



Management walk-arounds: Lessons from the Gulf of Mexico oil well blowout

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ABSTRACT

Many companies understand that good management requires senior managers to spend time with front line workers. Some companies build into performance agreements for senior managers a requirement that they conduct a certain number of such site visits each year. The challenge is to make productive use of these visits. Safety is often a focus for visiting VIPs, but too often safety is understood to be a matter of “slips, trips and falls”, rather than the major hazards that can blow the plant or the rig apart. This paper will examine a VIP visit made to the Deepwater Horizon rig by senior managers from BP and from the rig owner, Transocean, just hours before the explosion. It will argue that, despite their best of intentions, these managers fell into the trap identified above. The paper looks at things that senior managers can do to focus attention on the most significant hazards.

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1. Introduction

About seven hours before the Gulf of Mexico oil well blowout of 2010, a group of four company VIPs helicoptered onto the drilling rig in question, the Deepwater Horizon. They had come on a “management visibility tour” and were actively touring the rig when disaster struck. The blowout resulted in eleven fatalities and the worst oil spill in US history. It has been exhaustively analysed in the report of the [National Oil Spill Commission \(2011\)](#) and is the subject of more than a dozen books. The four VIPs were among the survivors.

There were several indications in the hours before the accident that the well was not sealed and was at risk of blowing out. These indicators were all either missed or misinterpreted by the rig staff. The touring VIPs, two from BP and two from the rig owner, Transocean, had all worked as drilling engineers or rig managers in the past and had a detailed knowledge of drilling operations.¹ Had they focused their attention on what was happening with the well, they would almost certainly have recognized the warning signs for what they were, and called a halt to operations. But their attention was focused elsewhere, and an opportunity to avert disaster was lost.

There is a tragic irony here. A major purpose of the visit was to emphasise the importance of safety, and yet the visitors paid almost no attention to the safety critical activities that were occurring during their visit. What were they doing? Where was their

attention focused? How might their visit have had a happier outcome? These are the questions this paper seeks to answer. There are lessons here for all senior managers who undertake management visibility tours in major hazard facilities. The information on which this paper is based came to light in the inquiry into the accident held jointly by the US Coast Guard and the US Department of Interior, and most of the references here are to the transcript from that inquiry.²

2. The purposes of the visit

BP/Transocean management visibility tours of Gulf of Mexico rigs were regularly scheduled events and it was more or less by chance that the Deepwater Horizon had been selected on this occasion.

The most general purpose of the tour, as the name suggests, was to make management visible to the workforce, by meeting and talking with workers on a variety of topics. It was first and foremost a social visit, without a tightly specified agenda. This aspect of the tour was best exemplified by the group's visit to the bridge, to talk to the marine crew. As one of the group explained, the marine crew was often omitted on management visibility tours and they wanted to give “credit” to this group (23/8/10:446). Another explained that

(The bridge) is kind of an impressive place if you haven't been there. Lots of screens, lots of technology. We had a long visit, a nice visit there. And we also had the chance to work with a

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¹ The two Transocean executives were Buddy Trahan, vice president and operations manager for assets, and Daun Winslow, operations manager. The two BP executives were David Sims, drilling operations manager and Pat O'Bryan, vice-president for drilling and completions, Gulf of Mexico Deepwater (Oil Spill Commission, 2011, p. 5).

² www.deepwaterinvestigation.com. To save space, references to this source will be by date and page number only.

dynamic positioning simulator that they have up there used for training and demonstration purposes.³

But in addition to this social function, the visit had a variety of more specific safety-related purposes. The rig had amassed a total of seven years without a lost time injury and the VIPs wished to congratulate the crew on this achievement and to identify any lessons that might be transferred to other vessels in the fleet (27/5/10:198). In addition, one of the VIPs was aware of a slip hazard that had been identified on another rig, and he wanted to see if Deepwater Horizon was aware of this hazard and had made appropriate modifications, for example by installing non-slip materials (29/5/10:187). The group in short was actively engaged in transferring safety lessons from one rig to another.

