Next Generation Non-Skid Surface Technology for Modern Offshore and Marine Applications

Technological Advances Give Non-Skid a New Life
A Price Worth Paying
No Compromise on Safety
Risk Can Be Managed
Avoiding Slips and Falls

Sponsored by Silvagrip
Silvagrip® Peel and Stick Nonskid is patent-pending product designed to last. Silvagrip is fabricated with metals that hold a matrix of sharp ceramic abrasives, with a hardness just under diamonds. This hardness increases durability which increases longevity and effectiveness.

- Longest Lasting Non-Skid Peel and Stick in the marketplace
- Easy installation, no curing time, ready for traffic immediately
- Corrosion-proof, water & UV proof
- Approved and used by the US Navy

Worldwide Distribution
www.SilvaNonSkidSolutions.com
Foreword

In many industries, quite unexceptional components in the process can contribute significant value on every level. That would certainly be true for non-skid, non-slip surfaces on offshore oil and gas platforms and installations and on supply vessels. Being in a marine environment and working on a complex engineered structure with large and powerful machinery is always going to be hazardous but when weather deteriorates, when the temperature falls, when daylight is lost (whether or not artificial light is available) the level of hazard increases.

And, in all of these conditions, one of the most frequent hazards is slipping and falling. Whether falling to the surface on which he was working or falling through the engineered structure, a fall on an offshore platform can result in serious injury or loss of life. Therefore, the quality of non-slip surface treatment is a vital contributor to platform health and safety.

The opening article in this Special Report looks at the advances that have been made over the years in non-skid applications. The basic peel and stick method has been advanced to a patent-pending solution, Silvagrip®, developed by Silva Non-Skid Solutions LLC, that revolutionizes the non-skid peel and stick industry. Designed to meet the needs of industries operating in challenging marine environments, Silvagrip® lasts longer, performs better and saves costs.

The second article, from Francis Slade, looks at the wider context within which all offshore processes have to operate, i.e. the business economy, and for any oil extraction process, that currently looks challenging with the lowest prices for a long while. However, given the long-term demand drivers, those circumstances are not going to last. Whatever the price, safety is one area where no compromise can be contemplated, as our next article explains. The cost of safety will never be as great as the cost of safety failure. Like every part of the process, safety and risk have to be managed and Peter Dunwell’s article looks at ways in which that can be achieved and some of the bodies whose regulations govern how things should be done.

Finally, we look at solutions and systems that go to ensure that workers are safe when moving around and working on offshore platforms.

John Hancock
Editor

John Hancock joined as Editor of Offshore Reports in early 2012. A journalist for more than 25 years, John has written and edited articles and papers on a range of engineering, support services and technology topics as well as for key events in the sector. Subjects have included auto-engineering, auto-engineering and electronics, high value manufacturing, testing, aviation IT, materials engineering, weapons research, supply chain, logistics and naval engineering.

SPECIAL REPORT: NEXT GENERATION NON-SKID SURFACE TECHNOLOGY FOR MODERN OFFSHORE AND MARINE APPLICATIONS

Technological Advances Give Non-Skid a New Life
Silva Non Skid Solutions LLC

The industry of non-skid applications has come a long way from the days of slapping a coat of fortified epoxy paint on a walkway each year during spring commissioning.

Advances in non-skid applications began with the introduction of peel and stick – basically a more efficient method to achieve similar or better safety features in a faster, cleaner setting.

Now, Silva Non-Skid Solutions LLC, has developed a patent-pending solution that revolutionizes the non-skid peel and stick industry with a superior product that lasts longer, performs better, and sustains lower costs in the long term. Silvagrip® is a peel and stick designed to meet the needs of industries operating in challenging marine environments.

What is Silvagrip®?
Silvagrip® is an aluminum/ceramic blend of molten metal and ceramic, applied to a back, with adhesive and a protective plastic liner. It can be shaped or bent, but also provides a strong and hard non-skid wear surface. When molten aluminum blends with ceramic and oxygen it creates a very tough material with a rough surface profile. The aluminum/ceramic blend is a patented product used in creating Silvagrip®.

