

ANATOMY OF AN OILFIELD HIGH PRESSURE GAS RELEASE CASE

BACKGROUND

Christopher Shirley, Juan Mendoza, and Thomas Frost were rig hands employed by Basic Energy Services (Basic) a well work over contractor. They were seriously injured on October 29, 2007 in an oilfield accident that occurred on the Davis Bros 29-9 ALT (Davis Bros 29-9) well located in the Vernon Field, in Jackson Parish, Louisiana.

Anadarko Petroleum Corporation was the owner and operator of the Vernon field in North Louisiana until April of 2007 when Anadarko sold the field to Exco Resources, another oilfield operator.

THE DAVIS BROS 29-9 ALT WELL

Anadarko contracted with Nabors Drilling (Nabors) to drill the Davis Bros 29-9. The well was completed and put into production in 2004.

The daily production rates from the Davis Bros 29-9 were low. The well was closed in on or about December 8, 2005 and the reported shut in tubing pressures (SITP) before sales were resumed was reported as 2,700 psig. The tubing pressures throughout the period from May 2005 through mid-August of 2006 were consistently reported as 1100 psig, which suggests the well was flowing through a wide-open choke against a line pressure of approximately 1100 psig. Casing pressures were also reported daily, ranging between zero and as 5,000 psig in late May of 2005. A review of the casing pressure data indicates the casing pressure was allowed to build to a certain level at which point the pumper who checked on the well on a daily basis bled the pressure off and the buildup-release schedule was repeated. Pumpers checked each well every day and recorded tubing and casing pressures and also production flow. They turned in their data every day. If they noticed any unusual changes in pressure they were to report this to the field supervisor.

THE NEW WELL - DAVIS BROS 29-11

The Davis Bros 29-11 was to be drilled from a surface location in close proximity to the Davis Bros 29-9 and Anadarko prudently shut in the Davis Bros 29-9 and took steps to secure the well in the event heavy equipment involved in the drilling operation knocked off or damaged the wellhead or production Christmas tree of the 29-9.

On August 15 of 2006 the shut in tubing pressure (SITP) and shut in casing pressure (SICP) of the 29-9 were measured and recorded as 2,700 psig and 1,800 psig, respectively. On August 16, a PX plug was set at 15,081 feet, the tubing pressure was blown to zero, and a back pressure valve (BPV) was screwed into the tubing hanger as an additional protective measure. The Christmas tree was then removed and replaced with a frac valve which sat on top of the well head. This removed the well from production. The 29-9 was considered shut in at that point since it was no longer capable of production.

Thomas Brown III acting on behalf of Anadarko was a consultant well site supervisor hired to oversee the drilling operations on the Davis Bros 29-11. He reported to Anadarko drilling engineer Scott Chesebro. Both were in the drilling department of Anadarko. Mr. Brown was instructed by some unknown person to contact Wood Group and request that a valve removal (VR) plug be installed in the casing valve of the 29-9 well as an additional protective measure in addition to the PX plug and back pressure valves which were previously installed. This procedure would maintain casing annulus isolation

in the event a piece of equipment knocked off or damaged the casing gate valve attached to the side outlet on the tubing head.

The operation was performed on August 18 of 2006 and documented in the daily drilling report for the Davis Bros 29-11 but no record of the VR plug was entered into the well file of the Davis Bros 29-9 well (All wells have well files which contain detailed information regarding activities regarding a well. They are kept in paper and digital form. They can be accessed remotely by engineers operating out of the main office). A VR plug is not usually used for this purpose. It is most commonly used to isolate casing pressure when as casing valve needs to be changed out or repaired. This is done by a specialty wellhead servicing operator such as Wood Group Pressure Control. The entire procedure is usually completed with a day and the VR plug is removed at the completion of the procedure by the operator. In this case it was anticipated the VR plug would remain in place for an extended period while drilling and completion operations were underway on the 29-11.

Grey Wolf Rig 754 was mobilized to the Davis Bros 29-11 location starting August 19, 2006, and the well was spud on August 23 2006. The Grey Wolf rig was released at 6:00 AM on October 2, 2006. The well was then turned over to the production department who would oversee fracking the lower formations and bringing the well into production.

