

## MINERAL DRILLING ASSOCIATION of AUSTRALIA INC

### Current Directors are –

Peter Wright – President  
James Colby, Wayne Clohessy, Tim James, Kenneth Macleay, Paul Mander, (Steve Shine), Greg Stagbouer, Brenton Wallace, Graeme Wallis

Contacts President – Tel 9311 5600, peterw@ausdrillnw.com.au  
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### INFORMATION BOX

|                       |    |
|-----------------------|----|
| Contractor Members    | 22 |
| Supplier Members      | 22 |
| Company Members       | 12 |
| Individuals           | 8  |
| Other Members         | 6  |
| Honorary Life Members | 2  |
| Total                 | 72 |

### FROM THE BOARD

New members this month are Fluidstar represented by Dan Quinn, and we have received applications from CKA Risk Solutions, with Eddy Pope as their nominated representative and Eureka 4 WD Training, who will be represented by Ray Harris.

There was no Board Meeting in April.

### FROM INDUSTRY

As many people will know, Barry O'Connor, "Mr Champion Compressors" retired shortly after the symposium and his chair has been filled by Ian Tessman. The following media release has been received.

### New product manager for Sullair portable and drill compressors

Australian compressed air specialist, Champion Compressors, has appointed Ian Tessmann as the company's product manager of Sullair portable and drill compressors. Tessmann brings 22 years of compressed air industry experience to the role, and has been instrumental in providing Sullair's innovative portable compressed air solutions to a wide range of industries.

"The Champion Compressor team of dedicated compressed air specialists provides customised solutions for a variety of industrial applications throughout Australia," said Tessmann. "The Sullair range of portable and drill compressors are designed and engineered to deliver the superior reliability and performance required for continuous operation in hot, humid, and dusty conditions.

According to Tessmann, the true value of Champion Compressors to its Australian customers extends well beyond its products. "The use of Sullair's range of portable and drill compressors is rapidly expanding throughout Australia's construction and mining industries," said Tessmann. "Our technical support specialists provide a country-wide network, offering global-quality solutions at a truly local level."



Ian Tessman, Champion Compressor Sullair portable and drill compressor product manager.

### Company background

Champion Compressors Pty Ltd is an Australia-based designer and manufacturer of industrial rotary screw air compressors especially designed for harsh environments.

A subsidiary of the Sullair Corporation, Champion Compressors also offers engineered compressor solutions, plus an extensive range of vacuum systems, air treatment systems, water chillers, and hire/rental services. The company's Melbourne headquarters and manufacturing facility is supported by seven branch offices (incorporating five airend rebuild facilities), 11 distributors and more than 70 field service units.

An ISO9001/2000 company, Champion Compressors is a market leader in Australia, and has an expanding presence in Asia, Africa, South America, and the Middle-East. The company's customer base includes large-scale corporations and smaller entrepreneurial enterprises. Sullair is a division of the United Technologies Corporation (UTC), a global aerospace and building technologies group.

### Technical enquiries

Ian Tessmann, Sullair portable and drill compressor product manager, Champion Compressors Pty Ltd  
Telephone: +61 7 3276 3519  
E-mail: [itessmann@champcom.com.au](mailto:itessmann@champcom.com.au)

### Fluidstar Expands to Western Australia

Fluidstar, an Australian drilling fluids company based in Brisbane, has recently expanded to Western Australia. FluidStar, established in 2003, is primarily involved in the development and supply of drilling fluid additives to the mineral exploration and waterwell industries. Manager, Dan Quinn, has for many years been involved in senior roles with Australian Mud Company and M-I. Other FluidStar sales and technical personnel include David Williams and Max Tuesley.

Quinn says that he believes there has been a trend in recent years in the region, for the large oilfield mud companies to downscale their direct support of the non-oilfield drilling industry, and this led to a situation where Australian mineral exploration contractors were left with limited options on mud products and services.

Mineral drilling contractors require their mud suppliers to be responsive and flexible on logistics, field technical support, training of new crews, pricing, and new product development. Quinn concedes that his main competitors do a pretty good job in most of these areas, however, Quinn believes that FluidStar now provides some options where, in his opinion, for a long time, none existed. Quinn contends that contractors now have a choice in mud additives and the technical back-up that goes with them. FluidStar has introduced some new products and ideas, and has focused strongly on field support.