Inventor and Co-Owner, Chuck Ligon, says “Silvagrip® is fabricated with metals that hold a matrix of sharp ceramic abrasives with a hardness factor just under diamonds. This hardness increases durability which increases longevity and effectiveness.”

The proprietary process to make Silvagrip® uses an advanced metallic, thermally assisted, surface engineered method for deposition of molten metal textured surfaces.

Silvagrip® has an expected lifecycle of more than ten years but it can last much longer with some estimations up to 50 years. Product testing only began ten years ago, so its lifecycle is expected to increase as time goes on.

Silvagrip® is heat resistant, corrosion proof, water proof and UV proof. The product resists oil and chemicals and has tested to withstand deck temperatures of up to 200°F plus, with no change to structure.

Silvagrip® is Proven Effective by Years of Research and Development
Silvagrip® was first designed for longboard racers. The hard turns and high speed of the sport requires boards with extreme grip and unflagging adhesive. The sheer force applied in longboard racing far exceeds the normal
The adhesive is the same as used on motor vehicle thresholds, emblems and components in engine compartments and inside door frames.

Metal encapsulated abrasive particles are more durable and secure than in polymers, epoxy, or resin based non-skid. Until Silvagrip® was invented, all nonskid peel and stick products were resin based. When metal decks contract and expand, the adhesive used in Silvagrip®, expands and contracts with the metal decking, thus eliminating the potential for cracks, chips and delamination you get with traditional epoxy and grit.

Silvagrip® is offered in various alloys using combinations of carbides and oxides of titanium, tungsten and ceramics. It comes in standard or custom sizes sheets or in rolls.

**Less Weight An Added Benefit**

Weight reduction has always been the goal for offshore rigs, ships, and marine structures. Less weight means better fuel economy and reduced emissions along with less vibration and stress on structures and machinery. By design, peel and stick applications do not need to cover 100% of the surface area. A two inch border between sheets greatly reduces the amount of product needed to cover a working surface. In contrast, a non-skid epoxy coating needs to cover the entire area, thereby adding weight to the application.

The abrasive particles don’t wear out, they just fall apart, especially in hot conditions.

Silvagrip® peel and stick has a Rockwell hardness of 60+ and a high bond strength of 2,500 psi. It adheres to the surface with a proprietary adhesive. There is no slipping of the grip on the deck or walkway once applied, even in the toughest of conditions.

Silvagrip® has the shear strength of their adhesive as per the U.S. Navy MilSpec MIL-PRF-24667 Type XI. A one inch square piece of adhesive is applied to a stainless steel vertical surface. Then a ten pound weight is secured to the sample. It must hold for one minute per the mil-spec. Silvagrip®’s adhesive stays secure for over an hour until it is finally taken down.

Another weight saving benefit is the actual weight of the application product. By comparing the weight of the product used for equal size surfaces, peel and stick products weigh less than half of epoxy paint thereby reducing the weight load even more. To date, Silvagrip® has the lowest product weight per square foot in the industry.

**Cost Savings during Lifecycle**

Silvagrip® is superior in durability results in less replacement and the total cost of ownership is significantly lower over the life of the product.

The cost of continually removing and replacing marine nonskid paint is expensive. It’s extremely labor intensive and there are many other costs associated with the procedure, as the areas sometimes need to be conditioned off and ventilated. Drying time adds time and cost to the project.

Silvagrip® has an expected lifecycle of ten years (120 months) compared to the estimated 15 months lifecycle of epoxy paint or conventional resin-based peel and stick. With less replacement over a ten year period, significant savings are realized from less labor costs, less product waste and loss of access to the area.

**Worldwide Distribution**

Silvagrip® is manufactured by Silva Non Skid Solutions based in Florida, USA and offers worldwide distribution.

