ABSTRACT

This paper portrays the advantages of utilising an 18-month “Fast-track” or Accelerated Assistant Driller’s Program for young people new to the Industry employed by a major drilling company here in South East Asia.

The challenge was to educate young people of different backgrounds, nationalities (Thai, Indonesian, Malaysian and Bruneian) whose practical and theoretical skill capabilities and language abilities in Tender Assist Drilling who have never come across such equipment before so that they clearly understood the design and functionality of their equipment on-board their specific rig.

Given that Drilling is not an easy subject for people to understand (especially those who are new to the Industry) the task of writing material especially suited for such people is not as easy as it may seem, since the bulk of material available on the subject is at too high and too complex a level. Also, there are very few books written specifically on the subject of Tender Assist Drilling as there are several units which have to be addressed: 1) The Tender and Anchor Winches; 2) The Umbilicals and Lines and 3) The Drilling Equipment Set mounted on the platform.

An 18-month E-Learning Program was considered the ideal solution for this training program since, through being bespoke, (i.e. written specifically for purpose) it could be clearly and unambiguously written. It could also dove-tail perfectly with the new IADC “Wellsharp” and IWCF well control training programs and the OGP Report No.476 which recommends certain enhancements to well control training.

That every trainee scored high marks in the the various sections both onshore and offshore is testimony to the fact that such an E-Learning Program is indeed the perfect training aide for young people coming into the Industry for the first time and is, furthermore, seen as an ideal standard for future training courses e.g. for Driller’s and Drilling Engineers for example.

OBJECTIVES

To show the structure of the 18-month “Fast-track” or Accelerated Assistant Driller’s Program; how it can quickly help with the training of new, young people coming into the Industry (as opposed to just sitting in the classroom) and how it dove-tails with modern equipment, practices, techniques and teaching the
difficult subject of well control (based particularly on OGP Report N. 476).

**BACKGROUND**

One of South East Asia’s leading, prestigious and forward-think Drilling Contractors based in Singapore and Kuala Lumpur had a requirement, in early 2014 (commencing in Singapore in January 2015), for a fast-track Assistant Drillers program which would take suitable young people through to the position of Assistant Driller within a period of approximately 18 months. As training providers, for both Drilling Contractors and Operators, IDEAS Singapore Ltd were approached to discuss the task.

![Figure 1: The young delegates and Trainers at the start of the Training program in Singapore, January 2015](image)

This was a challenging requirement due to the mixture of people. There were male and female personnel, people from a mix of countries i.e. Brunei, Malaysia, Thailand and Indonesia; differing English abilities; differing cultures; differing educational abilities (e.g. some had excellent engineering degrees from Leeds University in England and Heriot Watt University in Scotland. Some had not, having practical experience instead). There was a range of background skills and an age range.

Despite the differences, all were so keen to learn and hard-working; and all wanted to pass the course with flying colours.

Unique to the training programme was that all offshore training would be carried out on Tender Assist Drilling Units.
There is an excellent amount of well-written literature on virtually any variety of drilling subjects one might care to source and cross-reference. However, this is not true of well control material, particularly for young people at entry level. (IDEAS has been training drilling personnel for many years now on a variety of courses, including well control). Furthermore, post Macondo, Hercules and the K S Endeavour (where 2 more men sadly were killed in junction with 11 on Macondo, sadly, the Industry has really tried hard to promote the understanding of the subject as opposed to just passing and exam, and there have been many suggested improvements, not least those contained within the publication of OGP Report No. 476 for example.

Well control is also one of those subjects feared by many drill crew and even drilling engineers. Generally, it’s not explained at all well. A complex subject, which should be taught with sympathy and delicacy, it is often taught with all the finesse of a butcher in a butcher’s shop.

So, in order to a) reduce the student’s fear of well control, b) help them understand well control, c) achieve a high exam pass-rate, d) become more in-line with the post Macondo recommendations (e.g. OGP Report No. 476) and e) become more in-line with the differing levels of IWCF and the new IADC Wellsharp programs, IDEAS searched far and wide for the right material as regards BOPE (Blowout Prevention Equipment).

Generally, we found that much of the material readily available on the market and the material used by many well control schools wasn’t explanatory enough or wasn’t simple enough – in effect, it was neither well written nor was it at the right level.
The only documents / manuals which we could use was the Drilling Contractor’s Well Control Manual, API Standard 53, the British Petroleum “Barriers and Events” documentation and known facts pertaining to Hercules (Gulf of Mexico) and K S Endeavour (operating for Chevron, offshore to Nigeria). There was also the advantage that, apart from the delegates understanding their own company’s well control policies and procedures, they would also, at an early age, learn API Standard 53 and the well control aspects of the IADC Drilling Manual.

