of the water flow to compressors for cooling the morning of the incident is a contributing factor to compressor #3 overheating, which resulted in a fire and explosion occurring at the mill air receiver tank.

Evidence

I collected no evidence from the scene.

Photographs & Diagrams

A photo log and a scene sketch are attached to this report.

Interviews & Investigation Activity

I interviewed Verso Pulp & Utilities Manager **ROBERT BRIDGES**, who told me the following:

- Approximately 100 employees were working the day shift that day.
- He wasn't at the plant today; he was up north fishing when he received word about the fire.
- On the weekends, there is a two-man maintenance crew per shift.
- Four or five compressors are in the compressor room; only two or three run at a time.
- The compressors are 200-horsepower Gardner Denver, installed in the 1980s. The compressors operate at about 80 PSI.
- There is an oil cooler for each compressor; the compressors are cooled by water.
- There was a leak in a water line at the mill the morning before the fire. The plant shut the mill water off and switched to well water to cool the compressors.
- He's not aware of any problems and/or recent service work to the compressors.
- Most of the maintenance work is done in-house.

I interviewed Verso Utilities Area Manager **MARK WICHMAN**, who told me the following:

- He has been with the mill for 30 years. He is in charge of the operation of air compressors, chillers, steam systems, power generation and waste treatment.
- The plant is open 24 hours a day, 7 days a week. Employees work 12-hour shifts, 6:00 am to 6:00 pm and 6:00 pm to 6:00 am.
- He got to work at 6:30 AM and there were approximately 8 employees in his area.
- Paper machine #3 coordinator Mike Gunderson called him at about 7:00 AM about a mill water leak in the basement of the plant. A 3" water line off the water main below paper machine #3 was leaking.
- Air compressors in the compressor room are cooled by either mill water or well water.
- At about 8:15 AM, the mill water valve to the compressor room was closed and the well water valve to the compressor room was opened. Well water is on most of the time.
- Mill water is treated water from the river. The plant flows approximately 7,000 gallons of mill water per minute.
- He had a meeting about 8:30 AM to discuss a plan to repair the water leak. They also turned on city water to cool equipment in the south power plant.
- The water leak in the basement completely failed and came apart.

- At about 9:50 AM, #3 paper machine was shut down.
- At about 10:00 AM, he heard over the radios that two of the air compressors had tripped out due to overheating. When #3 paper machine was shut down, well water to the air compressors got shut-off.
- At about 9:50 10:00 AM, Randy Roeder went to the compressor room and tried to re-start the compressors, but the compressors wouldn't start, overheated.
- Once well water started re-flowing again to cool oil in the air compressors, the compressors were re-started. He made sure the well water was running fine.
- They waited for the pulp mill to shut-down before shutting the mill water main off in the raw water pump house.
- At about 10:30 to 10:40 AM, the pulp mill was shut-down. He radioed to shut the mill water off.
- Pipe fitters made the repair to the leaking water line.
- At about 11:00 AM, they started re-opening the mill water main valve slowly.
- He heard about the fire brigade call to the roll wrap room.
- On his way to the roll wrap room, he heard a thump and percussion noise.
- He came outside and saw smoke coming from the roof of the building.
- The compressors used to be air cooled and switched to water cooled about 2 years ago.
- When the compressors were air cooled, they would trip out due to oil overheating.
- He's not aware of any recent service work to the compressors; most of the maintenance is done in-house.
- The compressors used to have oil leak problems.
- The compressors were installed in the 1980s and are 400-horsepower. The oil temperature is approximately 180 degrees.
- There are 100 gallons of oil per compressor, and the oil is cooled through a heat exchanger. The operating air pressure is about 100 PSI.
- Three of the five air compressors were running at the time of the incident; two of the three chilled water pumps were running; and one of the glycol pumps in the compressor room was running at the time of the incident.

I interviewed Verso Water Treatment Operator **RANDY ROEDER**, who told me the following:

- He arrived at work at 6:00 AM and did his boiler water tests.
- At 7:00 AM, he went into the compressor room to check the compressors. Compressors #3, #4, and #5 were running fine.
- At about 10:30 AM, he got a call from the south power plant for a low air pressure problem.
- He and employee Gene Yasgar went back to the compressor room to check out the problem.
- Compressors #4 and 5 were in default, shut down because of high oil temperature. Compressor #3 was the only compressor running.
- He went up to compressor #2. Compressor #2 is set on auto and was supposed to be running, but wasn't. He turned the on-off switch for compressor #2 to off and then back to auto; the compressor started running.
- He also started compressor #1 up.

