

Wyo

# FATALITY NARRATIVE

**Christopher W. Michael**  
**Anschutz Wahsatch Gathering Systems, Inc.**  
**Casefile 303666291/B7378**

## **Date & Time of the Accident:**

August 10, 2001 at approximately 8:00 p.m.

## **Notification:**

On August 10, 2001 at approximately 11:07 p.m., Tom McCormick (Safety & Regulatory Compliance Manager for Anschutz Wahsatch Gathering Systems Inc.) [Anschutz], Evanston, WY notified Wyoming Workers' Safety Compliance Supervisor, Johnnie Hall that a fatality had occurred. The accident occurred at approximately 8:00 p.m. on August 10, 2001 about 18 miles north of Evanston, WY at the Anschutz delivery facility. Steve Foster, Assistant Administrator, assigned compliance officers [CSHOs] Daniel S. Bulkeley and Kenneth D. Lantta to investigate the fatality.

## **The Investigation:**

On August 13, 2001, the CSHOs drove to Evanston, WY and first met with representatives from the Uinta County Sheriff and Coroner's Offices to obtain copies of investigation information and accident scene photographs.

At 4:15 p.m., the CSHOs met with the following Anschutz management personnel: Stanley Dolinar (Field Operations Superintendent), Tom McCormick (Safety & Regulatory Compliance Manager), and Bud Metcalf (Vice President of Pipeline Operations). Also present at the meeting were Tom Hoglin (Hoglin Engineering) and David Etheridge (Etheridge Engineering). These two engineering consultants had been hired by Anschutz to assist with the company's internal root cause analysis investigation. This meeting was held at the Anschutz administrative office and control room complex in Evanston, WY.

The CSHOs conducted an opening conference with the Anschutz managers. The Anschutz managers and consulting engineers described what they believed happened based on the conversations they already had with their employees, with the Deputy Sheriff, and with the subcontractor personnel who

conversations they already had with their employees, with the Deputy Sheriff, and with the subcontractor personnel who were present at the time of the mishap. With this initial information, the CSHOs requested copies of Anschutz written safety programs, training records, technical data concerning the scheduled maintenance on the vessel, communications logs from the site to the control center, and copies of the written witness statements gathered by Anschutz. The CSHOs also requested assistance in scheduling interviews with all employees involved in accident (both company and subcontractor). Tentative plans were made to conduct all interviews the next day and to do a site visit late the next day.

On the morning of August 14, 2001, the CSHOs met with Anschutz managers and went over the documentation provided the previous day. The CSHOs also requested additional written data. Late in the morning, the CSHOs interviewed Mr. Dale Pullen at the Evanston Regional Hospital.

The interviews with the remaining Anschutz and subcontractor personnel were conducted during the afternoon. That evening, the CSHOs were escorted to the mishap site by Anschutz managers and consultants. The CSHOs performed a walk around and had the managers explain the facility layout. The Anschutz managers also discussed the policies & procedures as they applied to the scheduled maintenance project, and what the managers believed happened.

The morning of August 15, 2001, the CSHOs met with the Anschutz managers to wrap up and conduct the initial closing conference. The CSHOs advised that once back in the office, all information gathered would be reviewed. At that time a determination would be made if any Notices of Hazard would be issued, and if so, a second closing conference would be done by telephone. The CSHOs did provide Anschutz managers with a brief summary of the OSHA standards that looked to be applicable to the mishap.

All documentary evidence, photographs, videotape, and interview audio recordings related to this investigation are on file at the Wyoming Workers' Safety office in Cheyenne, WY.

**Victim:** Christopher W. Michael

**Address:** 116 Ute Court; Evanston, WY 82930

**Occupation:** Plant Operator

**Employer:** Anschutz Wahsatch Gathering Systems, Inc.

**Accident Location:** 18 miles north of Evanston, WY at the Wahsatch Gathering System Delivery Facility

### **Personnel Present at the Time of the Accident:**

<u>Name</u>	<u>Company</u>	<u>Job Title</u>
Dale A. Pullen	Anschutz Wahsatch Gathering Systems, Inc.	Foreman
Christopher W. Michael	Anschutz Wahsatch Gathering Systems, Inc.	Operator (decedent)
David C. Linn	Mountain States Oil Field Service	Driver
Dwane S. Graham	Double Jack Testing & Services, Inc.	Tester
Casey Hartzell	Double Jack Testing & Services, Inc.	Tester

