

THE DRILLER

Official Publication of
The New Zealand Drillers
Federation Inc.

MARCH 1991



TOUGH SYNTHETIC BEARINGS

Many New Zealand engineers in all aspects of their profession are familiar with Thordon elastomeric bearing material as it has been marketed in New Zealand for some 16 years by Dominion Construction and an enthusiastic network of distributors.

Developed in the late 1960's by Thomson-Gordon Limited, Canada. Thordon was first exported in 1971 and now goes to over 40 countries, this synthetic polymer alloy was hailed as the first technological innovation of its type in decades and has won wide acceptance and endorsement and in many industries. Thomas Gordon have continued to explore the limits of synthetic bearing technology with Thordon and market these new developments as progress has been achieved.

As a mark of future commitment and to bring even greater emphasis to market support, the Thordon Division of Thomson Gordon Ltd became a separate organisation as from 1st September 1990, now being known as Thordon Bearing Inc.

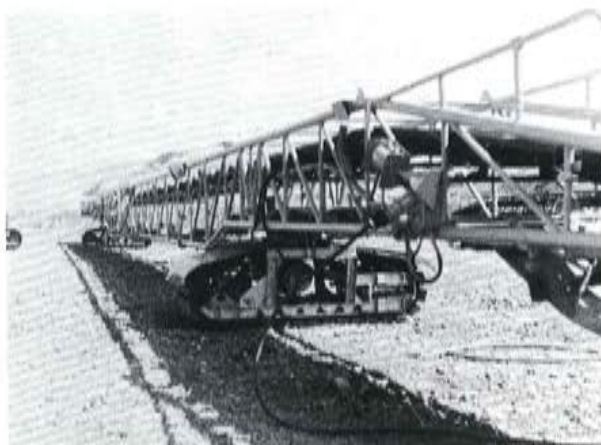
Thordon is well regarded in many fields, but its initial market was the mining and forestry industries in Canada where an opening for a tough, hard wearing, but flexible bearing material was perceived, mainly to replace bronze by resisting excessive wear from abrasives and deformation from pounding action. Thordon still has these attributes but in addition these days we have a material that can run dry or use water (slurry) as a lubricant, as well as oil or grease in the usual way. Since Thordon has been marketed in New Zealand for some 14 years many of the applications for it have been developed here in New Zealand.

Several of these developments are of interest to drillers, particularly as the recent direction of development is towards higher load bearing installations using thin wall materials that can be bonded into place.

As a guide to possible applications in the drilling industry here are a few examples:-

Trucks - spring shackles bushes, king pin bushes, air brake cams and other suspension components.

Cranes and Jibs - trolley wheel



Salt Works 'Harvesting' Mobile Conveyor

bearings, slide surfaces and wear strips.

Pumps - many pumps can take advantage of Thordon's properties, in fact several manufacturers use it on an OEM basis in production. This includes submersible pumps for intermediate and bottom bearings (not motor end bearings).

Mixers - Thordon is used as a maintenance replacement bearing in a wide variety of mixers, for muds, many chemical slurries and pastes.

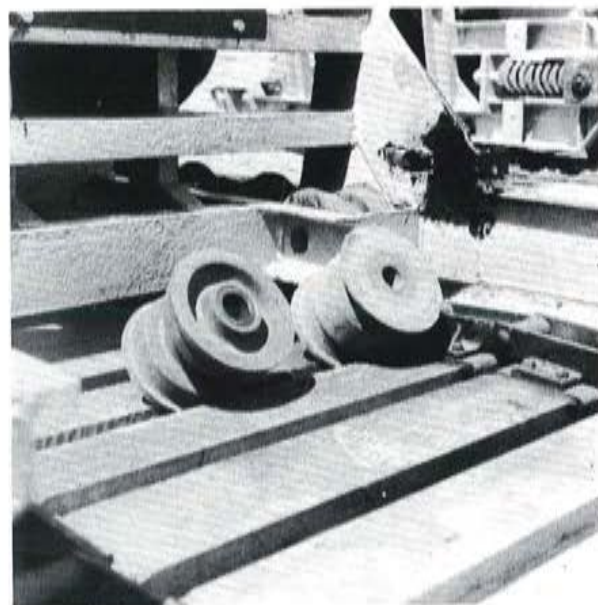
Winch bearings - we haven't tried this one but it has to be an option to consider. Certainly well proven on Total Support Vessels in the North Sea are similar bearings and Stern Rollers handling cables, anchors and buoys.

A typical installation involves individual bearings 582mm diameter x 330mm in length with a wall thickness of only 15mm

fitted to stern rollers 1500mm in diameter by 3000mm long with a maximum load per bearing of 175 tonnes! No lubrication here, just the occasional dip in salt water - no problem.

Whilst we are limited by Thordon's physical properties within this range its application is only limited by our collective imagination, so the list will never be complete.

Ideas, sizing calculations and other technical assistance can be provided by your local Thordon distributor or by contacting Dominion Construction direct.



Mobile Conveyor Track Rollers with Thordon Bushes

MANAWATU - WANGANUI REGIONAL COUNCIL INFORMATION FOR POTENTIAL BORE OWNERS

The Manawatu-Wanganui Regional Council manages the underground water resources in the region. To enable council staff to efficiently manage this resource and update the underground water data archive, the following conditions must be satisfied.

1. The Council is to be informed about the expected completion date of new bores if the proposed water use requires a water right¹. This is necessary to arrange interference tests to be carried

out at minimum cost if an objection to the water right application has been received.