Quinn admits that the very large WA mud market will not be easy to break into, but he believes that, if FluidStar can reproduce their achievements over the past couple of years, accomplished by their hard work and commitment, customers in WA will see the benefits of a competitive environment and, will in return, hopefully give FluidStar some support. "We're certainly prepared to earn a share of the mud business. There are some very large mud sales happening in this buoyant market and very few players, so we don't think we will be stepping on anyone's toes", said Quinn.

Fluidstar stockpoints will soon be available in Perth and Kalgoorlie. For further information, please contact Dan Quinn (0400 195 406), David Williams (0437 180 007), Max Tuesley (0448 751 790), or Todd Sneddon (0448 851 656).

**FlexIT introduce the new direction in downhole survey tools. GYROSMART® Field tests a huge success**

**The GyroSmart uses Imego's MEMS gyro sensor**

Claes Ericsson, founder and owner of Swedish company FlexIT, has been in the downhole surveying industry, manufacturing instruments for 32 years, developing a range of leading-edge multishot survey instruments that are now in daily use in exploration, mining and engineering projects around the world. With the GyroSmart tool, he has once again created what many thought was impossible.

The GyroSmart downhole survey tool has been designed in co-operation with a development team from Imego AB, which is an independent contract research organization engaged in sensory systems development.

Not since 1974 when Ericsson first introduced the Fotobor®, has such a revolutionary design change in downhole surveying equipment been developed and made available to the mining and civil engineering industries, as has now occurred with the GYROSMART survey tool.

The GyroSmart uses Imego's highly advanced MEMS (Micro-Electro-Mechanical System) gyro sensor. This is known to the market as the IBG10, Imego's digital Butterfly Gyroscope, and is licensed exclusively to FlexIT for borehole surveying.

The size of the gyro sensors is remarkably small and, to the surprise of the testing team, the results out-performed all their expectations.

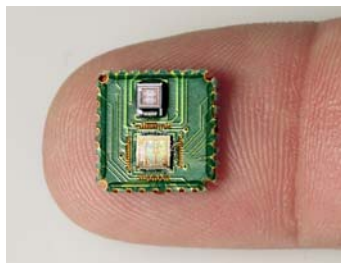


Photo: Manoo Eibpoosh/Imego

The sensor package is so small it fits on your index finger



Photo: Manoo Eibpoosh/Imego

GyroSmart : the size of the electronics section

**Testing the GyroSmart**

To prove the functionality of the GyroSmart, two prototype tools were run at a test facility in Sweden in early April 2006 to a depth of 790m. The hole had been drilled to 800m at a dip angle of -55 degrees with the top 100m of the hole steel cased, ranging in sizes from 300mm to 76mm, thus creating a challenge for any survey instrument.

The GyroSmart instruments were housed in standard 38mm brass running gear, and run In and Out of the hole at a speed of 20 metres per minute. At each 10 metre survey station the GyroSmart was held steady for 10 seconds allowing the system to become stationary before moving to the next station. The total time taken to survey In and Out the 790m drill hole was 1 ½ hrs.

Unlike other Gyro Systems, the GyroSmart requires no surface calibration. The surface computer and GyroSmart are initialized through blue tooth communication within seconds. For the purpose of the trial and due to freezing conditions at the surface, the GyroSmart assembly was placed in the water-filled borehole for approximately 10 minutes to stabilize to the in-hole temperature.

**The results**

**Repeatability**

From 6 x 790m In and Out runs:  
Azimuth 0.39°  
Inclination 0.26°

**Accuracy**

| Data  | Average data from 8 x 790m surveys In and Out runs | Reference Survey | Differences  |
|-------|--|------------------|--------------|
| Azim  | 30.98°   | 31.09°           | <b>0.11°</b> |
| Incl  | -45.09°  | -45.12°          | <b>0.03°</b> |
| North | 9960.16m   | 9960.29m         | <b>0.13m</b> |
| East  | 1682.41m   | 1682.54m         | <b>0.13m</b> |
| Elev  | -605.25m   | -605.12m         | <b>0.13m</b> |

**Statistics**

The differences between In and Out surveys were used to produce a total of 7 sets of difference data for both Inclination and Azimuth.