- Compressor #1 has vibration issues and is only supposed to be used in an emergency. Compressor #1 was vibrating and the vibration alarm for compressor #1 went off.
- The compressor room was fine when they left.
- He's not aware of any recent service work or problems with the compressors, other than the vibration issue with compressor #1, which is directly alongside the two vertical air storage tanks.
- He got a call from the power plant about an instrument air issue above the compressor room where air dryer equipment is located. He went up to the air dryer room.
- He then got a call about low water for the scrubber pump in the South Power Plant. He and Gene left the compressor room and went to the South Power Plant.
- He then heard about the fire alarm call.

I interviewed Verso Car Loader **DAVE POPP**, who told me the following:

- He started work at 5:45 AM Monday morning.
- He loaded rolls of paper into the warehouse until about 10:40 AM. Then he went to the car loaders office at the south end of the paper warehouse to take a safety course.
- He heard the page for the fire brigade and could see a smoke haze in the warehouse.
- He walked north in the warehouse to the area of the northeast roll wrap overhead garage door. The smoke level in the roll wrap room was about 5' above his head.
- He walked up to the garage door opening of the roll wrap room and the compressor room sliding door was open.
- He saw flames at floor level at the first compressor in the compressor room, south end.
- It looked like you could put the fire out with an extinguisher. The flames were about 2' to 3' high.
- He could see an orange glow coming from the compressor room.
- He saw Dennis and Jon across the roll wrap room near the compressor room sliding door.
- Jon was standing in front of the sliding door holding and pointing a fire extinguisher inside the compressor room.
- Then he saw the flames get brighter.
- He saw Dennis and Jon turn around and start walking away from the compressor room.
- Dennis was about in the middle of the roll wrap room when the explosion occurred.
- The explosion blew him back, injuring his shoulder.
- The roll wrap room got black with smoke.
- Fire Brigade employee John Wollak helped him up.
- He could hear water running from the sprinkler system.
- He and Fire Brigade person Dale Dires could see flames in a southwest corner of the warehouse adjacent to the compressor room.

I interviewed Verso employee/Fire Brigade member **JOHN WOLLAK**, who told me the following:

- At about 11:00 AM, prior to the Fire Brigade page, he was in the core room when he noticed a haze in the room. He walked out in the warehouse and saw a haze in the warehouse.

- Then he heard the page out for the Fire Brigade to respond to the roll wrap room.
- He saw Dave Popp when he was in the warehouse east of the northeast roll wrap overhead garage door.
- Then the explosion occurred.

I interviewed Verso Boiler Operator of the North Plant **JOSEPH DAVID**, who told me the following:

- At about 4:30 AM on Monday morning, before the fire, they were bringing a boiler on line at the north power plant.
- There was a problem with a pressure relief steam valve. The safety valve kept popping, which made a booming noise.
- He took care of the problem and it went away.
- At about 5:45 AM, he got a call from security about the banging noises and told them everything was fine.

I interviewed injured Verso employee **DENNIS SCHNEIDER**, who told me the following:

- He has worked at the mill for 21 years. He's a trucker/operator in the roll wrap room.
- He started working in the roll warp room this past February.
- He arrived at work at 5:40 AM the morning of the explosion.
- He was working with Jon Maus in the roll wrap room.
- Approximately an hour prior to the fire, he and Jon went into the break room. There were no more rolls of paper to wrap. He and Jon were in the break room for an hour.
- Sometime prior to the fire, he saw employee Randy Roeder walk into the compressor room and then walk back out.
- Approximately five minutes prior to the explosion, he heard a loud hissing noise coming from the compressor room. He's never heard that noise before. The noise lasted about three seconds and then quit.
- He and Jon came out of the lunch room and walked up to the compressor room sliding doors. He could see a haze of smoke in the compressor room.
- He (Dennis) went to the phone and called the Fire Brigade and came back to the sliding doors. Jon had retrieved a fire extinguisher. He doesn't know where Jon got the extinguisher from.
- They were both standing at the compressor room sliding door looking into the compressor room.
- He saw a puff of smoke come off the top of the middle air compressor, #3. Then he saw a 3' to 6' tall orange flame shoot out the top of the #3 compressor.
- He turned around and started running away.
- He doesn't know if Jon sprayed the fire extinguisher or not.
- Then the place blew up and he was thrown to the ground. He didn't know what happened to Jon.
- He saw the exit light in the roll wrap room and got out.
- He never heard any type of fire alarms prior to the explosion.
- He has no knowledge about the equipment in the compressor room.

