



FLUID TALK

June 2005
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The Official Newsletter of the
Fluid Power Society of Western Australia Inc.

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Technical Evening at Transeals

Over twenty members rolled up for a technical evening at Transeals. Transeals Managing Director Trevor Picher and his staff demonstrated the manufacturing techniques involved in manufacturing Vee Belts and Hydraulic Seals.

Forty years ago most vee belts used in Australia were made in factories primarily based in Melbourne, Adelaide, and Sydney. Over time the number of Australian manufacturers has gradually diminished and since April 2002 Transeals is now the only Australian manufacturer.

Transeals Volta machine uses special thermoplastic material and can make any vee belt section in lengths ranging from 450 to



Transeals Managing Director, Trevor Picher Demonstrates Their New Seal Making CNC

8500mm with a top width of 9.5 to 32mm. The vee belt construction can be cog type, vee or wedgerope. Viewing the manufacturing process gave members a greater understanding into the construction of all vee belt types.

Transeals also has a machine shop comprising 2 Sealmaker CNCs, four conventional lathes and a milling machine to manufacture special seals. This local machining capacity enables Transeals to supplement their wide-ranging stock and provide customers with a rapid turn around in break down situations.

On behalf of the members I would like to thank Trevor and his staff for their hospitality and staging such an informative evening.



Members Enjoying Transeals Hospitality

All Our Yesterdays

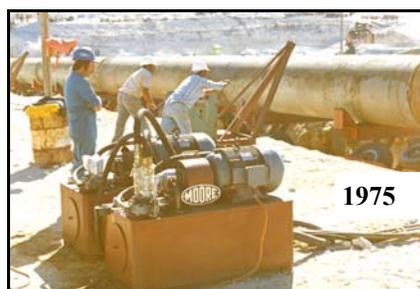
In early 1975 the team from Moore Hydraulics worked round the clock launching out to sea the main 2.7km sewerage pipe that formed stage one of the Ocean Reef Outfall Project.

The guy with the folded arms and ill-fitting safety helmet is Moore Hydraulics site supervisor John Binks, judging by John's body language the project seems to be running quite smoothly.

Some thirty years later John has swapped the safety helmet and overalls for the cut and thrust of sales engineering with JMV Hydraulics, this follows a twenty-year plus stint as State Manager Victoria for Hagglands.

In 1992 some seventeen years later the team from Pressure Dynamics designed and built the complete pipe handling system for stage two of the Ocean Reef Outfall Project. This project involved the on site fabrication, handling and launching out to sea of nine three hundred metre long sewerage pipe spools and was virtually a duplication of stage one.

From the two photographs above you can see in seventeen years how the approach to mechanical handling has changed from labour intensive in 1975 to an almost automatic system in 1992.



1975



1992

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Presidents' Prologue

By Tim Bailey

One good aspect of writing this column is that it is never difficult finding enough information to pass on to you! As most members would know, the general committee has one meeting each month except for January and an indication of the volume of discussion and business that takes place is that the minutes usually run to five or six pages! The main reason for this is that The Society has an active and interested committee and is making continuous and significant progress in raising the standard of professionalism in the industry.

The primary justification of 'raising the bar' is that the clients of fluid power industry companies that embrace the results of The Society's efforts will enjoy better standards of engineering, manufacture and service that will result in less accidents and failures. Further benefits flow-on to those clients in the form of higher productivity and lower costs.

In order to keep this momentum going, I repeat my request in this column in the last edition of *Fluid Talk* and ask that interested people put their names forward for election to the general committee. As previously mentioned, people at the 'younger' end of the age spectrum would be particularly welcome!

Most fluid power industry people in Western Australia have heard of Stuart Coleman and many probably know him personally. Stuart is a foundation member of the FPS of WA and has held a committee position for every year of the 29 years that The Society has existed. As the activities of The Society have increased, so has the need for an executive officer become more necessary.

Stuart made an executive decision last year to reduce his everyday workload and took on semi-retirement. This provided the general committee with the ideal opportunity to suggest to Stuart that in addition to his role as secretary-treasurer of The Society, he should also become The Society's executive officer! Most fortunately for us, he has agreed to take up the challenge and is now the principal contact person for The Society.

Please note that the annual general meeting venue and date has been changed. The AGM will now be held on Friday evening, August 5th at the delightful and exclusive Royal Perth Yacht Club. The provision of entertainment at our annual AGM dinner is always somewhat of a problem and the committee has opted for a prominent speaker in the place of live music this year. I have asked a very prominent person in Western Australia if he would speak at the dinner and I am hopeful of a positive result. Make sure that you read The Society's e-mails to you as I expect bookings for the event will fill quickly once I am able to confirm his attendance.