2. All underground water data (borelog, water quality, aquifer test) on new bores and work done on existing wells is to be forwarded to the Council by well drillers. Borelog, water quality and aquifer testing requirements are listed on the reverse of this form.

3. A threaded socket is to be

provided on all new bores to enable Council staff to carry out pressure or water level measurements.

¹ A water right is required to take underground water for irrigation, industrial and municipal water supply use. No water right is needed for taking groundwater for basic domestic, stock or fire-fighting use or for small takes which do not exceed 15m³/day. If you have any questions or need further information contact the Council's Consents Administrator on (063) 79-009.

SYNFUEL FIRST TO BUY INTERGRAPH'S HUGE 27-INCH MONITOR

Petroleum development firm invests in New Zealand's first 27in screen

December 5 1990: Synfuel is the first New Zealand company to purchase one of Intergraph's new 27-inch monitors.

The monitor, which has 2-megapixel resolution, provides twice the display area of a 19in screen with twice the number of pixels. This means it can display larger portions of a design file with no loss of resolution.

It is specially suited to CAD and 3D modelling, where its exceptional resolution gives shaded and ray-traced models a startling degree of realism.

Synfuel is the world's first commercial supplier of petrol produced by natural-gas-to-gasoline technology. At present it supplies about a third of New Zealand's petrol.

The company is a long-time Intergraph user. It started with an Intergraph 751 VAX-based system, and later added three InterPro workstations and 386-based PCs. All are networked, and run Intergraph's

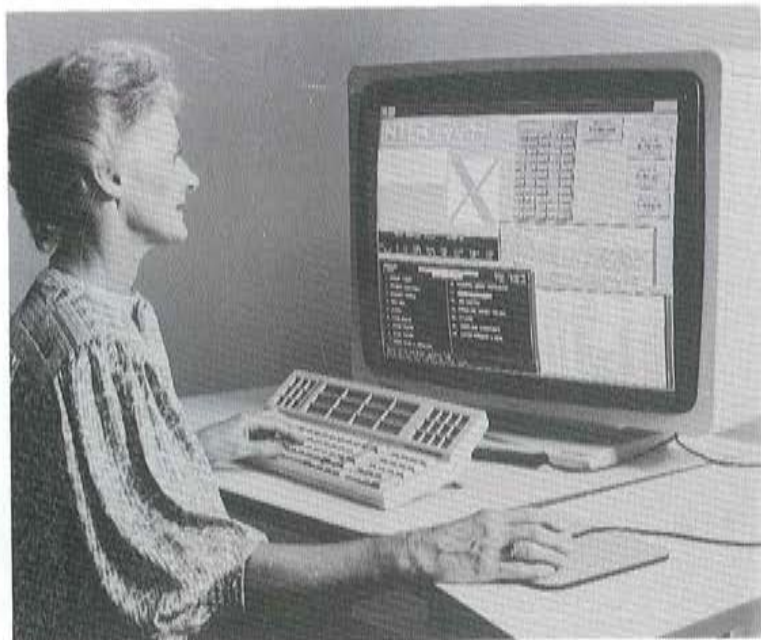
MicroStation™ design software.

In conjunction with the 27 inch monitor the firm has purchased a new InterPro Series 6000 workstation. This will be used as a network server and CAD workstation.

Steven Carrie, Synfuel's drawing office supervisor, said the firm had initially looked at a range of CAD packages, but found that Intergraph's MicroStation and Plant Design System packages best suited their drafting and design needs.

"We use our CAD system for designing pipes, process flow diagrams, electrical drafting, and for instrumentation loop drawings. We've found the Intergraph system increases the reliability of our designs, as well as speeding the design and drafting process overall," Mr Carrie said.

"Intergraph recently substantially reduced prices on a lot of their hardware. This persuaded



us to purchase the 6000 series workstation.

"The addition of the InterPro 6000 will allow for greater utilisation of our CAD system both now and in the future.

Mr Carrie said Synfuel had initially considered PCs as a way of expanding the firm's CAD capabilities.

"We looked at getting highly configured PCs. But by the time you added all the extras like a

high resolution screen and add-in cards for graphics and speed, it would have been much more expensive than buying Unix workstations.

"Not only that - a PC simply isn't a workstation, no matter how many things you add to it. The Intergraph workstations were built for graphics and for technical applications. Even the fastest PC will take a long time to do something a workstation can do in two or three minutes."

DRILLING QUALIFICATIONS

Driller Practice Certificate Examination

This 3 hour examination is held on a Saturday, mid-November each year.

The Open Polytechnic of New Zealand can supply the lesson material for those wanting to sit this examination. The course uses the Australian "DICAT" textbook and audio tapes to deliver the lesson material and the student works from this to answer 15 "user friendly" worksheets, one for each chapter of the book. There is also an assignment to do on New Zealand Legal requirements for Drillers.

The only condition for entry into the examination is the Open Polytechnic course must have been completed. Successful examinees will have their pass acknowledged but may have to wait to get their Certificate as it is only awarded when they can produce evidence of 4 years drilling industry related experience with at least one year as a rig operator.

Dicat Certificates

Because the Open Polytechnic uses the DICAT material developed in Australia, students completing the course become eligible to be awarded a DICAT Certificate (recognised throughout Australia). No examination is required. A student however will have to wait a short time until the Open Polytechnic can arrange with DICAT for their certificates delivery.

Course Costs

Currently the cost (1990) for the course is \$385.00. Of this amount \$133.00 is the Open Polytechnic charges and the remaining \$250.00 the cost of the textbook and tapes which becomes the property of the student. Fees however are forever increasing so anyone interested in taking this course should first contact the Open Polytechnic to get an update on fees.

