



April, 2011

The Catalyst

JOIFF



About JOIFF

Membership of JOIFF, the Organisation for Emergency Services Management is open to any Organisation which is a high hazard industry and/or has nominated personnel as emergency responders/hazard management team members who provide cover to industrial/commercial organisations.

Organisations which do not fully comply with these requirements are welcome to apply for Corporate Membership of JOIFF.

JOIFF provides a forum for discussion amongst peers, accredited training specifically developed for the sectors in which JOIFF members operate and technical advice through the JOIFF Standard and the JOIFF Shared Learning network. JOIFF welcomes enquiries for Membership - contact the JOIFF Secretariat

The Catalyst is the official newsletter of JOIFF, The Organisation for Emergency Services Management and is published quarterly - in January, April, July and October each year. Our policy is to bring you high quality articles on relevant technical issues and current and new developments and other happenings in the area of Emergency Services Management. In addition to The Catalyst, information relevant to Emergency Services Management is posted on the JOIFF website.

Readers are encouraged to circulate The Catalyst amongst their colleagues and interested parties and the Editors welcome any comments.

New Members

During January, February and March 2011 the Executive of JOIFF were pleased to welcome the following new Members:

Full Members

Polimeri Europa, Southampton, represented by John Hallam Senior Fire & Safety Officer. Polimeri Europa is a wholly-owned subsidiary of Eni S.p.A. with its Head Office in Milan. Polimeri Europa, Southampton is a chemical site producing elastomers, thermoplastics, PVCs – polymers. A team of full and part time Emergency Responders provides cover to the site.

Corporate Members

CPD Ltd., Redcar, England, represented by Ross Coulman, Operations Director, Peter Coulman, Managing Director and Laura Cowie, Marketing Director. CPD Limited (formerly Cleveland Process Designs Limited) has been operating for over forty years. CPD is a leading hub for the development of innovative technology and engineering solutions in the Oil, Gas and Process industries and industry workforce solutions. Detail on one of CPD's key products, iResponse is given in a separate article in this edition of The Catalyst.

Ramboll Safe Fire Engineering, Manchester,

England, represented by Pete Muir, Associate Director and Hannah Cain, Senior Fire Engineer. Part of the multi-discipline engineering Ramboll Group, Ramboll Safe Fire Engineering provide a wide range of fire engineering related services including Fire Risk Assessments, Fire Safety Systems compliancy audits, Fire strategies, Fire Engineering, Fire modelling to all sectors including Educational, Healthcare, Commercial, Industrial, Power Generation and Petrochemical and others.

Steamexfire BV, Putten, The Netherlands, represented by Michel Kooij, Managing Director. Steamexfire BV specialises in innovative methods of suppressing fire in enclosed spaces, washing down gasses and smoke, and cooling off tanks and other objects. They produce high flow inert gas generators with capacities up to 25 M3 per second, mixed with steam. Another product is a high flow aerosol (foam) generator capable of producing up to 200 meters of throw length. Steamex equipment is built onto standard fire trucks for fast deployment.

We look forward to the involvement of our new and existing Members in the continuing development of JOIFF.



JOIFF EXECUTIVE POSITION ON FIREFIGHTING FOAMS

From time to time there are topics which have the capacity to directly impact on JOIFF members emergency management planning and decision making. Fire fighting foams is one of these issues. The fire fighting performance of foams is increasingly challenged by consideration of their impact on the environment; indeed this has led to a growing unease in some quarters about the use of foams at all. The JOIFF Executive recognises it has a key role to offer in the debate; to represent its members' unique experiences in foam fire fighting and in emergency services management.

The Executive have reviewed the detail available to date and have agreed a position to put forward to the Membership. In this article, what has happened to date is summarised, searching questions are posed about the future of foam and members are invited to get engaged in the discussion process.

You can send comments by email to; joiff@iol.ie. Alternatively, you can view this article (published below) and contribute your comments through the JOIFF LinkedIn site: Whichever way you choose to get involved, be sure to have your say; it's your JOIFF and your industry.

With the on-going debate regarding fire fighting foam agents we thought we would re-visit this topic; summarise the position to date and suggest some thoughts for the future, from a user's perspective.

FLUOROSURFACTANTS IN FIRE FIGHTING FOAMS – WHERE ARE WE NOW?

The arguments about fluorinated vs fluorine free foams have raged for years. At some point, the facts salient to fire fighters and emergency services management seem to have become mixed with sales pitches and rhetoric in the fight for the hearts and minds of the buying user. The highly technical nature of these discussions, although key to the long term sustainability of foams, has left many non-chemists confused and even disenchanted. The fact that much of the debate takes place in the main between manufacturers trading ever more detailed technical points of view is less helpful to those responsible for selecting, applying and supporting such systems. Many might agree that manufacturers seem to have an inexhaustible energy and drive to postulate on, propose and promote their own solution whilst putting down all others. Attitudes have become polarised through the introduction of fluorine free foams, with the emergence of two distinct groups: those committed to fluorinated foam and their diametrically opposed opposites, the fluorine free camp. Though, perhaps bizarrely, most foam manufacturers offer and sell products using both types of foam technology!

Fluorine Free Foams

Fluorine free foam technology is not new, but has become much more prominent thanks to increased awareness of the persistent nature of fluorine released into the environment. Of course there are many sources for this fluorine and fire protection is just one contributor, but the fact is that large fires are highly visible and make headlines. Combine this with the ever-growing hunger for 'breaking news' and it is no surprise that we are made aware of the environmental consequences of fire fighting and the impact of airborne and groundwater contamination. In such circumstances the anticipation of being able to readily avoid the consequences of fluorine contamination presents an appealing proposition; although most experts would continue to caution that the principal requirements of system performance and fire fighter safety are keys to effective fire fighting.

There are other compounds and chemicals which are often discussed in the same debates including PFOS, which is produced during a particular process of fluorinated foam product creation. The ECF (Electrochemical Fluorination) process was the chosen process of the 3M Corporation until the first part of the new century but was discontinued after studies revealed recordings of PFC's in human samples. All manufacturers supplying foams today use alternate fluorination processes which do not use or create PFC's to the same levels as the ECF process, but there nonetheless exists a number of initiatives and stewardship programs to further reduce the potential for incidence creation.

