



The Catalyst

The Official Newsletter of JOIFF

December 2005

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FROM THE EDITORS

Seasonal Greetings to the December 2005 edition, the fourth edition of The Catalyst for 2005. As always, we extend a special thank to those JOIFF Sponsors who have contributed articles for this edition. DuPont provides us with a very topical article on protection against Avian flu and regular contributor Mike Willson from Angus updates us on large scale fire tests on LNG they have carried out at the BP training facility at Texas A + M. An article by JOIFF Corporate Member OmniQual explains their new low pressure Water Mist Firefighting systems and we publish the report on the 2005 AGM of the Institute of Fire Safety Managers.

In this edition, we have particular pleasure in launching the new JOIFF Guideline dealing with Fire Extinguishers using Foam, concluded after a recent Consultation with JOIFF Members. Our regular features in this edition include the Rector Column, New Members and Members Section in which one of JOIFF's Founder Members, Eddie Davies, extends

Christmas Greetings of a special kind !!

We would like to thank our advertisers and our sponsors for their support during 2005 - without them, we would be unable to function. We also thank our Readers for taking the time to read The Catalyst and hopefully to circulate it amongst their colleagues and interested Parties during the year and hope that you have found items of interest to you. We welcome your comments.

Our policy is to bring you high quality articles on new developments and other happenings in the area of Emergency Services Management. In addition to The Catalyst, current information relevant to Emergency Services Management is posted on the JOIFF website.

We look forward to your continuing support and wish all our Readers, Contributors of articles, Advertisers and Sponsors a very Happy, Safe and Healthy Christmas and New Year.

ABOUT JOIFF

JOIFF, the Organisation for Emergency Services Management, is a grouping of Organisations represented by their Hazard Manager - or equivalent position - and one nominated Deputy. Full Members of JOIFF are Industrial/Commercial Organisations that have nominated personnel as a Hazard

Management Team / Occupational Firefighters/Emergency Responders and Corporate Members are Organisations which do not comply with the requirements of Full Membership but which nonetheless wish to associate with and support JOIFF.

JOIFF provides a forum for discussion amongst peers,

accreditation of job competencies, information and technical advice. JOIFF welcomes interest from Organisations and persons who wish to become Members - contact the JOIFF Secretariat, details on the back page of The Catalyst.

JOIFF Ltd. Registration number 362542.

NEW MEMBERS

During September, October and November 2005 the Executive of JOIFF were delighted to welcome the following new Members. This brings the number of JOIFF Members to 69 Full Members and 21 Corporate Members spread through 22 Countries.

Full Members

Cardiff International Airport, Wales, represented by Ray Imperato, Senior Airport Fire Officer and Perry Latham Training Officer. Cardiff International Airport have a wide range of equipment and vehicles and a full time Fire Crew trained to and maintained at the high levels of competence specified by the United Kingdom Civil Aviation Authority to allow the Airport to provide Category 9 on request.

Corporate Members

Nutec Centre for Fire and Safety, England, represented by Keith Symington, Sales Manager and Bill Whyman, Operations Manager. Nutec Centre for Safety are providers of Health, Safety and Survival Training for Offshore, Industrial, Maritime, Military and Renewable Energy Sectors and have worked in partnership with Serco International Fire Training Centre for over 12 years. Nutec provide IFTC with sales, marketing and administration services for Industrial, Offshore and Maritime Sectors in the UK.

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

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MEMBERS SECTION

Following the report of the JOIFF AGM circulated to the Membership on 26th September 2005, the Executive are pleased to announce the cooption to the Executive Committee of Richard (Rick) Lanigan GFireE MBIM MISM, Chief Fire Officer, British Nuclear Group, Sellafield, England.

Rick is a very experienced Fire Officer and well known in "the Industry". He sits on a number of Committees representing his Company, his Industry and other Organisations. The Executive look forward to Rick's contribution in the development of JOIFF.

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Below is a Seasonal message to the Members of JOIFF, from Eddie Davies, GFireE, Dip SM, founder member, Director and Executive Committee member of JOIFF and Senior Safety Coordinator, Total Milford Haven Refinery, Wales.

Hello JOIFF members everywhere,

Warm greetings and best wishes to you all. Due to work commitments I am not as actively involved in JOIFF now as I would like to be, (I thought work got easier as you got older) but looking back to those early days when we begged and cajoled Companies into hosting our embryonic meetings, many of them being "hit-and-miss" occasions but nevertheless very enjoyable, it is so satisfying to see the progress JOIFF has made, and the high esteem it is now held in throughout not only the UK but Europe and rest of the World. I await in anticipation our first Chinese member.

All this hard work as you are all aware is all down to a small but very dedicated band who shall remain nameless but I am sure you all know who they are, and my personal thanks go out to them for a job well done.

Whilst trawling through the hundreds of endless e mails I seem to receive, I came across this Christmas Poem and thought to myself, let's hope the European Standards Committee don't get hold of it, because I am sure in today's bureaucratic market it would soon become law. I hope you enjoy it.

One last Christmas message: "Never catch snowflakes on your tongue until ALL the birds have gone south for the winter"

Have a very Happy Christmas and a problem free New Year. 'Nadolig Llawen'

Eddie.

A CHRISTMAS POEM (with Safety commentary)

*"T'was the night before Christmas, when all through the house,
not a creature was stirring, not even a mouse;
The stockings were hung by the chimney with care,
in hopes that St. Nicholas soon would be there;"*

St Nicholas (aka - Father Christmas, Santa and 'the big bloke with whiskers'), the contractor in question, specialises in out of hour's seasonal work - probably to avoid tax and be out of reach of the Enforcing Authority. The time of year introduces a foreseeable risk to anyone working outside subjecting them to inclement weather conditions and slipping hazards. The clear reference to stockings indicates a house of multiple occupations where extreme care should be taken when selecting and using any second parties to conduct work. It is evident that no predetermined time has been established for the contractor to arrive, just a 'hope' that the signing in register would be completed is wholly inadequate.