For information write to: Dave Fisher, The Open Polytechnic, Private Bag, Lower Hutt.

INTERGRAPH BACKGROUND

Founded in 1969, Intergraph Corporation now offers a product range from PC-based CAD software to Unix workstations and complete VAX-based CAD/CAM systems. Total revenues in 1989 were \$US860 million.

The company is best known as the world's largest specialist developer and manufacturer of CAD systems. It has become a major participant in the Unix workstation market.

Intergraph manufactures its own RISC chip set, the Clipper. This is used in all its Unix workstations. The Clipper comes in 5, 10, 12.5 and 20 mips versions.

Up to the end of Dec 1989, Intergraph had shipped over 34,000 Clippers, more than any other RISC chip vendor.

In 1989 Intergraph spent more than \$90 million on R&D, em-

ploying 2000 people in research.

The company has installed nearly 4000 large VAX-based graphics systems worldwide including 41,000 workstations and terminals. It has over 100 large CAD sites in Australia.

The company provides systems for all CAD applications: mapping, architecture, electrical and electronics, mechanical, civil and structural engineering, technical publishing, plant design and facility management.

In New Zealand, the company has sold large CAD systems to DOSLI, Alcatel STC, Auckland Regional Council, NZ Rail, Mobil, Cadabra Applied Computer Graphics, GECO Designpower, Warren & Mahoney, Auckland EPB, Synfuels, Land Information NZ, Mark Petch Seals, Southpower (MED), Petrocorp, Waitemata Electric Power Board and the University of Canterbury.

Drilling an active volcano



Proposed drilling site for the research hole on the plateau area of White Island.

An agreement signed recently between the DSIR and the Geological Survey of Japan provides for the first major joint project — drilling a 600m research hole down into White Island, a volcano located off the north-east coast of New Zealand.

This agreement which covers co-operation in the field of earth sciences was signed by DSIR's Director-General Mike Collins when he accompanied the Prime Minister to Japan in July.

The decision to drill was largely due to the contribution volcanic-hydrothermal source fluids make to the formation of many geothermal and ore depositing systems. Most of the geothermal areas presently developed for power production are located in active volcanic belts, but occasionally acid waters seep into wells and make them unsuitable for further energy production. This seepage is likely to happen after deepening or prolonged discharge.

The immature acid chloride-sulphate waters form by absorbing magmatic vapours into deeply circulating groundwater, generally at depths well below those reached by the wells. To devise techniques which prevent or avoid these acid waters entering the wells, it is necessary to understand the processes which convert the acid, oxidising magmatic fluids into neutral, reducing geothermal fluids. Eventually, it may be possible to exploit these geothermal fluids, or even magmatic heat directly, for power production.

White Island represents an ideal opportunity to study these processes. It is a typical example of the volcanoes most common in New Zealand, Japan and around the Pacific rim generally. It houses a well established volcanic-magmatic hydrothermal system, where both magmatic and hydrothermal fluids are able to be sampled. The volcano is also in a state of continuous, quite high

but manageable activity and is easily accessible.

The drillhole is expected to provide detailed information about the distribution of liquid and vapour phases and minerals within the magmatic to hydrothermal transition zones as well as the chemical, physical and geological processes governing their composition. For further information contact Dr W. Giggensch, DSIR Chemistry, Private Bag, Petone, Wellington. Ph: (04) 666 919, Fax: (04) 694 500.

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Dominion Construction Company Limited

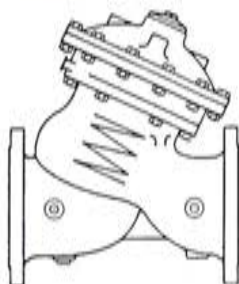
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Thordon

E.D.S. LAUNCHES MARK II RIG

Earthmoving Drilling Supply Co. is launching the sale of a new truck-mounted, auger drilling rig on to the New Zealand market.

This Australian manufacturer aims to sell its new Mark II E.D.S. 900 rigs to the New Zealand building and construction, mining and exploration and electricity supply industries.

The new model incorporates electric remote controls to regulate all hydraulic functions.

The director of the company, Mr Wayne McGuiness, says, "We are confident we can compete successfully on the New Zealand market, having been for many years a leading manufacturer and supplier of truck-mounted rigs in New South Wales."

Mr McGuiness says, "Our Mark II incorporates not only the latest technology but also many other improvements derived from the extensive and varied field applications in which E.D.S. 900 rigs have been employed for nearly a decade."

Since the Sydney-based company began making E.D.S. 900 rigs in 1981, these rigs have been used in many building construction projects throughout NSW.

Mr McGuiness says, "Since the E.D.S. 900 was introduced, it has developed into a proven contractor rig, being robust, versatile and efficient - with the original rigs still operating as efficiently today as they were when new."

Electric remote controls coupled with load sensing valves regulate the hydraulic flow required to perform any function of the rig, and so adjusts the hydraulic power to the rig's drive motor.

So the engine and pumps work only to the extent required, thus saving fuel and reducing wear and tear and maintenance.

Mr McGuiness says, "Electrics over hydraulics gives fingertip control of all functions."

"The introduction of electric remote controls is the greatest advance since the introduction of power steering," he says.

Proven and tested components of the truck-mounted rig remain: A six-cylinder Perkins engine powers the rig; four rugged, truck-mounted, hydraulic jack legs can lift the truck and rig entirely off the ground; the auger turns on a superb-rib Kelly bar driving through a heavy-duty crown wheel and pinion.