**Features**

- Long life, permanently safe surface
- Silvagrip® withstands high deck temperatures
- Usable on all metals
- Flexible – conforms to any deck substrate
- Lightweight and paintable
- Easy to clean by scrubbing or pressure washing
- Oil and chemical resistant
- Easy to repair or replace, even at sea
- Corrosion proof, waterproof, UV-proof
- Use in all weather environments
- Resistant to wear (Ceramic R60+) - Approved and used by the US Navy

**Company Information**

**Contact**

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www.SilvaNonSkidSolutions.com

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Chuck Ligon
Telephone: 1-941-320-9780

Allen Hildebrand
Telephone: 1-920-205-4074

**Easy Installation and Immediate Availability for Use**

Silvagrip® peel and stick is dry and clean surfaces. The finished product can be cut to surfaces that are submerged in water. Cost savings during lifecycle, the total life of ownership is significantly lower over the life of the product.

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**Application Area (sq. ft.)**

- **Epoxy Noniskid Paint:** 4000
- **Silva Peel & Stick:** 2000
- **Silvagrip Peel & Stick:** 1200

**Weight (lbs.)**

- **Epoxy Noniskid Paint:** 2492
- **Silva Peel & Stick:** 412
- **Silvagrip Peel & Stick:** 25

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A Price Worth Paying

Francis Slade, Staff Writer

The cost of safety must always be fully accounted for even in economically challenging times

The Economic Background

These days it is difficult to deal with any topic in the offshore oil and gas sector without at least a passing reference to the current and future economic state of the industry. Even with a subject as specific as non-skid surfaces, any program will involve cost and every cost has to be viewed in the context of overall prospects for the sector. According to the BBC in January 2015, “…since June [2014] prices have more than halved. Brent crude oil [had] slipped below $50 a barrel for the first time since May 2009 and US crude [was] down to below $48 a barrel.”

However, although the price of oil fell from mid-2014, there was already a glimmer of hope on that front at the time of writing. The Wall Street Journal reported on March 23rd 2015 that a slight decline in the US dollar had put the price of a barrel of Brent crude up by 60 cents or 1.1% to $55.92 on ICE Futures Europe. Beyond this glimmer of hope, longer term economic factors suggest that, in the medium- to long-term, global demand for energy will continue its historic upward path. Of course, sustainable and renewable resources cannot be ignored in any long-term view, but they are unlikely to be sufficiently developed to satisfy global energy hunger in the near- or medium-term future. Oil and gas reserves are likely to be the main source of energy for some time to come. Nevertheless, current conditions make every calculation involving cost a challenge and so operators will want to find the most cost effective solution for any requirement, including non-skid surfaces.

And even with a glimmer of hope, nobody should relax yet. Some energy businesses will cut investment levels or re-tune their businesses to cope with the current leaner dollar price. For instance, also in January 2015, Shell announced a reduction in investment of $15 billion over the next three years. But, if low prices discourage investment in more expensive projects (such as enhanced recovery and less accessible reserves) they will also spur oil consuming economies to grow and that, in turn, will increase demand for the things that require energy for their manufacture and the demand for energy itself, which will be positive for prices.

For a more realistic view, Lukoil has projected that “…a number of trends will support oil prices in the medium term, including population growth and urbanization; motorization in Asia; the increased costs of exploration and production; OPEC policy and US dollar depreciation…” – see Wall Street Journal report above.

If predictions about demographic changes are to be believed, global population numbers are set to increase by at least 1.1 billion people between 2010 and 2025. 1 billion of that growth will be in urban areas as growing populations migrate from rural, low energy consumption areas to cities where their expectations and energy consumption will rise as they join the consumer society. It all points to a growing need for energy. That said, it cannot be denied that confidence in the sector has been better. The Oil & Gas UK Business Sentiment Index for fourth quarter 2014 revealed a 16 point fall in optimism for the sector to -23 points.

Delivering On Investment and Efficiency

Governments have their part to play as Oil & Gas UK also confirmed when it reported that George Osborne, UK Chancellor, had recognized this, move to restore the North Sea tax regime to promote investment in oil and gas resources. This action will help to maximize recovery of that resource and sustain an industry which supports a million jobs in the UK offshore oil and gas industry. Of course, safety costs money but, as any airline operator will tell you, accidents cost a great deal more. UK HSE again, in the report ‘Slips, Trips and falls (STFs) from height offshore’, explains that the potential losses to employers caused by slips, trips and falls from height offshore are likely to be significant. These might include direct costs, loss of key staff, medevac, breaks in operations and a wide range of liabilities. The report continues to confirm that The Management of Health and Safety at Work Regulations (1992) require that employers carry out risk assessments including consideration of hazards which might lead to STFs.