In the EU such compounds continue to be referenced in the opening statements of most discourse on foam technology. An EU regulation was enacted (Directive 2006/122/EC of the European Parliament) which requires all holders of PFOS laden foam (>50ppm) to remove it from use and storage by July 2011; yet as we write we are unsure if all JOIFF members are fully aware and have taken the necessary steps to prepare for compliance with the regulation.

NB: There are other compounds which present environmental challenges and these are best informed through already published technical articles and manufacturer information.

What is likely to happen? – Outside influences and expectations

First to note is that the development of foam technologies for fire fighting has produced excellent products and greatly advanced our ability to fight fires safely and successfully. Society needs this technology to meet the demand for effective fire fighting in a world which has 'grown' dramatically. So without blowing our own trumpets too much we should keep in mind the great job already done in that regard.



At the same time there is recognition that the price our environment is paying for industrialisation and population growth is too high and unsustainable in the longer term. So as responsible societies we are taking affirmative action to correct these problems. Whether we agree or disagree with this conclusion is now immaterial: governments of all persuasions have decided and the ball is rolling; indeed the pace is more likely to speed up than slow down. The overall consensus is that environmental controls and commitment to sustainable solutions will impact all industries and will increasingly shape the development of fire fighting products. The purchase, application and disposal of foam is indeed already influenced by these measures.

Looking forward; there are a growing number of large corporations committing themselves and their businesses to programs of increased social and environmental responsibility. In the context of fire fighting foam this will translate to an increasing focus on lifecycle management: verifying and supporting the constituent compounds in foam purchase, the storage, application and use of the product, as well as post-use treatment and disposal of end of life foam stocks.

JOIFF members want confidence, certainty

Debates taken up at conferences, in the press and online have in general been able to draw out foam technology in great detail, yet the informed contributors from the supply side of the industry seem no closer to being able to reaching a consensus which JOIFF members can take away and apply in their workplaces. Nor is there an agreed perspective on foam technology to help inform users about the sustainability of their foam purchase options.

What JOIFF members need is visibility and confidence that a purchase decision taken now will not be threatened by some future regulatory change or use restriction, requiring not just the purchase of replacement foam, but the implicit costs of disposal and even site reclamation costs. Users expect certainty in their purchases and it is the absence of certainty which can cause users to question the return on their fire fighting investments.

In conclusion

The accurate and sensible arguments presented in the various debates on this subject cannot be ignored. All sides have contributed to a greater understanding of the merits and limitations of existing and new foams used for fighting fires. The contributions appear to have also enabled new groups of users and observers to see beyond the accepted form and challenge for a new solution spurred on in no small part by influence from the European region's declared intention to its environmental commitments. We should applaud this fresh input and have an open mind to the possibilities of how industry can improve and step on to the next level. At the same time our experience and knowledge ensures that we are able to resist the temptation to develop new solutions on anything less than the tried and trusted performance based approach for which our industry is renowned. Thus the various arguments presented to date all

have their place, but they must be addressed in context, i.e.

1. Performance under use conditions remains the primary measure of suitability. If fluorine free foams have a place in our fire fighting toolbox, it is because they meet this primary requirement and not just because they do not contain fluorine.
2. Turn the key issues debate to a fire fighting focused agenda. Including the affirmation of existing or development of new fire performance testing standards focused on JOIFF high hazard applications and applied consistently across the world.
3. Two new keywords in the lexicon of fire protection: sustainability and responsibility - including reliable methods of environmental impact assessment in product manufacture and selection.

There are other interesting influences which JOIFF members should also become aware of and which JOIFF needs to become a focus for discussion and debate:

4. The possibility of a life-cycle approach to the planning and use of fire fighting systems, including the commitment to responsibly remove foams out of service at the end of their useful life.
5. Education and Training: Can we ever have enough education and training? The foam industry does an excellent job of educating prospective buyers of the benefits of each manufacturer's products, but it now needs to consider how it can help educate the consultant and site designer, the user and the regulator.
6. The critical role the EU plays in driving forward new, game changing legislation and how the USA is planning to react to its own environmental obligations.

Where next? Your opinions count

Foam issues continue to be discussed and debated, primarily between manufacturers and technical experts. It is now time the emergency services management industry enters the debate. We need your comments and experiences to form how JOIFF should respond on behalf of its members, to regulators and decision makers.

If fire fighting foams are a part of your fire management strategy tell us your experiences in relation to:

- PFOS foam regulation restricting use/storage, effective July, 2011
- Fire fighting foams performance and classification
- Restrictions on the use of fire fighting foams containing particular chemicals/compounds
- Post-use containment/run off treatment
- Or any other issue you want to comment on, or would like more information about

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ADDRESSING THE IMPACTS OF THE FORTHCOMING EU BAN ON PFOS

By Thierry Moinet

On 27 June 2011, EU legislation comes into force banning firefighting foam concentrates containing Perfluorooctane Sulfonates (PFOS)*. An impurity found in high concentrations in the Electro Chemical Fluorination (ECF) process that produces fluorosurfactant compounds, PFOS is an extremely toxic, bioaccumulative substance and previous research data suggests that the material is not biodegradable. A report by the Organisation for Economic Co-operation and Development (OECD) in 2005** found that approximately 90 percent of PFOS-



related chemicals in the EU were used in fire-fighting foams, highlighting the industry's dependence on the compound.

The move to ban PFOS and related compounds followed the detection of Organofluorine in the blood serum of consumers and wildlife, along with its identification within global blood banks, leading to the intervention of both the EU and US authorities. In May 2009, PFOS was added to the Stockholm Convention on persistent organic pollutants (POPs). Canada has also proposed a ban on the substance - only the second chemical proposed for a complete ban under its Environmental Protection Act. However, the proposed and forthcoming bans on PFOS are not shared globally, with the compound still manufactured in large quantities in Asia.