I interviewed Verso employee Lead Hourly Tech **EUGENE YASGAR**, who told me the following:

- He's worked at the paper mill for 30 years. He makes rounds at the mill checking equipment, pumps, air compressors and writes up work orders if equipment needs repairs.
- The day of the explosion, he was called into work at 8:00 AM to take care of a mill water leak under paper machine #3. They had to shut down the mill water to the plant. The well water was turned on.
- The #3 paper machine was shut down. TMP was shut down and the turbine for the power plant was shut down. City water was also turned on.
- He shut down all mill water at the raw water pump house in order to repair the leaking 3" mill water line under paper machine #3.
- He walked over to #3 paper machine and heard over his radio about the compressors getting warm and alarms going off.
- The Power Plant Operator that day was Randy Cordie.
- He walked over to the compressor room and met Randy Roeder as he was walking out.
- He went into the compressor room and checked the water bleed off on #5 compressor. Water was flowing to the compressor.
- He doesn't remember if compressor #5 was running or not. He doesn't remember what compressors were running.
- He walked down the line of compressors and noted compressor temperatures were less than 200 degrees. Everything seemed fine in the compressor room.
- There was no smoke odor and he didn't see any smoke.
- He walked through the compressor room twice that day; he doesn't remember what time it was.
- He left the compressor room and went to the south power plant.
- After the 3" water line beneath #3 paper machine was repaired, he went back to the raw water pump house and started opening the mill water valve slowly.
- When he had the mill water valve about halfway open, he heard the explosion.
- Air tank receivers have automatic blow down valves to displace water and oil. Each shift, the shut-off valves at the bottom of each air tank receiver are opened and closed to check for water and oil.
- He's not aware of any problems with the compressors, other than #1 air compressor was switched out about 6 months ago because of a housing oil leak.
- PM Specialists monitor and fill compressors with oil.

I interviewed Verso employee Pipefitter **GLEN SCHELLINGER**, who told me the following:

- He has worked at the mill for 33 years.
- He started work at 7:00 AM the day of the incident. They were getting ready to shut down the power plant to repair a water leak beneath paper machine #3.
- They had a meeting at 8:30 AM to discuss how to repair the water leak. They needed to shut down the mill water to the entire plant, with the exception of the south power plant.
- The mill water in the pump house was shut off at about 10:40-10:45 AM. At about 10:50 AM, they started repairing the water leak and replaced a 3" water valve and two pipe clamps. The repair took about 11 minutes.

- The mill water valve in the pump house was opened up slowly.
- He heard the Fire Brigade get paged to the roll wrap room. Then he heard the explosion.
- He used to work in the compressor room until this past December when #1 and #2 paper machines were shut-down. He used to replace dresser couplings in the compressor room and used to change out oil separator filters in the compressors.
- He was a pipefitter. He never worked on wiring and/or controls on the compressors.
- He also checked relief valves on the receiver tanks receiver.
- The power plant and production people maintain the compressors.
- When compressors were air cooled, they would trip out often in the summer due to high temperatures.

I interviewed Verso employee Tour Millwright **JOHN HAUS**, who told me the following:

- He has worked at the mill since 1978 and takes care of maintenance issues in the mechanical area of the plant.
- He started work at 6:00 AM on the day of the incident. There was a water leak beneath paper machine #3.
- At about 8:30 AM, Mark Wichman had the compressors switched from mill water cooling to well water cooling.
- At about 10:30 AM, the mill water to the plant was shut down to repair a water leak below paper machine #3. He assisted with repairing the water leak and it took about 11 minutes.
- He heard the Fire Brigade call to the roll wrap room and then he heard the explosion.
- He does maintenance work on the compressors, changes oil separator filters and air intake filters.
- The last time he was in the compressor room was about two weeks ago. He changed air intake filters on one of the compressors, thinks it was #3 or #2.
- When he was in the compressor room, he noticed a green lock-out tag on he thinks it was #4 compressor, but he's not sure.
- The lock-out tag said, "Do not operate, runs hot, use only in an emergency, has high vibration."
- Tour Millwrights and E&I Techs use a computer program to go online to Verso's web site called Sar-Net to document maintenance issues at the plant.
- His brother Pete Haus is an oiler for the power plant and compressor room.

I interviewed Verso employee Environmental Health & Safety Coordinator **BOB HEINS**, who told me the following:

- He has worked at the mill for 40 years. He took the Health & Safety job this past December. He used to be an electrician at the plant.
- He got to work at 7:00 AM on the day of the incident. There was a leaking water issue at the plant.
- He was in his office doing his monthly audit.
- He's on the Fire Brigade at the mill.
- He heard the call for the Fire Brigade to the roll wrap room. Parts of the plant were dark, no lights.
- He responded to the roll wrap room for search and rescue.

- They discovered Jon Maus's body at the southern end of the roll wrap room; he had no pulse.
- He inspects the compressor room for housekeeping.
- There used to be oil pads on the floor, but there were no housekeeping issues with the compressor room since he took over.