Risk assessments are not the bureaucratic nightmare that some people imagine and that might lead them to cut corners in this key requirement. Still from the UK HSE, we learn that, “A risk assessment is not about creating huge amounts of paperwork, but rather about identifying sensible measures to control the risks in your workplace…” your risk assessment will help you decide whether you have covered all you need to.” It continues to suggest, “Think about how accidents and ill health could happen and concentrate on real risks – those that are most likely and which will cause the most harm.”

A fall resulting from slipping will fall squarely into this definition. The HSE notes (see above) include a helpful guide on how to assess the risks in your workplace which suggests:

1. Identify the hazards;
2. Decide who might be harmed and how;
3. Evaluate the risks and decide on precautions;
4. Record your significant findings;
5. Review your assessment and update where necessary.

Whatever the current economic circumstances might be, safety will always be an operator’s paramount concern especially for the ethics of looking after the workforce, but also because any interruption to production will only make the economic situation worse.
SPECIAL REPORT: NEXT GENERATION NON-SKID SURFACE TECHNOLOGY FOR MODERN OFFSHORE AND MARINE APPLICATIONS

No Compromise on Safety

John Hancock, Editor

It has to be part of the process as much as risk is part of the working environment.

Hazard is Part of the Environment

Offshore: Platforms for the oil and gas industry spend their working lives at sea, often far from shore. Once positioned and connected to the output and distribution infrastructures, even movable platforms are unlikely to travel far because of the massive expense of disconnection, moving and reconnection; not to mention the cost of lost production. As a result, and given the exceptionally arduous environments (weather, movement, hazardous materials and substances) in which most platforms operate, they are subject to considerable levels of wear and tear. Their condition, performance and safety can be compromised as structures and systems that worked well at the outset become progressively more worn and less effective. That can be especially true for the walkways, gantries, ladders, stairways and work surfaces on which workers need to be able to stand or on which they need to be able to move with optimum safety while going about their work.

As Francis Slade explained in the previous article, safety is a major consideration and concern for legislative bodies such as the European Union, whose Directive 2013/30/EU on safety of offshore oil and gas operations, “...will make sure that the highest safety standards will be followed at every oil and gas platform across Europe. Such an attitude is justifiable given the levels of hazard encountered in the sector. The first source of hazard is the ocean itself bringing the considerable pressure of constant movement by millions of tonnes of water: usually gentle but still considerable; sometimes violent, capable of inflicting enormous damage and positively threatening. Linked to and every bit as dangerous as the ocean is the weather. From simply carrying salt laden spray to wiping down even heavier, the wind can encumber and endanger even routine work. Safety systems such as painted non-skid surfaces can soon be compromised by the salt and deposits that the weather carries on to a platform. "Oil & Gas UK" summed up the problems of oceanic locations in ‘The Offshore Challenge’ (publication expired). "...the northern North Sea called for major engineering and technological innovation. Production facilities had to be designed to withstand wind gusts of 180 km/hour and waves 30 metres high. Other problems included the ever-present salt-water corrosion. ..." But beyond the big engineering of the system, if operators don’t give enough attention to the smaller details such as safety systems, the whole investment could be compromised.

Safety is Part of the Process

The Maritime Injury Guide10 sums up the problem: "Workers on offshore oil rigs, natural gas wells, and their support vessels are at risk of suffering injuries on the job due to the nature of their occupation and where they work. Even in good weather and calm seas, seamen and other maritime workers can get hurt, especially if the negligence of others causes an accident. To make matters worse, offshore workers live and do their jobs far from the nearest first responders or medical facilities. If an accident occurs, it sometimes takes hours for help to arrive via Coast Guard vessels or helicopters. " The guide continues to identify the most common injuries suffered by seamen and other workers in the offshore maritime industry, including spinal cord injuries, burns, scarring, traumatic brain injuries, head injuries, loss of limbs, lacerations, broken bones and crushed limbs – any one of these could result from slipping or skidding.