It is likely that you will be aware of, or have seen advertisements that are being placed in most Western Australian newspapers by the WA government Department of Consumer and Employment Protection with respect to the *regulation of motor vehicle repairers*. Whilst I acknowledge that the motor vehicle industry has a much more public image than the fluid power industry, I would suggest that it is only a matter of time before we see similar advertisements relating to the fluid power industry.

Two of a number of reasons for making this statement are:

1. The Western Australian Department of Industry and Resources (formally Dept of Mines) records show that up to 350 fires are caused each year in underground mines in Western Australia by high-pressure hose and fitting failures. The figures are based on a seven year period of case studies.
2. In 1999, the New South Wales Occupational Health and Safety Commission released the results of a study on the number of deaths caused by hydraulic system and component failures in the period 1989 - 1992. The study showed that 43 fatalities occurred in the 4 year study period equating to 3.5% of work place deaths in Australia. The study pointed to a lack of hydraulic training and product knowledge.

If the WA government took an immediate interest in applying regulation to the fluid power industry, The Society would be able to provide the 'regulated person' knowledge and ability requirements for every level and category of person employed in the industry by recommending the adoption of the High Pressure Hose Assembler (HPHA) registration in pertinent area and the curriculum matrix for all other categories.

The major benefit of having a ready-made system in place is that the regulatory requirements would then be those that have been established by the fluid power industry itself and not those imposed by public servants who would probably have little or no knowledge of the industry.

As announced in this column in the last issue of *Fluid Talk*, the International Fluid Power Society of Australia (IFPSA) has been formed and is listed as chapter 72 of the International Fluid Power Society (IFPS). Considerable correspondence is flowing between The Society and the IFPS in sorting out the details of individual memberships and the recognition of training courses and other related matters. You will be advised of all inter-Society arrangements as these arrangements are settled.

Please make sure that you read up on coming events such as the MOOG technical evening, the AGM at the sumptuous Royal Perth Yacht Club and the ever popular golf day - and please remember to encourage as many people as possible to become members of The Society.

One last reminder, don't forget if you want membership application forms or to arrange for your business or company to be linked to The Society's web site simply contact Stuart Coleman at secoleman@inet.net.au

With best wishes..... Tim Bailey

Where's The New Generation?

By Stuart Coleman

Engineering work in Western Australia seems traditionally to follow a 'feast or famine' agenda, and a direct casualty of this is the industry's training programmes. When work is flowing like there is no tomorrow, everyone is too busy to do any training; when there's no work, there's no money to pay for training.

Now we are experiencing a resources boom the perennial problem of skill shortages has raised its ugly head once again and nowhere is this more apparent than in the fluid power sector. As an example Tyco Motion & Control are advertising for Hydraulic Technicians in the British Fluid Power Association's journal. When you ask an industry colleague the standard phrase "How's business?" it invariably followed by "Know any good technicians or sales engineers who are looking for a job?"

This is anecdotal; for hard copy confirmation, study the 'West' classifieds and you will see the same jobs being advertised again and again. This undersupply is a direct consequence of the agonies the Australian manufacturing industry went through in the 1980's and early 1990's. Gone are companies like Moore Hydraulics and Vickers who manufactured in Australia and were the traditional training ground of today's generation of senior fluid power technicians, engineers – even CEO's.

The question is; how do we plug the gap created in the training area?

My vision is to see the fluid power industry sit down as a co-operative group and find ways to fund training and address the short term skills shortage. It would be reasonable to assume such a scheme would attract Government assistance if industry gave unanimous support to the proposals and then directed them through an industry body such as the Fluid Power Society.

Australia's present attitude to training was put into sharp perspective by a report blaming Britain's weakness in middle and senior management on the fact that most companies spent less than 2.5% of turn over on training. Where does that leave Australia, we used to have a 1.5% training levy but companies claimed it was too much so how much are they spending now?

We must act now to improve training in the fluid power industry. The skills and experience of the 'sixties and seventies generation' are now lost to retirement or soon will be. If no firm action is taken, there's a chance our industry will wither on the vine as employment opportunities and people are taken up by other industries.