I interviewed Verso employee Core Room Operator **MARVIN KOSHIOL**, who told me the following:

- He has worked at the mill for 30 years. He cuts cores for rolls of paper.
- He was at work at 5:30 AM and was cutting 6" cores in the core room until about 11:00 AM.
- John Wollak walked in the core room and asked him why it was so smoky in there. You could see a blue haze around the ceiling lights in the core room. There was also a different kind of odor in the air.
- He and John walked out into the warehouse and saw a train engine outside.
- They thought the smoke was from the train engine and went back to the core room.
- He heard the call for the Fire Brigade to the roll wrap room.
- He went into the east side of the roll wrap room and saw Jon Maus and Dennis Schneider standing near the break room. Then the explosion happened. It threw him to the ground.
- He hasn't been in the compressor room for years;

I interviewed Verso employee Pipefitter **PAUL PLAFCAN**, who told me the following:

- He has worked at the mill as a pipefitter for 40 years.
- He got to work at 7:00 AM and assisted with the repair of the leaking water line below paper machine #3. They changed out a shut-off valve and two clamp fittings.
- The water line came completely apart prior to the repair of the leak. The water line is about 90 PSI.
- The repair took 11 minutes and 30 seconds.
- After the repair, the mill water in the pumphouse was turned back on.
- He heard the call for the Fire Brigade to the roll wrap room and started walking toward the roll wrap room when he heard the explosion.
- The lights were out by the roll wrap room.
- He put his firefighter gear on and then he and Fire Brigade member Scott Beierman went into the roll wrap room to rescue missing employees.
- He looked in the employee break room and could see flames at the north end of the compressor room.
- They searched the roll wrap room and left the area.
- It wasn't real smoky in the roll wrap room; they could see with a flashlight.
- The last time he was in the compressor room was about 10 years ago. When he did work in the compressor room, he did pipefitting work.

I interviewed Verso employee E&I Tech **DALE DIRKS**, who told me the following:

- He has worked at the mill for 33 years.

- He got to work at 7:00 AM and there was a water leak below paper machine #3. The water was leaking on an electric motor.
- He grabbed a sheet of plywood and diverted the water away from the electric motor.
- The water line was repaired and he went to the E&I lunch room.
- He heard the call for the Fire Brigade to the roll wrap room. Then he heard the explosion.
- He headed toward the roll wrap room and ran into Dave Popp and John Haus in the paper warehouse.
- He saw an orange glow coming from the southwest corner of the paper warehouse.
- There was some water flowing from sprinkler heads in the warehouse.
- He's been called to the compressor room in the past to shut down compressors for repairs.

I interviewed Verso employee Millwright Mechanical Maintenance **BYRON BIRR**, who told me the following:

- He has worked at the mill for 32 years. He repairs mechanical equipment at the mill.
- He got to work at 7:00 AM and there was a water leak beneath paper machine #3.
- He assisted with the water leak repairs.
- The power plant was shut down.
- He heard a call for the Fire Brigade to the roll wrap room.
- He saw black smoke coming from the south end of the plant.

I interviewed Verso employee Millwright Mechanical Maintenance **DUANE ALBRECHT**, who told me that:

- He has worked at the mill for 40 years and repairs equipment and plans repairs of equipment.
- The last time he was in the compressor room was this past April to change out oil separator filters in one of the compressors.
- There used to be oil consumption issues with the compressors.
- The oil separators used to have two basket filters. About a year ago, they switched to one basket because it was cheaper.
- They also installed plugs in the oil separator head about a year ago to reduce oil consumption.
- They switched from Aeon Compressor Oil 2000 to Aeon Compressor Oil 4000 because it cools the compressor oil better.

I interviewed Verso employee Maintenance Oiler **PETE HAUS**, who told me the following:

- He has worked at the mill for 24 years. He greases and oils equipment at the mill.
- The last time he was in the compressor room was the Friday before the explosion, May 25.
- He checked the oil level in the compressors and the oil level was good.
- He changed out two oil pads lying on the floor between compressors #3 and #4.
- Compressors #3, #4, and #5 were running when he checked the oil in the compressors.
- He checks the compressors every day.
- About a year ago, the compressors were switched from Aeon 2000 oil to Aeon 4000 oil.

- The #1 compressor still uses Aeon 2000.
- He's never known the compressors to shut off due to high temperatures.
- He's never worked on either of the receiver tanks.

I interviewed Verso employee Assistant Maintenance Supervisor **JERRY SCHUBERT**, who told me that:

- He just started as Assistant Maintenance Supervisor this past January. Prior to that he was an E&I Technician.
- He has worked at the mill since November of 1981. He is in charge of scheduling maintenance and scheduling outages.
- Inlet valves on the compressors were rebuilt by Air Concepts within the last year.
- He schedules routine oil changes on the compressors.
- Compressor #4 used to have oil consumption issues. Since the rebuilding of the inlet valves and installing a plug in the separator head, oil consumption went away.
- Compressor #1 has a vibration issue.
- Prior to the compressors being switched over from air cooled to oil cooled, they would trip out often on high temperature.
- Since the mill shut down two of its three paper machines in December of 2011, they only need three air compressors running to operate the plant.
- He's not aware of any thermal couple failures at any of the compressors.