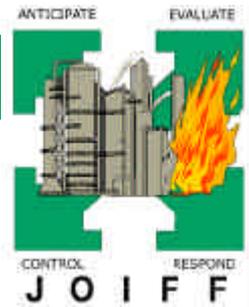
*"The children were nestled all snug in their beds,
while visions of sugar-plums danced in their heads;
And mamma in her 'kerchief, and I in my cap,
had just settled down for a long winter's nap,"*

Children require a separate risk assessment with particular emphasis on their psychological health, night visitors may lead to distress and anxiety attacks. 'Sugar plums', synonymous with brown sugar, smack, crack, ice and 'e' indicate a prior knowledge of drug taking within the proximity of the workplace. Admission of sleeping on duty and admission of nocturnal antics requiring a cap and handkerchief introduces concern for both welfare and morality of the children.

*"When out on the lawn there arose such a clatter;
I sprang from the bed to see what was the matter.
Away to the window I flew like a flash,
tore open the shutters and threw up the sash."*

A foolhardy reaction such as this could easily have resulted in a secondary incident, less haste and more speed (not the narcotic type of course) is the correct approach to the scene of an accident. The noise heard from behind closed and shuttered windows identifies sound levels that may have caused Noise Induced Hearing Loss to those involved or near by, so health checks may now be needed.

*"The moon on the breast of the new-fallen snow
gave the lustre of mid-day to objects below,
When, what to my wondering eyes should appear,
but a miniature sleigh, and eight tiny reindeer,"*



It is no wonder that the crash took place with snow on the ground and ice under foot. There is no mention of competent banksman being deployed and the meteorological office should have been consulted before work began, with appropriate traffic route gritting. The reference to horse power provided by animals introduce the risks associated with zoonoses not to mention livestock disease transmission across the travel route of such a delivery contractor.

*"With a little old driver, so lively and quick,
I knew in a moment it must be St. Nick.*

*More rapid than eagles his coursers they came,
and he whistled, and shouted, and called them by
name;"*

A speeding driver trying to gain control of his vehicle and staff raises the question of suitable and sufficient supervision of the operation and may be the a root cause of such an accident involving peripatetic and outdoor workers.

*"Now, DASHER! now, DANCER! now, PRANCER and
VIXEN!*

*On, COMET! on CUPID! on, DONDER and BLITZEN!
To the top of the porch! to the top of the wall!
Now dash away! dash away! dash away all!"*

Use of day contract foreign labour is increasing, particularly where no employment records are kept or hours are minimal and infrequent. Non-English speakers need to be informed of controls such as restricted access, rules regarding horseplay and they should be warned of significant risks such as falling from heights and this must be done in a way that they understand.

*"As dry leaves that before the wild hurricane fly,
when they meet with an obstacle, mount to the sky,
so up to the house-top the coursers they flew,
With the sleigh full of toys, and St. Nicholas too".*

A clear impression at the pace at which the work was being done emerges. The contractor should be given sufficient time to accomplish the task safely and preparation work should not be left until the last minute. It is clear that the overloaded vehicle was carrying unsecured cargo, which could fall, or at the very least, would cause the steering to become erratic.

*"And then, in a twinkling, I heard on the roof
The prancing and pawing of each little hoof.*

*As I drew in my hand, and was turning around,
Down the chimney St. Nicholas came with a bound."*

Night work is notorious for discipline problems; add to this a cocktail of hazards from working at height and confined spaces with a real risk of fire or noxious fumes it is fortunate that the injuries were not more significant following such a fall. The contractor should have entered the premises by a safe route, or at least demonstrated

a safe alternative involving Personal Protective Equipment if this was the only reasonable way in which to work.

*"He was dressed all in fur, from
his head to his foot,
and his clothes were all tarnished with ashes and
soot;*

*A bundle of toys he had flung on his back,
and he looked like a peddler just opening his pack."*

Suitable and sufficient for one thing may not be so for another - clothing for out door work will certainly be a hindrance when climbing though a narrow aperture. Health hazards such as chimney soot warrant an assessment under the COSHH Regulations and manual handling techniques described like this indicate another key assessment has been missed.

*"His eyes -- how they twinkled! His dimples how
merry!*

*His cheeks were like roses, his nose like a cherry!
His droll little mouth was drawn up like a bow,
and the beard of his chin was as white as the snow;"*

Nasal colouration, and facial contortion with more evidence of white powder around the face provide irrefutable evidence of substance abuse.

*"The stump of a pipe he held tight in his teeth,
and the smoke it encircled his head like a wreath;
He had a broad face and a little round belly,
that shook, when he laughed, like a bowlful of jelly".*

Failing to police established rules, such as smoking restrictions is the beginning of a progressive decline in standards. Occupiers should be vigilant not to leave alcohol or other temptation in a visible place for those with a weakness to over indulge.

*"He was chubby and plump, a right jolly old elf,
and I laughed when I saw him, in spite of myself;
A wink of his eye and a twist of his head,
soon gave me to know I had nothing to dread;"*

In the season of goodwill, humour can quickly turn into verbal assault and the equalities etiquette are all too easily lost after only moderate consumption. The legacy of lust will last longer than the festivities, so office party antics and amour should not be tolerated amongst staff or visitors.

*"He spoke not a word, but went straight to his work,
and filled all the stockings; then turned with a jerk,
and laying his finger aside of his nose,
and giving a nod, up the chimney he rose;"*

Visitor management and building security is the key to caring for both corporate assets and employee personal effects. High jinx and mischief around this time often

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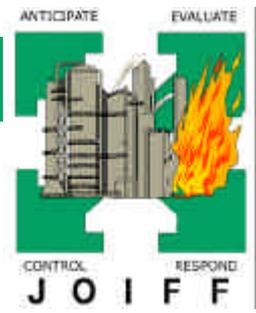
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- ☑ Military applications
- ☑ Emergency response services, spill clean-up and accident interventions
- ☑ Disease and disaster management
- ☑ Medical applications

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continued from page 3

results in high cleaning bills so it is wise to prepare with a stock of appropriate materials.

"He sprang to his sleigh, to his team gave a whistle, and away they all flew like the down of a thistle. But I heard him exclaim, ere he drove out of sight, "HAPPY CHRISTMAS TO ALL, AND TO ALL A GOOD-NIGHT!"