The impact on industry

This widespread use of PFOS-based compounds as a fire-fighting solution over the last 40 years has resulted in an estimated 30 million litres of foam containing PFOS in the EU market alone. Despite 3M phasing out its production of PFOS foams in 2000, one key concern is that after 3M left the market, other foam manufacturers stepped in to fill the supply gap and provided a filling service for 3M customers. This blending of existing 3M PFOS foam products with foam from another supplier, even those not containing PFOS compounds, often results in a mixture that exceeds the permitted EU tolerance levels of less than 50 parts per million. Where records of foam supply and mixture are either not kept, or not updated satisfactorily, this results in a high degree of confusion over

whether PFOS is present in existing foam stocks.

Meeting the requirements of the EU ban on PFOS ultimately requires a review of the installation and storage practices for foam agents. Alongside identification and disposal of known foam stocks contaminated with PFOS, rigorous cleaning of all key components, including pipe systems, storage tanks and bladders, is vital. However, the cleaning of tanks or equipment may not be sufficient, as porous material can re-contaminate the replacement non-PFOS-based foam. This represents significant investment from the industry in its foam handling and storage infrastructure, which many businesses simply may not be ready for.

A major area of concern is the use of foam agents in smaller businesses and non-regular users who are perhaps unaware not only of their foam stocks and any potential contamination, but also of the new legislation driving the forthcoming ban. This is applicable to any sector throughout the industry and highlights the danger of controlling and implementing the ban at a local level.

Implementing the EU ban on PFOS

Implementation of the EU ban on PFOS-based compounds raises immediate concerns for any business using foam products. A lack of historical data on foam storage makes evaluating potentially contaminated stock levels difficult. Combined with the issue of blended foams from different suppliers it is easy to see the scale of the task facing many organisations before June.

Major barriers to implementation include an apparent lack of clarity about how the ban will be managed in terms of declaring and reviewing foam stocks before disposal can take place, and ultimately the time pressures now placed on businesses to remove all PFOS compounds within the next few months. Where problems will undoubtedly occur is where a disconnect exists between EU policy and implementation processes at local level. Governments need to understand the support that may be needed within local industries in order for businesses to comply with the new legislation.

Outside of government, businesses also have a responsibility to ensure they are ready to comply with the PFOS ban. Within larger organisations, compliance naturally falls to safety managers and individuals involved in environmental policy. However, for smaller businesses that perhaps have no need, or are not large enough, for a specific individual focussed solely on safety and environmental policy, the responsibility for delivering the requirements for the new legislation may fall elsewhere. Senior management or directors may not be aware of the need to comply with the new legislation and this could contribute even further to the delay in meeting the deadline for the ban on



further to the delay in meeting the deadline for the ban on products containing PFOS.

Barriers to the implementation of the PFOS ban present some varied challenges to the industrial market. As the ban will only be effective within the EU at this stage, global organisations must be aware of the different regulatory requirements of the territories they operate in. These different codes of practice will require both a good understanding of compliant and non-compliant products and clear policies. The general lack of awareness is another concern but does not yet appear to be causing wider alarm, and uncertainty and confusion over current foam stocks would suggest that there is still some ground to make up. Many organisations involved in the industrial sector believe there is plenty of time to implement the new changes and comply with the PFOS ban, but as with any circumstance involving change, there is often resistance and a lack of preparation. The real risk is that the industry as a whole does not realise how unprepared it is until it's too late.

The Tyco approach to compliance and foam analysis

So far the lack of awareness, understanding and urgency adds up to an alarming set of circumstances. So how can businesses ensure they are ready to comply with the new legislative requirements? In addition to a complete review of current foam stock levels, analysis and testing should be carried out to ascertain which foams must be disposed of. For organisations facing this challenge, it is reasonable to expect manufacturers to offer compliant products as a replacement. Foam manufacturers offer sound knowledge and guidance on legislative drivers as they are often at the forefront of industry innovation to help their customers meet the new requirements.

One course of action is to use independent testing facilities, such as those offered by Tyco Fire Protection Products, which provide accredited laboratory testing to analyse foam samples to identify any contamination or certify that the product is free of any PFOS compounds. Once completed, Tyco then issues a report from an official external laboratory. This process requires only a 200ml sample for analysis, with kits available from Tyco Fire Protection Products.

If PFOS is detected within a foam sample outside of the limiting values, Tyco can provide technical assistance and guidance on foam replacement either directly or through its authorised distribution partners. This also includes the possible modification of existing piping in order to install new foam concentrate as part of the fire suppression system. Tyco's service also extends to the responsible disposal of contaminated foam and other components such as tanks and bladder systems through its specialist subcontractors.

In response to the industry's need for more advanced products and as a result of changing legislation and the forthcoming ban on PFOS, all of Tyco Fire Protection Products' manufactured and sold under the following brands – ANSUL, SABOFOAM, FINIFLAM and TOWALEX have been developed and manufactured using Telomer fluorosurfactants which do not

contain PFOS. This has been the case since the year 2000, well ahead of the EU laws coming into force. To support the industry in its review and replacement of PFOS contaminated foams, Tyco Fire Protection Products will continue to provide foam users with technical support and advice, regardless of foam supplier.

Whilst PFOS is scheduled to be banned only by the EU, the US is understood to be looking at how the EU ban is implemented and reaction within the industry before making further decisions on the use of products containing PFOS within its own market.

So the message to businesses currently using fire-fighting foam is, if you're unsure or unaware of potential contamination of your foam stocks, engage with your supplier or a trusted manufacturer such as Tyco as soon as possible - it may mean the difference between compliance with the forthcoming EU legislation, or missing the deadline.

* SOURCE: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0032:0034:EN:PDF>

** SOURCE: Results Results Of Survey On Production And Use Of PFOS, PFAS and PFOA, Related Substances And Products/ Mixtures Containing These Substances, OECD, [http://www.oecd.org/officialdocuments/displaydocumentpdf?cote=env/jm/mono\(2005\)1&doclanguage=en](http://www.oecd.org/officialdocuments/displaydocumentpdf?cote=env/jm/mono(2005)1&doclanguage=en)

Editor's Note: Thierry Moinet, Sales Director Foam & Foam Hardware EMEA, Tyco Fire Protection Products is a mechanical engineer. He joined Tyco in 1995 and has worked in both sales and technical support. Further information contact Tyco at +44 (0) 161 875 0402 or via email at marketing@tyco-bspd.com

About TYCO FIRE SUPPRESSION & BUILDING PRODUCTS
Tyco Fire Protection Products is a strategically aligned business unit with globally recognized products sold under leading brands including ANSUL, GRINNELL, HYGOOD, NEURUPPIN, PYRO-CHEM, RAPID RESPONSE, SKUM, SABO FOAM and TYCO FIRE PRODUCTS. Tyco Fire Protection Products produces fire protection and mechanical building construction solutions for commercial, industrial, institutional, governmental, and residential customers. Heavy emphasis is placed on research and development resulting in innovations and global approvals. Key products include manual firefighting equipment, detection/suppression systems, extinguishing agents, sprinkler systems, valves, piping products, and fittings.