I interviewed Verso employee Utilities Manager **MARK WICHMAN**, who told me the following:

- He has been at the mill for 30 years.
- On the day of the incident, he was made aware of a mill water leak beneath paper machine #3 that required shutting off the plant's mill water supply.
- At about 8:00 AM, he instructed Verso employees Ron Determan and Randy Roeder to switch the compressor cooling water from mill water to well water.
- Determan and Roeder went to the corridor alongside the west wall of the compressor room and closed the mill water shut-off valve and opened the well water shut-off valve for cooling compressors.
- He later physically walked over to the corridor and visually confirmed the mill water valve was off and the well water valve was open.
- Well water is on most of the time at the plant.
- Well water is capable of pumping 450 gallons of water a minute.

I interviewed Verso employee E&I Technician **JOHN KNESE**, who told me the following:

- He has worked at the mill for 25 years. He performs preventative maintenance and trouble shooting on electrical equipment and instrumentation equipment at the mill.
- The last time he was in the compressor room was two years ago to support AI's Electric during the Department of Energy switch over of air compressors from air cooled to water cooled.

- He has never replaced any thermal couples on the compressors. He has replaced oil pressure relays on air compressors in the past.

I interviewed Verso employee E&I Technician **JERRY BLOCH**, who told me the following:

- He has been at the mill for 36 years. He repairs electrical and instrumentation equipment at the mill.
- The last time he was in the compressor room was this past fall to replace a red line meter for air temperature on compressor #4. The digital temperature display went out.
- He's not aware of any problems with the compressors.

I interviewed Verso employee South Power Plant Operator **RAY CORDIE**, who told me the following:

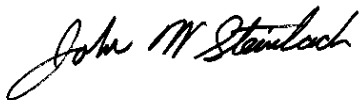
- He has been head power plant operator for 2 years. He was the assistant power plant operator for 7 years. He has been at the mill for 30 years total.
- He works in the control room at the south power plant.
- He got to work at 6:00 AM the day of the incident.
- He monitors mill operations, primarily pertaining to steam and hydro, from computer screens in the control room. He can also monitor compressor room operations at a computer screen.
- The screen for compressors has audible alarms for low air pressure and low oil pressure. The screen shows if an air compressor has stopped. There's no alarm for high oil temperatures for compressors.
- At about 10:10 AM, he had a low air pressure alarm go off. Compressor #5 had kicked out.
- He called Randy Roeder to check out the problem.
- When Randy got to the compressor room, #4 compressor was also kicked out. The compressors shut off due to high temperatures.
- He told Randy to start compressors #2 and #1. Compressor #1 has vibration issues.
- Mark Wichman called him and asked if the well water was on; the well water was shut-off and he turned the well water back on.
- He called #3 paper machine operator and told him not to shut the well water off.
- Gene Yasgar had also gone to the compressor room to make sure cooling water was flowing to the air compressors.
- At about 11:00 AM, he went up to the third floor of the south power plant and turned on an air compressor for additional air.
- He went back to the control room.
- Low water alarms were going off at scrubbers in the south power plant.
- Byron Cigkelski is the operator of the north power plant. Byron monitors raw water at the mill and air compressors. Byron didn't see any issues with the compressors.
- He (Ray) was away from the control room from about 10:16 AM to 10:26 AM. When he came back to the control room, he was working on getting recycling water pumps back on line.
- There were a lot of alarms going off that day.
- The north power plant controls all the water usage.
- Air pressure started coming back up.

- He was watching ash build-up in the stack.
- They had major water issues that day. He never experienced that many water issues in the past.
- There were no alarms going off just prior to the explosion, as he recalls.
- He doesn't normally monitor oil temperatures for the air compressors.
- In the past, it was common for the compressors to trip out on high temperature during the summer.

Conclusion

Based on my experience and training and the scene examination, it is my opinion this paper mill fire and explosion involving an employee fatality originated at compressor #3 in the mill's air compressor room. Compressor #3 overheated, igniting combustible oil vapors within the compressor on fire. The internal compressor fire communicated to the mill air receiver tank through compressed air piping, and explosive oil vapors in the receiver tank were ignited, causing an explosion and catastrophic rupture of the receiver tank. The resulting receiver tank explosion and fire caused concrete walls to be blown out, igniting rolls of stored paper in the southwest quadrant of the paper warehouse on fire. Review of computer-monitored data for the air compressors prior to the incident revealed a severe reduction in cooling water supply to operating compressors. Approximately an hour prior to the incident, compressors #4 and #5 shut-off due to overheating. Compressor #3 continued to operate, exceeding the compressor's thermal protection shut down controls and/or devices, possibly caused by a mechanical failure and/or maintenance issue. This case shall be closed.