On a global scale, little of the engineering work we handle in WA is ours by divine right. Australian companies therefore must be both competitive and progressive and only well-trained dedicated people can achieve this goal. We must never lose sight of the fact that the North West Shelf Development is almost as close to Jakarta as it is to Perth.

Members' Profile

To give you an idea of who's who within the 'Society' all future editions of 'Fluid Talk' will feature a member's profile. This issue we start the ball rolling with Leeza Wray of Pressure Dynamics

Leeza Wray

Leeza has been employed in the fluid power industry for almost twenty years with only one employer Pressure Dynamics. During her tenure with Pressure Dynamics Leeza has experienced many exciting and challenging roles, she commenced her career in Administration progressing through to Sales Management and is now General Manager.

Over the years Leeza has made a significant contribution to the 'Society' especially in the area's of administration, financial management and her current role compiling 'Fluid Talk' from the editors scratching.

On a personal note Leeza is a keen competitive sportswoman organising and participating in many sports especially volleyball.



Events Calendar

First Wednesday of Each Month

General Committee Meeting

AMTC Wembley

The Fluid Power Society general committee meets on the first Wednesday of each month except January. Members are always welcome! Contact the President, Tim Bailey, for details of the meeting location and time. Contact details are on the last page of this newsletter or on our website: www.fluidpowersociety.com.au



Notification of forth coming events and site visits. Members will be advised specific dates by email or by post.

July 2005

Wednesday 13th

Moog Australia Will Host a Technical Evening at the Metro Inn, South Perth

August 2005

Friday 5th

Annual General Meeting Will be Held at the Royal Perth Yacht Club

September 2005

Sunday 11th

Annual Golf Day at the Peninsula Golf Club Maylands

October 2005

Olaer Fawcett Christie Legislative Requirements of Accumulator Maintenance and the Responsibilities of the Maintenance Technician Under Worksafe Legislation.

Australian Made Product Spotlight DIN Modules

Customisation with Analogue Electronics

By Roy Park, Managing Director, Moog Australia Pty Ltd

The DIN range of analogue electronics was developed in Australia to meet the needs of local and export customers for rapid execution of electro hydraulic control systems. First produced 5 years ago there have been more than 4000 units shipped worldwide from our Mulgrave facility.

The purpose of the DIN module electronics range of products is to provide standard building blocks for creating customized control systems for open and closed-loop control. This approach gives us a set of products that are built in quantity with full customer support documentation for installing, commissioning and maintaining the resulting solution. For this reason it is preferable to aim for standard catalogue modules that have been designed and manufactured by Moog Australia for local and global export sales.

However there are instances where small changes will give major benefits in terms of cost and performance. Generally those changes will be within the available functionality of the module and be reflected in the dash number at the end of the model code.



Our standard PI Servo Amplifier G122-824-002 is the 'parent' to customised models with variations such as:

- Additional environmental protection for H₂S exposure in geothermal power stations. This is achieved with conformal coating and reloading of some devices where material corrosion is a potential problem. [G122-824A002]
- Inclusion of 4-20 mA output only for turbine applications. [G122-824-003]
- Synchronization control for Scissor lift table [G122-824-005]

Typical changes to the 'parent' product involve environmental protection, change of resistors, additional loading to the available capacity of the existing PCB layout. Generally we are taking a standard product from stock and making minor changes.

Moog can provide many such changes within a very short delivery period at similar prices to the 'parent' product. A 10% premium is typical for small changes. If quantities are sufficient it may be possible to justify a new product development.

The Mobile Servo Amplifier G122-826 has been designed for a wider range of customisation with specific building blocks allocated. Its designation as "Mobile" relates to the rugged power supply that will operate from the very noisy automotive environment and obviously, it is also suited to 24 volt unregulated industrial supplies. This closed-loop servo amplifier has provisions for easy loading of options such as:

- Frequency to voltage converter for velocity feedback.
- Non-linear function.
- Dual gain amplifier for high speed, high accuracy positioning.

Application Examples



A recent application used a DIN module to control the vertical movement of a lock crane boom. Located on the River Murray in South Australia is a series of locks for flood control. Concrete beams are lowered into slots to vary the height of underwater barriers.

The task of the control system is to simplify the control of the excavator boom to achieve an accurate horizontal movement of the beams as they are moved into position.

A closed-loop position control with feedback from a pendulum sensor has been applied with the following components:

- Servovalve with "outdoor" environment protection.
- Customized Mobile Servo Amplifier [G122-826-002]
- Pendulum level sensor



The Mobile Servo Amplifier was chosen due to its suitability to operate directly from standard "automotive" style power supplies without the risk of electrical damage and the ease of adding custom control requirements. DIN style packaging meant that a compact and reliable installation could be achieved in this relatively harsh environment.