CLEAN FOR A HEALTHIER YOU

By Chief Charles Brush MS EFO

Ever notice the amount of products marketed with a picture of a firefighter with simulated soot on the face? How many times have we seen seasoned instructors or veteran line firefighters with the battle hardened (dirty) gear, presenting a role model for new firefighters to emulate? Does the wearing of contaminated coats, gloves, boots and soot encrusted helmets with distorted, useless shields rationally equate to professionalism, or is it stupidity? If so, why do we are we so meticulous in decontamination at hazardous materials incidents?

The saying is "Cleanliness is next to Godliness". We clean and polish our fire apparatus, clean and service our suppression equipment and the cleaning of high angle equipment borders upon religious ceremony! Why "not so much" with our PPE? Is it misguided perception?

The reality is that today's interior fire in structures is a petro-chemical fire in a non-industrial setting. The gases and particulates during an interior fire in structures and the off-gassing with "invisible" particulate after a fire, carry all of the dangers to quality of life that your local chemical or petroleum company has plus the bonus of gases and particulates created by and unique to the specific fire. The proof of this is in the dramatic rise and "starting to be realized" threat of numerous types of cancer to firefighters.

The acquisition of these contaminants from our PPE is called "indirect contamination" and can occur through ingestion, inhalation and / or absorption:

- Ingestion - How often do you take a drink, or wipe your face in rehab (rehab is a designated area where firefighters go upon being relieved to recover, rehydrate, resupply and be medically monitored) with products of combustion on you from handling your PPE, around you or worse, on the heart healthy consumables you munch upon?
- Inhalation – Could our PPE, exposed to contaminants, be off-gassing?
- Absorption – While not thought of as an avenue since we are protected whilst wearing PPE but what about after our gloves come off and the PPE is doffed? How many times do we handle and re-wear it resulting in indirect contamination?

How well we fend off or succumb to this indirect contamination is dependent upon you:

- How bad is the contaminant?
- What dosage?
- How long were you exposed to it?
- What was the condition of your immune system at the time?
- What condition (well rested, tired, worn out) were you?

In the air force, they talk of "time on target". The longer an aircraft stays over the target, the greater the risk of being seriously shoot at. Shouldn't we consider "time on PPE"? The longer we keep interior structure fire contaminants of unknown pedigree on our PPE, the greater the potential for indirect contamination. Pilots do all they can to limit exposure, shouldn't you? Why allow the assault on your future quality and your time on earth!

While some enlightened individuals clean their PPE, others do

not and even resist efforts to decontaminate PPE. Why? – Perception

Let us relate the cleaning of our PPE with the cleaning of a house after a fire. The house is prepared so that humans can live in it safely after the fire by:

- *Removing the contaminants*
- *Airing out the building,*
- *Inspecting the building*
- *Repairing the building as necessary.*

Shouldn't our PPE be decontaminated, aired out, inspected and repaired as necessary so that it is habitable for firefighters! PPE can be cleaned at the station by rinsing and brushing, cleaned by washing utilizing approved methods and compatible cleaners or sent away for serious cleaning. Regardless of the level, use appropriate splash and barrier protection while handling / cleaning post interior structural operations. Treat it as if it were contaminated... Because it is!

Let us recap

Dirty PPE:

- Reflects less heat;
- Is more conductive;
- Can be less breathable;
- Can render the clothing more flammable.

Further:

- Closures may not work well as they become fouled with debris;
- Day-to-day contaminants acquired during routine use mixing with smoke born contaminants can create new threats in the form of new compounds formed.

The longer the gear is dirty, the greater the chance for indirect exposure.

Clean PPE:

- Minimizes your exposure to hazardous substances;
- Prolongs your life expectancy;
- Prolongs the life of your PPE;
- Reduces the potential for indirect contamination.

The issue of cleaning PPE is rather contentious, definitely an issue of cost and perhaps an attack on the advertising, Hollywood vision of what a seasoned firefighter looks like.

Before judging, consider the cost, future quality of life, and family impact of cancer and other debilitating conditions.

Break the perception, keep your gear clean. Save your future quality of life and perhaps the lives of those you care for.

If you do not take care of your body, where will you live!

Editor's Note: Chief Charles (Charlie) Brush MS EFO is Safety Programs Manager, Bureau Fire Standards and Training, Florida State Fire Marshal. He has held the rank of chief in both career and volunteer fire departments, working his way through the ranks of firefighter to chief. Charlie holds a Master of Science degree, is a Florida Certified Instructor III and a bunch of others "suitable for framing". When not involved in emergency services, Charlie can be found on the water aboard his sailboat. Contact Charlie at Charlie.brush@myflorida.cfo.com

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FIT FOR PURPOSE – FROM RISK ANALYSIS TO MATERIALS SELECTION FOR PROTECTIVE CLOTHING

The market for protective fabrics is characterized by massive demand and supply for multi-risk solutions. This often results in clothing certified in accordance with various EN standards. But does this really make it fit for purpose? The right fabrics are selected by specifically harmonizing user risk analysis with the protective functionalities of the fabric. EN standards are defined by the European CEN committees, but only dictate the minimum protective requirements. An end user must be aware that, in addition to the required EN standards, extra protection might be necessary. It is therefore important to check whether the stated requirements of an EN standard correspond fully with the necessary level of protection. However, this must not result in the over-specification of a garment.