Visitors and contractors need to be signed off and escorted off the premises in an orderly manner. Their work needs to be checked and they should not be allowed to just clear off calling to the wind. Documents should be kept for a suitable period of time after completion, not destroyed or given to the contractor, as their interpretation is likely to be for the lowest cost option and thus a risk of disappointment if goods do not match expectations. As well as the vehicle crash, slip and fall from height this incident resulted in serious physical and psychological trauma to at least one of the contractor's employees. Facial injuries (serious damage to nose causing it to swell and show signs of internal contusion) were sustained before departure from the contractor's depot. As no record was entered into the

accident book at the correct time it would not be unusual for the event to be linked to the rooftop fracas thus adding to the potential claim list.

With those around us determined to forget all we have taught them with any excuse for revelry, is it any wonder that the safety world can never take time off to enjoy the party?

('Twas the Night Before Christmas or Account of a Visit from St. Nicholas by Major Henry Livingston Jr. (1748-1828) (Previously believed to be by Clement Clarke Moore)

Members take note....

Members' Meeting

Plans are being formulated to hold a one day Members Meeting in a location in the United Kingdom during February / March of 2006 at which a number of Papers will be presented. Members will be advised as arrangements progress.

NEW LARGE-SCALE LNG FIRE TESTS

By Mike Willson

Angus Fire has conducted a series of pioneering large-scale tests on the effectiveness of foam and application equipment on Liquefied Natural Gas (LNG) fires. Natural gas is the cleanest burning of all fossil fuels, and global demand for it as an energy source is growing rapidly. The tests were organised to re-evaluate current fire protection equipment and techniques in realistic fire scenarios

The venue for the tests was the new world-class LNG testing and training facility developed and sponsored by BP in collaboration with Texas A&M University Emergency Services Training Institute (ESTI).

COLD FUEL

When natural gas is chilled to -164oC at atmospheric pressure, it condenses into a cryogenic liquid, takes 620 times less space, and can be economically shipped around the world aboard ocean-going tankers, just like oil. Once landed, it is transferred to storage tanks, and then returned to its gaseous form before being fed into pipelines to reach end users.

When LNG is warmed up and turned into natural gas it is flammable within a very limited range. If the mixture of natural gas with air contains less than 5 per cent natural gas, it cannot burn because it is too lean. If the mixture contains more than 15 per cent natural gas, it is too rich to burn.

However, the big problem with LNG is that if it catches

fire it gives off twice the amount of heat of an equivalent sized gasoline fire! Heat emissions are the principal cause of damage from LNG fires, capable of causing severe damage to personnel, structural steelwork, plant and adjacent facilities if left unchecked.



Angus LNG Turbex High Expansion Foam Generator

THE PROPS

LNG terminals and facilities follow practices that are different in some ways from those in other industrial installations. For example, many LNG facilities have piping laid in trenches to contain any leaks. ESTI has



a 19m² L-shaped trench to simulate just such an LNG pipeline. The new facilities at ESTI, referred to as "the props", consist of four parts - the trench; two 1.2m deep pits with areas of 9.3m² and 65m²; and a third pit, 2.4m deep covering some 45m². The three pits represent typical impounding basins in an LNG facility. The third pit includes a simulation of an LNG manifold on an LNG tanker and the steel deck and hull of a ship simulating the facilities used during LNG offloading. The added depth enables a water base to be used that simulates the sea.



45 sq metre bund fully alight

VAPOUR DISPERSION

If LNG spills on to the ground, it starts to vaporise instantly. The cold LNG vapour condenses moisture in the air to produce a white vapour cloud. One option is to allow this process to continue, provided you can control the vapour and there is no ignition source nearby.

Alternatively, the flammable vapours can be dispersed away from potential ignition sources more quickly by warming up the LNG. Water or low expansion foam should not be applied directly on to LNG to do this, since the heat transfer from the water causes a severe reaction as a result of the LNG vaporising too quickly. This was graphically demonstrated in the "marine pit" where LNG vaporisation rates on water were around five times that on land.

Water curtains can be used to control the drift of the LNG vapour. But these can be difficult to place correctly with changing wind direction, and the water must not be allowed to come into contact with the LNG spill.

A good quality high expansion foam is a far more gentle and effective way of warming LNG and controlling vaporisation. The highly aerated foam provides a thick, light blanket with much lower water content per unit volume.

The 65m² pit was used to simulate an unignited LNG spill from pipework or a bulk storage tank. A high

expansion foam was observed to reduce ground-level vapour concentrations within seconds to well below the Lower Flammable Limit of 5%. A layer of frozen foam was formed at the LNG/foam interface that supported several feet of additional foam. Ice tubes also formed where the vapours boiled through the foam blanket. As the vapours ascended through the foam, they were warmed, became lighter than air, rose upwards, and dissipated safely in the air above potential sources of ignition.

FIRE CONTROL

If vapour finds an ignition source it is likely to be outside the white vapour cloud, and the flames will burn back to the liquid pool and generate intense radiant heat. A high performance dry chemical powder like Monnex can put the fire out quickly provided it is not too large and does not have any obstructions. However, this is not always desirable since a potentially flammable vapour cloud may subsequently build up above the liquid and pose a risk of reignition. Should the LNG vapours enter a semi-confined space, damage could result from the resulting ignition.

The accepted approach is to use high expansion foam of expansion ratio around 500:1 to achieve a controlled burn-off and in the process greatly reduce the radiant heat emissions. The principle is to apply it fast enough and at a high enough rate to get control quickly and avoid potential risk to personnel, plant and equipment.

As the lower portion of the foam freezes, ice builds up within the foam blanket, venting the vapour in a controlled way, producing flames of greatly reduced intensity on the surface. The foam bubbles insulate the LNG from the heat source above, controlling the



Angus Hydroshield Water Curtain

release of vapour. As the heat breaks down the foam blanket, more foam must be applied regularly as a series of pulses until all the LNG has burnt away.

Initial small-scale tests were carried out to assess the effectiveness of different types of foam and application technique on a range of LNG fires. A variety of application techniques were used including low, medium and high expansion as well as low expansion



compressed air foam (CAF) systems. Low expansion foam delivers too much water to be effective. Dry CAF performed slightly better when applied gently, but the logistics and equipment required to produce the foam was impractical.

Slow-draining Tridol ATF foam applied gently through a hand-held medium expansion foam branchpipe was observed to control the fire and achieve a reduction in heat radiation of over 90%. This was only considered suitable for small-sized spills due to the high application rates required.

