Fluid Power: using MDG41 to promote Hose Safety

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My name is Rosa Burns and I work in the Training Department at MMG Century Mine. Century Mine is an open cut zinc and lead operation and is situated approx 350 kms north west of Mt Isa in the Lower Gulf Region of Queensland.

Late last year, the Manager of our Heavy Vehicle Maintenance Workshop approached me to discuss the possibility of introducing MDG 41 Guidelines to our site. I must admit, although I had heard of MDG 41, I was not really too familiar with the details contained in these guidelines. Over the past 2 years he had attempted on a few occasions to implement these Guidelines without success, as each time there were too many hurdles to overcome and so it was put aside again and again. I agreed to look into it and so the journey began. It has not been easy, I am not a technical expert on hydraulic hoses, but I could see the vision he had and I was determined that this time we would succeed. While we are not yet there 100%; we can see the finish line!

MDG 41 is a set of Guidelines established by the NSW Department of Primary Industries and is at present still in 'draft format'. Nevertheless, some underground mines in NSW and other states have undertaken to implement the guidelines within their workplace. MDG 41 deals with hydraulic hoses; the manufacture, labelling, storage, installation, inspection, repairs and the recording of the history of a hose from the beginning of its life until its end. It also describes processes and procedures that should be followed should an injury occur.

Our fleet of machinery consists of Haul Trucks, shovels, dozers, loaders, excavators, water carts, graders etc. The fitters regularly inspect hydraulic hoses on these machines during routine planned maintenance and replace any that are showing visible signs of wear and tear. Even with the best efforts possible, we have not been able to eliminate hose breakdowns that lead to expensive downtime. It is of course, impossible to see what wear and tear exists inside the hose and this is difficult to manage. At present we are averaging approximately 30 to 35 hose incidents a month that require maintenance attention. These incidents are occurring despite regular maintenance checks and inspections.

This year we experienced hose failures that have lead to a fire on a machine and resulted in some expensive downtime in that part of our mine operation.

We have been very fortunate, that up to date there have been no physical injuries resulting from a hydraulic hose failure.

The possibility of someone receiving a serious injury such as fluid injection, from a leaking or burst hydraulic hose, is always present and it is this aspect of safety that has driven us to look at MDG 41 as a way of improving hose safety on our site. Should such an injury occur, it could of course, be catastrophic and even fatal, for the person concerned.

Once we decided to go ahead with using MDG41 Guidelines we looked around for some assistance and information from another mine that was using this already, and found that no mine in our vicinity had tried to implement it. We had to start from scratch.
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Our first task was to clarify the aspects we needed to cover:

- Appropriate hose making and testing equipment
- Appropriate Storage facilities
- A labelling system for our hoses and components
- A data bank to store the history of the hoses
- A review and Quality Assurance system
- Training for the Diesel Fitters
- Funding

I saw almost immediately that this was rapidly becoming a huge task and would need to be properly supported with funds and other resources.
We quickly developed a business plan and presented this to our General Manager who was very interested in all aspects of the project. Once this was approved we knew we could go ahead with confidence.

It was decided that we would begin by making sure that our workforce was trained to be able to use best practice in the manufacture, installation and repair of hydraulic hoses. Up to now, we have relied heavily on the supplier of our hoses to provide any necessary training for our fitters and workshop employees. While this has been satisfactory to some extent, the training received is not nationally accredited or recognised by other workplaces that might be using a different supplier for their hoses. This training is not transferrable between mine sites and the quality of the training could vary greatly from place to place. We were looking for training in Hydraulic hoses that would be nationally recognised across the industry as a person changed employment. All our fitters are trade qualified and we were looking for an RTO that could provide us with the competencies under AQTF that would meet MDG 41 Guidelines. This meant they needed to be trained in

MEM18020B Hydraulic System Components

and

MEM18021B Maintain Hydraulic Systems.

This training is from Certificate IV in Engineering.

Trying to find a Registered Training Organisation in Queensland that had these competencies on their scope, and would be prepared to come to a remote site to deliver this training to over 80 fitters, proved to be an almost impossible task. We made numerous enquiries not only in Queensland but also right along the East coast of Australia trying to find an RTO that could assist us. We were aware that there were RTOs in Western Australia who were delivering what we wanted, but we really wanted an RTO closer to home. We finally found one who did not have exactly what we wanted, but was very enthusiastic about the possibilities that MDG41 offered and were prepared to work with us to achieve our goal. They were willing to write the required training package to suit our needs and source experienced trainers in the field of hydraulics who were willing to come to site on a weekly basis to deliver the necessary training. We considered off site training but this proved to be too difficult as our workers come from many different parts of the state and it would be too inconvenient. We have estimated it will take approximately six months to deliver these competencies to our workforce. If other mine sites also take up this training it will give confidence to employers that the competencies gained by these individuals are of a nationally recognised standard and are fully transferrable.

We then had to undergo a formal audit of our facilities to ensure our workplace and equipment was at an appropriate standard. This was done through TAFE. The Audit proved to be successful with all equipment and storage facilities being thoroughly examined.

We had acquired a new Hose Testing machine which we had commissioned and then had several of our Workshop employees passed out on it in readiness for its use.

We were fortunate in having a designated Hose Technician appointed early in 2010, and he has been invaluable in his assistance in setting up a labelling system for hoses and their components. The labelling system is a crucial part of what is required under the MDG 41 Guidelines as this is the main tracking system for each and every individual hose. Many hours have been spent trying to work out the best code to use and how this would fit into the data bank. MMG Century Mine uses SAP as its main software and we were keen to design something that would dovetail into the SAP modules that the maintenance planners used as well as the modules in SAP used by the warehouse to purchase goods. It was important that we could track costs, regular maintenance, and also unplanned maintenance. This task required some expert advice and is still being fine tuned.

A regular review and auditing system was another consideration we had to consider and at the present time this is still a work in progress.

One might ask, ‘Why are we doing this?” when we have operated successfully without it for many years. We believe very strongly in safety and business improvement. With MDG41 we believe we will achieve both.

Hydraulic hose safety will be improved by not just relying on external inspections for signs of wear and tear or the number of hours that the machine has been in operation. It will give strong guidance on when hoses should be changed long before they approach a time in their use when they could experience failure.

From a business point of view, this will result in cost savings as we will see a decline in the number of hose failure incidents we are currently experiencing and the expensive downtime associated with these failures.

It will also ensure we have a well trained workforce that is using best practice in the industry and for the first time will have nationally accredited qualifications that are specific to fluid power hydraulic hoses and are transferrable across different mine sites.

It has taken many months to reach this point but we are now very confident that it is all coming together as planned.