Material selection

The right protection is mainly determined by the composition of the protective fabric. Fibre selection, weight and weave all play an important role. Fabrics that offer protection against heat and flame, for instance, or static electricity, arcing, welding splashes, liquid chemical splashes and/or poor visibility – the so-called multi-risk fabrics – are always basically flame retardant. Taking this as a given, there are then three distinct types of fabric:

Inherently heat and flame-resistant fabrics	<i>This group of fabrics has been developed on the basis of meta-aramid and para-aramid fibres (including Nomex®, Kevlar® and Technora®) or fabrics (TenCate Tecashield®). Aramids are very strong and offer a high degree of thermal stability. The heat and flame resistant properties are permanent.</i>
Inherently flame-resistant fabrics	<i>The basis here is a mixture of natural fibres (including cotton or cellulose) with flame retardant modacryl (including TenCate Tecasafe® fabrics). These fabrics ensure a high comfort levels and are an excellent solution when a combination of high visibility and flame retardancy is required. The flame retardant properties are permanent.</i>
Flame-retardant finished fabrics	<i>These fabrics have been developed mainly on the basis of cotton. They are made flame retardant using a refinement process (including Proban®, Pyrovatex® finish, TenCate Tecapro® fabrics). Strictly speaking, this method does not endow the fabric with permanent flame retardancy. However, the finish is generally so durable that it outlasts the useful life of the clothing. It is common in the market that flame retardant clothing is certified for at least 50 industrial washes.</i>

All three types of flame retardant fabric comply with the EN ISO 11612 requirements – but all in their own particular way. End users in the metal and welding industry usually opt for fabrics



with a flame retardant finish. These fabrics are generally heavier and thicker and provide effective protection against welding splashes. The mechanical load on the clothing in such industries is significant, requiring garments to be replaced frequently. For this segment, inherently flame retardant fabrics are often an expensive and unnecessary solution.

End users in the chemical sector for example often choose inherently heat and flame resistant solutions. In this context, the risk of explosion by flammable chemicals plays a key role. In the event of an explosion and/or flashover, temperatures can climb to as much as 800 °C. To protect the underlying skin, it is important that the protective fabric stays intact for as long as possible without becoming compromised. Aramid solutions are extremely well suited for reducing such risks. What is more, aramid fabrics are also chemically resistant. To protect the wearer from chemical splashes, the fabric must feature a repellent finish. However, if the fibres are resistant, this prevents damage to the garment, thus lengthening its useful life. Inherently flame resistant garments are often worn in the energy and utility sectors, as they offer a balanced solution encompassing protection, durability and comfort. They offer the benefits of combining inherent flame retardancy and high visibility, but also feature cooling, breathing and moisture-regulating properties thanks to the high concentration of natural fibres.

The above account demonstrates that the right material choice is





The above account demonstrates that the right material choice is only possible by effective risk analysis and obtaining the right information. The supplied material might well comply with the relevant EN standard, but is it really fit for purpose? Selection of a material that is neither under



-specified nor over-specified demands specialist knowledge. The likelihood of a welder, for example, finding himself in a flashover with temperatures over 800 °C is pretty much zero. However, he does require effective protection against splashes of molten metal. Choosing lightweight aramid fabric on the basis of high

thermal properties is not the right solution.

Although flame retardancy is often a prime requirement, other risks also play a key role. Hence the demand for multi-risk solutions. Making the right material selection requires an understanding of the degree to which a given risk is present. Which risk has the highest probability and most serious effect? Drawing up a PPE analysis with a clear set of priorities is essential.

Something that must not be forgotten is the use of the clothing. For instance, whether it requires industrial or domestic washing. Will the garments be used in rough conditions, or in a clean working environment? Is the clothing season-specific or is the same kit worn the whole year through? What is the expected useful life of the garments? This is just a small sample of issues that play some role in the selection of materials for protective fabrics. Each fabric features extremely strong specific properties, but also has its weaker points. This balance must accurately reflect the end user's requirements.

This article was written together with TenCate Protective Fabrics, manufacturer and supplier of high-tech fabrics. The fabric collection comprises the three flame retardant groups that are mentioned in this article. This provides various industries with the opportunity to make considered choices for optimum protection and use. For more information and/or advice on selecting the right protective fabrics for your workers, please contact Mrs Karin Klein Hesselink, End Use Market Manager on +31 (0)548 633 667, or email k.kleinhesselink@tencate.com.



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OCCUPATIONAL SAFETY & HEALTH

PRESS RELEASE: ORGANISER OF SAFETY & HEALTH EXPO LAUNCHES SOUTH AFRICAN EVENT

UBM, the organiser of Safety & Health Expo, Europe's largest annual health and safety event, has announced the launch of OSH Expo Africa. Taking place from 6-8 September 2011 at the Gallagher Convention Centre in Johannesburg, OSH Expo Africa will utilise the extensive expertise that UBM has in providing the health & safety market with a variety of media solutions, to offer suppliers of health and safety products and services with a direct route into this rapidly growing market.

"With a swiftly developing infrastructure and multinational investment in sectors such as mining, construction, manufacturing, utilities, oil, gas and transport, OSH Expo Africa will provide a great opportunity for health and safety suppliers and service providers from across the world to showcase their latest innovations and meet new contacts," said

Adrian Newton, Portfolio Director – Safety & Building Management, UBM Live. "Compliance with health and safety legislation is becoming increasingly important for companies across South Africa and OSH Expo Africa will provide health & safety professionals and business operators with educational advice, training and access to the latest products and services available, giving them the tools to manage the process of legislation compliance easily and effectively."

OSH Expo Africa is a joint venture between UBM Live and Montgomery Worldwide, organiser of African events including Electra Mining and Interbuild, the leading events for the mining and construction industries respectively. UBM Live brings to OSH Expo Africa a wealth of experience in providing media channels for the health & safety market including

Safety & Health Expo, IOSH conference & exhibition, the online news site SHPOnline, IOSH SHP Awards and also the market-leading magazine, Safety & Health Practitioner (SHP). Combining this experience with Montgomery Worldwide's extensive history in working within the African market OSH Expo Africa will be an event that sits at the heart of the African health & safety market.

OSH Expo Africa will be co-located with IFSEC South Africa 2011. This event provides a definitive route to market for security buyers, specifiers and practitioners. Visitors to OSH Expo Africa will be allowed free access to IFSEC South Africa.