One of the VIPs had a particular interest in harnesses used for work at heights. “One of the things I look for in addition to house-keeping, (he said), I look at harnesses and look at when inspections were done on harnesses. And I noticed when I looked into the harness locker some of the harnesses did not have tagging on the, inspection tags” (26/8/10:362). He took this up with the offshore installation manager and received a satisfactory answer. Apart from this, he was interested in asking questions of various employees to check on their understanding of safety culture (24/8/10:193).

Transocean and BP were at the time running a concerted campaign to increase awareness of the risk of hand injury and the risk posed by objects dropped from height. Members of the VIP group spoke about this campaign on several occasions to different crew members. This was the most consistently stressed theme of the visit.

It is clear from this account that this was a lot more than just a social visit, or a management visibility tour. These visitors were very much focused on safety. They came with messages about safety and each in his own way was engaged in an informal safety auditing process.

3. The VIP failure to discover what was going on

Given that the visitors were engaged in a variety of informal auditing and fact finding activities, let us consider how close they came to discovering that the warnings of blowout were being systematically missed or misinterpreted. To answer this question we need a little more detail about what was going on.

The drilling of the well had been completed and the rig was getting ready to move. While drilling is being carried out, well-safety is assured by keeping the well full of a heavy fluid, called mud, nearly twice the weight of sea water. This prevents any possibility of blowout. Before the drilling rig moves to its next assignment the mud in the column rising from the sea floor to the sea surface must be replaced with sea water. This will only be safe if the casing or lining that has been inserted into the well is fully sealed in such a way as to prevent any influx of oil or gas into the bottom of the well. To test whether the seal is effective, the pressure inside the well is temporarily reduced and observers note whether there is any tendency for fluids to flow out of the top of the well or for the pressure to increase. If such things happen they are an indication that the well is “flowing”, and that if the mud is removed completely, the well is likely to blow. Staff of the rig were engaged in carrying out this reduced pressure test at the time the VIPs arrived on the rig. They ultimately misinterpreted the results of their testing and concluded that the well was secure when in fact the evidence indicated otherwise. This was a terrible mistake, calling into question the competence and training of all those involved.

Soon after their arrival the VIPs visited the drilling shack, the centre of drilling operations. They found the rig personnel engaged in discussion about just how to do the test and the meaning of the results. The BP man in residence on the rig told one of the visiting BP executives: “We’re having a little trouble getting lined up (for the test) but it’s no big deal” (26/8/10:136). The BP executive asked no more questions about this and moved onto a social conversation about the history of the company – “ARCO days and Alaska days”.

Presumably because the rig was owned by Transocean, the senior Transocean executive in the VIP party assumed the de facto role of tour host. He noted that the tone of the conversation he heard among the drillers was confused.⁴ He sensed that they needed help – a sixth sense that drillers have – he said (24/8/10:200). As a result of this intuition he suggested that the on-site rig manager, who was accompanying the VIPs on their tour, should stay behind to help (23/8/10:443), and that the VIPs should move on so as not to distract the people engaged in the reduced pressure test.

Later in the day he asked the on-site rig manager if the test had gone well and was given the thumbs up (26/8/10:445). His question clearly invited the response he got. It was more a conversational question than a serious inquiry. He did not probe for evidence and simply accepted the reassurance he was given.

The VIPs said later that they would have been available to provide advice, had they been asked, but they were not asked and so did not concern themselves further with what was going on. There was no recognition that this was an opportunity to do some auditing, to check on competence of the people involved and to verify that they were complying with procedures that were critical to the safety of the well and the rig.

In retrospect this was a dreadful tragedy. Something was going seriously wrong before their eyes, but because of the constraints they had imposed on themselves (to be discussed below), they turned away and investigated no further. Not only was an opportunity lost to do some informal auditing, but so too was an opportunity lost to avoid disaster.