Large-scale tests were then carried out to simulate a major spill fire in a containment pit or the bunded (diked) region surrounding an LNG storage tank. LNG was placed in a huge 65m² test pit, the largest of its kind in the world.



White LNG vapour cloud before ignition

The procedure to ignite the LNG was to allow a vapour cloud from the LNG to extend out from the pit over a distance of open ground. A white cloud was observed

where the cold LNG vapour condensed moisture in the air. The flammable vapours were then ignited using a torch on a 3m long pole. Flammable vapour levels of 5 to 15% are normally expected on the fringes of the visible cloud, but portable gas monitoring equipment detected pockets of flammable vapours up to 150 metres from the visible cloud.

Once the vapour cloud was ignited, flames shot in all directions consuming and mixing the gas, which burned through the extended cloud back to the source, turning the pit into a burning cauldron of fire. The flames reached over 30 metres into the air and gave off so much heat that personnel were forced to retreat to a safe distance.

In the past, fire testing of LNG tended to be carried out on wet sand or earth pits which often had sloping sides. These are easily cooled by the LNG, making the test easier as moisture in the soil freezes and absorbs heat, avoiding the heat attack on the foam seen with concrete. Therefore they are not as representative of

today's more common vertical-sided reinforced concrete impounding basins. Historic test data using various foam application rates with outdated LNG storage and handling techniques provides no margin for safety in the modern world. Only foam and equipment proven to be effective on the ESTI fire ground for prolonged periods of use are now acceptable to BP. Only a minimum application rate of 10 l/m²/min through water turbine-driven foam generators delivering 500:1 expansion ratios and capable of 90% radiation reductions within 60 seconds proved effective under realistic site conditions.

SPECIALIST FOAM EQUIPMENT

Intense heat emissions from LNG fires means that ordinary high expansion foam equipment is totally unsuitable. It quickly distorts, buckles and ceases to generate any foam. That is why two specially engineered LNG Turbex high expansion foam generators from Angus Fire were used throughout the test programme. The exceptional heat resistance, careful choice of materials and robust design of the LNG Turbex ensures reliable operation even after prolonged exposure to intense cold and searing heat. It has previously passed the NFPA 11:2005 Fire Exposure Test with flying colours, withstanding internal temperatures as high as 1000oC.

Additional features of the LNG Turbex that proved crucial during the tests included a unique water-driven turbine motor, tiered foam-making stainless steel net and special aerofoil fan. These provided a consistent air flow through the foam generator that produced Expandol foam with uniform expansion ratio at all times. Its cocoon-shaped design generated a stable slow-draining foam blanket with uniform bubble size for optimal performance, while stainless steel ducting ensured reliable foam delivery.

FOAM CONCENTRATE



Applying foam to LNG fire



Selection of foam concentrate from the wide range of high expansion foams available is also important. They are known to vary enormously in their effectiveness on LNG. Low quality brands exhibit poor stability as indicated by their faster drainage rates. In contrast, high quality brands like Expandol and slow-draining Tridol ATF foam from Angus Fire are known to produce a more stable foam layer for optimal performance and minimal topping-up.

Expandol high expansion foam of around 500:1 expansion ratio was found to achieve rapid fire control and subsequently a controlled burn-off, achieving a 90% reduction in heat radiation in less than one minute. Once control was achieved, the foam application rate was pulsed to maintain full control.

SYSTEM DESIGN

The importance of applying these latest findings to the design of LNG fire protection systems cannot be overstated. NFPA 11:2005, for example, suggests that application rates and discharge times should be established by test work on LNG.

Designing a successful system is not limited to using foam generating equipment and concentrates that

have been thoroughly tested on LNG. A detailed risk analysis should be carried out early on, and critical variables such as the proportioning system, induction rate, expansion ratio, drainage time and foam depth, as well as application rate and discharge time, should be carefully defined to suit each individual risk.

Combining all these factors into a properly engineered system to protect an LNG facility is the next challenge. Some companies such as Angus Fire have extensive experience of LNG contracts, and a proven track record of designing specialist LNG systems.

The test programme is continuing this year with the construction of additional LNG fire testing facilities. As LNG becomes more prominent in the world's energy supply mix, Angus Fire's latest test data will help emergency responders world wide to prevent and combat LNG fires. Make sure you talk to Angus Fire before finalising your LNG facilities upgrade or new build to obtain a reliable and effective system for when you need it most.

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Design & Construction					
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Sizes:	8/S, 9/M, 10/L, 11/XL, 12/XXL				
Colour:	Dark blue				
Length:	approx. 32 cm				
Particularities	Material composition and construction patented under EU Patent Certificate no. 0724848				
Pictograms and Performance level according to EN 659:2003					
Certificate No.: BP 60010613 0001 15644 20-FF-A			Requirements	PL	Inspection authority: 0197 Testing and Certification: TUV Rheinland Product Safety GmbH D-51101 Koln
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THE INSTITUTE OF FIRE SAFETY MANAGERS

Report of the 2005 AGM by the General Secretary Bob Docherty
29 September 2005 at the Heritage Motor Centre, Gaydon Warwickshire. There was an excellent turnout with a total of thirty two members and guests attending to hear a number of excellent speakers and participate in the Institute's AGM business.

The Chairman of the Institute, John Williamson, opened the day with a welcome and introduction of the sponsor for the day, Ford of Britain, represented by Peter Whalley, Risk Engineering Manager for the Premier Motor Group/Fire Control Engineer Ford of Britain. Peter gave a warm welcome and opening address to the meeting and also a potted history of the museum as well an outline of the fire safety philosophy that was established for the building when it was first designed and also improvements that have been included over recent years to safeguard the valuable vehicles and exhibits that are kept in this fascinating museum. Members were pleased to learn that the museum is undergoing a programme of fire safety upgrades including the installation of sprinklers.

The first speaker was David Jones, formerly a Chief Superintendent with Lancashire Constabulary. Dave's presentation was sponsored by LANPAC (Lancashire Partners Against Crime) and he gave a fascinating talk on business resilience in the face of



severe disruption whether caused by terrorism or by other security breaches and criminal acts. The presentation suggested that there are strong links between the survival of a business from terrorist or criminal acts and the impact of a major and there followed a lively questions and answers session which showed that there were many members who

were interested in how to plan to ensure that their business could survive if affected by such incidents.