Companies interested in exhibiting at OSH Expo Africa should contact David Bishop on +44(0)20 7921 8049 or david.bishop@ubm.com.



PRESS RELEASE: DR STHAMER – HAMBURG

Dr Sthamer – Hamburg, a leading European Fire Fighting Foam Manufacturer, which celebrated its 125 anniversary earlier this year, recently launched a range of state of the art foams especially designed for Bulk Storage Tank Fire Fighting.

Dr Sthamer-Hamburg is the first European manufacturer to launch new firefighting agents for industrial response that have achieved both UL listing and EN 1568 2008 IA IA rating. To top this, these new products have also been LASTFIRE tested, which is currently the most stringent test for industrial foams in existence.

The first new agent being brought to market is the brand new Sthamex AFFF 3% F15 Premium. It is compliant with the latest EN standard as well as having received 1A rating, which means that it has the best possible burn-back resistance and very rapid extinguishment capabilities. This is the highest rating that a foam can achieve, but what is even more impressive is the fact that it has just passed UL162 the American Foam Standard. This means that this agent can be used in UL preferring markets. The new Sthamex- AFFF 3% F-15 Premium is a low expansion foam with a high density so its delivery is more accurate and it can be thrown for longer distances. It is quick to foam and can therefore also be used in sprinkler and fixed foam systems. In addition, the high water releasing capacity favours film formation with increased flowability. These properties reduce the extinction time and cool the source of the fire.

The aqueous film extinguishes fires even in areas not yet reached by the foam and prevents re-ignition should the foam blanket be ruptured. The foam is oil-repellent (oleophobic) and resists fuel pick up, making it ideal for sub-surface foam application.

The second new product that is being launched is the new MOUSSOL-APS 3/3 F-15 Premium, which has also achieved the IA IA rating. This alcohol resistant foam has also recently passed the UL162 Foam Fire Tests.

Dr Sthamer-Hamburg points out that environmental protection was one of the key factors while developing this new agent, and that its special blend of components are partially made from naturally occurring raw materials and therefore have a lower environmental footprint. "It forms a polymer layer on polar solvents which effectively prevents the

destruction of the foam blanket, thereby re-ignition is prevented, and stability is ensured. The foam is gastight and it resists flames and heat radiation, making it an ideal agent to cover spills as a preventative measure, without any vapours escaping, reducing the environmental impact considerably."

The LASTFIRE accreditation means that the foams are acceptable for use by the Oil Majors that belong to the LASTFIRE Consortium. "This is the toughest test for foams, it is even harder than EN1568 and



For more information contact Jan Knappert, International Sales Director Dr Sthamer- Hamburg Tel + 44 7795 101770 Email jknappert@sthamer.com Web



WEARERS OF PPE – WE SEEK YOUR ASSISTANCE

Personnel working in High Hazard Industry are major users of Personal Protective Equipment (PPE), both on production processes and by their Emergency Response personnel engaged in firefighting, rescue, hazmat accidents/incidents etc. JOIFF regularly receives communications from Members seeking information on PPE and commenting about heavy and restricting PPE, PPE that is too hot to wear, too heavy to wear, confusion in certification, poor quality product, bad deliveries, effects of cleaning on the PPE etc. The volume of communications has increased since the publication in 2007 of the JOIFF Handbook on PPE to protect against Heat and Flame, available from the JOIFF website for free download. The Catalyst would like to gauge the attitudes of Users of PPE Worldwide to the PPE that they use, particularly PPE to protect

against possible exposure to heat and/or flame, with a view to the possibility of establishing User positions on the various problems that the massive and growing PPE Industry is causing to its Users.

When we talk of PPE we mean all PPE used to protect all parts of the human body – clothing, gloves, footwear, head protection, face protection, eye protection, hearing protection, respiratory protection.

We invite PPE Users to go to the JOIFF website at www.joiff.com and to fill in the few simple questions in the questionnaire and send them in to us. This invitation is extended to PPE Users both working in and not working in JOIFF Member Organisations.



OBSCURE HAZARDS DUE TO PROCESS CONDITIONS

By Jeanne van Buren

Many readers of The Catalyst are more than aware of the relation between the hazardous properties of a very common substance like water and the process conditions under which this substance exists. Compliance with specific legislative requirements must be achieved when water is used at elevated temperatures as high pressure steam, to protect us from the hazards of water under these process hazardous conditions. Other examples are dust of a product, which is commonly non-flammable when it is a solid, in silos and liquid sprays of products which are considered to be non-flammable under normal conditions.

For other substances similar requirements are required too but legislation is more obscure than is the case with high pressure steam. The hazards only become apparent through a Hazard Analysis which takes process conditions into account. Various examples can be given. One of them can be found in the SEVESO Directive – <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1996L0082:20081211:EN:PDF> The SEVESO Directive, like legislation covering high pressure steam, is aimed at the prevention of major accidents which involve dangerous substances, and the limitation of their consequences for man and the environment, with a view to ensuring high levels of protection throughout the EU in a consistent and effective manner.

Annex 1 part A provides a list with specific dangerous substances and their quantities covered by the Directive, while part B of the same annex lists quantities of products/substances classified according to the risk they pose like explosive substance, flammable substance, etc. The classification of products is based on the information in Council Directive 67/548/EEC of 27 June 1967. This Directive lists the methods which should be used to determine flammability (among other properties) of a substance under ambient conditions in the atmosphere. So far the process for selecting establishments which have to comply with the legislative requirements of the SEVESO Directive is quite straightforward based on prescriptive legislation.

However products that are not flammable or explosive under ambient conditions can have identical behaviour and pose similar risks as for instance (highly) flammable products because of the process conditions they are exposed to. Legislators have not overlooked or ignored these conditions. But the process to unravel the risks is more complex.

The second paragraph of article 2 of the SEVESO Directive states:

For the purposes of this Directive, the 'presence of dangerous substances' shall mean the actual or anticipated presence of such substances in the establishment, or the presence of those which it is believed may be generated during loss of control of an industrial chemical process, in quantities equal to or in excess of the thresholds in Parts 1 and 2 of Annex I.