E.D.S. 900 Mark II.

A 1.2 metre slide rail combined with a full-circle turntable enables the auger to be quickly aligned over a hole position and often allows more than one hole to be drilled before moving the truck. The fully enclosed circle turn enables the rig to rotate through 360 degrees without the auger fitted and 270 degrees with it.

The E.D.S. 900 drills to a depth of nine metres normally although when used with a service winch it can drill as deep as 15 metres.

As a result of considerable interest in E.D.S. rigs by some South-East Asian countries, the company presented an audio-visual display and exhibits over four days at Sibex '90, the South-East Asia International Building Exposition in Singapore in May this year.

Earthmoving Drilling Supply Co. Pty Ltd is at 155 Magower Road, Girraween, NSW, 2145; phone (612) 636-1155, fax (612) 688-1470.

OBITUARY

HOFFMAN, Jack Edward — Passed away March 6, 1991 at the Mary Potter Hospice. Cherished husband of Joyce. Loved father of Wendy Wells (London), Noeleen Clifford and Edward. Respected father-in-law of Keith Clifford and Roger Wells. Loved grandfather of Monica, Jonathan, Elizabeth and Caroline. "In my house there are many mansions and I go to prepare a place for you". RIP Requiem Mass will be celebrated in the Church of St. Vincent de Paul, The Rigi at 1pm on Friday March 8, 1991 and thereafter interment at the Whenua Tapu Lawn Cemetery.

At its last meeting the Federation's Executive discussed the following matters - Transit N.Z. tendering procedures. The meeting noted with concern how in the past tenders had not been called for some contracts, but instead work had been offered direct to Works Consultancy Drilling Section. However it was noted that from October 1990 all Transit N.Z. work had to be put out for public tender. Members were requested to monitor the situation.

1990 Conference - the meeting expressed thanks to Conference Convenor Bain Webster for what had the makings of an excellent programme. Special thanks was paid to Trade Exhibitors for their support of the Federations Conference Driller Magazine - the meeting noted that whilst the Federation's resources did not now go to publishing on a regular basis a glossy magazine. The pre-conference

EXECUTIVE DECIDES

issue had been fully sponsored by Long Year N.Z. Ltd. The President urged members to seek sponsorship for future issues as the magazine was a valuable communication medium to all members. Particularly those who could not always come to conference.

Finances - the Secretary reported that the Federation though only a small body, was in a sound financial position. He praised successive Executives who had seen fit to maintain a policy of prudent financial management. Annual subscriptions - given the Secretary's comments, the meeting resolved to maintain the annual subscriptions at their current levels. Conferral of Life Membership - in recognition of long standing services to the NZDF and the ground water industry, the Executive resolved to recommend to the AGM that Mr Dick Baylis of Napier, be the Federation's

first recipient of Life Membership. It was noted that Mr Baylis had played an active role in the Federation's affairs right from the time when it was first mooted that such a body be formed.

Economic Downturn - the meeting was cognisant that the current economic climate still showed little in the way of positive indicators and as such there had been a steady decline of the industry and its personnel. Whilst some contractors had weathered the storm, others were now but a shadow of their former operational capacity of particular significance had been the loss of a highly skilled workforce, which would now be difficult to recruit given any sudden upswing in the economy. There being no other business President Cecil Woodford thanked members for their attendance and continued support, and closed the meeting.

QUALITY COSTS

To many people in the drilling industry the term "Quality Costs" implies that increased costs are automatically incurred during the process of assuring the quality of product or service. This of course is not necessarily the case, in fact usually the opposite.

The most common definition of the term "Quality" in standards throughout the world is "Fitness for Purpose", however a definition more widely accepted as being more appropriate is "Conformance to Requirements".

The term "Quality Costs" may therefore appear to be very negative in that a picture of an undesirable cost burden is often envisaged. Such costs are often lumped together with non-productive or overhead charges such as taxes, overtime, maintenance, transport etc., all of which are entires on debit side of the ledge, whereas a strong and effective quality system can easily be shown as having a very positive contribution to the financial performance of a business. In views of this it would be more appropriate to consider the operating costs of a well run quality system as an investment project with planned and budgeted reductions in overall costs.

It is further suggested that a good quality system still remains as a relatively unknown and therefore untapped, source of increased profits in almost every business today.

This opportunity may not be exploited unless all areas of a company are included in the quality system. Departments which are traditionally excluded from an involvement in the quality system are those of purchasing or accounting. The co-operation and involvement of these departments is essential if an effective system for gathering "Quality Costs" is to be introduced.

Drs. Deming and Juran have been credited with the dramatic improvement of "Quality in Japan".

In the 1950's the perception of Japanese goods by the rest of the world was that they were cheap and nasty, whereas today advertising agencies spend million of dollars extolling the virtues of "fully imported" Japanese vehicles etc.

This is mainly because of the improvement in efficiency brought about by the introduction of quality system.

If managers were aware of how much quality is costing their companies they would be better motivated. The proper gathering of "Quality Costs" has, in many instances, been put in the too hard basket for too long and the accountant has not been given a role to play in quality system development or implementation. Expenditure on quality system development should never be seen as a "lost investment" in the way that Research and Development is often written off.

Now is an opportune time to address this very significant, yet poorly understood subject (which has remained neglected for years) through positive action being taken to gather "Quality Costs" with a view to introducing quality programmes and developing cost effective quality systems.

One company servicing the drilling industry which has in recent years addressed this subject and subsequently implemented a quality management system encompassing all areas of the company, is Surescreen Manufacturing Co. Pty. Ltd. of Brisbane, Australia. This system has since been accredited by Standards Australia to AS3901/IS09001 (NZS9001), which is the highest achievable standard.