The next speaker was Paul Dryden from Greater Manchester Fire and Rescue Service. Paul works in the Policy and Legislation Section and has recently



returned to Manchester after a secondment with the Office of the Deputy Prime Minister where he helped to develop Government guidance for the Regulatory Reform (Fire Safety) Order 2004. Paul spoke on the Order and explained the current status and likely implications when it is implemented in April 2006 - with particular reference to the likely enforcement regime to be adopted by fire authorities. All those present expressed great interest in this subject especially given its relevance to everyone with an interest in fire safety.

The third and final speaker for the day was the Institute's President, Stewart Kidd, who gave a fascinating paper on the reality of fire (and sometimes the unreality of fire behaviour!) using the example of the Windsor Building fire in Madrid. Stewart not only pointed out the human failures in the project but also the physical building failures and the problems of firefighting that were encountered when this fire occurred in the heart of Madrid.

Whilst each speaker adopted a different position, there was a strong feeling that there was a common thread running through each presentation which showed just how we try to legislate for buildings that are in use and how we try to protect them as best as we can, given the knowledge base which exists at any particular time. Even then we do have building fires that become disasters and this demonstrates a clear need for proper pre-planning so that businesses can continue to operate and, forgive the



pun, rise again from the ashes. A neat integrating theme then for the day that came out of three excellent as well as diverse presentations that were delivered professionally and with passion.

Following an excellent buffet lunch provided by the sponsors, Ford of Britain, it was down to business with the formal proceedings of the AGM proper. The Chairman took the meeting through the agenda with deft skill making his own challenge to those persons sat in the room and also other members who could



not be present on the day, to persuade other associates, colleagues, working partners etc. who are charged with the responsibilities of fire, security and safety management to join the Institute to make it truly representative of the sector and help it to achieve its aims for the future.

Other officers of the Institute then gave their reports in turn. The new Memorandum and Articles of Association were passed by the membership and the draft Rules and Regulations for Membership and the draft Code of Ethics for members to read and absorb and comment on before the next Council meeting early in the New Year were circulated at the meeting. These papers are also available on the website and there was an appeal from the President for members and non members to consider applying for the Institute's Risk Assessors Register. The President, Stewart Kidd, was reappointed in that role for another year with Gary Whitworth reappointed as Vice President and Robert Docherty newly appointed as Vice President. Council members, John Williamson (Chairman), Peter Cowland (Hon. Treasurer), Ken Day (Membership Secretary), May Husseyin, Richard Whitehouse, Les Askwith and Frazer Agyros-Farrell) were re-elected to fill all the Council vacancies.

Another change was the increase in membership fees to £20 per year. Given the new impetus of the Institute and hopefully more value for money via meetings, activities and a regular newssheet, the

Institute needs more revenue to be able to deliver these increased services to members and carry out all that it needs to do in the next year and beyond. A pleasant surprise for Bob Docherty was the conferring of the membership grade of Fellow on to him and he was delighted and grateful that the membership fully supported the proposal.

Finally, the President posed three challenges to the meeting and the Institute. Firstly, to press forward in representing and promoting the Institute and its views. As part of this Stewart said that we should seek representation on relevant standards committees. Secondly, to write articles and papers that represent the Institute and put the name of the Institute at the forefront of fire safety, and thirdly, to forge partnerships and associations with other like minded and relevant organisations. The President then reiterated the Chairman's request from earlier in the day that all Members should encourage colleagues, associates etc. from all sectors of the industry to join the Institute.

All in all it was a most successful day with thanks to all those concerned in making it happen. The meeting ended at around 1445hrs and some members took the opportunity and invite from the sponsors to go around the museum. John Williamson, Dave Jones, Alan Stoker and Bob Docherty grabbed this invite and we all had nearly as good a time looking at those classic motors as we did attending the AGM! See you at the next meeting so watch the website at www.ifs.org.uk





TECHNICAL BULLETIN

DuPont Personal Protection

Protective Clothing recommendation for Avian Flu Activities

Infection control required implementation of many practises to enable personal protection. Personal protective equipment (PPE) is only part of an entire plan for preventing the spread of an infectious agent. This document provides a protective clothing recommendation based on European Avian Flu Directive Proposal, guidelines published by the German Robert Koch Institute (RKI), the Committee on Biological Agents (ABAS) and the World Health Organization (WHO).

What is Avian Influenza?

Avian influenza (AI) is an acute, highly infectious disease that may affect all types of poultry and other birds. It is caused by different virus types of the family influenzae. AI viruses may spread to other animals and humans in case of contact with infected animals.

Infection risks and protective measures

Transmission of the avian influenza virus to humans is typically via inhalation of contaminated particles (liquid or solid) and smear infection by contact with feces, blood and other body liquids as well as dung and sewage from poultry farms. Medical employees treating infected humans at hospitals are also potentially at risk.

Normal citizens are not at risk only if they have occupational or spare-time contact to birds, chickens, ducks, etc which are infectious or contaminated environments.

According to official publications, the employer or any private person concerned must undertake appropriate biosecurity measures aimed at preventing the spread of avian influenza. This includes personal protective equipment to protect humans against flu pathogens and minimise the risk of cross contamination. The following type of personal protective equipment shall be used: face protection, (mouth, nose, eyes) respiratory protection, hand protection, full body protection (including head and foot protection).

Safe handling of Personal Protective Equipment

When leaving a contaminated area or ending work with an infected living or dead animal, PPE especially gloves, shoe/boots and garments must be cleaned from dirt and other contamination. After this cleaning process a second decontamination process, using Influenza A-effective disinfectants, is recommended. This disinfection work is typically done with low pressure showers, brushes and wipes. Its purpose is to reduce the number of active viruses to a minimum before PPE is taken off to minimise risk of cross

contamination. (Source RKI 7 Bevölkerungsschutz-Gruppe, Germany.)

The recommended type of full body protection is based on the exposure to above mentioned factors, the environment and the decontamination/cleaning substances and processes.

DuPont recommendation

Based on risks of infection by human and the personal protective measures recommended, chemical protective clothing of European Type 4 level may be used depending upon the level of mechanical and chemical exposure during decontamination. For assured protection including chemical barrier against disinfectants, Type 3 level protection is recommended. (The clothing fabric selection is based on the chemical barrier requirements against the selected disinfectant.)