Given the nature of offshore operations and the equipment used, the need for working at height, in exposed places, on sometimes unstable and always complex structures in generally hazardous conditions cannot be avoided. Michelle Morrisey-Carlisle puts it starkly in her article ‘The ups & downs of oil rig tail protection’ for Canadian Occupational Safety magazine11. "Through wind, snow, heat, rain and sleet, oil rig workers often grapple with another obstacle: elevation. Whether they are changing light bulbs, working on blowout preventers or greasing motors and pulleys, they conduct various tasks above ground level. Even for crews that are properly trained and equipped, sometimes accidents happen because of a sudden change they didn’t account for. Equipment moves fast and things happen quickly." Notwithstanding the difficulties, the safety of workers must always be managed to the highest degree possible. While a lot of that can be achieved with harnesses, lifelines and the like, if the surfaces on which people work have been made as safe as they can be, that will contribute greatly to overall safety performance and workforce welfare. A workforce that feels well looked after will be more stable and more focused on the tasks in hand.

Prevention is Better than Cure

Health and safety agencies around the world will all adhere to a ‘prevention is better than cure’ policy with safety on oil and gas installations, especially those positioned offshore. But there are other factors that need to be taken into account. Oil & Gas UK worked with researchers at Robert Gordon University, Aberdeen to map the changing physical state of North Sea offshore workers12. Findings included that; “make offshore oil and gas workers are now on average almost 19% heavier and two per cent taller than in the mid-1980s. The average weight is now 90.5kg in minimal clothing and 91.7 kg in clothing without shoes. The average height is now 178.7 cm. The circumstances of different body regions have risen substantially since 1985 when a previous study of North Sea workers was undertaken, more so in the heaviest 1% of the workforce.” This will all have bearing on the performance and therefore the design of various safety (prevention of harm) devices used by workers and around the platform.

A good employer will always wish to ensure that workforce safety is at the highest level possible which includes ensuring that all work surfaces are as stable and skid resistant as possible.

SILVAGRIP PEEL AND STICK MEANS LESS WEIGHT THAN EPOXY OPTIONS WHICH RESULTS IN BETTER FUEL ECONOMY.
Risk Can Be Managed

Peter Dunwell, Correspondent

And such a risky industry as offshore oil and gas will certainly be regulated

Safety is a Wider Issue

Continuing the safety theme addressed in the previous article, there are numerous threats to workers on offshore installations but none of them should be viewed in isolation. Threats are inherent to the work and environment. The Maritime Injury Guide\(^1\) explains that, “Offshore oil rigs are multi-level structures that rise many stories above the water. As a result, most workers climb up and down ladders from one deck of the rig to another or perform their jobs near the deck rails overlooking the water. Although oil rig workers wear safety gear that includes steel-toed boots with soles designed to provide good traction, falls from higher levels to lower ones or into the water account for many accidental injuries and deaths. These accidents stem from various causes, including lack of safety training, presence of a low safety culture in some companies, and poorly maintained ladders and safety railings.” Maintenance would include the duty to ensure that surfaces are made and kept as slip- and skid-resistant as possible.

Another concern cited in the Guide is the issue of worker fatigue resulting from long shifts in monotony conditions undertaking physically demanding jobs. Again, the maintenance of stable surface textures, while it cannot reduce fatigue, can mitigate some of the consequences of moving around the platform in that condition.

It is generally accepted that slips, trips and falls account for a significant number of all accidents on offshore platforms, amounting to 47.2 per cent of all major injuries in the offshore oil and gas industry in 2011-12; and so, as well as maintenance, training of workers plays an important role in safety, including, according to OSH Academy\(^2\), that workers should always,

“Use designated walkways or access routes wherever possible.” Again the surface quality of such designated routes will be critical.

Footwear is a further factor in the equation as borne out by the UK Government’s Health & Safety Laboratory’s research undertaken on behalf of BP to reduce “the risk of slipping on UK\(^3\)” offshore installations. This research into footwear simulated various surface qualities in order to determine where and in what conditions footwear would perform safely.

