



DYNAMIC POSITIONING CONFERENCE
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RELIABILITY

DP Management Philosophy

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1. Introduction

In 1998 a significant milestone was established, when the RB Falcon owned DP production vessel, the Seillean was upgraded for operations in Brazilian waters. An extensive DP upgrade was required and it was decided that in line with normal DP practices and to a degree client requirements a process of DP capability based verification should be undertaken. This verification covered all issues from DP capability to FMEA and trials and personnel competency. As a result there was a relatively painless acceptance of the vessel into the Brazilian waters a very significant benchmark in the DP Management process.

Since that time other R&B Falcon units have been exposed to a similar process of verification and trials for operations in the same area. As time has progressed, the standards demanded by this verification and testing process are being supported by a developing DP Operational Management System.

This paper is based upon what has to date be proven to be a necessity to enable the high risk DP Drilling operation to be maintained at an acceptable risk level whilst the demands to go to deeper water and harsher environments are ever increasing.

1. What is a DP Management System

As a definition of active DP management I would offer the following;

“A dynamic process of communication, between the onshore and offshore specialists, based in striving to achieve a standard of best industry practice, using a framework of operational practices and procedures derived from proven operational experience.”

The conception is that through such a system operational confidence is established which will produce that magic product “uptime”

2. Objective of this Paper

This paper is entitled *DP Management Philosophy*, the slow evolution of the process has been covered. The reason to sustain this evolving process will be covered through the following topics;

Integration of DP and Drilling to DP Drilling, The DPO and the Driller

Deepwater Locations - Systems and Support.

People and equipment - Age and Ability

Practices and procedures – Credible Standards

Reporting - Open and Accurate

Harnessing resources - Integrating Management

DP Operational management - Need & Viability

1. Integration of DP and Drilling.

In the late 1970's and early 1980s one of the last seafaring barriers was breached. Oil and water were starting to mix, the Deck department and the Engineers were not only sitting at the same table, but were starting to talk a similar language. Integrated bridges were being designed, a major barrier was disappearing. Simultaneously many of the larger shipping companies were introducing shipboard management, the reason behind this was to place some of the decision making with the people at the sharp end who had a major ability to influence the profitability of the unit.

Going back in history Shipping companies were of note as being the hardest task masters, apart from work houses, and because of their reputation certainly in the UK their failings were recognized and brought under control by governmental legislation and the UK Merchant shipping Act. This has since been re-enforced through the International Maritime Organization, and the policies that the flag states agree, on a world wide basis.

It terms of history, the drilling industry is in it's infancy compared to the shipping industry, it's members have had a similar employment reputation as the shipping industry. However the drilling industry is changing very rapidly, far faster than it's marine counterpart. Hence the combination of the Drilling and Marine industries has brought to life a product of two very hard task masters, each with their own established way of going about their own high risk business.

The DP Drilling industry has brought together two strong bedfellows both of which believe they know how to run their business to the best end, it has also put these bedfellows on the same small piece of steel beyond the day to day visibility of the onshore base.

Offshore DP drilling units are hence operating with two distinct disciplines, each pursuing their business in the best way they know. Both the Drilling and DP disciplines carry an equal risk to make or break the units, and their Company's reputation.

It is reasonable to say that at any one time corporate reputation and profit depend upon the relationship between the Driller and the DPO; the two persons with access to a significantly important large red button. Both these individuals may at any moment have to make a very rapid decision whether to act or not, and upon their decision lies company reputation and future employment prospects.

It is absolutely imperative that the DPO and the Driller are aware of each other's activities and have confidence in each other. These two individuals must build a bond of trust and understanding to ensure

during times of crisis or high risk each will act upon the others directions without question or delay, if circumstances dictate.

The DPO and Driller above anybody onboard a DP Drilling unit must develop a good working relationship and good communication and at least each should have an outline understanding of the other's job together with an understanding of each others significant operating criteria. How many DPOS have actually been to the Driller's Work-station, are they aware of the complexity of control systems now in that area. How many drillers are aware that the DP desk is but a part of the overall watch-keeping process that has to be maintained on a marine unit, particularly in a harsh weather environment. The pressure on both persons is extensive, and it is not until operations start to diverge from a normal operating condition that the benefit of an understanding about each others job will help both these critical personnel to communicate and possibly save a disconnect.

As an illustration of the benefit of such good working relationship it might be useful to relate the following occurrence.

On board a particular DP drilling unit it was established practice for the Driller going on tour to visit the bridge to check the weather. This activity had naturally led the DPOs and the Driller to develop a good working relationship and understanding of each other's role. It was shortly after the Driller had gone on tour that an ET decided to open a panel on the main bridge console and observe a certain PCB.