Apart from the reduced pressure test, there was a second missed opportunity to avoid disaster that afternoon. The drillers were in the process of replacing the drilling mud with sea water in the column between the rig and the sea floor. This meant that the weight of fluid in the well was getting progressively lighter and at some point the oil began flowing into the bottom of the well at an ever increasing rate. One of the basic safety principles governing well drilling operations is that the volume of fluid going into the well should be matched by what is coming out. If more is coming out than is going in, you know that the well is flowing and needs to be immediately “shut in” so that the situation can be evaluated and rectified. In turn this means that the flow into the well must be continuously monitored and compared with the flow out. The standard procedure in the drilling industry is that what goes into the well is drawn from one “pit” and what comes out of the well goes into another. The total volume in these pits can then be monitored both electronically and visually to check for net fluid loss or gain. However, that afternoon and evening numerous other activities were occurring which made it virtually impossible for observers to know whether the outflow matched the inflow. There were still some ways that observers might have checked what was happening (BP, 2010, pp. 91–96), but it seems they were all busy doing other things and no such checking actually occurred.

Had any of the VIPs asked the question that afternoon: “how are you monitoring flows?”, they would certainly have realized that no

³ The Deepwater Horizon was floating vessel that was kept in position by multiple propellers in a process known as dynamic positioning. (29/5/10:172).

⁴ 24/8/10:78. Later in testimony he denied that personnel were confused. (24/8/10:200).

effective monitoring was taking place. Had they then intervened to ensure effective monitoring, the disaster would not have happened. The VIP team understood that the rig was in the process of removing one of the last safeguards against blowout that afternoon, but they did not inquire as to what was happening and did not see this as an opportunity to audit how well-safety was being managed.

There was good reason to expect that the VIP team would have paid more attention to the mud replacement process than they did. Four months earlier, Transocean had a near disastrous blowout in the North Sea, off the coast of Scotland (WSJ, 2010). The circumstances were very similar. Workers had tested that the well was sealed and were replacing mud with seawater. Because the well had passed the test, they were not paying attention to flows in and out. But the crew had let their guard down prematurely. The well was not secure and a blowout ensued. Fortunately they were able to regain control by other means before an explosion occurred.

Transocean management wrote a ten page advisory about the incident which was circulated within the company. “Do not be complacent (it warned), remain focussed on well-control”.

Given that members of the VIP group were intent on checking that the Deepwater Horizon rig had learned from earlier incidents in the fleet, it would have been appropriate to check whether the crew had learned the lessons from the blowout in the North Sea. However the VIPs, it seems, were unaware of the North Sea event (24/8/10:120) and there was no attempt to ensure that this critical lesson had been learnt.

4. Explaining the behaviour of the VIPs

The preceding discussion identifies some surprising gaps in the activities of the VIPs. How are we to make sense of this? How can we account for their failure to take advantage of the important auditing opportunities available to them that day?

4.1. Behaviours and conditions

There are several things at work here. I begin by making a distinction between behaviours (actions, decisions) on the one hand, and conditions or relatively unchanging states, on the other. The VIPs appeared to focus their informal auditing activities on checking that certain conditions were as they should be, rather than checking on behaviours. So for example they checked on whether the harness tests were up to date, on whether a certain slip hazard had been remedied, and whether house keeping was up to standard. They did not set out to check on what people were actually doing at the time of observation and whether they were complying with safety requirements. This is a common auditing preference. States or conditions are easier to audit, because they are relatively unchanging. They await the arrival of the auditor and can be assessed at a time of the auditor's choosing. On the other hand, compliance with procedures, especially where the behaviour is intermittent, is much harder to audit. The auditor needs to catch the behaviour at the time it is occurring. If the auditor does not make a special effort to be present at relevant times the behaviour will be missed. This is why behaviour on night shifts is notoriously less compliant than on day shifts. Given that the VIPs were touring according to their own schedule, it was far easier for them to plan to audit conditions than behaviours.

There is a second reason VIPs preferred to audit conditions (24/8/10:120). They were very concerned not to interfere in what was going on – they did not want to disrupt activities. The decision to limit their time on the floor of drilling rig was explicitly motivated by this concern. They were also aware that, because of their senior-

ity, any interventions on their part had the potential to undermine the authority of the managers on board the rig. Their policy therefore was to audit as unobtrusively as possible, which on the whole meant not examining too closely what people were actually doing.

