FLUID TALK

The International Organisation for Fluid Power & Motion Control Professionals

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The International Fluid Power Society of Australia (Inc)

President's prologue

by Tim Bailey

Everyone who has read this column in recent *Fluid Talk* magazines will have been following the progress of discussions between The International Fluid Power Society of Australia Inc (IFPSA) and The Fluid Power Society Inc. (FPS Inc) that is based in Victoria, as both bodies work towards establishing a national fluid power society for Australia – to be known as *Fluid Power Society Australia Inc.* (FPSA).

The laws of the states in Australia require that any such organisation has to have a set of rules to govern its functioning and these have to be written up in the form of a constitution.

To this end, The IFPSA approved a draft constitution before last Christmas and forwarded it to FPS Inc for discussion at the first FPS Inc committee meeting in 2014 which took place this month. The FPS Inc committee approved the draft and John Bolton, FPS Inc President, a Lawyer in a 'former life' and managing director of *Fluid Dynamics Pty. Ltd.*, took on the task of writing the document up in proper constitution-type language. By the time that you receive this magazine, John will have, or be very close to, finishing it in preparation for the incorporation of FPSA.

Whilst this has been happening, The IFPSA Executive Officer, Stuart Coleman, has been researching the two available avenues of incorporating associations in Australia – one being through the *Australian Securities and Investments Commission* (ASIC) and the other through a state government. When Stuart presented his findings, it became clear that the most appropriate pathway at present would be to register FPSA in a state rather than with ASIC.

However, whilst the ACT (Canberra) had been thought to be an acceptable, neutral place, residential address requirements rendered this option unsuitable. To solve this problem, the February general committee meeting of The IFPSA unanimously passed a resolution that FPSA should be registered in Victoria. My discussions with John Bolton subsequent to the IFPSA meeting indicated that he could see no obvious reason for the FPS Inc general committee not to endorse this decision at the next meeting of that committee.

In anticipation of the likely FPS Inc approval, Stuart Coleman has commenced the process of registering FPSA under Victorian state law with the final 'stroke of the pen' to take place once the approval has been confirmed.

Three years ago, The IFPSA was represented at the USA-based *National Fluid Power Association* (NFPA) tri-annual Summit Conference and the CETOP statistics meeting by IFPSA committeeman, Frank Mulholland of *Hydraulic Component Services* which is based in Welshpool, Western Australia. Frank was asked by the NFPA to speak at the Summit Conference about the state of the fluid power industry in Australia.

That Summit conference and Expo was held in Las Vegas in 2011 and based on the apparent success of the event, the NFPA has opted to do the same thing at the same place from March 4 to 8, 2014. Late last year, the NFPA invited The IFPSA to send a representative from Australia who could speak at the Summit meeting about the fluid power industry in Australia.

As none of The IFPSA general committee members was able to make the trip to Las Vegas this year, I asked John Bolton if he may be able to spare the time to attend as the IFPSA representative and most fortuitously, John has been able to wedge the trip into his busy life.

During my discussions with him about the event, he and I have agreed that he should use his speech to the Summit to promote the Curriculum Matrix and the HPHA registration system to the Summit attendees as a basis for each to instigate the same process in their own countries.

I understand that about twenty countries will be represented at the Summit and John and I think that it is an opportunity too good to miss based on our understanding that no other country has a licensing system in place for any category of person working in fluid power engineering and sales.

In short, we see no reason why Australia should not lead the rest of the world in yet another aspect of industry and business!

Of course, if you know of a country that requires any category of fluid power work to be licensed, please contact me with the relevant details and I'll be happy to publish the information. The importance of us obtaining information on other countries having a system of licensing is that it will support the case that FPSA will be putting to the federal government of the necessity of establishing a licensing system in Australia similar to that applying to electrical work.

You will find ample supporting information on the necessity of establishing fluid power practitioner licensing in two following articles by international authors in this magazine.

With my best wishes…….Tim

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Vale - Robert Cloud Womack

Robert Cloud 'Bob' Womack passed away on November 20, 2013 surrounded by his loving family. He was 97. While working as the director of tooling and maintenance for the National Housing Corp. during WWII, Bob developed many of the key principles that later led to his success in manufacturing and engineering.

After WWII , he joined the Army Air Corps to serve as a machinist and a welder during the rebuilding of Germany where he met his wife, Ruth Dengler.