As the ET put his head into the console he was totally unaware he had touched a cable with a loose connection. To the Driller's consternation a Yellow and then Red DP Alert were initiated. There was no indication at the DP desk. Through his knowledge of the bridge personnel, plus his awareness of the current weather and hence thruster loads etc., the Driller rather than go for an unquestioned disconnect immediately contacted the bridge. It was confirmed by the DPO he had not issued a red alert, and a possible disconnect was avoided.

2. Offshore Location. - Systems and Support

The Offshore operation is bound in innovative technology, much of which is being used to the full extent as soon as it arrives offshore. Operational experience of this new technology is very often limited, and therefore there is a very heavy reliance upon the workplace personnel to keep it going. The old saying:

Give me machines anytime, they you can control,,,,,,,,,people you can't!!!!

Is possibly outmoded through the demand of a very rapidly developing industry. In addition of course much of the equipment is virtually only just out of the development and commissioning stage and it's performance over a period of time is as yet not totally understood or appreciated. Another well-used phrase that has been seen frequently in association with new technology is;

“in the light of operational experience”.

The offshore team, both drilling and marine have a huge responsibility maintaining the technology and the systems, and are often under extensive pressure to maintain the operation on schedule. Communication systems, no matter how sophisticated they might be, cannot remove the demand upon the personnel at the front end to not only keep the operation on track, but try to keep at least up to date with technical advancements if they are to be able to maintain the operational state of the systems in their domain. Irrespective of support through communication the Offshore team have a heavy burden on their shoulders.

In addition to the challenge of maintaining equipment on track the offshore team also have to provide assistance to the offshore commercial management of the contract and when necessary be able to extricate the operation from a possible contractual default through system failure. This calls upon all their abilities and skills to be deployed to ensure that the unit is not penalized. Many clients are now far more demanding upon unit productivity and uptime, and whilst the onshore support can provide very significant back up, it is often well after normal office hours when things start to go wrong and the offshore team feel the increasing demands of the clients rep. An example of this could be as follows;

"It's two o'clock on a Saturday morning in an Atlantic spring, an unexpected weather front has come through and a surface current has increased to 3 knots, a thruster is down for maintenance, yet the client is demanding a cement job is commenced. For good measure the DP Operator reports he has lost the DGPS reference systems due to scintillation, and then a 10-cent connection on a thruster feedback panel fails and another thruster is lost. This is the time when all the skills of the offshore personnel are called upon, and whilst maybe the rig manager might get a call, all the world of communication cannot help the team on board, where a stream of commercial and operational decisions have to be made. In such an event a set of formally issued guidance, or operating procedures, will assist the decision process to be clearly defined for both operator and client. The ability for both client and operator to have agreed guidelines covering certain operations or technical equipment failures will not only demonstrate corporate commitment to

minimize risk but also reduce some of the decision process required by those offshore and enable the remedial activity to be thought out within these guidelines.

From the above it is therefore clear that to assist the offshore operation there must be guidance documentation in existence to assist the decision making process, but it is absolutely critical that such documentation is relevant to that vessel at that time. Guidelines/ rules establish the boundaries for operations, without such a framework in place there is always a risk of:

“doing our own thing”

How many units, for the want of clear undisputed guidelines, or standard operating procedures are "doing their own thing" in one way or another to ensure employment? A measure of this will be downtime incidents and lack of productivity.

It must be the duty of the onshore support to clearly identify suitable operating standards and ensure systems are in place to maintain these standards. Standards can easily be set, but only by open communication between the offshore unit and supporting onshore management and the relevant onshore technical specialist will there be any confirmation that compliance is in place and company risk is being minimized. Formal auditing, and offshore visits is of course another method of system verification.

3. People and Equipment - Age and Ability.

The DP Drilling industry has expanded rapidly, this has demanded a rapid injection of manpower from the respective marine and drilling industries. In many cases units have been put into operation with a crew comprising of personnel who have never experienced the integrated DP Drilling operation.

There has been a major learning curve to be climbed and in some cases this has been done at cost, due to lack of experience, on not only the offshore side but also the onshore support.

Due to something of a down turn in other parts of the world and sometimes other commercial incentives there has been movement of personnel from other DP and Drilling activities to new builds, and conversions bringing with them some degree of experience. The relevance of experience within a particular operational context is often open to question. An example of this would be a long-term experienced jack up hand on a small DP mono-hull unit, faced with a transatlantic passage. To his credit the individual did return and try his best but vessel motion was a major factor that effected his workplace activity. There is also the case of the long term experienced North Sea mariner used to fishing boats and

the like, that could not cope with the height of the vessel structure above the waterline. Sadly he returned to the North Sea. The point is made however, are the personnel not only suitable for the job, but also suitable for the environment.