A third reason for not inquiring too closely about what people were actually doing was provided by another BP executive who was interviewed at the Joint Inquiry but who was not one of the VIPs on the tour. “You are managing a group of professionals who have very clear responsibilities” (25/8:156) he said. The implication here is that to question what they are doing is to doubt their professionalism, which this man was clearly unwilling to do. He was asked (25/5/10:88):

“How would you ensure that people [who are] answering to you are actually doing their job if you're not doing spot checks or having some type of accountability to make sure they're doing what you're paying them to do?”

He answered:

“We would check with people what they're doing but this would go down through the chain of command. So you know, I wouldn't necessarily go direct to a single person, I may go to his manager (and ask) Are we on track? Are things going OK? Are we managing the way we should be?”

There are two problems with this approach. First, the questions suggested in the previous paragraph are so subtle that the manager may not even pick up that he is being questioned about the competence of his subordinates. The other problem is that if the manager himself is less than competent in some respect, he will be unaware of any similar deficiencies in those he manages. This appears to have been part of the problem on Deepwater Horizon. Be that as it may, there is an obvious reluctance here to test competency by engaging directly with the people concerned. This attitude was almost certainly present in the minds of the VIPs touring the rig, which meant in particular that the lack of competence of those engaged in the pressure testing went unrecognised. President Obama said after the oil spill that henceforth government agencies would need to “trust but verify” that oil companies were doing the right thing. Perhaps senior executives need to apply the same philosophy to their subordinate managers.

There is at least one qualification that needs to be made to the preceding observations about non-intervention. One of the VIPs did say: “if we happen upon someone who appears to be doing something extremely critical (read “dangerous”) we might take the opportunity to have a conversation with them. But otherwise we don't cross any barrier tapes and we don't interfere” (29/5/10:190). In other words if something stands out from a distance as dangerous, he would take some action. An example might be seeing someone working at height without a harness. But as this man suggests, this is an exception to the general, self-imposed rule.

4.2. Major hazard risk

Another quite distinct factor contributed to the failure of the VIPs to focus on what was going on that afternoon. To understand how this operated we must first make the distinction between occupational safety, sometimes called personal safety, on the one hand, and process safety, on the other. This corresponds to a distinction between conventional safety risks, that result in relatively high frequency, low consequence events (e.g. slips trips and falls) and major hazard risks, that give rise to low frequency high consequence events (e.g. explosions). It is important to recognize that, because process safety disasters are rare, they do not contribute to workforce injury statistics on an annual basis (Hopkins, 2008, chapter 6). However, BP evaluated its own safety performance and that of its contrac-

tors on the basis of LTI rate and TRI rate (26/5/10:365–5). For important practical purposes, then, safety for BP and for Transocean personnel was synonymous with occupational safety.

The senior health and safety manager for BP drilling operations in the Gulf of Mexico confirmed this at the Joint Inquiry. He told the Inquiry that his focus was on occupational safety, not process safety – that was a matter for engineering authorities (26/5/10:395). Safety for him was about whether the job of pushing the button or turning the wrench had risks specifically for the person carrying out this action (26/5/10:432). By implication, whether pushing the button or turning the wrench was the right thing to do in the circumstances, whether it might lead to an explosion, was not his concern.⁵

This was the general mindset the VIPs took with them to the rig. Their informal safety auditing activity was focused on occupational safety, not process safety. Hence they were highly focused on things that might cause injury to an individual – a slip hazard, a faulty harness, house keeping not up to scratch. They were not at all focused on major hazard risk and made no efforts to ascertain how well it was being managed (e.g. how effectively the reduced pressure test was being carried out) or whether people were following procedures that were designed to protect against major hazard risk (e.g. monitoring mud flows). These matters lay outside the scope of their informal auditing activities.

This one-sided concentration on occupational or personal safety has been identified as a contributor to many previous process safety accidents, including the BP Texas City refinery disaster of 2005. It remains an issue for BP and was one of the underlying reasons for the failure of the VIPs on that fateful afternoon, to recognize that the rig was on a path to disaster.