Anadarko decided to place the Davis Bros 29-9 back in production in February 2007 and, on March 5 of 2007, Wood Group removed the capping flange, re-installed the production tree, and pulled the back pressure valve (BPV). The SITP after the extensive shut-in period was reported by the Wood Group technician as 5,100 psig, which suggests leakage past the PX plug which would have blocked any upwards pressure in the tubing.

The VR plug remained in the tubing head because Anadarko's Production Department was apparently totally unaware of its existence and it does not appear that Wood Group's service hand advised Anadarko about the plug and the need to subsequently remove it. There was no system in place to note the installation of the VR plug and remind Anadarko personnel that it needed to be removed after the adjacent operations were over and the well returned to production. Although there is no record to document this action, it is reasonable to conclude the PX plug was removed from the well before production was restored on or about March 16, 2007 since there can be no production as long as it remains in the tubing string since it blocks any upward flow from the well. Please note that the PX plug installation was correctly recorded in the 29-9 well file and the VR plug was not.

Exco became the operator of record for the Vernon Field effective April I, 2007 by purchasing the field and all its equipment from Anadarko. The record of each well are contained in a paper and digital well files which were also transferred.

WOOD GROUPS' INVOLVEMENT

Wood Group Pressure Control was a well head supply and servicing company and was the contractor of choice for the Vernon field.

WG installed the VR plug at the request of Tom Brown the Anadarko consultant. There is no record of WG performing this procedure even though everyone agreed it occurred. There is documentation in the 29-11 well file indicating a VR plug was installed on August 18, 2006.

The VR plug in this instance was forgotten since there was no tag or notation to remind anyone to take it out after the completion of fracking operations. The VR plug was installed on the Davis Bros 29-9 well some four months after this accident on April 22, 2006. Wood Group should have had in place a policy to alert users of a VR plug left in a wellhead. The accident on the Davis Bros. 29-9 would not

have reasonably occurred if Wood Group had attached, at minimum, a warning tag to the valve or side outlet on the tubing head.

At another job site in Texas, Robert Dale Gayan was fatally injured on April 22, 2006 when he removed the VR plug from the off side of the tubing head on a well owned by XTO another operator located in Fort Worth, Texas. He believed there was no pressure on the casing since the gauge inaccurately read zero. The VR plug had been installed by Wood Group to provide protection to the casing valve during fracture operations which generate very high pressures.

Following the Gayan incident Billy Pate a Wood Group area manager sent out an email requiring that VR plugs installed in the XTO field be tagged The purpose of the directive was "to eliminate the uncertainty of whether a VRP (VR plug) has been installed on a well or not." The policy was not retroactive to prior installations and did not apply to the Gosey 1H well. He indicated there had been a number of instances where VR plugs has been forgotten with no record showing they had been installed.

Although this directive was only directed to a particular geographical area we were successful in establishing that it had companywide implications since upper management received a copy. It also had a substantial role to play in WG attempt to use Louisiana Rule of Evidence 407, alleging subsequent remedial measures.

In May of 2011 Larry Benson of Wood Group gave a slide show titled "Wellhead Safety for Non-wellhead Professionals" to an industry Group showing a VR plug installed on a well head gate valve and the Well head having a chain and tag on it. It was further acknowledged that WG began to do this after the Shirley accident. .

WG attempted to claim this policy change was a subsequent remedial measure but the Court correctly rejected this argument because of the Pate directive which occurred prior to the Shirley accident. This was a substantial victory in establishing some responsibility on the part of WG.

It had been WG's position that after installation it was solely up to the operator to determine when the VR plug should be removed and call to request it.

THE ACCIDENT OF OCTOBER 19, 2007

The Exco Vernon field foreman was requested by Houston engineering to pull the tubing from well 29-9 in order for seismic equipment to be inserted into the well bore to gather data for future exploration activities. Basic Energy Services(Basic) a regular Vernon field contractor was called to perform this task.

Basic sent a reverse unit (a skid-mounted equipment package including a triplex pump, tank, and piping) to the well along with a work over rig and a Basic Daily Field Ticket shows that the rig equipment had been "spotted" {positioned} by 8:30AM on October 19,

Basic Rig #1550 arrived at the 29-9 Well about 0830 on October 19, 2007 and began to rig up to pull the tubing from the well. . The Basic crew consisted of rig operator Billy Gray, derrick hand Thomas Frost, and floor hands Juan Mendoza and Chris Shirley. George Albright was the tool pusher over the job. Rickey Johnson was working for Exco at the time as a production or completion foreman in the Vernon field office One of his responsibilities was to assign site supervision work on a given well to one of several consultants working for Exco at the Vernon Field.