Risk Management and Regulation

The risk from falling is not only from impact injuries but also from falling from the platform into the ocean. The fall itself is, of course, extremely dangerous but, as dangerous is the effect of cold water on the body that can kill a man in minutes. Working on an offshore platform is hazardous and risky at the best of times so the more steps that can be taken to reduce that hazard, the better. The only people to really benefit from a law approach to safety are workplace injury lawyers whose websites offer oil and gas workers assistance in making a claim if they think their slip or fall was contributed to by absence, poor installation or maintenance of safety measures.

The offshore oil and gas sector is rather like the airline industry in the respect that it never takes its collective eye off the safety ball but, also like the airline industry, offshore oil and gas is subject to a number of regulatory and standards bodies for whom health and safety are prime concerns. A number of organizations fall into this group including the UK’s Health and Safety Executive (HSE) and the American Petroleum Institute (API). Other professional bodies such as the Society of Petroleum Engineers also take a legitimate interest in the sector and its health and safety aspects. The Society states that,\(^1\), “Safety Regulations in the UK require operators to demonstrate that the risks to workers from well operations on offshore platforms have been reduced to the lowest level that is reasonably practical.”

Risk management is a necessarily important component in any offshore management process. Summing up the importance of risk management in ‘Offshore Oil and Gas in the UK’, Geoffrey Maitland’s review of the regulatory regime commissioned by the UK Government concludes,\(^2\) “The exploitation of offshore hydrocarbon resources in often hostile
evironments is, by its very nature, a hazardous activity with the potential to cost lives and cause environmental damage. In a society which values the economic and social benefits of the product of that activity, it will fall to the industry and the regulatory authorities to ensure an acceptable balance between the risks and rewards it presents.”

Addressing the Risks as and Where They Are

One thing of which all regulations take account is site specific characteristics. This approach avoids compliance becoming a ‘box ticking’ exercise and puts the onus on the operator and/or contractor to identify and address concerns that are specific to the installation or structure in question and the processes that it hosts. These will usually then be submitted to their competent authority with a requirement, in the case of the UK HSE, that the submission should include a demonstration that all hazards with the potential to cause a major accident have been identified and a demonstration that risks have been evaluated and measures have been, or will be, taken to reduce the risks to persons affected by those hazards to the lowest level that is reasonably practicable.

Places where slip, slip or fall accidents are a risk include walkways, gangways and ladders on and between installations; helicopter landing decks and supply vessel loading and transfer areas; material handling areas; and areas where heavy or potentially dangerous equipment is running as well as the general work spaces all over an offshore platform.

The injuries that can result from a slip, slip or fall include spinal cord injuries, head and brain injuries, broken bones and crushing or loss of limbs, and lacerations. The results of a slip can be life changing or life threatening so regulation and risk management are critical.

Longest Lasting Non-Skid

Footwear is a further factor in the equation as borne out by the UK Government’s Health & Safety Laboratory’s research undertaken on behalf of BP to reduce “the risk of slipping on UK\(^3\)” offshore installations. This research into offshore hydrocarbon resources in often hostile

SILVAGRIP IS READY FOR IMMEDIATE USE AFTER APPLICATION. NO VENTILATION OR CURING TIME REQUIRED.
Avoiding Slips and Falls

John Hancock, Editor

Several systems are in use to help with the avoidance and prevention of skids, slips and falls.

What is Slipping? – Understanding the Mechanics of Friction

We all know what slipping looks and feels like when it happens but do we know why it occurs? Put very simply, it is when the force applied to an object overcomes the friction that holds it in place on a surface. There is a slip science to research and better understand the phenomenon which can account for anything from earthquakes to a worker on an offshore platform losing control of his movements with the risk of falling and injuring himself. Underlying the understanding of slipping is the coefficient of friction which takes into account angle and type of surface as well as forces applied to an object on that surface to calculate when frictional force will be overcome and when slipping will occur. This is not the place to expound on that theory but the Math Centre offers an excellent summary from its Mechanics program.