### **Company Employees Interviewed during the Investigation:**

<u>Name</u>	<u>Company</u>	<u>Job Title</u>
Dale A. Pullen	Anschutz Wahsatch Gathering Systems, Inc.	Foreman
Timothy R. Holland	Anschutz Wahsatch Gathering Systems, Inc.	Operator
Jerry D. Brunow	Anschutz Wahsatch Gathering Systems, Inc.	Operator

### **Contractor Employees Interviewed during the Investigation:**

<u>Name</u>	<u>Company</u>	<u>Job Title</u>
David C. Linn	Mountain States Oil Field Service	Driver
Dwane S. Graham	Double Jack Testing & Services, Inc.	Tester
Casey Hartzell	Double Jack Testing & Services, Inc.	Tester

### **Events leading up to the Accident:**

The scheduled maintenance project on a scrubber vessel at the Anschutz delivery point facility was nearing completion. At approximately 7:45 p.m. on August 10, 2001, all work inside the vessel (#502) had been completed and Mr. Dale Pullen and Mr. Christopher Michael were working on top of the vessel. They were preparing to remove two blank-off plates (blinds) from the flanges on inlet piping at the top of the vessel near the east end. They had just carried their tools to the top of the

vessel and had started loosening/removing bolts from two inlet piping flanges when the accident occurred. At the time of the mishap, two Double Jack Testing & Services, Inc. [Double Jack] employees were working on the vessel at floor level. In addition, a Mountain States Oil Field Service [Mountain States] driver was positioned near his water truck just outside the building waiting for direction to fill vessel #502 with water.

The Anschutz scheduled maintenance project had been ongoing for about one week at the gas gathering delivery system facility. The project involved inspection and refurbishment of one scrubber vessel (#502). During the project, the vessel was isolated from the other systems at the delivery facility. This allowed the natural gas field to remain on line with the gas isolated from and bypassing vessel #502 and continuing down the pipeline.

When the project began, vessel #502 was isolated and then opened for interior inspection and refurbishment. All inlet piping was first depressurized. Then blinds were installed in the piping flanges adjacent to the vessel. The blinds assured that no piping contents could enter the vessel during the project.

Anschutz had written procedures for various steps of the project, including installation and removal of blinds in flanges. Most of these procedures had been drafted and incorporated when the facility was under prior ownership, but had been reviewed and adopted by Anschutz following their acquisition of the facility. Anschutz acquired the facility on September 29, 1999. The change of ownership also carried forward a number of employees who had worked at the facility with previous owners.

The foreman for the scheduled maintenance project was Mr. Dale Pullen. He had approximately six years experience at the facility, having transferred from the prior owners to Anschutz with the acquisition. Anschutz also contracted for services from a number of sub-contractors to assist with the project. Among these were Double Jack who assisted with vessel work involving bolt torquing and related millwright activities and Mountain States who provided roustabout support including water hauling.

Mr. Pullen had participated in drafting many of the written procedures used for the project, including the procedures for installing and removing blinds from pipe flanges. These procedures were written approximately six years earlier when the facility was owned by Union Pacific Resources Company, Inc.

## **The Accident:**

On the day of the mishap, the vessel refurbishment was completed in the afternoon. Mr. Pullen had done some final inspections of the interior and then directed that the vessel be closed. The next step in the process was to reconnect all piping to the vessel, which included blind removal from inlet piping.

Mr. Pullen had given directions to the Double Jack employees to perform tasks near the bottom of the vessel at floor level. As these employees were starting their work, Mr. Christopher Michael

provided them with an H<sub>2</sub>S monitor. This monitor was the one that Mr. Michael had checked out for his use that day.

Mr. Pullen and Mr. Michael then climbed the stairway to the top of the vessel. They climbed over the catwalk at the east end of the vessel and moved to the inlet piping which enters the top of the vessel. Although the top of the vessel is approximately 20 feet above floor level and is rounded, neither Mr. Pullen nor Mr. Michael donned personal fall protection equipment. The inlet piping at this section of the vessel consists of an inlet gas line that enters a "T" which splits the line into two lines. Each of the two lines is then flanged to the top of the vessel. The flanges were blinded during the project to assure the contents of the inlet line could not enter the vessel.