API STANDARD 53, IADC DRILLING MANUAL & CONTRACTORS MANUAL

At 112 pages long, of great vintage, containing 43 sections, 18 Figures and 11 Tables, API Standard 53 must be one of the clearest, most succinct and most unambiguous documents in the Industry. We also included several sections of the IADC Manual and the well-written Drilling Contractor’s Well Control Manual.

OTHER MATERIAL

We also used a wide variety of other reference material:

- The Institute Francais due Petrole: Drilling Data Handbook
- Manufacturers of certain items of equipment
- Drilling Data Sheets
- Applied Drilling Engineering
- Service Company Data Sheets (e.g. Motors, MWD / LWD)

E-LEARNING MODULES

E-Learning modules are an excellent way to learn anytime, anywhere and are regarded as being both highly flexible as well as informative.

There are a total of 3 E-Learning Modules to the Training Program, and it’s within the first module (Drilling Equipment & Systems) that reference is made directly to the heavy duty equipment. (Please see Figures 2, 3 and 4).

One of the main advantages of E-Learning is that you can keep repeating material if you don’t understand it the first time.

It’s also possible to cross-reference the E-Learning material with videos (which were built-in to the Modules) and other important documents such as the Drilling Contractors Well Control Manual, the IADC Drilling Manual, SPE papers, the Drilling Data Handbook, Equipment Data Sheets and Troubleshooting Sheets (e.g. the National 12-P-160 Pumps Trouble Shooting Guide) and Service Company Equipment Data Sheets such as MWD / LWD, Cementing, Bit Dull Grading Charts and Well Control Surface Stack Sheets. They can also be used during time off to facilitate learning.
Figure 2: The Tender T18 wins a 5-year contract for Chevron Thailand, commencing Q1 2014

The main reasons why the delegates were asked to study the equipment on board the tender first was to:

- Note the positions of the lifeboats
- Become aware of helicopter and crane safety
- Understand what type of equipment is loaded onto and off the deck
- To understand the anchor patterns and how they work
- To understand what’s below decks such as engines, generators, chemicals, mud pumps, the mixing hoppers etc
- To become familiar with the OIM’s, Company Reps, Toolpushers offices and Service company personnel
- To become familiar with all equipment below decks
- To note how transfers (e.g. casing) are effected to the Drilling Equipment Set
- To become familiar with the interface between the Tender and the DES (hoses, air lines, power lines etc.

Also, as this is one of the rare drilling courses which engenders and embodies Teamwork Skills (and how to liaise with people ranging from Floormen through to Pumpmen, Drillers, Toolpushers, OIM’s, Company men and Service Engineers (e.g. Mud Engineers) the Tender was considered to be an excellent starting place for the young delegates to develop and hone their inter-personal skills in-line with the Orientation classroom training given in January 2015 in Singapore, Bangkok in July 2015 and December in Kuala Lumpur in 2015. The last session will be in June 2016.
Having learnt as much about the Tender as possible and the linking of the Tender through Umbilicals to the Drilling Equipment Set, it was then time to understand the Umbilicals and the DES which here can be seen with the mast raced with drill-pipe over the platform.
PRACTICAL TASKS

Once the E-Learning Modules had been completed either offshore on the Tender or at home during time off (which would provide a good grounding in the subject material, the next set of tasks was for the delegates:

EXAMPLES OF OFFSHORE PRACTICAL TASKS

- Sketch where the glycol injection point is and where the glycol injection pump is. Explain to your Supervisor / Mentor just why the injection of glycol is so important during well killing operations. State what must injection pressure be and the flow rate of glycol.

- Sketch the hook-up of all of the lines and what the functions are of each line. State the Working Pressure.

- Draw the hook-up of the line from the cement unit. State when this line might be used and what its pressure rating is.

- Study the BOP / Diverter Control System and list your observations. State the function of the Control System. State how actuation of the valves at the choke manifold is carried out.

- Find out what is inside an accumulator bottle and what the principles of operation are. Explain the operation to your Supervisor / Mentor, particularly the pressure / volume relationship.

CLASSROOM TRAINING

Once the E-Learning Modules have been completed, the next major task is for the Offshore Practical Tasks booklet to be completed (examples given directly about). This whole cycle of E-Learning and Offshore Practical Tasks takes 6 months, and then its Classroom time for one week. The first day within the classroom requires that the delegates discuss and present their previous 6 months training. This work is assessed and marked by the Training Manager and his Assistant, with marks being duly recorded and logged.

The next 4 days are a mixture of Powerpoint material (including Drilling Operations and Teamwork / Soft skills, videos, studying written material and carrying a variety of tests which are all duly graded and handed to the Training Manager at the end of the week. This is often seen as one of the fun parts of the course for the delegates, particularly the Teamwork sessions, which are conducted by IDEAS’ organization / industrial psychologist.

Examples of such psychological Teamwork Exercises are:-

- The psychological make-up of an individual
- Personality assessment review
- Understanding group dynamics
- The work environment

Again, the marks are recorded and entered into the overall scoresheet by the Training Manager’s Assistant.