The basic statistics (Mean and Standard Deviation) were calculated for each for data from 0 to 790 metres and from 150 to 790 metres (to lie in the zone of the holes unaffected by the initial cased section).

The mean of the Standard Deviations for all the Inclinations and the Azimuths were calculated to show the average variation for these items overall:

| Station range | Inclination Std.Dev. (deg) | Azimuth Std.Dev. (deg) |
|---------------|----------------------------|------------------------|
| 0 - 790 m     | 0.26                       | 0.39                   |
| 150 - 790 m   | 0.14                       | 0.29                   |

This shows:

- 1) An improvement in data quality if the "bad" initial section is removed from the calculations.
- 2) An average Standard Deviation of 0.14 for Inclination. This is almost at the level of resolution for the GyroSmart.
- 3) An average Standard Deviation of 0.29 for Azimuth. Twice the level of Inclination but still a very low variation between surveys.

Further information and a full transcript of the press release may be obtained from –

Claes Ericsson  
[info@flexit.se](mailto:info@flexit.se)  
Ph +46 707 170 575  
[www.flexit.se](http://www.flexit.se)

Mike Ayris  
[mike@downhole.com.au](mailto:mike@downhole.com.au)  
ph +61 (0)409 289 285  
[www.downhole.com.au](http://www.downhole.com.au)

As a matter of academic interest, Claes Ericsson was awarded the Polheim Prize in 1993, by Sweden's Engineers Association for his development of the Maxibor instrument.

The citation for the award included "Claes Ericsson's creative engineering capacity, combined with drive, his willingness to make sacrifices, and an unswerving belief in his idea, resulted in an ingenious solution to the mining and civil engineering industries measuring problems. Claes Ericsson's development of the MAXIBOR qualifies him well for the 1993 Polheim Prize".

Forty four developments and the individuals behind them have received this prestigious prize since it's inception in 1878.

Source – Reflex Instruments AB.

**HERE and THERE**

There is a great deal being said about skills shortages and training, so it was felt the following reprint of a paper presented at the symposium by Karl Malitz, a graduate Geologist working for Xstrata Copper at the Ernest Henry Mine would be of interest.

It should be pointed out that the opinions expressed are those of the author and do not necessarily reflect the opinions of the

MDA, or any Director, or of the Board in common.

### The title of Karl's paper was

**"Graduate Geologist, No Experience"**

#### INTRODUCTION

In the mining and exploration game, many graduates from Australian geology degree courses are lacking significant knowledge about drilling or its hazards. I believe this is due to the lack of educational components covering this field in the degree courses. The degrees and courses are purely academic in content, and provide students with knowledge mainly suitable for an academic path. Skills that are not generally taught are the ones fitted for industry, the ones that get us jobs and improve the industry as a whole.

Drilling is an essential part of our industry; it is the one that provides us with the information to find the next big deposit but, at university, very little is taught about the safety or the workings around a drill site. It is not until we end up working in industry that we suddenly realise what is going on, and get taught, sometimes through accidents, what is safe, what is not, and how to prevent accidents from happening.

#### TRAINING IN DRILLING

From a small survey of some of the major universities in Australia only one has shown some form of drilling contained within a course. Not all universities were contacted and as such the results should be taken as a small representation of the major universities which produce geological graduates.

The University of New South Wales offers a course which covers some aspects of drilling, mainly focused on coal exploration, but it does provide valuable general knowledge about the drilling industry. The University of Ballarat, does offer a comprehensive course in geology, though drilling is not highly in any detail within their courses. Methods of drilling are discussed briefly, though safety is not discussed. Students, however, can take some courses in drill and blast (mine scale drilling).

Monash university students have very little exposure to the drilling industry, though they do use drilling data for exercises. Safety is an aspect that is not even touched on in coursework.