The cost savings to Surescreen as a result of the implementation of this programme have not only outweighed the initial costs of implementation, but also outweigh the on-going "Quality Costs" associated with a quality system.

In addition Surescreen remains a serious competitor in the international arena, particularly in respect to Japan.

The management of Surescreen firmly believe that without the implementation of this programme their competition would lie only in the arena of "Western" countries, which is said to be left well behind that of Japan when it comes to quality of product or services.

WAIKATO REGIONAL COUNCIL GROUND WATER BYLAW 1990 EXPLANATORY NOTES

In 1987 the Waikato Valley Authority enacted a ground water bylaw effective over all the area administered by the Authority. The Waikato Regional Council is now responsible for administering the bylaw, acting as the Regional Water Board, with such powers and responsibilities as are described in the 1967 Water and Soil Conservation Act and subsequent amendments.

The Waikato Regional Council Ground Water Bylaw (1990) will be introduced to provide continuity of ground water management throughout the Waikato Region (Figure 1) and will supersede the Waikato Valley Authority Ground Water Bylaw (1987).

Effective ground water management depends on adequate knowledge of the water resource and suitable controls over its development where necessary. The ground water bylaw seeks to achieve three main aims:

- (i) assist water allocation and ground water management in the Waikato Region;
- (ii) prevent ground water pollution by specifying minimum standards of bore construction; and
- (ii) control wasteful use of ground water by ensuring efficient bore operation and minimum standards of bore maintenance.

These aims are achieved by requiring a permit before drilling a new bore or altering an existing bore. Records must be kept which describe the geology encountered when constructing a bore and details of the bore's construction and use. These records must be forwarded to the Regional Council. Minimum standards of bore construction, maintenance and use are specified in the bylaw. Reasonable access is also provided for Council staff to inspect the bore or to measure or sample ground water.

DISPENSATIONS
Dispensations may be granted by the Council if any provisions of the bylaw are unnecessary or unreasonable for a particular bore. Applications for dispensations must be made in writing to the Council and state clearly the specific provisions of the bylaw for which dispensation is sought. For example, a dispensation may be provided for emergency work to replace or reinstate a failed bore to provide essential water supplies. However, continued operation of such a bore would depend on whether it satisfied the intentions and requirements of the bylaw.

OZONE-FRIENDLY FIRE EXTINGUISHERS SOLD BY NZ SAFETY

A range of high-quality ozone-friendly fire extinguishers is being sold exclusively in New Zealand by NZ Safety Limited.

Known as Alsaf ABC, this dry-powder range conforms to new legislation which outlaws extinguishers containing Halon compounds such as BCF's which deplete the ozone layer.

Alsaf is manufactured by Eversafe Extinguisher Snd Bhd, a Malaysian company which exports extinguishers throughout the world. Its products, which conform to the British Standard and the Malaysian Standard which is based on it, are renowned for their strength and quality. The extinguisher cylinders contain only two welds - significantly fewer welds than conventional fire extinguishers.

General manager Mike Arnott says many people do not realise that existing BCF extinguishers once used can no longer be serviced or refilled.

"Customers can rest assured we will not be taking advantage of

the situation. Alsaf extinguishers will be competitively priced to enable clients to upgrade existing systems at a fair and reasonable cost and we can assure people these extinguishers will put out fires as effectively as traditional alternatives."

Alsaf will initially be available in six sizes - 1kg to 9kg - all of which are portable.

Chow T W, marketing director of Eversafe Extinguisher Snd Bnd, said his company was looking forward to working closely with NZ Safety and its Australian subsidiary, Alsaf Safety Industries Pty Ltd.

"We started exporting five years ago and currently export around 60% of our product. New Zealand will be the 23rd country we will be exporting to," he said.

Eversafe, which is based on the outskirts of Kuala Lumpur, employs 70 people and has a turnover of 11 million Malaysian ringgit (about \$NZ6.5 million) a year.

A Big One

Mine safety and ventilation have always been major concerns ... never more so than now

THE ABILITY to accurately drill large holes to intersect drives at some distance from the pit head is becoming ever more valuable to mine developers. A big hole drilled recently demonstrates the feasibility and promises of such work.

W. L. Sides & Son Pty. Ltd. has over many years, principally in N.S.W., been drilling tightly controlled wells both vertical and inclined to intersect targets at up to 500 m depth without using the slow and expensive well deviation techniques. To achieve this, stiff and well supported drill strings are used which resist deflection and enable accurate drilling to full depth to be achieved with confidence. This type of drilling was developed initially from the experiences of drilling pilot holes for raise drills at the quite small diameters of 280 mm by air hammer techniques.

More recently mine ventilation has become a major problem from methane flows into mines in the Sydney Basin resulting in the mines needing to have holes drilled to intersect drives at around the 500 m level.

The Tahmoor Mine near Wollongong required two wells to be drilled at 508 mm diameter in the very hard sandstones of the area, with a target diameter of 1.5 m at that depth. Due to tooling restraints at that time these holes were drilled conventionally by fluid and rock roller bits. Surveys were not carried out until well completion, when alignment accuracies well within tolerance were confirmed. The high bit cost and low penetration rates indicated the need for an alternative system so when the nearby Tower Colliery required a similar but even larger hole to be drilled, air hammer was the chosen method to perform the drilling but there were a few new problems to be solved first.