Respectfully submitted,



John W. Steinbach CFI
Deputy State Fire Marshal – Investigator

Date Submitted: 7/12/2012

Attachments

1. Photo Log
2. Consent Form
3. Sketch
4. Sketch prepared by Onsite Engineering
5. Confidentiality Agreement
6. Midwest Medical Examiner's Office Preliminary and Final Summaries for Jon Maus (Confidential)
7. Sartell Police Department CAD report
8. Sartell Police Department incident report
9. Sartell Police Department statement from David Popp
10. Whitemore Fire Consultants interviews
11. Site Examination/Sign-In Sheets (10)

PHOTO LOG
CASE FILE #2012-171

1. South power plant looking west in direction;
2. Verso business office building;
3. East side of paper warehouse looking north in direction;
4. South employee entrance to plant;
5. Sign displayed at south employee entrance;
6. Corridor looking west in direction from south employee entrance;
7. West corridor;
8. Corridor doors at south end of plant;
9. Corridor outside roll wrap room;
10. West entrance to roll wrap room;
11. Roll warp room looking east in direction;
12. Roll wrap room looking northeast;
13. South wall of roll wrap room;
14. Victim Jon Maus's body as discovered at south end of roll wrap room;
15. Victim Jon Maus;
16. Roll wrap room looking north toward employee break room and compressor room;
17. Victim;
18. Victim;
19. Roll wrap room looking north toward employee break room and compressor room;
20. Remains of employee break room looking into compressor room;
21. Victim;
22. Victim;
23. Victim;
24. Victim;
25. Victim;
26. Victim;
27. Area beneath victim's body;
28. Location of victim's body in roll wrap room;
29. East side of paper warehouse at north end of plant;
30. East side of paper warehouse looking south;
31. East side of paper warehouse, exterior sheeting removed;
32. South power plant;
33. East side of paper warehouse;
34. Southeast corner of paper warehouse and loading dock area;
35. South side of plant, employee entrance;
36. Electrical transformers;
37. South side of plant;
38. South side of plant, sprinkler shut-off valve and well water well;
39. Roof above southeast end of plant;
40. Roof;
41. Roof;
42. Roof;
43. Roof;
44. Employee break room in roll wrap room;
45. Offices in mezzanine above roll wrap room and compressor room;
46. Offices above roll wrap room and compressor room;
47. Looking north in roll warp room into compressor room;
48. Collapsed piping and debris at south end of compressor room;
49. Compressor room;
50. Compressor room looking north;
51. Collapsed east concrete block wall of compressor room;
52. North end of compressor room, ruptured mill air receiver tank, instrument air receiver tank in foreground;
53. Ruptured receiver tank;

54. Compressor ceiling, north end;
55. Ruptured receiver tank;
56. Ruptured receiver tank;
57. West wall of compressor room where receiver tanks were located;
58. Instrument air receiver tank lying on its side, originally vertical located on right side of photo and/or northeast corner of compressor room;
59. Southwest corner of paper warehouse, adjacent to compressor room;
60. Looking east into paper warehouse from compressor room;
61. Paper warehouse, charred rolls of paper;
62. Paper warehouse looking north along west wall of warehouse;
63. Ruptured receiver tank;
64. Instrument air receiver tank, north end of compressor room;
65. Paper warehouse;
66. North end of compressor room;
67. North end of compressor room;
68. Paper warehouse looking north in direction;
69. Southwest end of paper warehouse;
70. Rolls of paper in paper warehouse;
71. Corridor alongside blown out west wall of compressor room;
72. Corridor alongside compressor room;
73. Paper warehouse from the south looking north;
74. Paper warehouse;
75. Paper warehouse;
76. Paper warehouse;
77. Paper warehouse;
78. Paper warehouse looking west toward compressor room;
79. Corridor west of roll wrap room and compressor room;
80. North end of roll wrap room and employee break room;
81. Compressor #5, south end of compressor room;
82. Compressor #4;
83. Looking north in compressor room;
84. East wall of compressor room;
85. Sprinkler system water lines;
86. Corridor west of compressor room, west concrete block wall of compressor room blown out;
87. Corridor alongside compressor room;
88. Stairway in corridor to second floor of plant;
89. From stairway looking into north end of compressor room;
90. Ruptured receiver tank in compressor room;
91. North end of compressor room;
92. North end of compressor room;
93. North end of compressor room;
94. North end of compressor room;
95. North end of compressor room, instrument air receiver tank;
96. South side of plant from bridge;
97. Southeast corner of plant from bridge;
98. Southeast corner of paper warehouse;
99. Demolition of east wall of paper warehouse;
100. East wall of paper warehouse;
101. East wall of paper warehouse;
102. East wall of paper warehouse;
103. Demolition of east wall of paper warehouse;
104. Demolition of east wall of paper warehouse;
105. Collapsed roof above west side of paper warehouse;
106. Collapsed roof above west side of paper warehouse;
107. Demolition section of paper warehouse;
108. Aerial photo looking south toward south power plant;
109. Aerial photo of paper warehouse roof looking north in direction;