The University of Queensland does provide a general degree in geology through a Bachelor of Science, with a major in geology. However, within this, only one course comments on differing types of drilling, which mentions drilling in, and for, coal and gas regions.

One part of the brief survey for this paper found that most students out of these universities do not have much practical or theoretical experience around drill rigs, let alone any experience in the aspects of safety.

Fresh university graduates are full of 'knowledge' but is it the correct knowledge for the job? They will be able to tell you what mineral is what, but do they truly know what hazards surround a drill rig? The short answer is no. We are trained at university to read books and manuals, books and diagrams and, from all this, to make a judgment on what is good, and what is not good drilling. Students are rarely placed into the position where they must make financial decisions about where to drill and budgeting, but are generally placed into the position of looking after operating drill rigs.

Stories in this industry about fresh graduates being very cocky are not uncommon. You hear stories about graduates telling drillers that they are doing it all wrong, and that they, the graduates, are doing it all right. Moral of the story – some graduates think they know more than they do.

When students leave university, the best idea about drilling that most of them have, is that it involves a large drill that either produces a core product, or rock chips. Little is known about how to get the sample out and what to do with the sample once retrieved.

Drilling techniques, RC, diamond and RAB are all fancy names or acronyms that some students are familiar with, but have little idea about what is involved. If they have little knowledge on the technique, they will have little to no concept about what can go wrong, and how quickly.

Orientation systems such as BallMark, spearing and pen orientation marking, are generally mystery concepts to graduates, who have even less idea on how this information is used to orientate core. Once graduates start working in the industry, they then gain the knowledge and experience they desperately need. The question is, is it too late for this?

Safety is one of the aspects about which many students lack knowledge, and it is not until we enter the industry that there is a large shock to the system in this regard. Everything is about risk management, high pressure hoses, rotating drill rods, noise, dust, visibility and what may go wrong. Little do most students know how fast these things can go wrong.

#### PERSONAL EXPERIENCES AS A GEOLOGIST

I wanted to become a geologist because it gave me a job with an outside view of the world, not from the inside of an office. My career as a geologist started with a degree in Applied Geology, at UNSW in Sydney. I graduated with a Bachelor of Science with a double major in Geology with Honours Class 2 at the end of 2004.

My professional experience started with a stint in Xstrata Copper Exploration as a vacation student, and then moved into a Graduate Geologist position at Ernest Henry Mining. My experiences around drill rigs are few and far between.

As a pre-university introduction into the minerals industry, I was able to work at a small gold mine in central Victoria. A high school student at the time, I was fortunate to work on a small RC rig doing some short holes (around 200m). As the youngest person there, and the most energetic, I was successful at the fantastic job of sampling. I can remember walking away from that rig dusty, dirty and very tired, and I began to hold great respect for the drillers.

During my university career, my courses mainly focused on the rocks behind the drilling, not the drilling behind the rock. My university time focused on the background of geology, the minerals and mineralisation of ore deposits, with little experience or exposure to drilling.

On one field trip we had the chance of looking at a diamond drill rig on a prospect north east of Cobar. With the focus of the trip based on geology and not drilling, only a brief look at the rig was taken, along with all the flies, dust and noise. A "This is what this does" look at the rig was completed, though not much information was forthcoming about the safety or the intricacies of the rig.

The best university training that I had on drilling was portion of a course which focused on coal exploration drilling. This portion of the course contained detailed information about different drilling methods and their benefits, and both cost and sample integrity for all the methods. This gave me the most knowledge about drilling, and the differing techniques.

In one of my final year subjects we did do a small exercise on drilling and the costs of doing the drilling. With figures given to us, we tried to calculate the cost of a program, though these days I realise that the numbers were grossly undervalued. This exercise gave a clear indication of how little some academic staff are in touch with the industry.

I have chosen to start my career with a focus on Mining Geology, which has given me a small focus on drilling operations. Compared to my exploration based colleagues I do not have much exposure towards diamond/RC drilling. We have had drill rigs on site, both RC and diamond, which have taught me a lot about drilling and, in particular, safety. Talking to the operators about how they are going, what the drilling is like, and if there are any problems, has taught me about working together with drillers to have a better outcome for both the clients and the business operators.