This text provides leverage for potential coverage of other substances by the Directive depending on the process conditions. Further information on the method to review potential hazards can be found in the *Guidance on the preparation of a safety report to meet the requirements of council directive 96/82/EC*. This guidance document allows additional methods for

selection of substances based on their risks. On page 20 of this guidance document under the title *Preliminary Hazard Analysis* the following text can be found:

Step A

6. *A Preliminary Hazards Analysis (PHA) should identify the safety relevant sections of the establishment. These sections are characterized by the quantity and the intrinsic properties of dangerous substances and/or the processes involved and hence constitute the parts of the establishment requiring more detailed hazard analysis. The PHA can be accomplished using a variety of hazard screening methods; examples are listed in Annex D.2.*
7. *Lessons from past incidents and operating experience can make a significant contribution to the selected hazard screening method and to its results. A relevant list of accidents in similar storage or process facilities is considered useful.*
8. *Section identification can be by the use of Hazard Index methods, the identification of threshold criteria such as a fraction of the qualifying quantity of the dangerous substance in Annex I of the Directive, or other suitable methods. The criteria should take into account the physical and chemical properties of the substance and the accident consequence potential of the process conditions. Therefore threshold criteria may result in values well below the limits in the directive. This procedure should consider all parts of the establishment capable of generating conditions for a major accident.*

More support can be found on page 14 of the same guidance document under the title *Hazardous installations and activities*. It is explained that *Further details may be required of the safety relevant sections in accordance with the hazard analysis. This description should thus include a substantial amount of data significant from the process engineering and technical safety standpoint; and cover the safety systems as well. This may include:*

- c. *process conditions i.e. pressure, temperature, concentration (their safe operation ranges) and any relevant thermodynamic and transport properties at the successive steps of the process such as:*
 - *normal and maximum flows, consumption of reactants, production of intermediate / end- / by-products (e.g. overall and substance mass balances);*
 - *average or typical quantities normally or accidentally possible to be present, stored or in process;*
 - *formation conditions of by-products and unplanned accident products;*
 - *conditioning of the final products; [...]*
- f. *characteristic process conditions and substance state parameters (i.e. temperature / pressure / concentration / boil-off fluctuation etc.).*

So if the Hazard Analysis shows that heated products can pose a risk for a major accident occurring, the regime of the SEVESO Directive must be applied to these heated products even if this product is not classified as a hazardous substance under ambient/atmospheric conditions. This is logical and identical to the way we deal with high pressure steam.

Such risks will only surface if the selection process for SEVESO sites is carried out in the proper sequence and by carrying out a Hazard Analysis and/or using information from previous incidents as required by the Directive.



Jeanne Van Burren
Continued...



iRESPONSE BY CPD LIMITED



The first step should therefore be a review to find if any of the substances listed in part A of Annex 1 of the Directive are present at the establishment. Next the residual substances should be reviewed based on their under ambient temperature and atmospheric conditions against the hazards properties in part B of Annex 1. After both reviews are completed a Hazard Analysis should be preformed for all substances present at the establishment considering actual process conditions on the establishment in question. The results of this final step of this lengthy procedure will provide a profound answer to the question if the risks of an industrial establishment have to comply with SEVESO requirements or not.

Editor's Note: Jeanne van Buren is a Safety specialist working with the Rotterdam-Rijnmond regional emergency response organisation in The Netherlands. She has BSc degrees in the Dutch equivalent of Process Engineering, Chemical Engineering, Applied Chemistry and Environmental Engineering and an MSc in Environmental Quality Management as well as Risk Crisis and Disaster Management. She is currently carrying out a PhD research into integrated fire safety during the whole life cycle at SEVESO sites.

No longer are onshore industrial facility owners restricted to utilising expensive risk consultants OR expensive software modelling solutions, to determine the impact of an emergency and how to best plan and then respond. **iResponse** places modelling and decision support tools in the hands of responders, SHE managers and plant operators via a simple to use map based user interface.

The user is able to load a map of their facility, setting the weather conditions to ensure the predictive models output results, incorporating the effects of the facilities environmental conditions. From here, the user can take themselves to the area of their facility involved in the emergency and start to develop their scenario which can then be stored as a pre-plan or developed further to form a response plan.

By interacting with the map on the screen the user can model multiple fires, explosions or atmospheric dispersions for storage tanks, pipelines, spills and contained areas. Once complete, any model can be instantly modified, changing as many parameters as desired at the click of the mouse. A model can be cloned, then modified, enabling comparisons to be drawn on the same facility feature (e.g. storage tank) by the changing of a parameter such as wind speed or direction.

Once one or more scenario models have been defined the user can then bring further information in to the map to help evaluate the impact of the emergency, such as:

- Measure the proximity of other facility assets to the source of the emergency with ruler tool
- Bund volume calculator to determine capacity and time to overflow of contained areas
- Placing NFPA standard icons to represent the location of key personnel and response equipment such as hydrants and toxic refuges
- Annotate the site drawing with text and shapes to highlight areas of concern
- Measure the impact of people and property beyond the facility perimeter via overlaying the scenario on top of satellite imagery

Scenarios can then be saved locally on the user's PC or published to a central server to be retrieved as a pre plan in the event the visualised scenario one day becomes a real emergency. The user then has the option to take the scenario pre-plan further to become a response plan, using decision support tools such as:

- Run a Hose: enables the user to determine the most suitable routes to lay hose runs across a facility, maintaining a running total of the total length of hose required and calculating the number of booster pumps

required for each hose length

- Foam Calculators: User can calculate the total volume of foam required for four application types – Rim Seal, Bund / Dyke, Mobile & Fixed Equipment
- Place Monitor: Display on the map the range of any fire monitor range & maintain a running total of the water being applied to the fire ground
- Burn Down Calculator: Depending on the location, product type and volume, it may make more economical sense to permit a fire to self-extinguish, iResponse Burn Down Calculator enables a user to determine the time this will take
- Layer Control: The user can customise what they display on the map preventing information overload, using the Layer Control panel

iResponse has been designed to encourage co-workers to share scenario plans, users are able to publish their scenarios to CPD's secure server farm, enabling:

- colleagues on opposing sides of the world to share knowledge and
- commonality to organisation's standards and methodology of emergency planning and response for all their facilities using iResponse

Via the ability to publish a scenario, facilities that are part of a mutual aid organisation or who rely upon the support of their local municipal responders can share their response plans via the internet, ensuring that all those involved in the mitigation of the emergency have access to the same information, leading to increased effectiveness and safety.

iResponse can be configured to enable responders to access the same data in their emergency control centres, on vehicle mounted data systems and to the forward muster point, enabling crisis managers and incident commanders to see the same information at the same time.