Interestingly, there is not much difference between the University Graduates (who studied Engineering) and the non-graduates who typically take more of a practical approach to the problems they are set as opposed to, in many cases, a theoretical approach. Nonetheless, when the Graduates and Non-Graduates work together, they work marvelously well.
CLASSROOM TRAINING EXAMPLE

Figure 5: Reviewing the Choke Manifold

One of the key advantages of carrying-out Classroom Training examples is that difficult subject areas (shown here for example is an offshore Choke Manifold) is that we have the time to discuss, in class, through photographs, slides, sketches and schematics on the whiteboard exactly what is what, why it does what it does and how the routing of the valving and the pipework works.

For example, it’s all very well for the Accelerated Assisted Driller to study the Choke manifold as shown here, but the changes are, because things move quite fast on the drill-floor, he/she may be seeing other things too, for example:

- Making-up certain critical BHA components (E.g. Motors, MWD / Jars etc)
- Breaking-out certain BHS components (E.g. Motors, MWD / Jars etc)

In this regard, he/she may not focus upon the Choke Manifold because the Driller / Toolpusher wants him/her to focus upon tripping. Yes, for sure, in the classroom, the delegates can “slow down” and focus upon, as is the case presented here, the “Choke Manifold”.

Here we see that learning isn’t just from a text book. We see that it’s from text book, getting your hands greasy, talking to the Driller, talking from the Toolpusher and drawing diagrams. In other words, there are many, many ways in which to learn.
RESULTS & OBSERVATIONS

IDEAS’ personnel have been teaching / lecturing / assisting people since the days of Noordijkerhout in Holland from 1989 onwards.

Since that time Graduates have been taught in Aberdeen, making use of the former drilling rig and wireline rig sites at Montrose, Scotland, classroom facilities and “self study facilities”. 2008 saw assistance given to a variety of Operators and Drilling Contractors in Singapore, Australia, Indonesia, Malaysia, Vietnam, India, the U.A.E, Pakistan, Egypt, the U.K. and Angola with a variety of courses. IDEAS also taught on the MSC in Offshore Engineering under the expert tutelage of Professor Andrew Palmer (formerly Professor of Mechanical Engineering) at Cambridge.

Without doubt, this is the best course we have had the pleasure to both write and teach. Management’s vision of including “Teamwork” / “Soft Skills” is a first. And, perhaps not surprisingly, its one of the delegates most enjoyable aspects of the course.

Sadly, of the original 13 course delegates, 2 have been lost: 1 to acute sea-sickness and one due to personal reasons, which is a great shame. Nonetheless, the remaining 11 are doing fantastically well, and are on-track to a marvelous career in the coming years.

CONCLUSIONS

This course is truly excellent. The ad-hoc / hand-written material by approximately 30 people IDEAS
Staff world-wide (principally the U.K. North Sea, Dubai, U.A.E and Singapore is but one principal reason. The Staff of this major drilling contractor in Asia should be justly proud of their initial concepts, guidance and hard work. Their results will soon be garnered. Good luck to everyone!

ACKNOWLEDGEMENTS

This course would not have been possible vision the visions of the management team of this world’s largest Tender Assist Company, based principally in South East Asia. Grateful thanks also go to all the Driller’s, Toolpushers and OIM’s who have helped these hard-working young people they are destined to become: Assistant Drillers first – then – literally, the sky’s the limit. Thanks too for Scott, Sound Engineer, for all the recordings in Scotland, U.K and all the IDEAS Staff who wrote (Powerpoint and Documents) and loaded the material onto the tablets.

The encouragement from the top senior management was marvelous and the first meeting with HR and Operation key person tought IDEAS to listen to what the client needs: rather that say what they think the client wants. This was both Eileen’s (Business Development) and Lucia’s (GM’s) skill.

BIBLIOGRAPHY

A wide variety of material was used for the construction of this course. The following documents are the principal documents referred to: -

1. Drilling Contractor’s Well Control Manual
2. Various SPE Papers on Tender Assisted Drilling
3. Various Papers and Guidelines on IADC Wellcap Plus Well Control
4. Various papers and Guidelines on IWCF Well Control
5. IWCF Well Control Formulae
6. IWCF Surface Stack Kill Sheet (Vertical Well)
7. IWCH Surface Stack Kill Sheet (Deviated Well)
8. OGP Report 476 Well Control Advances
9. IADC Drilling Manual
10. Drilling Contractor’s Advisory Sheets
12. Techsheets – Service Company (e.g. Drilling Fluids, MWD / FEWD, Solids Control, Jars, Dull Bit Grading, Directional Drilling)
13. Stuck Pipe Prevention, Hole Cleaning and Hydraulics
14. Jarring
15. Tender Assist Drilling Rig Resign.