Not only should it be evaluated if the personnel are suitable for the role and the environment, but is the experience they bring suitable for the equipment they are to use? There is a host of high powered shiny new drilling units out upon the oceans, there is also a very significant fleet of mature units, being nurtured by possibly an aging but highly experienced team of personnel, that are aware of every quirk and peculiarity of their own unit.

Hence there is a sharply contrasting picture of brand new equipment with a predominance of new Personnel, and the more mature units, some over 20 years old with a slightly more mature manning profile. Ideally there is benefit in spreading experience throughout a fleet, but at what risk to the more quirky operations that demand a high skill level. There is some evidence that suggests, on the new vessels the quality of the hardware, and indeed software, often make up for experience, but on the old ladies the reverse is very much the case. This is simply evidenced by looking at a two vessels on location in the South Atlantic. One is a large DP III unit, with 40 Megawatts of power and five azimuth units, the other is a mature Pelerin class drill ship, with possibly 20 megawatts very maximum and 5 tunnel thrusters and two main props. Due to power limitations on the mature unit heading change is a frequent occurrence with all the traumas it brings in maintaining the unit over the well.

Hence I have highlighted experience of people and the relevance of old and new equipment. We must be careful and achieve a right balance of operating personnel to ensure there is a satisfactory level of operating experience onboard the units and that at the same time personnel can gain experience to help them progress through the operation. A stagnant workforce with little hope of advancement will be of little benefit to anybody, and eventually will depart to seek fresh grounds and advancement elsewhere.

If nothing else a significant factor of a management system must be to encourage and develop personal experience in readiness for promotion. It is a form of investment that is absolutely critical if operations are to continue with minimal risk. As the 10,000 foot water depth becomes a thing of the past and vessels go to deeper depths the experienced personnel must be retained. The transfer of personnel to a DP drilling unit from a more conventional unit can have problems, in addition the nature of the occupation and the unit may place more restrictions upon the suitability of personnel.

In the case of Marine Personnel there is an additional requirement due to essentially International Maritime Law and the requirements for Certificates of Competency. The acronym STCW (Standards of Training, Certification and Watch-keeping) is well known by the aging mariner, and hated by the recruitment departments due to it's complexity, but it does provide the international guidance on seafarers standards of competency. It is also a fact that underwriters would pay close attention to a vessel that is not correctly manned in the event of an incident, and therefore the marine manning of vessels has to be correctly structured. However whilst to many a Marine Department as such may be seen as a new development these personnel do bring their own skills and experience in a marine environment.

It should also be remembered that from the first day of DP the mariner has provided the support to the core money earner, which has been the design activity of the vessel, ie diving, accommodation, construction or drilling. The significant difference is however that whilst offshore the marine function remains in the supporting role, onshore the support is from the design activity experienced personnel in place of marine personnel. There is absolutely nothing wrong with this although it does overload non-marine background personnel with a lot of decision processes to which they will be unaccustomed. A formally structured DP Operational Management system should provide great assistance in these decision-making processes in the offshore drilling company, provided it has credibility with the offshore team.

4. Practices and Procedures – Credible Standards

It is inevitable that without standard practices and procedures there will be a likelihood that an operation will become personalized and out-with the limits of credible risk. Alternatively by over emphasizing such procedures there is also the risk for the “monkey see monkey do” attitude to prevail which has it own risks and allows no leeway for “practical common sense” to prevail. This term alone will probably bring a sense of horror to the purist, but good practices and procedures must contain such an element if they are to remain operationally viable. From a corporate standpoint there has to be a single company philosophy for the DP Drilling Operation supported by a unit specific operating manual.

These manuals must be available to and read by all supervisory marine and drilling personnel if they are to be of benefit. Essentially these guidelines will provide the unit with specific guidance on the level of DP operating standards that the owner believes should be maintained in the pursuit of a safe operating condition. These documents must also be accurate, in plain English and to the point.

In some respects the adoption of such standard documentation may be seen as a reduction in the offshore team's responsibility. However it is also an indicator to the offshore team that the company requires credible operational standards to be met, and indeed realize that in some instances they will incur downtime through the desire to minimize such risk. An example of this may be such an item as pre-location arrival check lists, which might take in the region of some hours to complete, but will have been identified as the last verifiable check that the vessel systems are ready for a prolonged period of DP operations.