Methane in the rock above the coal is a major problem in the area with quite large gas flows likely, hence the need for a Blow Out Preventor and substantial string of cemented in surface casing. The desired completed diameter of 608 mm ID casing was another problem as tooling for such sizes was not readily available nor economically practical, so a home built

system was developed. Further hole design considerations involved the crush strength of the main casing string which ultimately had to be cemented in place over its full length without collapsing either the casing or the roof of the mine. Because of the extreme danger from the ever-present methane, it was deemed not desirable to drill into the mine except at the last moment to avoid risk to the mine from the surface via the borehole as say from welding sparks during the casing installation. This meant the hole had to be drilled blind with all cuttings conveyed to the surface and position had to be known exactly so mine roof stabilisation or support could be built under the well.

The hole design ultimately chosen was based on all these and many other practical considerations. The end result was very successful.

The B.O.P. casing chosen was 711 mm so a 760 mm hole was drilled using a gang hammer comprising of two modified Mission SD 8 hammers fitted with 250 mm bits following a previously drilled 310 mm hole drilled to 60 odd metres with a Mission SD 12.

The casing string of 60 m of 711 pipe was installed and cemented back to surface, the B.O.P. (a 320 mm opening Shaffer) was installed and tested.

Drilling was then completed at 310 mm diameter to 470 metres, just short of the mine roof when the hole was surveyed to confirm its accuracy. This pilot drilling was completed using 2350 CFM of air at 250 PSI, methane was not a serious problem as the air diluted inflows sufficiently to keep it below the danger point. The methane concentration was constantly monitored, and on several occasions the B.O.P. was closed in and methane flows dissipated before work could continue.

The hole reaming then started using again a gang but with Mission SD 12 hammers and 310 mm bits and a pilot bit below to follow the pilot hole. This tool had up to 4000 CFM of high pressure air applied to it. The hammers were fully shrouded and a dual pipe system conveyed the cuttings back to the surface. The gang performed very well although a little trouble was experienced at times with cutting returns blocking off for reasons unknown.

This hole is, we believe, the largest diameter hammer hole drilled in Australia blind, and it is certainly one of the largest in the world.



Cardwell HL drilling 711 mm hole to 477 m using air hammer techniques. Probably the largest and deepest hole so drilled in Australia. Running drill pipe to bottom, Tower Colliery.

It was drilled to 477 metres at 660 mm diameter.

The superb quality and alignment of the hole was then confirmed when the 608 mm ID casing was installed freely to full depth with an annular gap of only 300 mm. It was floated in place with a drillable cement plug cast in the base sealing it, water was added at a carefully chosen rate to the inside to prevent hydrostatic collapse of the casing but resulting in a 70,000 kg hook load applying at full depth. During casing installation 4 cementing lines were added connected via valves at staged levels down the casing. The cementing was then done in 4 staged rises back to the surface to avoid exceeding the collapse strength of the pipe with the weight of the cement.

The breakthrough was achieved simply by drilling the last little bit into the mine when the hole was proved perfectly placed. A piece of pipe 12 metres long 15 mm similar than the ID of the casing was then telescoped from the surface into the mine, confirming perhaps by an ultimate tenet the real alignment of the well and casing string.

The successful development of the technology which allows large wells such as this to be drilled in the hardest of rocks with high accuracy is of great value to the mines and the fact it can be done from the surface wholly without risk to or congestion in the mine offers special advantages. There seems little reason why diameters cannot be increased significantly by using these techniques in the future.

Quite apart from freeing the shaft from extra services where space is a real premium, such large holes offer the potential for the use of escape shafts in time of accident in the mine and it is a technique all mines should be considering.

EDUCATION: THE KEY TO JOBS AND GROWTH

The Institute of Professional Engineers New Zealand believes that the connection between education and employment must be acknowledged, and that those leaving the education system should be equipped with the key skills for earning a living in a technological age.

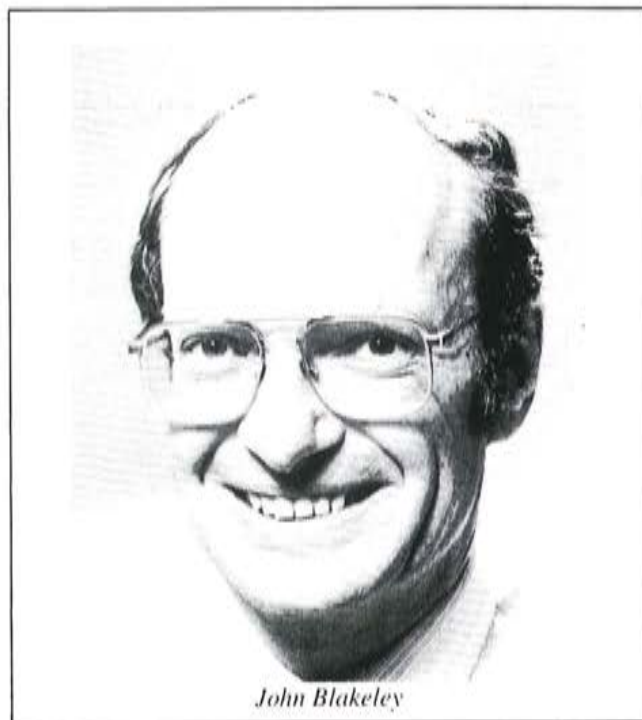
Speaking in Christchurch in October, Council member John Blakeley said that it was quite obvious that New Zealand will never again return to a job market with large numbers of manual jobs. Opportunities for unskilled and semi-skilled people in areas such as farming, food process-

ing and manufacturing are becoming few all the time.

