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THE MAGAZINE



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WELL CAPPING

Mark Badick's Safety Boss crew on the Kuwait Fires Project.



Not for the Faint of Heart

Unless you've been living on a desert island with no TV, radio or newspapers for the past 30 years, you've likely heard about the late Paul "Red" Adair, undoubtedly the best known well-capper in the world.

Adair's use of explosives, water cannons, bulldozers, drilling mud, and concrete revolutionized the business of well-capping. Adair's numerous exploits were immortalized by John Wayne in the 1968 movie "Hellfighter", loosely based on the life of Adair. Although the movie gave well-control specialists a chuckle because of Hollywood's tendency to romanticize the events it portrayed, it did raise the profession to a newfound prominence.

When a well blows out, either as a result of human error, or mechanical failure, it generally spews high-pressure jets of oil and gas into the air. If the gas is sweet, or nonlethal, the potential dangers associated with a blow out are the operational repercussions of an explosion, air pollution, and, of course, the loss of revenue incurred while getting the well under control. If the well is sour, however, the dangers associated with a blow out are much more severe. A sour gas well contains a toxic substance called hydrogen sulfide. An out of control sour gas well that emits hydrogen sulfide into the atmosphere has the power to put many lives in danger. For instance, the Lodgepole blowout on October 17, 1982, 176 kilometres southwest of Edmonton, killed two people and proved to be a serious health hazard to those living in the area.

Regardless of the nature of the gas involved in a blowout, however, few people have the expertise to deal with the

explosions, the fires, and the release of potential poisonous gases caused by a blow out. Generally, oil companies do not have specialists on staff that can deal with full-scale blowouts. They prefer, instead, to turn to those who have carved out an exclusive niche for themselves. For Maurice Engman of Key Safety, the Lodgepole blowout was the starting point of his career in well-control; a career that now spans almost a quarter of a century. "It was the biggest blowout in Canadian history," said Engman.

Lodgepole released 190 million cubic metres of toxic chemicals into the air and filled most of central Alberta with the odour of rotten eggs. Despite the risks involved, well capping is an ideal vocation for those individuals who thrive on challenge. "It [well capping] definitely makes the adrenaline flow. There's no room for error and you've got to be working two steps ahead of yourself. When you put a cap on it [a well] everything is wide open until you get it landed and bolted down. It all depends, maybe you can shut the well in, and maybe you can't," said Engman.

Personal safety aside, according to Mark Badick, the President of Calgary-based Safety Boss, some individuals find that the benefits and job satisfaction of the profession outweigh the minor inconveniences, such as being on call every day of the year and dealing with the blistering heat emitted by an out of control well. One of the highlights in Badick's 24-year-career was the two-hundred days he spent in Kuwait.

With countless oilfields on fire you'd think it would be hell on earth, but that's not the case, said Badick, whose company

Bill Steele

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managed to extinguish 180 wells during the time he was there. "It can be very, very dangerous, but it's the coolest job in the world. To be honest, I wouldn't do anything else," Badick also mentioned that for those individuals who are trained in the art of blowouts, Kuwait was 'the Olympics' of the well-control business.

Engman also spent time on the Kuwait campaign and described it as "the most fun you can have with your jeans on." But, not surprisingly, Engman and his colleagues in the Middle East had a few close calls. One particular incident involved a well that had been severely damaged when the Iraqis had blown off the wellhead. After the several hours of exhausting work required to extinguish the resultant fire, it only took a slight wind change to re-direct the plume of natural gas emitted just enough to reignite the well. The well-control crew was right back where they had started. "It caught three of my hands right down at the well," Engman recalled. He had removed most of his protective gear at the time, but was able to jump on the back of a water truck, and provided his men with the necessary cover from the flames so they could escape. That experience highlights the greatest dangers encountered by those in the profession of well-control. A single spark can turn what appears to be a harmless situation into a towering inferno.

"I would rather deal with a burning well than an unlit one," explained Badick. "You don't get those lazy little pockets of gas that can migrate off elsewhere because of a shift of wind and then have a flash fire." "Dealing with the heat isn't as bad as you would think", said Engman. He went on to say that even though the temperatures usually get so high that metal on the well begins to melt, a curtain of water in the midst of the fire acts as a cooling agent, and with proper safety gear, the situation is not that uncomfortable for a seasoned well-capper.

While no two blowouts are the same, many of the methods used to cap wells are standard in the industry. The first step in capping a well is to clear away the damaged rig and expose the wellhead. This may require cutting away the mass of steel debris that occurred as a result of the blow-out, although a large fire will progressively melt off the debris, partially exposing the wellhead. Once the wellhead is open, a new blowout preventer can be installed. If the well casing is still in good shape, then the process of shutting-in the well begins. This involves pumping fluids into the well bore, which displaces the column of gas with a column of much heavier mud, forcing the gas to remain at the bottom of the hole.

With only a handful of men qualified to tackle a major blowout, it's experience that makes the difference. Becoming a well-


capper requires a period of apprenticeship. "The only way you can learn to do this [job] is through on the job training," said Badick, who noted that a background in the oil and gas sector was necessary before someone can be taught how to fight a fire.

It's usually feast-or-famine for those in the business. "There isn't room for a whole lot of competition because there are not that many jobs that come up," said John Jacobsen, Chairman of the Canadian Association of Oilwell Drilling Contractors, and Vice-President of Calgary's Precision Drilling. "When the jobs do come up they [well-cappers] certainly make some money, but prior to that, they may sit a long time twiddling their thumbs."