DuPont recommends its Tychem® C and Tychem® F protective clothing range which offer Type 3 level protection and meet the European requirements for protection against biological hazards (EN 14126) in the highest performance class. Test certificates are available on request. Garment models are available in different sizes, S-XXXL and colours with and without integrated socks.



Tychem® C Coveralls Type 3B

Tychem® F Coveralls Type 3B

For questions or further information on the selection and proper usage of DuPont range please feel free to contact the technical hotline.

Techline +352 021 164 043

Email techline@lux.dupont.com

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Disclaimer:
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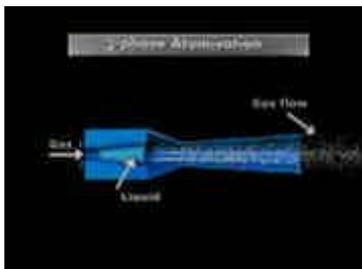


LOW PRESSURE WATER MIST SYSTEMS - A NEW SLANT ON AN OLD FIRE FIGHTING MEDIUM.

by
Tony Loizou Managing Director OmniQual Ltd., Cyprus.

Water mist has long been recognised as an effective means of fire control and suppression but, in these ever increasingly "environment-friendly" days, the consideration of water mist in the control of certain fire types has taken on a new lease of life. With the benefits of water mist well known - rapid cooling and fire knockdown, minimum collateral damage, low resource consumption, smoke particulate scrubbing effect and, as said, environment-friendly, water mist remains an essential tool in the fire-fighting arsenal available to us.

Traditional technology has seen water mist systems using high pressure - anywhere from 40 bar to 140 bar and beyond - to achieve the required atomisation. Such pressures require high pressure sources and high pressure lines, as well as resulting in increased user recoil and water consumption. However, the patented technology in AFT's new range of portable systems achieves an optimum 100-150 micron droplet size from pressures as low as 7.5 bar at the gun. Building upon research originating from within the rocket industry and the study of flow engineering involving liquid/gas mixtures, AFT have succeeded in applying this technology to a range of portable water mist fire fighting systems - systems that are finding themselves already in use world-wide within civil defence units, fire fighting services, production facilities, petroleum refineries and commercial vessels, to name a few.



Greatly simplified, the two-phase atomisation process takes place within the gun and nozzle, where the liquid and gas flows are mixed in a specifically shaped chamber to achieve the required atomisation.

Application gun and nozzle



Through the design of the gun nozzle and internals, the ejection velocity is maximised to the extent that a "jet" of water mist can be thrown up to approximately 18 metres, even from the smaller

back-pack units. This allows the fire source to be approached from what might be considered a "safe" distance whilst still applying a highly effective water mist, or water mist/foam, blanket.



Back-pack unit in use with jet nozzle and foam additive

Close quarters work is achieved by swinging the machined nozzle head into position, giving a controlled 60 degree spray pattern (see below).



machined nozzle head

spray pattern



With EN A55 and B233 ratings being easily achieved when used with the AFT foam additive, the technology has been applied to a number of portable and semi-portable systems providing a range of effective rapid response fire cover units. For the larger units, the single-phase atomisation is employed, resulting in slightly larger droplet size but longer throw - up to 20 metres from the semi-portable "Cheetah" unit.

For the ultimate in portability, the technology has been built into a back-pack mounted unit. This unit can also be provided with a harness design that



back-pack mounted unit



The Catalyst

The Official Newsletter of Joiff

allows the user's SCBA to be mounted on the single harness, noting that whilst there is a weight premium to pay, such units are already successfully in use within the Far East market.

despite the high performance, might not be considered suitable.

As with any system, effective training is an integral and essential element in its success. Apart from the "Cheetah" unit, all systems utilise simple compressed air, at 300 bar, as the driving medium. This allows for regular training with the equipment, with no need to refill CO2 or nitrogen bottles, but only access to a source of 300 bar compressed air. For example, with the marine industry systems have tended to rely on compressed gases not found on board, and customarily only a single refill bottle has been carried. The result? Limited or no "hands on" training takes place and, when needed, the crews are neither familiar nor confident in the use of the equipment. With these systems simplicity is the key. When expended, just exchange the compressed air bottle with another recharged unit and drill again. In a real fire scenario, the 50 litre system can be turned around in around 30 seconds and returned to use again - providing extended capability.

SCBA mounted on the single harness



Scaling up the same technology introduces the 35 litre and 50 litre trolley units, equipped with the two-phase gun and a standard 5 metre (optional 10 metre) hose. Utilising the same fire fighting performance of the smaller units, these units offer increased duration for larger fires, whilst still retaining an element of portability.



Trolley Unit



modular "CAFS" units

Where a larger response is required, the semi-portable "Cheetah" and modular "CAFS" units, using a single phase atomisation process, provide extended duration. With both systems being designed to be fitted in a standard pick-up truck or fixed-mounted, they provide an effective emergency response capability in facilities and areas where the duration of the smaller units would not be sufficient. The compressed air -driven "CAFS" unit has, for example, already found a market within petroleum facilities where the petrol-driven "Cheetah" unit,

Cheetah



OmniQual Limited, a company set up in partnership with AFT GmbH, are Corporate Members of JOIFF. They can be contacted via Info@OmniQual.com or via the website at www.OmniQual.com.

PRESS RELEASE

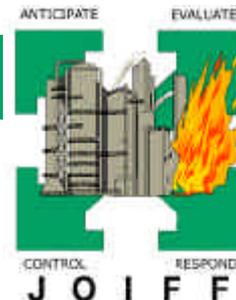
GD Fire and Safety Ltd. is pleased to announce details of its new glove for Firefighters Model Premium S. The supple protective materials used in the manufacture of the glove allow excellent dexterity as well as providing a very high level of protection against heat and flame. The back of the glove is Nomex laminated with a special para aramid felt over heat resistant reflective dots. The palm of the glove is a double faced para aramid knit with carbon coating and the glove has a Nomex knitted cuff and shirring at the wrist, a special finish which gives strength and supports the comfort and protective properties of the glove.