5. Summary

The informal auditing activities of the VIP group on Deepwater Horizon were limited in two ways. First, they tended to focus on conditions rather than behaviour, partly in order to avoid disrupting ongoing activities. This meant that the VIPs avoided looking in detail at the behaviour of people who were engaged in well operations that afternoon. Secondly, the focus of safety for these VIPs, as well for their companies, was on managing conventional safety hazards, not major process safety hazards. Again, this diverted the group's attention from the operations that were underway. Had the VIP group not been limited in these ways it is very possible that they would have identified some of the mistakes and non-compliances that were occurring at the time of their visit, and intervened in such a way as to prevent the accident.

6. Stopping the job

Before moving on, let us reflect a little further on the concern shown by the VIPs not to disrupt on-going activities. One of the behaviours that BP and Transocean were trying to instill in their workers was that they could and should stop the job when something was amiss. People who stopped the job for safety reasons were acknowledged and even rewarded (22/7/10:7), and witnesses said that stopping the job for safety reasons was relatively common (26/5/10:450). However, in all cases where the job had

been stopped, the issue was a perceived risk to an individual, such as a risk that an object might be dropped on someone. Witnesses at the inquiry were not aware of instances where drilling or other well-operations had been stopped for safety reasons. This issue was highlighted by the evidence of one of the mud loggers (7/12/10:79–83). He had been “uncomfortable” about the simultaneous operations that were making it difficult for him to monitor mud flows in the hours before the blowout, but it did not occur to him to try to stop the job, even though he knew in general terms about the stop the job policy. He said later that he should have stopped the job. There are a number of reasons why the stop the job policy does not in practice apply to major hazards,⁶ but the point to be made here is that the behaviour of the VIPs unwittingly reinforced this interpretation. If the job was too important to be interrupted by VIPs, the subliminal message was that one would need a very good reason indeed to justify stopping the job. In this way, the concern of the VIPs not to disrupt rig activities undermined the stop the job policy in the case of major hazard risks.⁷

7. Imagining a more effective executive safety auditing strategy

The limitations of the VIP auditing on Deepwater Horizon challenge us to think constructively about how these executives might have gone about their informal safety auditing in a more effective way. Here are some suggestions.

First, prior to the visit they would have reminded themselves of the major accident events that were possible on the rig. Sometimes, if executives are not experts, they may need to be briefed about this. One of the executives on this tour was indeed provided with a briefing about matters he could discuss. The briefing included such things as the productivity of the rig (non-productive days and days per 1000 feet of drilling), but apparently no reference was made to the possibility of blowout and questions of well-control (26/8/10:157).

Second, they would have reminded themselves (if necessary, asked for a briefing) about the controls that were supposed to be in place to prevent such events, and they would have made a mental note that, should circumstances allow, they would seek to verify that one or more of these controls was working as intended.

Third, just as executives on this occasion briefed themselves beforehand on previous occupational safety incidents on other rigs, with a view to seeing whether lessons had been transferred, they would have briefed themselves on previous well-safety incidents, for the same reason. In this case the North Sea incident, four months earlier, would have led them to pay particular attention to whether the rig was monitoring the fluid flows in and out of the well.

⁶ The mud logger chose not to stop the job in part because he did not perceive an immediate threat (7/12/10:238). This is perhaps the nub of the problem. The control of major hazard risks depends on the concept of defence in depth, which requires that there be multiple barriers or checks in place. The problem is that the failure of any one of these is usually not perceived as increasing the risk significantly. It is therefore hard to argue that the failure of any one barrier is sufficient to stop the operation in its tracks.

⁷ I was once asked by a mining company CEO to take safety culture soundings in several of the company's mines. I was told I could stop mining in order to talk to workers if I wanted to. So, at one mine I asked that the whole operation be stopped in order to talk to miners at the face. This was resented by the miners themselves, whose bonuses were at stake, so nothing much was gained from this conversation. On arrival back at the surface I was greeted by the mine manager who first asked what seemed like a ritual question about whether I had identified any issues that required his immediate attention. His duty done, he went onto tell me quite aggressively that the stoppage I had requested had cost \$20,000 worth of production. I was shocked. If he was willing to speak in this way to me, a representative of the CEO, it would be a very brave miner who tried to stop production for safety reasons. I am reminded of the work of the sociologist, Harold Garfinkle (1967). He suggested that the best way to understand the rules that are implicitly operating in a social order is experimentally to disrupt them. The manager's reaction to my disruption of his social order demonstrated the power of the production imperative operating at this mine.