The scenarios created in iResponse can be used to meet the standard of your corporate Health & Safety policies and procedures and at the same time those of government body guidelines, such as COMAH in the UK and OSHA in the US.

In summary, iResponse enables its users to quickly build up a comprehensive understanding of the risks and capabilities to respond within their facility, via its simple to use tools responders can create their own pre-plan and response plans saving the cost of:

- Contracting Fire & Explosion Hazard Management Consultants. For a reduced cost iResponse enables the user(s) to produce for themselves the same materials produced by the consultants but to a greater quantity and level of detail – instead of always working on



iResponse continued

the best and worst case, a scenario can be tweaked to show all permutations across the entire range of input variables.

- b. Incurring higher license fees for modelling systems which lack the decision support tools of iResponse, support tools which enable the user to formulate a response plan.

iResponse can be purchased including a managed service, which includes system population and regular training. If you would like to find out more about iResponse, CPD are hosting a series of 'Webinars' dedicated to system demonstrations of iResponse. If you are interested in this free opportunity, please email laura.cowie@cpd-limited.com or call +44 (0)1642 438114 to reserve your place.

Further information on iResponse and a useful presentation on 'A Review of IT Technology in Emergency Planning' can be found on the website: www.cpd-limited.com

JOIFF Training Notes

**"TRAIN AS IF YOUR LIFE DEPENDS ON IT,
BECAUSE SOMEDAY, IT MIGHT!"**

JOIFF accredited training is within a Competency Based Training framework and involves not only course content, as also critical to the effective provision of training are the facilities of the training provider/training establishment and the capabilities of the instructing staff. JOIFF has developed systems of accreditation for training providers and minimum instructional requirements for Instructors. All students who successfully complete a JOIFF accredited course/programme are issued with a JOIFF Certificate of Competence which has its

own unique number. Records of all successful students and the courses in which they qualify are retained. There is growing recognition worldwide of the JOIFF Certificate of Competence which is coming to be regarded as a passport to the level of employment and rank which an emergency responder's qualifications enables and entitles them to deserve.

"If you think that you can do it, that is confidence. If you can do it well on an on-going basis, that is competence!"

JOIFF Accredited Training for 2011:

For further information about JOIFF accredited on-Site Competency Based Training Programmes, the range of Fire Service NVQs and any other aspect of JOIFF Training, please contact the JOIFF Secretariat.

The dates below have been provided by UK based JOIFF accredited training providers. If the dates are not suitable for you or your own specific training requirements are not listed below, contact the JOIFF Secretariat.

PROGRAMME FOR 2011/2012

JOIFF ACCREDITED TRAINING ESTABLISHMENTS:

JOIFF Accredited Course	Dates	Venue / Organiser
Basic Industrial Firefighter Course	16 th – 20 th May 2011	Washington Hall
	3 rd - 7 th October 2011	
	16 th – 20 th January 2012	
Team Leader Course	11 th – 15 th April 2011	Washington Hall
	19 th – 23 rd September 2011	
	5 th – 9 th March 2012	
Fire Incident Command Course (5 Days)	11 th – 15 th April	Netherlands / Falck Risc
	23 rd – 27 th May	Malaysia / Falck Risc
	4 th – 8 th July	Netherlands / Falck Risc
	12 th – 16 th September	
	24 th – 28 th October	Brazil / Falck Risc
	21 st – 25 th November	Netherlands / Falck Risc
PERO Pipeline Emergency Response Officer (UKOPA)	21 st June	Wilton/ Sembcorp UK Protection Group
	10 th October	
Site Incident Controller Training (1 Day)	20 th May 2011	Wilton/ Sembcorp UK Protection Group
	21 st September 2011	
	17 th November 2011	
Site Main Controller Training (1 Day)	27 th May 2011	Wilton/ Sembcorp UK Protection Group
	23 rd September 2011	



Diary of Events 2011

May

- 16th - 19th *International Firex*, NEC Birmingham, England
17th - 20th *Storage Tank Fire Hazard Management Workshop*, Brazil
23rd - 26th *Fire Systems Integrity Assurance and Maintenance Workshop*, Singapore
25th *Fire and Rescue Congress 2011*, London, England
25th - 27th *EUROFIRE 2011 5th European Conference*, Paris, France.
25th - 27th *Practical: Storage Tank Fire Fighting Workshop*, Spain

June

- 6th – 8th *Fire & Gas Detection Workshop*, UK
7th – 10th *Storage Tank Fire Hazard Management Workshop*, Thailand

July

- 5th - 6th *Emergency Scotland*, SECC, Glasgow, Scotland
6th - 7th *Ambulex*, Fire Service College, England
26th - 29th *Fire Systems Integrity Assurance and Maintenance Workshop*, Brazil

September

- 13th – 16th *Fire Systems Integrity Assurance and Maintenance Workshop*, Australia
20th – 22nd *Practical: Storage Tank Fire Fighting Workshop*, Brazil
27th – 29th *Fire & Gas Detection Workshop*, Singapore
28th – 30th *LNG workshop*, Netherlands

October

- 4th – 5th *Practical with Fireground Training: LNG*, Spain
10th – 13th *Storage Tank Fire Hazard Management Workshop*, Malaysia
24th – 27th *Fire Systems Integrity Assurance and Maintenance Workshop*, Abu Dhabi

November

- 23rd – 24th *Emergency Services Show*, Stoneleigh Park, England
28th – 30th *Practical: Storage Tank Fire Fighting Workshop*, Malaysia

Please contact the JOIFF Secretariat with details of any event that you think that JOIFF Members might be interested in attending.
Note: The Catalyst is not responsible for the accuracy of dates and / or venues announced. This is based on information given to the Editors and is published in good faith.

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