The background of such a Corporate DP Drilling guidance Policy should be international standards and the highest industry practice if the company wishes to remain a significant worldwide operator. In addition another driver is the increasingly demanding pre acceptance audits and trials that many operators are requiring. All too frequently a significant corrective action list has to be closed out prior to the vessel being allowed to operate. By adopting a company standard in line with a high level of industry and regulatory requirements much of this pre-qualification down time will be removed and the vessel should proceed to work at an early date.

5. Reporting - Open and accurate

Reporting and communicating are absolutely critical to the pursuit of a low risk operation. Incidents of one form or another do occur and will continue to occur, and whilst each unit will learn from its own problems, on a corporate basis the problems of one unit must be shared with another to reduce a re-occurrence throughout a fleet.

In addition to fault reporting, regular structured reporting on a monthly basis should also be conducted to ensure that onshore management is aware of the vessels current operating criteria and any potential shortfalls. ie, is there any system or piece of equipment non operational that effects the vessel redundancy, have critical spares been processed are reference systems fully available, are software systems operating correctly? Such a report to be of use to the vessel and the company has to be open and accurate, and issued to the various onshore support groups for action or information as appropriate.

If it is apparent across the fleet there are common failures then another information process has to be established identifying such common occurrences and the possible fix.

This process of communication must not be one way, the various departments onboard the unit have taken time and trouble to put the report together in a structured format, it may identify issues that have to be

addressed immediately. In other cases the experienced reader may detect some possible root cause failure that could have a major impact, and has not been noticed by the vessel. In other cases a fix for a particular equipment failure may have been devised that would be worth promulgating to the rest of the offshore fleet.

The structured communication and reporting system will not only indicate to the offshore team that they have access to the onshore specialists, but also the fleet-wide experience will grow as information is formally transmitted around the units. Such a flow of information will also encourage a far better sense of team effort and belonging to a recognized and actively involved management team.

6. Harnessing Resources - Integrating DP Management.

The DP Drilling industry is slowly seeing the integration of the respective parents, although slow the pace is faster than that of the oil and water mix from ten years ago. The integration is borne out of the offshore requirements where two high risk industries have come together with their own extensive operational experience and onshore where the explosion of the drilling industry into the "shipping type environment" has highlighted the peculiarities of management requirements of the marine business.

The driver for the onshore management team is to ensure a safe and profitable operation within all the boundaries of international and state laws etc. Offshore the driver is similar and is maintained by use of the vast array of operational experience brought in by the unit's personnel.

Onshore however, the Rig manager or his assistant is suddenly having to not only deal with the usual day to day problems, but in addition he has a unit on his hands that can move under it's own power. A self propelled DP drilling unit is totally exposed to all the liabilities and consequences of International Maritime Law and marine liabilities. This could vary from the simplistic compliance with manning scales to the definition at law of "seaworthiness". This is a totally new experience to non-marine background personnel and undoubtedly requires specialist knowledge if corporate responsibility is to be limited.

Accepting that the requirement for an active DP Drilling Management system is recognized, it would therefore seem sensible that a possible way ahead may be to view the requirement for a management system from the offshore perspective. There is a huge wealth of experience offshore, if that experience is called upon it can only help to identify critical areas requiring structured supporting systems.

Therefore by harnessing the input from the offshore units and looking at industry and international standards a gap analysis would indicate a possible format for a DP Operational Management system to

meet the needs for the Onshore/Offshore DP Drilling organization, and be based in fact. In addition, by obtaining input from the offshore personnel, both good and bad practices will come to light and by education and communication the latter will be removed, and the management framework arising will have a solid basis in the operation.

Mariners have been aware for some years of the advancement of ISM and some companies have been proactive in the pursuit of setting standards in compliance with the ISM requirements. The DP Operational management system is nothing but a simple bolt on to any accredited ISM system but covers the formalizing of DP Operational Management with respect to the DP Drilling operation.

Within any such system however there have to be not only credible systems but also credible people and it is a fact that there is sometimes a communication barrier between personnel of differing disciplines, which often goes hand in hand with a lack of appreciation of each others abilities. The human factor cannot be quantified but in any such DP Drilling management system the requirement for the presence of the specialists is critical, to ensure the expertise of all disciplines is available at all times and particularly during any crisis.

7. DP Operational Management - Need and Viability.

This paper has been borne in fact, some of which may be recognized. The initial conception happened about 2 years ago as has been related. In 1999, RB Falcon management decided to adopt an identical formal DP verification and testing process for a new DP deepwater drilling unit destined to work in Brazil. This unit presented a major challenge, but with total commitment from both the project and the rig manager, and a great deal of blood, sweat and tears from third party consultants, the vessel crew, technical specialists, and indeed the client themselves a significant number of potential major DP issues were resolved. On arrival in Brazil, the vessel was presented to the client for DP acceptance trials, which it passed with little problem.