"A key issue that is still to be resolved is whether Tomorrow's Schools is really a financial exercise concerned principally with controlling expenditure, or whether it will also be concerned with promoting educational excellence and relevance," said Mr Blakeley.

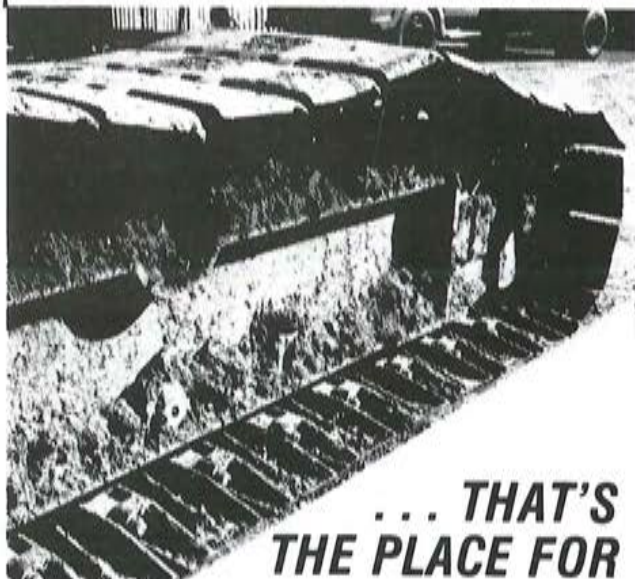
Background Statistics

Mr Blakeley said that the Marh 1989 Household Labour Force Survey showed that 44.1% of the labour force had no formal school qualification. The 1987 Certech Report found that out



John Blakeley

**WHEN THEY'RE
ALWAYS IN THE GRIT...**



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Name

Address

of every 100 children entering the third term in 1982, 54 reached Form 6 in 1985 and 20 reached Form 7 in 1986. It was expected that no more than 25 of those 100 children would have gained a tertiary qualification by the end of 1990, and only 9 of those would be in technology, including qualifications at technician and trade level.

A 1989 NZ Planning Council book, "Tomorrow's Skills", compared the 1985/86 participation rate in education of New Zealanders aged between 20 and 24 with that in 12 other countries and found us to be near the bottom at each age level.

The need for change

Mr Blakeley said that the education system has not changed rapidly enough during the last 20 years to prepare more young people for the developments in the job market. If the New Zealand economy is to survive and grow in an increasingly technology-based world, we have to work very hard on developing an education system that retains people within it for a longer period than at present, and one that also gives people the key skills that they will need to provide them with employment.

"That is the great challenge to both politicians and educators," said Mr Blakeley. "How they cope with it will have a considerable bearing on the future prosperity of the nation".

Mr Blakeley said that the abolition of external examina-

tions and social promotion for underachieving students from one year to the next were said to make them feel better about themselves. He questioned whether these measures were really in the students' best interests.

"Holding these students back for a year to improve their standard at a particular level might actually be to their advantage in the long run."

Task Force on Teacher Education

In October the then Minister of Education, Mr Goff, announced the establishment of a task force on teacher education to recommend ways to improve teacher education.

Although the new Minister has put this on hold, IPENZ believes that such a task force is essential. One of the key objectives of the task force would be identify the attributes of a quality teacher and the key skills, knowledge, understanding and attitudes that will be appropriate to the 1990s and beyond.

New Zealand has had to confront major changes to survive in an increasingly competitive international marketplace. We have had to adapt to rapid developments in areas like science and technology and now need a more highly educated, skilled and flexible workforce in the 1990s.

IPENZ will encourage the new Minister to recognise that the need to deal rapidly with these changes in the schools means greater emphasis on improved teacher training.

DO I GET VALUE FOR MY NZDF SUBSCRIPTION

— By Bill Washington

On a number of occasions I have been asked this very question. To answer this, let us go back to the formation of the Federation in 1974. Two separate groups were formed to promote an Association of Drillers. One group was pushing for an organisation exclusive to the larger Companies and the second group wished to form an organisation for all Drillers, regardless of how big or how small the Company. No need to tell you which was the successful organisation. Yes, the result was the formation of the New Zealand Drillers Federation at a meeting in Hamilton in 1974.

The Federation immediately set about contracting all Drilling Contractors in the Country and in July 1975 the first Annual Conference was organised by our now Life Member, Mr Richard Baylis, of Baylis Brothers in Napier. Sixty people attended this two day event where we were presented with both drilling demonstrations and informative lectures.

At the Annual General Meeting, it was agreed that the Incoming Committee would meet three to four times a year at the Wellington Conference Centre to get the Federation up and running. This was the start of many years of hard work for the Federation Committees to establish what is now one of the most successful Federations in New Zealand.

From the start our top priority was to establish Driller Education. No formal training was available in New Zealand and we set out to rectify this through our Conferences. The huge success of these Conferences over the years have been that they are run for all members of the industry, Management, Drillers, Assistants and associate members who are all encouraged to attend and this is both the main strength of our organisation and our main difference from other Federations.

Other Federations run Conferences exclusively for Management, our Conferences are for all those in the Drilling Industry. We then established what must be a world first when all those attending a Conference were asked to sit a 50 question examination paper based Conference demonstrations and lectures, thus Driller Training had made its initial start.

In 1978, Gordon Brown, Hamish Pearson, Cecil Woodford and myself, travelled to Singapore to an International Water Well Conference to further our knowledge on Driller Training. We also attended a five day Advanced Driller Training School at Murdoch University in Perth where we established many friendships with members of the Australian drilling industry.