⁵ These comments reveal a crucial weakness in BP's approach to safety. It is no doubt true that BP's engineering authorities had a role to play in process safety, but that role was restricted to engineering decisions. They were not responsible for whether or not workers were complying with safety critical procedures such as monitoring mud flows. These are essentially behavioural issues that escape scrutiny in the approach as outlined. One solution may be to extend behaviour safety programs to cover behaviour relevant to process safety, such as compliance with process safety procedures.

Fourth, regardless of the North Sea blowout, given the fundamental importance of the mud monitoring for the safety of the well, at least one of the visitors would have dedicated himself to observing this process. He would have discovered that it was not happening, and would have raised the matter immediately with the installation manager.

Fifth, they would have inquired about what was happening on the rig before they arrived, so as to be able to take advantage of any particular auditing opportunities the might arise. They would have discovered the rig would be pressure testing the well while they were there. As a result, at least one of the visitors would have decided to monitor closely this testing process. They would have asked people to explain at every step along the way what they were doing. This is certainly an interventionist approach, but it is not necessarily a disruption or distraction to what is going on. Indeed it may focus attention more effectively on what is going on. Admittedly it may slow activities down, but that is surely the prerogative of a senior manager, and it may be a necessary price to pay if managers are to assure themselves that all is in order. On the afternoon in question it would not initially have slowed things significantly since there was considerable debate occurring about what should be done.⁸ Of course, when it finally became apparent that the well had not passed the reduced pressure test, the existing timetable would have had to be abandoned. As it was, the concern of the VIPs not to disrupt what was going on could only have reinforced the view that speed was the all-important consideration.

Had the executives not been expert drillers, they might not have been in a position to understand what was going on. In such circumstances it would have been appropriate to include an expert drilling engineer in the party, who might have acted almost as an interpreter for the visitors. The high status of the visitors, coupled with the expertise of the “interpreter”, makes this a surprisingly effective auditing strategy.⁹

8. Conclusion

Management-by-wandering-around is a widely recognised and advocated activity (Buckner, 2008; Frankel, 2008; Peters and Waterman, 1982). Such walk arounds are not always focused on

safety. But where they are, as this one was, executives need to plan their strategies carefully. One very important activity is to talk to employees in such a way as to elicit from them information about what might be going wrong (Hopkins, 2008, pp. 116–119). Very often they are the ones who know best that something is amiss.

But just as importantly, senior executives need to engage in their own informal auditing, making sure to sample the detail. Trevor Kletz puts it thus:

After an explosion managers have often said, “I didn’t know that the employees were not following correct procedures. If I had known I would stopped it”. But it is the manager’s job to know that correct procedures are not being followed. They can only do this if managers, at all levels, look at details from time to time. A helicopter view is bad management. All you see are forests. If you want to know whether or not the forest is healthy you have to land the helicopter and look at the twigs and leaves.¹⁰

The VIPs on the Deepwater Horizon were certainly sampling the details. But it was a biased sample – biased towards conditions rather than behaviours, and biased towards occupational safety. As a result, they failed to sample details of how well the rig was managing its major accident hazards. This paper has suggested ways in which they might have done that more effectively.

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⁸ Various readers of the unpublished version of this paper have suggested that an approach by VIPs asking probing questions might be a distraction. My response is that if the task is time-critical then certainly VIPs would need to avoid interfering and perhaps wait for an appropriate time. But the people on the Deepwater Horizon were not in a time-critical situation. The BP well site leaders and the Transocean toolpusher spent more than an hour discussing the anomalies and arguing about the meaning of the various signs. A VIP could easily have joined this group, initially as an observer, without hindering the process.

⁹ I once had the experience doing an informal audit of compliance by electricity line workers with safety procedures. I did not know what I was observing but I was accompanied by an expert who understood very well what going on, and in the course of one morning we discovered several cases of unsafe behaviour arising essentially from inadequate procedures.

¹⁰ Personal communication.