The lining is a special para aramid "senso touch" lining system for extra dexterity and the lining is sewn on a Crosstech membrane for extra protection against entry of water.

The glove is anatomically shaped for perfect fit and Wearer comfort and it has excellent touch sensitivity with a very high level of abrasion and cut resistance in the palm.

The glove is CE Marked to EN 659:2003.

For more information contact Declan at services@gdgroup.ie



GUIDELINE FOR THE USE AND MAINTENANCE OF FIRE EXTINGUISHERS CONTAINING FOAM.

JOIFF concerns itself with the protection of life, property and the Environment in those sectors in which its Members operate. In pursuance of this aim, JOIFF Members recently concluded a period of consultation on the use of Foam in Fire Extinguishers. As a result of this consultation, the following JOIFF Guideline has been issued.

SUMMARY

This Guideline relates to the importance of the environmentally friendly use of foams in Fire Extinguishers even when comparatively small quantities are discharged when a Foam Fire Extinguisher is activated. The validity of universally using Foam Fire extinguishers to cover certain risks is questioned as is the requirement for periodic testing by discharge of such extinguishers.

INTRODUCTION

The Fire Extinguisher Industry is a major User of Firefighting Foams and when all of the individual small quantities of foam discharged through each fire extinguisher throughout the World are added together, it becomes a total of a very large quantity of Foam covering a huge area of the World. The intention of this Guideline is to highlight the importance of the environmentally friendly use and the efficient and controlled application of foams in Fire Extinguishers.

The wider issue of Firefighting Foams discharged in large quantities per discharge by Emergency Response Teams through pumps, hoses etc. in Industries such as the Aviation and Petrochemical Industries is already being addressed in JOIFF at another level and JOIFF Members have voluntarily taking action to reduce such discharges of Foam particularly in Training and non-fire related incidents.

DETAIL

For some time, there has been a growing awareness of the possible damage to the Environment and to Human Health by uncontrolled discharge of Firefighting Foams. Before this issue came to major prominence as a result of the cessation in May 2000 by the Company 3M of production of PFOS (Perfluorooctane sulphonate), a constituent of some of the best selling Firefighting Foams that the Company 3M had produced until then, the European Union had published a wide ranging Groundwater Directive, the objective of which is to prevent polluting substances entering groundwater, primarily as a consequence of the disposal of waste substances. As an EU Directive, its requirements apply throughout the EU and in the United Kingdom, the Directive has been implemented by the Groundwater Regulations 1998 and Regulation 15 of the Waste Management Licensing Regulations 1994.

The Directive specifies groups of substances that are considered to be particularly undesirable in groundwater falling into two lists, List I and II substances, and requires that substances in groups included on List I should be prevented from entering groundwater, directly or indirectly unless they are contained and disposed of correctly.

Any Aqueous Film Forming Foam (AFFF) will contain one of the organohalogen substances in List I of the Directive and discharge of these products to open land or to drain may risk these substances entering groundwater, thus contravening the requirements of the Directive.

Whilst this European Directive relates specifically to the European Union, it should be regarded as

Best Practice and its proposals may be adopted in Countries outside the European Union.

Foam Fire Extinguishers are discharged not only in Training and "in anger" on actual fires, but also as a result of the requirement of National Standards / Codes of Practice for service and maintenance of Fire Extinguishers in a number of Countries for a 5 year test by discharge of Fire Extinguishers containing Foam. Those who know the methods used by those employed in the Industry dealing with service and maintenance of fire extinguishers are aware that in many cases, these extinguishers are tested by discharge in car parks, grassed areas, into drains or rivers etc. without any containment, therefore where applicable, putting large quantities of fluorinated material into the environment.

JOIFF GUIDELINE PROPOSAL for USE and MAINTENANCE

Use

JOIFF supports the use of Fire Extinguishers containing Foam where Companies have decided, based on a risk assessment which includes an environmental impact assessment, that it is the "the most effective" type of Fire Extinguisher to suit their needs. However, when considering the potential damage that discharge of such Fire Extinguishers will cause to the Environment, the validity of using them to cover certain risks should be questioned where perhaps other types of environmentally-harmless extinguishing media might be just as suitable.

Maintenance

The validity of regular test by discharge of Fire Extinguishers containing Foam as required currently in National Standards /



Codes of Practice for the Maintenance of Fire Extinguishers, should also be

questioned from the point of view of the value of this requirement versus the potential environmental impact of indiscriminate discharge of such Fire Extinguishers by service technicians.

CONCLUDING COMMENTS

Certainly in the United Kingdom, discharging a Fire Extinguisher anywhere without the relevant permission constitutes a technical offence under various environmental statutes - this probably applies in many other Countries also. JOIFF issues this Guideline in the hope that this subject will move the issue into the Public Arena for a wider debate and in particular that Manufacturers of Fire Extinguishers containing Foam will come forward with suggestions to assist their Customers in complying with the relevant statutes and that National Standards Bodies responsible for the Standards / Codes of Practice relating to service and maintenance of portable fire extinguishers will constructively and responsibly join the debate and change the relevant clauses of their Standards / Codes of Practice to reflect the concerns expressed by JOIFF in this Guideline for protection of the environment.

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After the conclusion of the Consultation Process on the JOIFF Executive Position Paper on Portable Foam Fire Extinguishers, the following detail was received from Tom Cortina, Executive Director, Fire Fighting Foam Coalition, whose members are manufacturers, distributors and users of aqueous film-forming foam (AFFF) fire fighting agents and their chemical components.

We are concerned that the paper does not include any information on the clear differences between

page 16

PFOS-based and telomer-based fire fighting foams. This is surprising because JOIFF published an article by FFFC in its March 2005 newsletter that explains these differences in great detail.

Below are some facts from that article that we would ask to be reflected in this position paper and any future JOIFF position papers that relate to fire fighting foams:

- Foams formerly manufactured by 3M contain and degrade into perfluorooctane sulfonate (PFOS), which has been classified as persistent, bioaccumulative, and toxic (PBT) and phased out of production.
- foams are also known to contain and degrade to perfluoroalkyl carboxylates such as perfluorooctanoic acid (PFOA).
- Telomer-based AFFF agents do not contain or degrade into PFOS.
- Telomer-based AFFF agents are not made with PFOA and contain no PFOA-based products.
- A workgroup of the US Environmental Protection Agency (EPA) has determined that telomer-based AFFF is not likely to a source of PFOA or its homologues.
- Telomer-based AFFF agents do not contain any chemicals that have been classified as PBT by environmental authorities.