110. Paper machine #3, second floor of plant;
111. Standing in paper warehouse looking west into north end of compressor room;
112. Mezzanine above compressor room;
113. Southwest corner of paper warehouse;
114. Southwest corner of paper warehouse, shattered pieces of concrete blocks scattered about warehouse;
115. North end of compressor room;
116. North end of compressor room;
117. North end of compressor room;
118. North end of compressor room;
119. Ruptured mill air receiver tank;
120. Air pressure gauge among debris in compressor room;
121. North end of compressor room, looking west;
122. Ruptured receiver tank;
123. North end of compressor room;
124. North end of compressor room;
125. Air dryer equipment in mezzanine above compressor room;
126. Mezzanine above compressor room;
127. Mezzanine above compressor room;
128. Mezzanine above compressor room;
129. Mezzanine above compressor room;
130. Mezzanine above compressor room;
131. Shoring operations of compressor room;
132. Corridor alongside compressor room;
133. North end of compressor room;
134. Ruptured receiver tank setting atop compressor #1;
135. Shoring operations of north end of compressor room;
136. Shoring operations north end of compressor room;
137. Shoring operations, north end of compressor room;
138. North end of compressor room;
139. North end of compressor room;
140. North end of compressor room;
141. West wall of paper warehouse;
142. North end of compressor room looking south;
143. Mezzanine above compressor room;
144. Shoring operations of north end of compressor room;
145. North end of compressor room;
146. North end of compressor room, ruptured receiver tank setting atop compressor #1;
147. Pile of copper wiring;
148. Paper warehouse;
149. Paper warehouse;
150. Paper warehouse;
151. Paper warehouse, shoring operations of north end of compressor room;
152. North end of compressor room;
153. North end of compressor room looking south;
154. Paper warehouse;
155. Paper warehouse;
156. Rolls of charred paper in paper warehouse;
157. Paper warehouse looking north;
158. Shoring operations north end of compressor room;
159. Paper warehouse, west wall;
160. Shoring operations north end of compressor room;
161. Shoring operations north end of compressor room;
162. Instrument air receiver tank;
163. Instrument air receiver tank;
164. Mezzanine above compressor room;
165. North end of compressor room;
166. North end of compressor room;
167. Compressors along west wall of compressor room;
168. Compressors along west wall of compressor room;

169. Compressors along west wall of compressor room;
170. Ruptured receiver tank setting atop compressor #1;
171. Ruptured mill air receiver tank moved to warehouse;
172. Ruptured receiver tank;
173. Ruptured receiver tank;
174. Ruptured receiver tank;
175. Base of ruptured receiver tank;
176. Top of ruptured receiver tank;
177. Southwest corner of paper warehouse, temporary wall constructed along east wall of compressor room;
178. North end of compressor room, ruptured receiver tank removed;
179. Ceiling area above compressors;
180. Compressor #1;
181. Compressor #1;
182. Instrument air receiver tank;
183. Compressor #2;
184. Compressor #3;
185. Compressor #3;
186. Compressor #3;
187. Compressor #3;
188. Compressor #3;
189. Compressor #4;
190. Compressor #4;
191. Compressor #5;
192. Compressor #5;
193. Compressor #5;
194. Backside of compressor #5;
195. Thermal damage to oil tank and oil separator for compressor #3;
196. Thermal damage to compressor #3;
197. Thermal damage to compressor #3;
198. Thermal damage to compressor #3;
199. Thermal damage to compressor #3;
200. Thermal damage to compressor #3, intake air unit;
201. Intake air unit for compressor #5;
202. Interior of ruptured receiver tank;
203. Interior of ruptured receiver tank coated with oil and black soot;
204. Shored up north end of compressor room;
205. Compressor #1;
206. Compressor #1;
207. Compressor room looking south;
208. Compressor #3;
209. Compressor #3, top of heat exchanger for cooling compressor oil;
210. Compressor #3 relief valve;
211. Close-up of compressor #3, plumbers wire used to secured relief valve's pressure handle to body of relief valve;
212. Same as photo #211;
213. Compressor #4 relief valve;
214. Compressor #4 relief valve;
215. Compressor #5 relief valve;
216. Close-up of photo #215;
217. Close-up of photo #215;
218. Compressor oil;
219. Compressor oil;
220. Front of compressor #3;
221. Compressor #3 relief valve, relief valve handle secured with plumbers wire;
222. Compressor #2;
223. Compressor #2 relief valve;
224. Close-up of photo #223;
225. Compressor #1;
226. Compressor #1 relief valve artifacts;
227. Relief valve compressor #1;
228. Relief valve compressor #1;
229. PLC panel for compressors discovered among debris in compressor room;
230. Instrumentation receiver tank;
231. Computer #1;