During this period there was considerable work with both the client and the vessel crew to evolve credible operating procedures and station keeping criteria in line with the forthcoming operations. A similar procedure was adopted for other units and as time progressed these formal operating procedures became the basis for a credible company policy. Further development continued of company procedures based upon what had been proven to be practical and sensible operating criteria.

It was therefore apparent that a formal structured approach to the management of the DP Operation was emerging through a desire to not only establish clear operational guidelines, but also to minimize downtime for client acceptance audit and trials.

The benefit of having some structured guidelines, although in their infancy was clear. Indeed the increased risk due to a lack of such guidelines on other units was also clear. It was accepted there was a case for a DP Operational management system.

Earlier this year RB Falcon Management recognized the need of implementing such a DP Operational Management System. The implementation process was clearly defined with three separate stages.

1. Conduct a review of both the Corporate and Unit DP operating policies, with respect to the full management spectrum from HR issues to Operational practices.
2. Identify a suitable format for a DP Management system, which will capture and enhance the existing corporate policies with internationally recognized DP Standards. The system had to dovetail into the existing ISM philosophy.
3. Initiate such a DP management system and verify that all areas involved are actively complying with it, by means of audit.

Initially the process undertook a technical review of all the company's DP units using as a background a standard of "Best Industry Practice. This "BIP" was developed for deepwater DP operations from 18 established DP practices evolved to cover other high-risk operations by the IMCA (International Marine Contractors Association). A suitably experienced DP project team was established, comprising of the author and two consultants from Global Maritime. This team had been associated with several of the previously mentioned DP verification projects, DP trials and FMEA projects. Through the need to meet clients operational demands for DP verification and testing the team had jointly been exposed through time to this evolutionary process and had already accrued a certain amount of knowledge of the onshore and offshore management system.

To date 11 vessels have been visited, and throughout, a structured interview process has been used to develop a data base which establishes a factual base for the establishing of a DP Operational Management framework. Marine, drilling, engineering and electrical staff were interviewed and it is apparent there is unanimous agreement that a formal management system is required to support the offshore operation. In

addition discussions with the offshore personnel have identified the priority areas for support and more importantly the process of two-way communication has commenced. A host of issues were identified as requiring attention, many of which had already be recognized by the shore management. It was obvious that some 100 people of 13 nationalities were saying with one voice, we need a DP Operational Management System, and the back up of experienced onshore support. In addition however by undertaking this project not only had a management system been initiated, but also some of the process had begun, by establishing the structure for communication, and exchange of views.

A DP Operational Management system was in essence being borne and gathering momentum, it was needed and was and is proving viable. Its impact is to provide credibility to the corporate fleet and also structured support to the offshore personnel using best industry practice as it's guiding criteria.

Conclusion

The work is not finished, but to date many of the items highlighted as needing to be active have been initiated, communication is happening as is reporting, there is active and ongoing operational management and exchange of experience. The system is developing, and it is interesting to note that the buy in by the units has been 100%. Onshore systems are being developed in consultation with the offshore units to ensure credibility. I look forward to seeing a mature Operational DP management system evolve that will cover a fully integrated and intelligent DP Drilling Operation and will also be sufficiently resilient to meet the contractual demands of our clients on a worldwide basis.

Author's Brief Biography

Captain Mike Easton has been connected with the sea since 1966 when he commenced an apprenticeship in the deepsea tanker world. After almost 20 years he regained some of his lost sanity and in 1985 transferred into the North Sea, and commenced learning about offshore support operations and harsh weather environments. In 1988 the author commenced his long association with Dynamic Positioning as master of a Class II DP Semi submersible unit undertaking diving, accommodation and emergency support functions, and operating virtually 365 days a year in the DP mode. Departing for shore operations in 1996 he remained closely connected with his former vessel but worked in providing her with the necessary marine support.

Therefore in both his lives the author has been closely in the world of DP Audits, FMEAS, capability plots, risk analysis, and also as another part of job the marine auditing of Drilling units and reviewing their operational and mooring characteristics.

Presenter's Biography

Captain Alan Adamson has a similar background as the author but left the deep sea operations for the world of the DP diving and construction operations in the North West European area of operations. After some years in this area he headed for a warmer and more demanding world in the deepwater DP drilling operation of Offshore Brazil.

After some years in this sphere of operation he joined Global Maritime in 1996 where he has specialized in the areas of DP Audits, FMEAS with particular reference to the operations of DP drilling units.