Of course there is a limit to how far we can go with analogue electronics. For complex control with digital interfacing it is preferable to use digital solutions such as the Moog Servo Controller (MSC) or Digital Interface Valve (DIV) that offer complete flexibility with respect to control strategies. However, many simple control systems will be successfully implemented with the standard Moog DIN modules or from simple customisation of these Australian made analogue electronics.

For more information visit www.moog.com/dinmodules

Editorial Note: Roy Park Managing Director Moog Australia Pty Ltd would like to offer 'Fluid Talk' readers the opportunity of free subscription to Moog's Quarterly Industrial Newsletter by simply registering their details at www.moog.com/industrial/newsletter/signup/

Storing Hydraulic Energy

By Sten Bjerking

Eaton's contract with Impact Engineering in the development of the energy saving "Hydraulic Launch Assist Technology" for the US Army is welcome news to the fluid power industry. The program is aimed at reducing fuel consumption, brake wear, and emissions for vehicles in start - stop applications. This is achieved by the use of a hydraulic regenerative drive system that stores the kinetic energy of the vehicle in an accumulator during braking and then delivers it back during acceleration.

Figure 1 of the simplified hydraulic circuit shows the vehicle in braking mode. The pump / motor is working as a pump being driven by the wheels as the vehicle decelerates. The accumulator is then charged as fluid is drawn from the reservoir by the pump during deceleration.

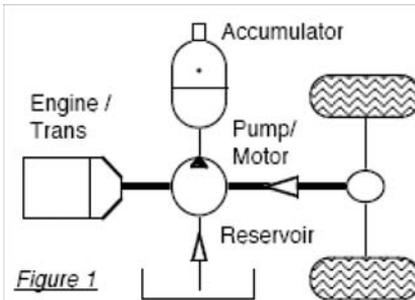


Figure 1

Figure 2 shows the vehicle accelerating. The motor / pump now works as a motor driving the wheels and power assisting the vehicle during the accumulator discharge mode.

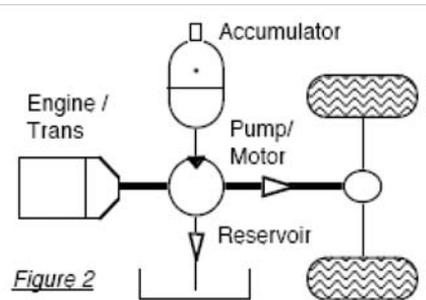


Figure 2

The Ford company have been developing a "Tonka Truck" with the same feature and in Australia Permo-Drive of Bellina NSW have been building and testing prototypes over a number of years.

The concept is not new. Over twenty years ago Moore Hydraulics together with Rexroth and the Queensland University fitted a similar system to a Brisbane bus. Trials were carried out with encouraging results but for some reason the concept did not go past the experimental stage.

Other alternatives available to engineers are limited for this type of application. The energy may also be stored mechanically by the use of a flywheel or electrically via a battery - Volvo have experimented with both concepts as part of their commitment to reducing vehicle emissions and the development of a hybrid car.

The electrical concept is the option that seems most obvious until it is closely scrutinized. Adopting the electrical concept means the energy is constantly changing form from mechanical to electrical to chemical, within the battery, and via versa. As every engineer knows each conversion means losses so with the electrical concept overall efficiency is inherently poor.

The hydraulic concept has a distinct advantage as the energy is converted only once by pressurizing of gas within the accumulator. Accumulators by their characteristics can charge and discharge energy very rapidly and efficiently when compared to the electrical concepts equivalent, the battery.

Storing large amounts of energy in accumulators is not practical but an advantage of accumulators is in the rate at which the energy is stored and discharged. For example, 50-litre accumulators can store and discharge energy at a rate of around 300 kW although the amount of energy stored may only be as little as 200 kJ.

With a good understanding of the principles, advantages, and limitations, hydraulic engineers may be able make use of this technology in other applications. As a spin off in the future hardware may be developed for the vehicle drive system that may be of use in other fluid power applications.

