

IPLOCA HEALTH AND SAFETY AWARD

2022



INTERACTIVE EXCLUSION ZONE AWARENESS

Recognizing an Exemplary Success in
Improving Health & Safety

BUSINESS PROFILE

Spiecapag as a business hold Quality and Safety in the highest regard across all our projects and ensure that systems are put in place to protect all our personnel and ensure we construct Pipelines of the highest quality as a matter of priority. We are proud members of IPOLOCA and see true benefit in what the association brings to the Pipeline Industry.

Spiecapag provides full life-cycle support to the pipeline industry. Starting from project conception and financing assistance, to engineering, procurement, construction, commissioning, operation and maintenance. This expertise covering onshore pipeline and related ancillary works such as pumping and compression stations, metering and regulation facilities, storage complexes and loading-unloading facilities.

Since it constructed its first high-pressure pipeline in the Paris region in the 1920's, Spiecapag has acquired unsurpassed experience with more than 50,000 km of pipelines and onshore infrastructures in more than 60 countries on all continents. With more than 90 years of continuous experience and a fleet of equipment that it can mobilise rapidly to all points of the globe, Spiecapag has become a specialist in complex projects, from both a technical point of view for large diameters, and from a project execution standpoint, working in environmentally-sensitive areas like deserts, arctic regions, mountainous zones, tropical rain forests, etc.

We are a multicultural, multinational and multilingual company. Wherever our clients go, chances are that we have been there before and that we have personnel familiar with that part of the world. So we know what matters and how to find our way. This know-how is one of the keys, not only to our own success, but also to the overall success of a project.

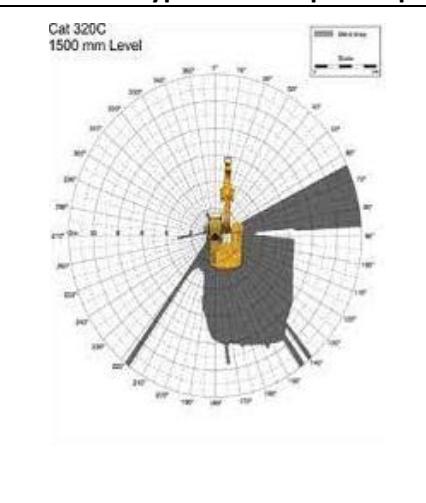
FINDINGS

What was the situation before the initiative was implemented; what were the reasons that lead to a decision made;

In Australia 13% of workplace fatalities are a result of being hit by moving objects, some of these events include being crushed between mobile plant and other objects. When we further investigated these occurrences a common theme appeared, workers were not complying with exclusions or failed to understand them. Currently the main method of communicating exclusions to the work force is through the use of static illustrated images, see photo 1. However, these images can be difficult to fully comprehend and truly appreciate the operators restricted field of view.

To further compound this issue, over the next 18months the Australian pipeline industry is expected to lay over 1000 km of new pipeline infrastructure. This will not only see an increase

Photo 1 – Typical Blind Spot Map



in the number of new personnel entering the industry, but also see a number of people returning to the industry after several years away. This surge of new personnel to the industry increases the risk of exposure to crush incidents if the exclusion zones and blinds spots are not adequately and effectively communicated. Spiecapag believe that in-action on this topic could have dire consequences for our fellow pipeline colleagues and agreed on an initiative that the entire pipeline industry could benefit from.

SOLUTION

what was the initiative selection process; how many solutions have been studied; why was this initiative selected

Spiecapag is a business that is constantly seeking to improve and innovate, especially with matters regarding occupational health and safety. To remedy this industry risk, the business brainstormed a range of strategies to help raise blind spot awareness around some common pipeline machinery and to highlight what harm we are exposed to if we don't comply with exclusion zones.

When the team started investigating workers perception to risk around exclusion zones and blind spots, we discovered that there was a basic understanding of the fundamentals, but the 2 key findings were:

- Unless you have operated a machine, very few people comprehend the reduced field of vision from the cab
- None of the people questioned or the team involved in developing the material had firsthand experience of a pipe drop or uncontrolled release of pressure. Although some had been involved in the subsequent investigation.

As humans we learn better if we can visualise the outcome, this is especially relevant in safety. The more people we have on a crew that can visualise the risks and our exposure, the safer the area will be.

The decision was made to produce a series of safety videos that met one of two criteria:

1. Provided a real representation of what happens when pipeline equipment fails, or
2. Provided a 360degree immersive view of what operators see from their cab.

The decision was made to keep the initial videos produced specific to the pipeline industry. In doing this it ensured that personnel new to pipelines that had experience within construction immediately became aware of terminology and risk.