As was their practice, Exco's consultants met at the Vernon Field office early the morning of October 19 and the work assignment was given to Michael Garcia that morning.

Garcia was responsible for this well in addition to two others assigned to him on that same day. He had only been an Exco consultant for two weeks at the time of this incident. He had previously been a Basic tool pusher and was very familiar with this crew

The pressures were checked on the well and found to be 900 psi on the tubing and 0 psi on the casing. The personnel on location were unaware that the VR plug was installed in the casing valve and that the casing pressure gauge readings were untrustworthy.

To kill the well fluid was pumped down the tubing using the rig manifold, but no pumping operations were performed on the casing annulus since the crew believed the casing was dead. The wellhead was unbolted but left in place. Prior to removing the wellhead and installing the blowout preventers ("BOPs") the tubing hanger lockdown pins were unscrewed. At approximately 140 pm, as the final lockdown pin was being unscrewed, pressure on the casing annulus being exerted on the tubing hanger forced the tubing and hanger rapidly upward, lifting the production tree off of the wellhead, and releasing the high pressure gas that was below it in the casing annulus. Release of the high pressure gas resulted in serious injuries to Chris Shirley, Juan Mendoza, and Thomas Frost.

George Albright and Billy Gray who were uninjured secured the well by tying the winch line onto the frac valve, installing the frac valve on the tubing head, and closing the valve. Juan Mendoza and Chris Shirley were given assistance, Exco and Basic personnel were notified, and the two injured men were taken away by emergency medical services. Several Exco and Basic employees and Exco consultants were on site not long after the accident and, at some point that afternoon, George Albright stuck a piece of capillary tubing into the tubing head outlet and discovered that access into the head was blocked.

After the accident further investigation revealed that a VR plug was installed in the casing valve.

ACCIDENT FALLOUT

After the accident Exco implemented a policy whereby Wood Group or any other well servicing company had to get permission from senior Exco management to install a VR plug in a well head and when approved, a tag had to be placed on the well head documenting the existence of the VR plug.

THE COURSE OF THE CASES

Litigation in Webster Parish ran on for 4 years. The last two were very intense. Over 400,000 documents were produced. Each side was armed with expert petroleum engineers. Claimants had two with one having safety engineering and OSHA qualifications.

The claim against Anadarko was for failing to document the VR plug and remove it which included a lack of proper organization since the drilling department and production departments were not aware of each other activities. Anadarko had an indemnity agreement with Exco which assumed it defense. We claimed a conflict existed which required separate counsel but this was never resolved when the case settled.

The claim against Exco was for failing to find the VR plug when pressure readings indicated a total loss of casing pressure which was anomalous. There were also squeeze perforation in the well which should have suggested casing pressure would exist. Further the Exco engineer who ordered the tubing pull procedure should have reviewed the well file where he would have seen prior casing pressure which suddenly ceased. He also would have seen squeeze perms which would have suggested a possible source of leaking into the casing annulus. Additionally the Exco consultant on site should have reviewed the well file and seen prior pressures and required the Basic crew to engage in safe well practices in killing the well prior to removing the hanger pins and exposing themselves to casing pressures..

The claim against Wood Group was the failure to tag the casing valve as Billie Pate had recommended and Larry Benson illustrated in his slide show. We were dealing with a lot of testimony which said that it was a not industry practice to tag VR plugs and many witnesses said they never saw it done. On the other hand this was an unusual application where tagging was appropriate.

Defendants claimed with some credibility that Basic violated industry accepted practice in the following ways: 1) failing to pump into the casing valve which would have revealed an obstruction 2) failing to install blow out preventers on top of a frac valve (which was optional) which would have redirected any gas pressure above the workers on site. Plaintiffs emphasized that the Exco supervisor also bore responsibility since he was the senior most person on site.

THE CASES AS ULTIMATELY RESOLVED

The case settled after a second mediation. session Wood Group, Exco and Anadarko participated through their insurers. The compensation insurer waived it's sizable liens and participated in the settlement fund. Structured settlements were put in place for Shirley and Mendoza.