Editorial Note: Stan Bjerking is the principal and proprietor of Hydraulic Torque, Hallam, Victoria. Stan has over thirty years experience in the design, specification and trouble shooting of hydraulic systems in the marine, mining, industrial and agricultural industries. Hydraulic Torque can be contacted by email at sten.bjerking@bigpond.com

Setting The Record Straight

In the March 2005 edition of 'Fluid Talk' we mentioned Cross Hydraulics was moving into premises built by former Hydraulic Manifold Australia MD Richard Tweedie. Mark Hryb, Cross Hydraulics WA Manager, has advised their new Midvale premises was not only designed and built by Cross Hydraulics but is also completely owned by them. Mark also advised that the only development connection with Richard Tweedie is that Cross Hydraulics purchased a portion of the subdivided land and contracted the same builder.

A Word From Our Newsletter Sponsor



WELCOME TO MOOG AUSTRALIA PTY LTD

Moog Australia is a wholly owned subsidiary of Moog Inc., with headquarters in Mulgrave an outer suburb of Melbourne, and is directly responsible for customers in Australia and New Zealand. The Australian operation was established in 1979 to provide specialized support for all aspects of electrohydraulic servosystems and proportional systems.

This capability includes Australian assembly, test and overhaul of Moog servovalves and proportional valves; manufacture of servo electronics and servoactuators; engineering for design, commissioning and training. Other activities include brushless electric servodrives and remote radio controls.

The design and development of a turn-key hydraulic control system is an important part of the activities. Examples include a locally developed motion simulator for the entertainment and training markets which came from our expertise in precision hydraulic actuation and knowledge of flight simulators used for pilot training. The final result has been recognized as the best in its class on the world market.

Quality control and assurance are essential to all assembly, test and overhaul functions of our company, and have been since our commencement of operations in Australia. The existing standards and procedures are identical to those used by Moog throughout the world for over 50 years.

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New Members

The Fluid Power Society of WA extends a warm welcome to the following new members.

- Ken Crommelin - Australasian Seal Company.
- Jos Vanderlaan - Australasian Seal Company.
- Garry Jones - Australasian Seal Company.

Movers & Shakers

- Steve Rees has become sole proprietor of Tidal Fluid Power after acquiring the interests of Chris Flint.
- Steven Seward is now the new owner of Deanquip Powertrans Hydraulics & Tools Pty Ltd having purchased the business.
- Harald Sieffer, Vice President of Moog Inc announced that Moog Inc has acquired ProControl AG the Switzerland based expert on motion control solutions for the plastics industry.
- Parker Hannifin Corporation has acquired the Indian braided and spiral hose manufacturer Marwell Hose Products PVT Ltd.
- Parker Hannifin Corporation has entered into a joint with Tianjin Tejing Hydraulics Company Ltd to produce hydraulic systems and components in China.
- Bosch Group has acquired a majority shareholding in Oil Control Group S.p.A. of Milan and the company will be affiliated with Bosch Rexroth AG. Cross Hydraulics and Berendsen Fluid Power represent Oil Control Group in Australia.
- Eaton Fluid Power has appointed Michael Spink as General Manager – Australasia. Jerry O’Gorman has been promoted to Director of Marketing for Asia Pacific.
- After 25 years at Electro Hydraulic Systems, Tony and Carol Rikken have announced their retirement from business. The business has been bought by existing staff members Stuart Milne, Paul Steers and Neil Hellmuth.
- Kevin Mason ex Tidal Fluid Power has joined Australian Tipping Services.
- Norman Crossley of Custom Fluid Power has joined Renold Hydraulics.
- Charlie Lee, Victorian Branch Manager for Custom Fluid Power has left to pursue other interests.
- Ian Kirkwood has left David Brown Hydraulics to pursue other interests.



FPS Contact Names and Numbers

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|------------------------|--|-----------|-----------|--------------------------|
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| Technical & Training: | Barry Catanach | | | |
| Accreditation: | Tim Bailey | | | |
| Newsletter: | Stuart Coleman | | | |
| Committee Members: | Phil Bristow-Stagg, Lloyd Hollier, Ian Lavington, Danny Mayers, Malcolm Tucker, Ken Fletcher Jnr, Jim Muir | | | |

Disclaimer

Whilst the Fluid Power Society of WA Inc. makes every reasonable effort to ensure that the information in this newsletter is accurate, no liability or responsibility of any kind is accepted in this respect by The Fluid Power Society of WA Inc. or The Society's members, agents and servants.

The Fluid Power Society newsletter is edited by Stuart Coleman . Suggestions, ideas and information for the newsletter are most welcome - contact us on 9401 6487 or email secoleman@iinet.net.au