However, this is the place to suggest that materials and technologies that can increase the frictional force between an unsheathed body and the surface on which it stands will reduce the likelihood of slips occurring and, in the case of a worker on an offshore platform, will materially increase the safety of their operating environment. The importance of slip mechanics has certainly not been lost to the Health and Safety Executive (HSE) which, in 2007, undertook ‘A study of the slip characteristics of metal flooring materials’ to assess the slip resistance of a wide range of industrial flooring materials, both profiled and open grid.” The report continues to explain that, “Little is understood about the slip characteristics of these floors, although appreciable anecdotal evidence exists which suggests that this type of flooring can present a high slip potential in contaminated conditions.” All of the elements for high slip potential exist on an offshore platform and so this is an area where precautionary steps can minimize risk and save lives.

A Dangerous Business

HSME Magazine in its November 2012 issue summed up the challenges. “The combination of heavy equipment, high seas… and/or remote locations and long work hours makes drilling for oil and gas one of the most dangerous professions in the world… the risk of falling in an open pit of oily water and drilling fluid [on an oil rig] is a high risk… Simply by walking on the drilling floor a worker can easily slip on the mud that has accumulated, causing a serious injury.”

Minimizing the Risk of Slipping and Falling

There are several elements in any slip prevention policy including installing guard rails, grips, and protective cages as well as providing steel toe non-slip footwear, safety body harnesses and lifelines (including self-retracting lifelines); plus, as importantly, training workers how properly to use these systems. This extends to routines like the imperative to clean any spills before proceeding with the job, using correct methods to ‘hold on’ when moving around the platform (such as the three-point method when on a ladder – always maintain three contact points), and paying attention to the path ahead and the environment around you. There is also ‘fall protection gear’ which must not only be comfortable to wear but also requires that any moving parts are themselves protected against the elements in which workers operate. But, as well as these active methods, passive safety devices can also help to improve safety by minimizing the risk of slipping. Signage and lighting can contribute significantly to making workers aware of hazardous areas and enabling them to see surfaces where the hazards might be present. But, perhaps most important is to ensure that the surface itself is equipped to minimize the slipping risk attaching to any hazard.

A traditional solution to slip risks has been to paint a textured surface in areas where slipping is likely to be a problem. Various techniques have been developed to enhance the effectiveness of spraying including Wire-Arc metal spraying which fires metal particles at a surface that has been pre-prepared with a substrate. A similar technique is used for Thermal Spray Aluminum application. That will help to a degree, especially in areas that are either indoors and/or not exposed to the elements affecting an offshore oil and gas installation. However, structures (and surfaces) on offshore platforms are usually under attack from a variety of sources from drilling muds to water to acid and to the corrosive and slippery products that they’re there to exploit – after all, oil is used as a lubricant.

Unfortunately, all of those substances can either fill the space between texturing elements and/or degrade those texturing elements along with the slip resistance they offer. So a non-slip solution that offers a more durable, robust and more easily cleaned textured surface will enhance the frictional qualities that minimize the possibility of skidding or slipping.

Care and Maintenance are Always Important

Maintenance and cleaning will always play an important part in any risk management process. Maintenance might well mean replacing a surface and the easier and faster that can be achieved on a busy platform, the better. In that sense, while spraying might require drying time, a ‘peel and stick solution’ will not. In the cleaning process, compressed air and steam are often used to ensure a fast, thorough and complete removal of contaminants from a textured surface. Both methods are very effective but less wear on surfaces and components than mechanical or abrasive cleaning systems. Compressed air can also be used in a ‘dry air spread’ application to clean large surfaces quickly. Worker safety is paramount and a properly prepared and maintained surface will reduce one of the greatest risks; that of skidding, slipping and falling, which makes it well worth getting it right.
References:

1. BBC http://www.bbc.co.uk/news/business-29643612
4. Oil & Gas UK http://www.oilandgasuk.co.uk/news/news.cfm/newsid31220
13. Oil & Gas UK http://www.oilandgasuk.co.uk/news/news.cfm/newsid31214
15. OSH Academy https://www.oshatrain.org/courses/studyguides/908studyguide.pdf
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