The strategy included producing the following videos:

- 572 Sideboom, 360degree immersive challenge video
- 30t Excavator, 360degree immersive challenge video
- Bucket Wheel Trencher, 360degree immersive challenge video
- Simulated pipe drop from a vacuum lift
- Simulated pressurised hose failing without adequate restraint.

IMPLEMENTATION

how, when and where was the initiative implemented, funded, communicated and explained to workers; personnel and management commitment; any problems encountered; any modification made to the initial project; etc...

The series of videos was produced over a 6-month period, we reflected and listened to peer feedback after each video was released. Below is the summary of each video;

Video #1 - Simulated pipe drop from a vacuum lift

The first video Spiecapag produced was the pipe drop from a Vacuum Lift, this was particularly relevant to the business as we have performed over 120,000 pipe lifts in Australia over the last 10 years and have experienced 5 uncontrolled pipe drops. We wanted to better understand the leading factors and any resulting secondary risks. Our goal was to provide more information to the field personnel involved in pipe lifting.

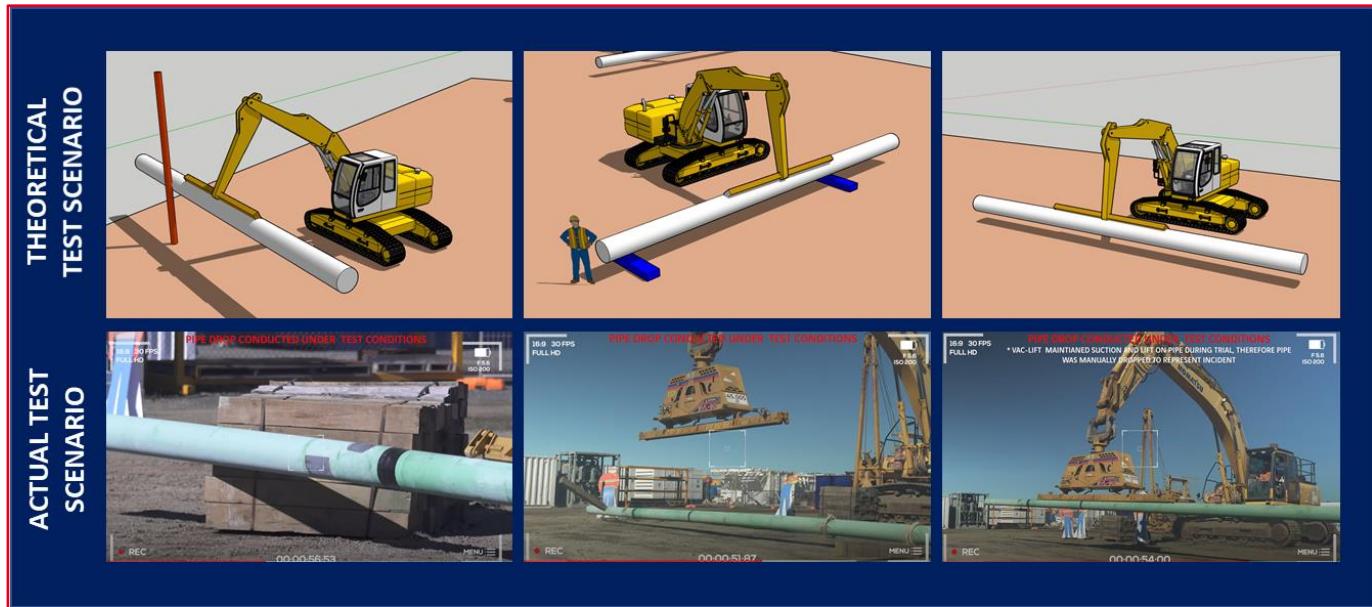
To demonstrate what happens, it was decided to film a series of pipe drops, performed in a controlled environment, and use these video's to better understand what happens during and after the pipe has been dropped. The intention was to demonstrate factually what occurs and why exclusion zones are important.

For the video to be relevant, scenarios were selected based on the finding from previous incidents. The scenarios tested were:

- Loading pipe onto trailers where the edge of the suspended pipe contacts a fix object,
- The Vaclift loses suction when picking the pipe from the trailer and placing the pipe on the skids.
- Pipe flexes when being tracked along the RoW with an excavator.

One of the biggest risks associated with pipe movement on large projects is complacency that is brought about through the highly repetitive activity. By bringing real life demonstrations of what can happen if the pipe drops to the forefront of the crews minds re-enforces the need for exclusion zones.