In 1982, Cecil Woodford and myself travelled to Kula Lumpa to again sit in on further sessions related to driller training. We gained valuable information on the training methods used in Canada and more importantly were updated on the excellent training program being developed in Australia.

From discussions held with Les Mahoney, Col Barden and members of the Australian Drilling Training Unit, we found the Australian "DICAT" Drilling Certificate training course met most of New Zealand's needs, including having the advantage of being taught by correspondence. No need to attend classes at the local Polytechnic with resulting loss of time at the job, or equally bad, missing lessons because of the job taking you far away from home base.

After successful negotiations, your Federation was able to purchase the rights to the "DICAT" Training Modules. This purchase alone, costing your Federation in excess of \$20,000.

Having obtained permission to use the course, we then needed the means of teaching it so we sought the help of the then Ministers of Education and Energy and found them very cooperative, with their approval and the assistance of the then New Zealand Technical Correspondence Institute (TCI) now renamed The Open Polytechnic of New Zealand, a correspondence course was set up. This was done and the first classes started in 1984 and the first Certificates (Australian DICAT designed) were issued in 1985.

However, we felt the Drilling Industry needed something more representative of New Zealand in the certification. With the help of TCI, we jointly approached the New Zealand Trades Certification Board and a series of meetings resulted in

the setting up of a Drilling Practice Certificate examination. The first examinations were held in 1988. This examination is a National one and New Zealand is the only country in the world we know of offering a National examination for drillers.

Qualifications in themselves do no substitute for experience but they do demonstrate that holders have made an effort to fully understand all areas of knowledge in their chosen career. They also demonstrate a willingness to learn new skills and will give the qualified person "an edge" if they seek employment with other firms in New Zealand or overseas.

The New Zealand Drillers Federation has put a lot of effort in getting a New Zealand Drillers course established. We want to see more Drillers become qualified and so fully recommend all Drillers to enrol for the Drilling course run by The Open Polytechnic of New Zealand.

A well qualified labour force is essential for the well being and development of the individual driller, the industry and the country. Thus 14 years of hard work had finally come to a successful conclusion in 1988.

However, your Committee was also working on your behalf on many other important matters including negotiations with Government Departments on Accident Compensation Rates, Road User Charges, Log Book Requirements, Driller Contract Forms, Government Department competition, pipe quality and availability, and many other drilling related subjects.

Council Members over the years have given freely of their time and have personally paid their own air fares to and from Wellington.

On one occasion your Federation was accused of being interested only in the larger Drilling Companies. This is far from the truth. Remember, all the larger companies were once small companies. However, size or position does not count with your Federation. We are only interested in people.

Our next Conference will be held in Blenheim around July 1991. Yes, I know it always seems to come at the wrong time, however, make an effort to attend. If you have not at-

tended before, you will be most welcome and I can assure you, you will find the time spent with fellow drillers most rewarding

Back to start, What value do I get from my subscription? Well, I consider Members get excellent value and should be asking, Now I am a member, how can I contribute to the future of this excellent organisation? Yes, there are many ways you can contribute. Have you ever thought of submitting an article of interest, (not necessarily on drilling) for our magazine. How about hosting our 1992 Conference. The success of every Conference is the result of many hours of preparation and organisation by the hosts. What better way to contribute.

Next time you are nominated for a position on the Federation, don't decline, accept the challenge and contribute to the future of our industry.

To me, membership of the New Zealand Drillers Federation has many privileges, none being greater than the many friendships I have made.

MANAWATU-WANGANUI REGIONAL COUNCIL BORELOG, WATER QUALITY & AQUIFER TESTING REQUIREMENTS

BORELOGS

All borelogs are to include:

- the name and address of the bore owner
- the location of the bore
- casing and screen particulars
- static water level
- a summary of the aquifer test : flow rate, drawdown and duration
- description of strata penetrated

WATER QUALITY TESTING

Stock bores: Conductivity, Iron and Manganese.

Domestic bores: Conductivity, Iron, Manganese, Total hardness, Chloride and Nitrate-nitrogen.

Irrigation and industrial bores: Conductivity, Iron, Manganese, Chloride, Nitrate-nitrogen, Alkalinity, pH, Sulphate, Sodium, Potassium and Total hardness.

AQUIFER TESTING

No water right (to take groundwater) required : a minimum of three hours test on the required flow rate.

SURESCREEN

The Management and staff of Surescreen are pleased to be the first manufacturer of welded wedge wire screens and associated products to be accredited by Standards Australia to AS3901/ISO9001, which is the most severe quality system standard and are proud to be authorised to use the registered standards mark for quality endorsed companies.

AS3901/ISO9001 quality system applies to design/development, production, installation and servicing.

Surescreen's quality system specifically addresses the design/development and manufacturing of welded wedge wire screens, screening systems and associated products from low carbon galvanised steel, stainless steel, cusilman bronze, hastelloy and other weldable alloys.

Operational capabilities include CAD CAM engineering and design, mild steel and stainless steel wire drawing, shaping and annealing, computer controlled wedge wire screen manufacture, CNC machining, skilled fabrication, pattern making, stainless steel and non-ferrous casting, immerse passivation, dynamic balancing and stress relieving.

Customers are now benefiting from a better technical quality of product and a greater confidence of conformance to their own requirements, when compared to that offered by manufacturers/suppliers who have not achieved accreditation. This increased customer confidence has been gained by specific attention being paid to satisfying customer written and perceived requirements at tender/quotation and design/development phases.

Customers are now receiving the products they require on time and at **good value for money**.



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Company**

AS 3901 / NZS 9001

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WEDGE PROFILE SCREENS