At the start of the project, this inlet piping was drained of contents to bring the pressure to zero and then the blinds were installed in the flanges. Mr. Pullen supervised and participated with this work. The normal operating contents of this line include natural gas from the field (which contains 15% H<sub>2</sub>S) plus water and hydrocarbon condensate that the scrubber vessel removes.

The written procedures for removing blinds provide for first "hot bolting" the flange. This involves loosening every other bolt on the flange. This procedure will retain the blind firmly clamped between the flanges.

During the "hot bolting" work, air supplied respirators are not required per the written procedure and overall company policy. Air supplied respirators are required, however, anytime the integrity of a gas line is broken. These procedures are in place due to the potential of a gas leak with H<sub>2</sub>S.

The plan was for Mr. Pullen and Mr. Michael to "hot bolt" the two flanges, climb down from the vessel, don harnesses and air supplied respirators, and return to the top of the vessel to disconnect the flanges and remove the blinds.

As the work on the two inlet piping flanges near the top of the east end of the vessel began, Mr. Michael worked on the flange to the west and Mr. Pullen worked on the flange to the east. The two flanges are approximately three feet apart. Mr. Michael was sitting down, straddling the vessel. While working on the west flange, he was facing the east flange. Mr. Pullen was working on the east flange from a more kneeling or stooped position with the catwalk behind him.

While this work was being done, gas pressure from the line and H<sub>2</sub>S was released from the east flange where Mr. Pullen was working. Mr. Pullen heard Mr. Michael comment about smelling H<sub>2</sub>S and Mr. Pullen heard the alarm on his H<sub>2</sub>S monitor sound. Mr. Pullen simultaneously heard the hissing sound of gas escaping under pressure. Mr. Pullen stood up and noted Mr. Michael slumped forward over the west flange and piping. Mr. Pullen yelled to the Double Jack employees below. Double Jack employees had smelled H<sub>2</sub>S, heard their monitor alarm sound (the monitor provided to them by Mr. Michael), and were exiting the building. Mr. Pullen yelled to Double Jack employees to get the fan pointed up in their direction. Mr. Casey Hartzell of Double Jack held his breath and ran back into building to point the fan upward when he saw Mr. Pullen lose consciousness and fall from the top of the vessel to the concrete floor below. On the way down, Mr. Pullen impacted the catwalk & other structural materials. Mr. Hartzell then ran back outside of building. Both of the Double Jack employees observed Mr. Pullen's fall.

Mr. Hartzell of Double Jack took another deep breath while outside the building and then ran back into the northwest door of the building to try to assist Mr. Pullen. He tried to drag him clear but was unable due to Mr. Pullen being caught on a needle valve. So, he ran back outside to locate a self-contained breathing apparatus (SCBA) respirator.

At this time, Mr. Dwane Graham of Double Jack and Mr. David Linn of Mountain States located and donned SCBA respirators. Mr. Linn entered the building, pulled Mr. Pullen outside, and immediately put an SCBA mask onto Mr. Pullen's face. Mr. Pullen was then attended to by Mr. Graham, where he regained consciousness, and was assisted to a nearby office building.

Mr. Hartzell reentered the building while wearing an SCBA to try to rescue Mr. Michael. He climbed the stairway to the top of the vessel and found Mr. Michael unconscious. Mr. Hartzell was not able to move Mr. Michael away from the flange since he was slumped over and caught on a wrench protruding from a flange bolt. Mr. Hartzell tried to place an SCBA on Mr. Michael, but he could not lift his head and keep the SCBA tank from falling. After Mr. Linn reentered the building, he proceeded up the east ladder attached to the vessel. Mr. Linn then climbed on the top of the vessel from the east side, and placed the SCBA face piece on Mr. Michael and turned the unit on. Mr. Hartzell heard his alarm go off on his SCBA so he climbed back off the vessel to get another SCBA. He then pushed a mobile ladder over against the vessel. Mr. Hartzell then climbed back onto the vessel to help Mr. Linn lower Mr. Michael down to the mobile ladder. Mr. Linn heard his alarm go off on his SCBA so he climbed down and returned after he changed SCBA's. They both evaluated the situation and possible rescue techniques to use once they got Mr. Michael down. They were able to remove the wrench from the flange bolt and lower Mr. Michael from the top of the vessel onto the top of the mobile ladder. They pushed the mobile ladder, with Mr. Michael on it, to the west end of the building to the open bay door to get him outside. However, the mobile ladder was taller than the bay door and it could not be pushed the remainder of the way outside. Mr. Hartzell and Mr. Linn attended to Mr. Michael but noted no vital signs. They again tried to administer SCBA air with Mr. Michael laying at the top of the mobile ladder, but to no avail. Mr. Michael's large build prevented Mr. Hartzell & Mr. Linn from moving him off the mobile ladder by themselves.