Prior to performing these simulations, we had pre-conceived ideas of what would happen in each of the situations, these were largely based on previous incidents findings and our own experiences. The simulations demonstrated that well maintained Vac-lifts are safe and securely hold the pipe, this was evident as in some instances we had to manually trigger the vac-lift to release pressure. Additionally, our existing SWMS did not cover the risk of the timber skids becoming projectiles when stuck in the right position by the falling pipe.



There was a great reaction from the industry, generating conversation, and was shared as a Toolbox presentation or Safety Moment.

The pipe drop video now features as part of our induction package for anyone involved in Pipe Receipt, Pipe load out and stringing.



Video #2,3,4 - 360 immersive views of machines

The next phase was to produce the blind spot awareness suite of videos. Pipeline Construction invariably involves large machinery, which inherently has many blind spots. We have always been advocates of the phrase "if you can't see the driver, he can't see you" and this is a message we are very vocal in communicating.

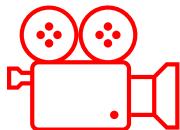
We found there is often complacency that creeps in when people become used to working alongside large equipment. We also acknowledge that most modern equipment has a series of camera's fitted as standard or installed aftermarket which can help the driver with blind spots. Technology is having a great impact on safety, however, if we look at the hierarchy of control, we want to be eliminating the risk (keep people out of exclusion zone) rather than relying solely on an Engineering Controls (camera's and alarms).





For this demonstration we mounted a 360° Camera in the cab of 3 common pieces of pipeline plant (an excavator, bucket wheel trencher and sideboom). The camera was placed where the operator would be situated. We then positioned a series of coreflute cut out people around the item of plant. The finished video allows the viewer to navigate around the full 360° view and try to identify how many of the cut outs they can see.

Click on the links below in red to see the video's, You can use your mouse to navigate around the cab and see exactly what the driver see's.



- [**572 Sideboom 360 Video**](#)
[**Bucket Wheel Trencher 360 Video**](#)
[**Excavator 360 Video**](#)

Working with Pressure Hoses and Whip Check

The final video we developed was to showcase the dangers around pressure hoses. There is a massive amount of stored energy in the hoses that are used for activities such as; cleaning and gauging, hydrotesting and abrasive blasting. The hoses notoriously are heavy and are dragged around the site to get them where they are required.

It has become second nature to install a whip check to secure a hose to the compressor, hose to hose and hose to attachment, however very few people have seen the force that can be expelled and the effect of having no whip check or a poorly fitted whip check in place.



The video shows 3 scenarios to demonstrate the purpose and limitations of a whip check:

The scenarios tested were:

1. Connection between 2 hoses comes loose with no whip check in place
2. Connection between 2 hoses comes loose, with an incorrectly fitted whip check fitted and slack within the hose.
3. Connection between 2 hoses comes loose, with a correctly fitted whip check and no slack within the hose.

The 3 scenarios were filmed from above and at ground level to understand the amount of movement.

We discovered that if the whip check is poorly fitted and there is slack (freedom for movement) in the hoses the whip check is totally ineffective.

In all 3 scenarios there was no stored energy in the line, i.e the hoses were open ended and there was no opportunity for pressure to build up. If there had been pressure built, the force would have been much greater.

In scenario 1 and 2 listed above the pipe moved approximately 2m's. If there was someone stood in this area when the connection broke free the metal quick connection on the end of the hose has the potential to cause a serious injury.



Pressure Hose and Whip Check Video

Video #5 & 6 - Involving Industry Specialists

After the success of the Pipedrop video and all the positive feedback we received from the industry we reflected on the finished video, whilst we were really pleased with the outcome, we felt it wasn't complete, we had highlighted a problem but not offered up a solution.

We wanted to include a short general awareness discussion as part of the pipedrop video we had already produced and in the pressure hose video we were about to start. These were not intended to give an in-depth tutorial to operators but a general awareness for people that may be doing a leadership walkthrough or in the vicinity of the works being undertaken.

Rather than having the Spiecapag safety team discussing the findings of the video purely from a safety perspective we wanted to get some hands-on people from the industry involved, people that deal with these issues 365 days a year.

We had been in discussion with Vacuworx after the release of the pipe drop video and they were kind enough to give us some very constructive feedback and information on what they were doing to try and prevent incidents such as the ones we demonstrated from happening. When we contacted them and requested them to provide some high-level points to look out for they were more than happy to assist.