When he returned to the United States, Bob eventually founded *Womack Machine Supply Company* in 1953. The company, headquartered in Dallas, Texas, expanded its business by offering free courses and developing numerous textbooks focused on hydraulic and pneumatic engineering principles which Bob had learned through his own experience.

Bob's fascination with inventing and developing his own products led to the foundation of *AAA Products Inc.* in 1960.

Due to the professional expertise Bob combined with his lifetime passion for teaching and learning, Southern Methodist University and Texas A&M University invited Bob to assist in the establishment of engineering labs at their respective campuses .

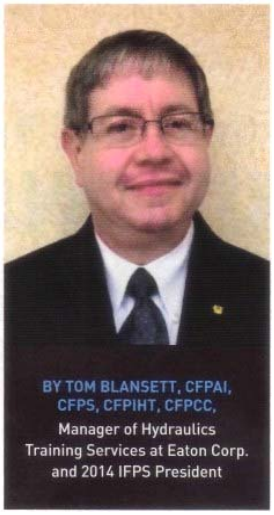
In 2008, SMU bestowed on Bob a honorary doctoral degree in engineering. An avid outdoorsman, Bob enjoyed fishing and hunting. He also became an accomplished pilot and owned his own plane.

When his business grew into a multi-state operation, Bob used to fly to the cities where he had offices to personally teach fluid power classes using textbooks that he had written himself.

A carpenter, a machinist, an engineer, an inventor, a pilot, an author, a teacher, a businessman, a philanthropist, and a benevolent Christian, Bob leaves a legacy of years of service to his community and devotion to his family.

The Womack Group has numerous IFPS certified professionals and is part of many current IFPS educational programs .

Education in our industry



In the words of one of my favourite bands - *"What a long, strange, trip it's been."* Having recently been elected to serve as the 2014 President of the International Fluid Power Society (IFPS), I've paused and reflected on just how I arrived at this point. Never, in my wildest dreams, could I have imagined that this day would come about after I first heard of the organisation so many years ago. My election as IFPS President is truly an honour and I am humbled.

It has been my pleasure to meet many very smart people in this industry over the course of my career and many of them have played various roles in helping get me to where I am today. Some of the roles were those of mentors, teachers, peers, co-workers and students. Yes, I have learned a great deal from my teaching experiences over the years and I have had the privilege of knowing some of the legendary teachers in the industry—such as George Altland of *Vickers* - and it is the area of industry education on which I want to focus my comments.

I'm sure that I am 'preaching to the choir' when I say that education is extremely important in any professional field but in some repects, it is uniquely so in the fluid power industry because a widely accepted and consistent set of standards does not exist in educating students in fluid power technology. Unlike *ABET* which is the accreditation body for engineering and technology degree programs in the USA, no universally accepted, specific standards have been adopted to ensure that people working in the fluid power industry at various levels possess consistent core knowledge and skills. The closest that the fluid power industry has come to achieving essential education and training standards, so far, are the various certifications programs offered by the IFPS.

The industry lacks a consistent and agreed-upon set of teaching standards to ensure that fluid power practitioners attain a common, essential level of knowledge. Many different organisations offer many wide and varied levels of hydraulic training and instruction. Some programs claim to teach basic hydraulics in as little as a day whilst other well-structured, associate degree programs take two years to complete. A disturbing trend over the past few years is that many people who claim to be seeking knowledge aren't as concerned about the depth and quality of the instruction as they are about the length of time which they have to take off from their work and the associated cost in obtaining a certificate. As a result, the people who take 'shortcuts' do not acquire enough knowledge to perform at an optimal level.

Consequently, I am a firm believer in IFPS certifications which offer the best tool currently available to evaluate and substantiate an existing knowledge and skill set. It's a shame that companies in the industry don't, as a whole, actively embrace and seek certification for their employees as certification provides confirmation that the people who are responsible for the operation, maintenance and selection of fluid power components and systems have, at least, met some minimum established standard of knowledge.

I encourage all professional people in the industry to take a positive step forward and attain certification at whatever level is appropriate to their area of work.

This would go a long way in improving safety, reducing energy waste, enhancing productivity and promoting the professionalism of people who work in our industry.