In the mean time, Mr. Graham and Mr. Pullen had summoned for help and rescue personnel from a nearby gas processing plant arrived on scene. Shortly thereafter Uinta County Sheriff and Fire/EMT personnel arrived.

Mr. Michael likely died nearly instantly after inhaling the H<sub>2</sub>S while working on the top of the vessel. Mr. Pullen was transported to the hospital in Evanston, WY for injuries sustained in the fall and for observation following exposure to H<sub>2</sub>S. The Uinta County Coroner removed Mr. Michael's body later that night after his on scene investigation was complete.

## **Findings:**

- The decedent, Mr. Christopher Michael, was a 51-year-old male.
- Decedent worked as a Plant Operator for Anschutz Wahsatch Gathering Systems Inc. from

September 29, 1999 to the time of the accident.

- Decedent had a total of eight years working with oil and gas containing H<sub>2</sub>S.
- Decedent was working with his foreman on the top of vessel #502 preparing to remove inlet piping flange blinds in preparation for putting the vessel back on line.
- The foreman, Mr. Dale Pullen, had worked at this facility for six years with three different employers as the facility was bought and sold.
- The foreman had drafted the written procedures in effect for installing and removing blinds from piping flanges.
- Approximately one week earlier, the foreman had supervised and participated in the installation of the flange blinds.
- At the time of the mishap, the decedent was working on the west flange and the foreman was working on the east flange at the top of vessel #502.
- The company has in place specific written procedures regarding the use of personal protective equipment, including air supplied respirators and fall protection.
- Installing and removing flange blinds is a relatively routine function in any facility of this type.
- Uinta County Fire Department personnel photographed the accident scene on the night of the mishap for the Uinta County Sheriff and their records.
- The photographs and subsequent investigation showed seven of eight bolts on the east flange were loose or removed. The pattern of loosened or removed bolts was not in accordance with "hot bolting" procedures.
- The photographs and subsequent investigation showed two of eight bolts on the west flange were loose (none removed). The pattern of loosened bolts was in accordance with "hot bolting" procedures.
- The pipeline upstream from the blinds was approximately 3000' long before reaching a closed valve.
- The pipeline between the valve and the blinds had not been purged of gas or hydrocarbon condensates prior to being blocked off. Only the pressure had been bled off.
- Part of the facility system that remained on line while vessel #502 was isolated introduced heat to the blocked pipeline.
- The condensate and residual gas in the blocked off pipeline contained H<sub>2</sub>S.
- Gas pressure built up within the pipeline while it was blocked off during the period vessel #502 was isolated.
- The foreman/employee did not measure the pressure in the pipeline prior to beginning the work to remove the blinds.
- A sufficient number of bolts on the east flange were loosened/removed to break the integrity of the flange.
- At the time of the mishap, gas pressure within the pipeline at the flange was sufficient to produce an audible hissing sound.
- One measurement of leaking gas near the flange after the accident showed H<sub>2</sub>S levels above 1200 ppm.
- The Uinta County Coroner determined Mr. Michael's cause of death was exposure to H<sub>2</sub>S.

## Analysis & Conclusions:

The project foreman, Mr. Pullen, had assisted in installing the blinds in the flanges at the top of vessel #502 at the beginning of the project. Prior to doing this installation, he had closed the valve upstream from the flanges and bled off the pressure to a closed drain system. Thus at the time the blinds were installed, he knew that the pipeline pressure was at zero.