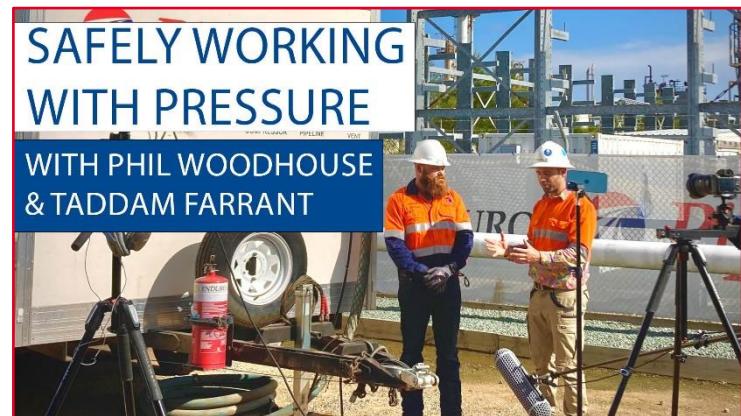
We also wanted to take a similar approach to the pressure awareness video, PipeTek were also happy to spend half a day with us explaining the key things to consider when working around pressure hoses.

The intent of involving other parties in these videos was to make them an industry tool rather than something Spiecapag have produced solely for internal use.

The pressure hose discussion was included as part of the awareness video, the pipe drop discussion was kept as a separate video and can be viewed via the link below:



Vacuum Lift Discussion Video



ACHIEVEMENTS

Proven positive results on cost, productivity, etc...; how did employees and clients consider this innovation; any problems encountered; any positive/negative feedback; etc...

Spiecapag believed the entire industry should benefit from our efforts, therefore all the videos have been made freely available via YouTube to allow ease of sharing.

The feedback to date has all been positive, there have been other companies within the industry that have told us they have shown the video's as part of their toolbox meetings, this means they are serving their intended purpose.

As a result of the industry recognition around the video's, Phil Woodhouse our Corporate Safety Manager has been requested to present the videos as part of the APGA (Australian Pipelines and Gas Association) and IPLOCA HSE Seminar on 12th May.

From a Spiecapag perspective we have used the video's in a number of ways:

- Pre-starts and toolbox meetings
- General awareness in induction packages
- Activity Kick-Off meetings
- Internal and External Safety Moments

They have all been posted on LinkedIn to reach as many people within the Pipeline Industry as possible.

As there is an interactive element to all the video's they are good at holding the audiences attention rather than just being a talking point.

The feedback we have had from the employees has been great, people that have been in the industry for years hadn't seen first hand what can happen and it reconfirmed some of the specific dangers around pipeline construction sites.

Does it add value?

We believe it adds a great deal of value, it is an easy means of communicating high risk situations to a wide audience in a visual manner. This means the information is easily absorbed and retained.

Visually showing the workforce what happens when safety devices fail is a proven method of effectively communicating a safety message across cultures and languages. These videos have been publicly available and viewed over 12,000 times they have also added value to training programs by using a modern approach and new technology.

Does it show management commitment?

Management identified an opportunity to make a difference to the safety of everyone in the pipeline community, not just at Spiecapag. Management recognized the value of producing industry specific content that was interactive and easily shared.

Does it constitute an identifiable step forward in safety for the Industry?

This is a step forward as it is not only telling people to be safe, but showing what happens when things fail. Three of the videos were produced by using interactive 360-degree technology which is supported on Youtube. This is the first time this technology has been used to allow spotters to see what operators see firsthand. Adopting this technology will revolutionize how training is provided and does not require expensive simulators.

This is another great tool for the industry and hopefully one that will be built on by all IPOCA Companies, collaborative sharing of tools and awareness such as this will definitely make the industry a safer place in the future.

How efficient is it?

This is an extremely efficient means of getting an important message across to the people that matter. These are real life scenarios that allow for the information to be easily absorbed. A few minutes of video captures the audiences attention and keeps it.

Does it have additional benefits?

The real benefit we have found is the fact it immediately generates a conversation, when we play these video's in a safety moment or a pre-start meeting, there is always a lengthy and constructive conversation afterwards of people's experiences, we very rarely have the same response when we present other topics or simply talk to a powerpoint presentation.

While the videos were developed for the Pipeline Industry, they have been adopted by other industries including civil construction, thus assisting other industries in making a safe site. They have also generated conversations within the industry and have been used as safety shares and presented at industry events.

Long term planning

any plan to monitor, renew or expand the initiative; etc

We are currently looking at variety of other subjects that would benefit from a similar visual approach, this involves listening to the feedback we receive from the various groups that have used the current suite of videos.

One of our current projects involves pipeline construction in an urban area, we are in talks with a local school and scout group and intend to invite a group of children to site so they can participate in a first hand experiment around truck blind spots. The children will be asked to sit in the drivers seat and count their classmates. This is to ensure that they appreciate that the driver won't be able to see them in various locations around the truck and that they need to stay well back at all times.