Perfect reliability

by Steve Skinner

Is it possible, in the 21st. century to build a hydraulic system that doesn't break down? Mechanical devices will eventually wear out, of course, so by *break down* we really mean to fail unexpectedly. We now have systematic tools available - such as proactive maintenance procedures and Design For Six Sigma (DFSS) - to help us achieve our aim of perfect reliability,.

The objective of DFSS is to design systems that have a target reliability level of at least 99.99966%, which equates to no more than 3.4 failures in every million opportunities.

Proactive maintenance combines many of the techniques of preventive and predictive maintenance into a process also designed to achieve similar levels of reliability. The essence of both tools is to attempt to think of all possible failure mechanisms and then to prevent them from happening either by design or maintenance.

However, safety experts tell us that between 80% and 85% of industrial accidents are caused by human error so, is perfect reliability already a lost cause?

Fortunately, human beings are very predictable animals, so it's a fair bet that at some time during the life of a hydraulic system, someone will try to start it up with no oil in it. There's a 50:50 chance that when the electricians first wire up the electric motor, the motor (and pump) will run backwards. If there's a shut-off valve on the inlet or drain line of the pump, someone is inevitably going to start the pump up with one or both of the valves closed.

If something is adjustable, then as sure as ‘eggs is eggs’, at some time or another, someone will adjust it. If there is an accumulator on the system, sooner or later someone will forget to drain it down before starting maintenance work on the system. Additionally, one thing that's 100% certain is that if there's a pressure compensated pump on the system with a relief valve to protect it, one day the compensator will be wound up higher than the relief valve setting and the oil will eventually boil if someone doesn’t discover the problem soon enough.

Anyone who's worked with hydraulics for any length of time could probably come up with a whole page full of such instances. It's not that maintenance people are fools - it's just that sometimes, we get tired and lose concentration, sometimes our mind is elsewhere and sometimes we forget things. Sometimes, we don't really know enough about the job we're doing. so we really shouldn't be doing it ... but someone has to. So there are all sorts of reasons why people sometimes do stupid things. I’ve done enough stupid things myself to know!

Therefore, Engineers need to think about all of the things that might (or rather, *will*) go wrong and try to design them out. Automatic drain valves for accumulators, interlock switches on shut-off valves, float switches in tanks, thermal cut-off switches, lockable adjusters, etc.

“...experts tell us that between 80% and 85% of industrial accidents are caused by human error, so is perfect reliability a lost cause?”

I know, it all sounds very expensive, but probably not as expensive as the first breakdown - if anyone ever stops to add up its true cost. Not only are we talking about lost production, consequential damage, premium labour costs, shipping costs, clear-up costs, etc., we may also be talking about people's wellbeing and even their lives.

To illustrate the point, in 1886 it was determined that a new bridge was required across the River Thames in London but being down-stream of what was then the biggest port in the world, it had to allow tall-masted ships to pass freely beneath it.

The result was Tower Bridge, one of the best-known landmarks of the City of London with its two opening sections or *bascules*. The problem was, each 162-foot long bascule weighed about 1,500 tons and for the bridge to open, each had to tilt through almost 90 degrees in just over a minute then close again once the ship had passed through.

Initially, this would occur more than 20 times a day. The tilt mechanism was powered by eight 20gal/rev hydraulic motors which were fitted with built-in brakes, driving a curved rack and pinion arrangement. Being aware of the consequences of a failure of the bridge tilt mechanism, the Victorian engineers built in numerous parallel systems and devices and no doubt, when the bridge opened in June 1894, they were confident that they had covered every eventuality.

Unfortunately they were wrong, and one sunny afternoon in July, the bridge suffered a mechanical failure and would not close. However, this was in July *1968* and in the interim 74-year period, the 1,500-ton bascules had hydraulically opened and closed 352,713 times!

So is it possible, in the 21st century, to build a hydraulic system that doesn't break down? Maybe not - but we should at least be able to get close if the 19th century Engineers could achieve a 99.99972% reliability!

About the author

Steve Skinner's 46 years of experience with hydraulics was gained mainly with Vickers and subsequently Eaton in the UK.

Having occupied roles in applications, sales and product management for much of the time, he completed his career with Vickers/Eaton in the capacity of European Training Manager.

Now a freelance lecturer but still actively involved in BFPA and CETOP fluid power certifications, he is soon to publish a book on the history of hydraulic fluid power.

Visit:

www.steveskinnerpresentations.co.uk to view Steve’s work.