Anschutz uses previous owner's written procedures for installing and removing blinds. Mr. Pullen assisted in drafting these procedures some years prior. Following their acquisition of the facility, Anschutz deemed the procedures valid. These procedures include the provision of "hot bolting" whereby every other bolt on a flange can be loosened without breaking the integrity of the flange.

Anschutz uses previous owner's written policies regarding the mandatory use of air-supplied respirators whenever the integrity of a line containing H<sub>2</sub>S is broken. Anschutz also uses previous owner's written policy regarding the use of personal fall protection.

Mr. Pullen and Mr. Michael did not follow company procedures for blind installation and removal when they began the work on the blinded flanges on the top of vessel #502 late in the day on August 10, 2001. Mr. Pullen and Mr. Michael had not considered the possibility of pressure building up within the closed off pipeline upstream of the blinds while the vessel was off line. In addition, they did not measure the pressure in the pipeline prior to beginning the work on the flange blinds. The bolts on the east flange were loosened and removed sufficiently that integrity was broken. As a result, H<sub>2</sub>S was released from the flange area with the escaping, pressurized gas. Mr. Michael had earlier provided his H<sub>2</sub>S monitor to the Double Jack employees working below. Neither Mr. Pullen nor Mr. Michael had donned air supplied respirators prior breaking the integrity of the east flange. Neither Mr. Pullen nor Mr. Michael had donned fall protection equipment before beginning the work on the flanges. Mr. Pullen fell off the vessel as he was overcome by H<sub>2</sub>S. Very likely this fall saved his life in that he was then out of the H<sub>2</sub>S concentrated area. Mr. Michael became entangled on a wrench he was working with on the west flange and did not fall from the vessel.

The angle of the leaking gas from the east flange was pointed in the general direction of Mr. Michael. It is likely that he received a burst of concentrated H<sub>2</sub>S and died nearly instantaneously while sitting on the top of the vessel.

The quick actions of the Mountain States and Double Jack employees very likely saved Mr. Pullen's life once he had fallen clear of the top of the vessel.

If Mr. Pullen and Mr. Michael had followed existing, written company policies and procedures, the fatality would not have occurred. It had been reported by management and other company employees that both employees had been observed performing similar procedures on past occasions using the proper equipment and procedures.



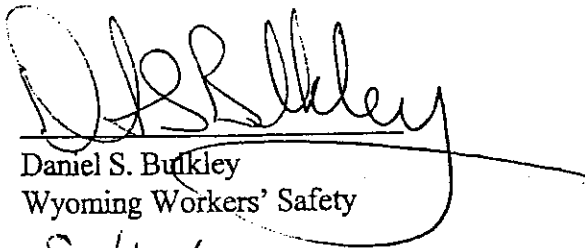
## Recommendations:

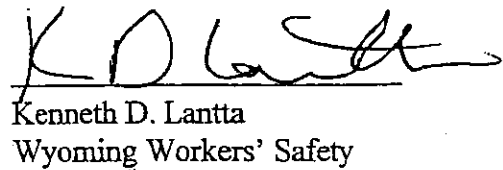
- All employees should be briefed on the facts and circumstances of this particular accident.
- Measures must be taken to reinforce with all employees the requirement to follow written policies and procedures, in particular those involving employee health and safety (LO/TO, respirators, fall protection, and confined spaces).
- All employees must be made aware of the mechanical and chemical actions that can take place within a closed off pipeline that will cause pressure to build up over time and what action to take prior to working with pipelines.
- Lockout/Tagout procedures should be updated to provide for positive steps to assure that potential energy has been controlled prior to breaking the integrity on any equipment capable of holding stored pressure.
- The company must provide site-specific training on how to check for zero pressure on all facility piping.
- Reevaluate current procedures dealing with non-pressure rated blanks and only installing gaskets on downstream side of flange connections.
- All programs/policies/procedures need to be updated to reflect current Wyoming Rules & Regulations.

This report of investigation and findings are regarding the fatal accident involving:

Christopher W. Michael  
116 Ute Court  
Evanston, WY 82930

Signed:

  
Daniel S. Burkley  
Wyoming Workers' Safety

  
Kenneth D. Lantta  
Wyoming Workers' Safety

Date:

9/13/01

9/12/01