- 232. Elevated concrete base of compressor #1;
- 233. Instrumentation receiver tank;
- 234. Compressor room;
- 235. Compressor #3;
- 236. Artifacts retrieved in compressor room during debris removal;
- 237. Ruptured receiver tank;
- 238. Ruptured receiver tank;
- 239. Pool of oil inside ruptured receiver tank;
- 240. Close-up of photo #239;
- 241. Edge of ruptured receiver tank;
- 242. Severed piece of metal from ruptured receiver tank;
- 243. Compressor room after debris removal;
- 244. Compressor #5, south end of compressor room;
- 245. Compressor room after debris removal;
- 246. Compressor room;
- 247. Compressor #3;
- 248. Compressor room;
- 249. Compressor #3;
- 250. Air intake for compressor #3;
- 251. Precast concrete wall setting atop chiller pipes along west wall of compressor room;
- 252. West wall of compressor room above compressors;
- 253. Interior compartment of compressor #3;
- 254. Interior compartment of compressor #3;
- 255. Interior compartment of compressor #3, discolored oil separator due to overheating;
- 256. Interior compartment of compressor #3, melted pressure gauge;
- 257. Interior compartment of compressor #3;
- 258. Interior compartment of compressor #3;
- 259. Compressor #1;
- 260. Compressor room looking south;
- 261. Compressor #2;
- 262. Interior compartment of compressor #5;
- 263. Interior compartment of compressor #5;
- 264. Interior compartment of compressor #5;
- 265. Interior compartment of compressor #5;
- 266. Interior compartment of compressor #5;
- 267. Interior compartment of compressor #5;
- 268. Compressor #5;
- 269. Deleted photo;
- 270. Deleted photo;
- 271. Deleted photo;
- 272. Deleted photo;
- 273. Deleted photo;
- 274. Artifacts including compressed mill air piping removed from compressor room during debris removal;
- 275. Soot and oil deposits inside of mill air piping;
- 276. Same as photo #270, different view;
- 277. Oil heat exchanger for compressor #1;
- 278. Close-up of oil heat exchanger, copper cooling lines inside of exchanger;
- 279. Compressor #1;
- 280. Area behind compressor #1, west wall of compressor room;
- 281. West wall of compressor room looking up;
- 282. Compressor #1;
- 283. Compressor #2;
- 284. Compressor #3;
- 285. Compressor #3;
- 286. Area above compressor #3;
- 287. Compressor #3;
- 288. Temperature sensor atop oil heat exchanger for compressor oil;
- 289. South end of compressor room;
- 290. Compressor room;
- 291. Compressor #4;
- 292. Instrumentation receiver tank, north end of compressor room;
- 293. Compressor #3;
- 294. Compressor #3;

- 295. Chiller lines behind compressor #3 supporting collapsed precast concrete wall;
- 296. Air intake for compressor #3;
- 297. Compressed air pipe from compressor #3;
- 298. Air temperature sensor at air discharge side of compressor #4;
- 299. Rear of compressor #2;
- 300. Interior compartment of compressor #3;
- 301. Air heat exchanger for compressor #3;
- 302. Compressor #3;
- 303. Shored-up precast concrete wall in corridor along west side of compressor room;
- 304. Corridor outside compressor room;
- 305. Raw water pump house, north end of plant;
- 306. Raw water pump house;
- 307. Raw water pump house;
- 308. Raw water pump house;
- 309. Mill water valve in raw water pump house closed to repair water leak beneath paper machine #3;
- 310. Raw water pump house;
- 311. Raw water pump house;
- 312. Corridor beneath paper machine #3 where leaking mill water shut-off valve was replaced;
- 313. Corridor beneath paper machine #3 where leaking mill water shut-off valve was replaced;
- 314. Same as photo #313;
- 315. Same as photo #313, different view;
- 316. Corridor outside compressor room, mill water shut-off valve to compressor room for compressor oil and air cooling water;
- 317. Close-up of mill water shut-off valve to compressor room in the closed position;
- 318. Well water shut-off valve to compressor room for compressor cooling water in the open position;
- 319. Same as photo #318;
- 320. South side of plant, well water well;
- 321. South power plant control room;
- 322. South power plant control room.