The greatest thing that has happened to me is on-the-job training. The best way I have found to begin to understand drill rigs, is by asking general questions about the running of the rig and rig safety. General questions like these have taught me a lot about rigs and working around them.

I have also been very fortunate to sit in on just a small portion of the course run by David Stevens, named "Drill management for the Geologist/Non-Driller" out of Central TAFE, Perth WA. This is a well designed

course with many practical thoughts added, suitable for the likes of myself, from a fairly theoretically minded point of view. It contains fantastic images and diagrams focused on a safety theme, with great practical suggestions and ideas about keeping our rigs safe when on site.

### **RECOMMENDATIONS FOR THE INDUSTRY**

Once they walk out with a degree and leave the academic life, most graduates tend to go into industry. Few graduates actually pursue a higher degree, the PhD or Masters. Out of my class of twelve, none have continued onto a higher degree and, from the previous graduating year, only two (in a class of around eight students) have gone onto a higher degree. This meant most of us were heading into industry. Once in the mining or exploration industry is where you learn the "industry way" of doing things; business, jobs, learning and practical skills.

There are a number of recommendations that I would make to the drilling community to better work with the 'others,' the geologists.

- Most universities teach their graduates in a way that prepare them for an 'academic' career. A career in which graduates are taught to think the way of the university – funding and papers. What the universities need is a spin on reality. Graduates walk out of their degree courses with little to no knowledge of safety around rigs and no skills on drill management. Focus on these must be improved before graduates come into the industry, so that they have more of an idea about what happens in the real world.
- Universities should try and change the mentality that graduates know everything. We are trained up to be the best, and this carries on through to the next stage, which generally is industry. If this sort of ideology is taken through with university graduates, there can be only one outcome, a cocky little graduate.
- The drilling industry should in fact assist the new graduates, to train them into the geologists that industry requires. Universities are there as a learned community, and many people within this learned community do not think that it is their responsibility to teach graduates about details on drilling. If this is the case, it needs some pressure from the drilling industry to convince those who go into the industry to take a course in drilling, especially in safety and operational issues.

One method of ensuring this training occurs is to implement courses such as the TAFE course run by David Stevens on Drill management for the Geologist/Non driller into universities.

### **CONCLUSIONS**

Moving forward for a better bonded industry is essential. With the mineral industry

booming like it is, one can only think about what tomorrow might bring. As drillers become harder to come by, contracts become more expensive, and graduates become more ignorant, one can only imagine what it will come to in the future. What both the mining/exploration industry and in particular the drilling industry needs to do is to pressure the universities to teach university students the basics about drilling, with a particular focus on the safety issues surrounding drill rigs.

If the institutions will not teach these things, then I believe it is up to the industry as a whole to educate us, the geologists of the future. Yes we get some training when we get into industry, but is it too late? We should have some training before we end up in industry, as it would make us better team members and geologists for the future.

#### *Acknowledgments:*

The author would like to thank the following people for their communications on subjects and courses:

Professor Colin Word, University of New South Wales, Sydney.

Dr Ian Cartwright, Monash University, Melbourne.

Dr Stafford McKnight, University of Ballarat, Ballarat.

Dr Massimo Gasparon, University of Queensland, Brisbane.

Note - a table in the original paper has been omitted from this reprint due to insertion difficulties

The course "Drill Management for Non Drillers", mentioned by Karl, has recently been run at Central TAFE for two groups from Minara Minerals and a further group from Rio Tinto Iron Ore.

### **HISTORY**

A couple of interesting photographs sent to me by Robert (Bob) Fahey, Principal of International Drilling Consultants.



The sign reads –

**YANDI EXPLORATION OFFICE**

Relocated from Mining Area C's old Packsaddle Exploration Camp 2002.

Previously 8 man sleeping quarters, converted to Geology/Mapping Office in 1994.

Originally obtained by Goldsworthy Mining Ltd in the 60's from the Snowy Mountains Hydro-Electric Scheme construction project of the 1950's

Heritage Listed Donated by BHP Billiton Iron Ore Exploration Group.

Bring back any happy memories ?