There were 23 blowouts in Alberta in 2004, according to Alberta's Energy and Utilities Board (EUB). The biggest well blowout involved the Acclaim sour gas blowout near Edmonton in December 2004, which took 30 days and cost \$50 million to get under control. Most of the other blowouts have been relatively minor, and caused by individuals accidentally hitting well valves with trucks, road-graders, and/or farm equipment. Mechanical failure and inadequate well-design also added to the list of causes for blow outs.

Even though the number of incidents has increased over the past few years, this should come as no surprise, since drilling activity has also increased over the last number of years with over 18,570 wells drilled in Alberta in 2004. "It [the number of incidents] is a jump, but considering the number of wells being drilled it's a pretty low number," said Paul Bothwell, section leader for the Compliance and Operations Branch of the EUB.

A lack of work in the future isn't something Key Safety or Safety Boss is concerned with. There'll continue to be jobs as long as man (versus machine) is responsible for operating rigs. "I've never seen a piece of equipment just out-and-out fail. It's usually [caused by] human error on some level," Badick explained. Failure could result due to an improperly serviced valve or the lack of attention by an operator when safety equipment indicates that something is amiss. With record activity in the oil patch, due to skyrocketing oil and natural gas prices, the amount of work can only continue to grow, according to Engman. He says the workforce seems to be getting younger each year and incidents will continue to rise. In addition, several oilfields are aging and beginning to show failure at the wellheads. This will also be a determining factor for the activity those in the well-control industry will see in the coming years.

That kind of news means Red Adair, wherever he may be, is likely smiling. 

The first warning of the nuclear meltdown at Unit 2 came shortly after 4:00 a.m. on March 28, 1979, when an alarm warned that pumps in the steam-making pipes had shut down.

comes to safety we tend to notice only the dramatic. Success in safety is rarely dramatic, however, since it usually means that no one was hurt. Nothing to report here. However, there are some exceptions, and the story of Rick Rescorla is a good one.


Rescorla was the first vice president of security for Morgan Stanley Dean Witter. The New York office occupied 22 floors of the South Tower of the World Trade Center. On September 11, 2001, the North Tower was struck by a terrorist-flown aircraft at 8:46 a.m. Minutes later, Rescorla began an organized evacuation of the South Tower, despite a loudspeaker announcement directing occupants to stay put. With the help of his six fire wardens, Rescorla evacuated all 2,700 employees of Morgan Stanley from the South Tower in an orderly fashion. Everyone from the firm got out alive except Rescorla and his six wardens, who stayed behind to help others.

Rescorla had the support of a willing employer, so his situation was different from Boisjoly's. The World Trade Center had been bombed in 1993, which served as motivation to Morgan Stanley to rehearse evacuations every other month. Rescorla believed another attack on the World Trade Center was inevitable, and he had convinced Morgan Stanley to relocate, but, in the meantime, they rehearsed evacuations under Rescorla's direction. Everyone, without exception, was required to participate in the evacuation drills by marching down the stairwell.

The point of the Rescorla story is that, at a pivotal moment, Rescorla made a difficult decision, and he made it decisively and defiantly. He ignored the direction of the voice on the loudspeaker and immediately started the evacuation. The employees of Morgan Stanley Dean Witter who survived that day have Rescorla to thank. His actions saved not only their lives, but the lives of others, whose escape from the building was facilitated by the early evacuation. Rick Rescorla will be remembered because, in following good safety practices, he saved the lives of many people.

The difference one person can make is again exhibited in the story of Brian Mehler, a shift supervisor for Unit 1 at Three Mile Island near Harrisburg, Pennsylvania. The first warning of the nuclear meltdown at Unit 2 came shortly after 4:00 a.m.

on March 28, 1979, when an alarm warned that pumps in the steam-making pipes had shut down. Mehler was at home, asleep in bed at the time. He was not due at work until 7:00 a.m., but at 5:00 a.m., an engineer decided to call Mehler to the control room to see if he could help. At 6:00 a.m., Mehler walked into the control room. He was confronted with a disturbing and desperate situation. There were over 50 people in the control room, the alarm siren was ringing, and more than 110 alarm lights were flashing on the control panel. Within 15 minutes, Mehler had developed two theories about the possible problem. One of his theories led to the discovery of a leaking relief valve. The valve did not close, causing operators to reduce the emergency coolant, which in turn caused the meltdown. The President's commission on Three Mile Island later concluded that the reactor core came within a half hour of total meltdown. The results of a complete meltdown would have been catastrophic. A total meltdown would have released a massive cloud of radioactive steam across the towns and farms of western Pennsylvania causing immeasurable harm. Once again, the situation was saved by the power of one: Mehler and his theory made a marked difference.

These stories illustrate the experience and challenges of many safety professionals and managers when trying to prevent a dangerous work situation. James R. Chiles in his book *Inviting Disaster*, provides more details of these and other industrial accidents. Every day, on job sites across Alberta, individual workers and safety representatives help prevent injuries and death — perhaps not as dramatically as Rick Rescorla and Brian Mehler, but every accident prevented means fewer lost work days, and fewer lost lives. We must never lose sight of the importance of each individual in helping to make their workplace safe. We can never forget the power of one. 

** David Myrol is a partner of McLennan Ross LLP. Before joining the firm he was a crown prosecutor in Alberta, prosecuting criminal and occupational health and safety cases. He was the first full-time occupational health and safety prosecutor in Alberta and helped plan and develop an investigative training program, as well as operational policies, for OHS officers in Alberta. He now only practices OHS law for clients across Western Canada.*

Photo: Safety Boss at Acclaim Acheson 12/04



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