FFFC is especially concerned about the statement in the third paragraph that suggests that there is the same level of concern for telomer-based foams as there is for PFOS-based foams. This is simply not true. PFOS-based foams have been phased out of production and either regulated or considered for regulation by environmental authorities in many countries. DEFRA recently announced that it is moving forward with a UK national action plan on PFOS, which is expected to include a future requirement for the removal from service and destruction of PFOS-

based foams. Telomer-based foams, on the other hand, have not been regulated in any country that we know of, and continue to be produced worldwide for military and civilian applications.

As stated in your position paper, any AFFF agent whether PFOS-based or telomer-based will contain substances in List I of the UK Groundwater Directive. Manufacturers of telomer-based foams have been working closely with their customers in the UK to help them comply with this directive. But it is wrong, based on the information outlined above, to imply that there is the same level of concern for environmental releases of telomer-based foams as there is for PFOS-based foams.

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Note from the Editors:
With particular reference to the second sentence in the first paragraph of the above detail from the Fire Fighting Foam Coalition, we would like to point out that on the front page of each edition, we print a disclaimer that states "The views and opinions expressed in The Catalyst are not necessarily the views of JOIFF or of its Secretariat Fulcrum Consultants, neither of which are in any way responsible or legally liable for any statements, reports or technical anomalies made by authors in The Catalyst." The Catalyst is pleased to provide a platform for views and opinions, but unless specifically stated, no view or opinion published is necessarily a view or opinion of JOIFF or of the JOIFF Secretariat nor does its necessarily become a view or opinion simply because it is published in The Catalyst.



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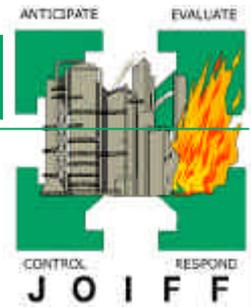
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"THE REACTOR COLUMN."

Write to Mr. R. of The Reactor Column with comments, problems, ideas or anything at all that you would like to be heard. The Editors may decide not to print a letter or part of a letter and letters may be edited. No letter will be published unless the name and address of the Writer is given to the Editors, but names and addresses will not be published without the Writer specifically requesting it. The opinions expressed in this Column are not necessarily the opinions of JOIFF, its Executive or the JOIFF Secretariat who publish The Catalyst.

Season's Greetings to all Readers. On this occasion, I would particularly like to extend good wishes to our JOIFF Members and friends in South Africa as I highlight some of them in this edition. We were very pleased to receive the following email from one of our South African JOIFF Members, Colin Hull, Chief Fire Officer of Engen Petroleum Ltd., Wentworth, Durban.

Hello All,

I read the weather forecast for London every day, just to remind me of what I left behind 34 years ago. Our summer is just starting, with temperatures around 30 degrees Celsius plus another 6 degrees humidity. I have just had a canopy put on my boat to prevent us frying while in the harbour fishing. Quite a change from the days when we used to go trout fishing and rabbit hunting at Glen Neath in Wales, often wading through the snow in many layers of clothing.

We have just had our 4 monthly Refinery Fire Chiefs meeting at PetroSA in Mossel Bay. Day one was spent work-shopping "Natural Disasters". We used the KwaZulu Natal 1987 floods as a case study, when SAPREF Refinery had to be evacuated due to the nearby canal breaking its banks and totally flooding the refinery. We used newspaper cutting from the time and TV news broadcasts to set the scene. It was interesting but scary to relive that year. Even more interesting was discussing the problems associated with floods. Bridges collapsing, workers stranded, fire equipment isolated, communications disabled and a shortage of drinking water, to name but a few.

Day two covered the official meeting with a full agenda. Among the items we discussed were Fire training involving an Instructors Course (country wide), a Community Development programme for Refinery Fire-fighters, best practices for extinguishers and foam compounds, and new developments in Breathing Apparatus.

South African refineries have all been shut down for major modifications to change to lead free products these last few months. Considering the amount of work, it seems to have been a relatively successful period, with no major incidents.

Let me take this opportunity of wishing the Members of JOIFF a peaceful festive season and great shared communications for 2006.

Cheers,
Colin

There are 4 Full and 1 Corporate JOIFF Members in South Africa and they regularly make excellent contributions to the Shared Learning network. A

colleague had the privilege of attending a recent Refinery Fire Chief's meeting in South Africa and was full of praise for that Organisation which was established in October 1980. The South African Refinery Fire Chiefs Association has similar aims as JOIFF and during its 25 years of operation, its Members have developed a very strong mutual aid culture - information and everything else is freely shared between the Members of the Association.

Another Member of both JOIFF and the South African Refinery Fire Chiefs Association, is Sasol Synfuels, Secunda, and our friend and colleague Pine Pienaar, Sasol's Area Leader for Emergency Management and Occupational Health Services sends us copies of "The Fireman's Gossip", the monthly Newsletter of the Emergency Response Team of Sasol Synfuels. In the October 2005 edition, the Newsletter published "A Stroll down Memory Lane" which covered some of the "happenings" over the past 99 issues of "The Firemen's Gossip" from which I am pleased to list some interesting extracts:

December 1998:

- Sasol EMS reached 1 year without any disabling injury in December 1998.
- Our name changed from Fire Department to Emergency Management.

April 1999:

- Emergency Services introduced fitness tests for all operational personnel

June 1999:

- Emergency Management won the SHERQ Safety Competition with a score of 98, 7%.

February 2000:

- Sasol Synfuels received the Nascar recognition with a score of 98.2%, sparking a RCR of 0.43 for 1999.

November 2000:

- We took E-One Big Foot and the Ambassador into service. The demonstration of the vehicles was demonstrated in Durban and all the Officers were out to learn to operate the machines.

January 2001:

- The smoking formal policy was implemented.

July 2001:

- Gert Lubbe was nominated by the Inter Refining Fire Chiefs Committee to serve on the Standards Generating Body for Fire and Rescue Services.

September 2001:

- The whole World learned of the Twin Towers



tragedy in New York

November 2001:

- NOSA audited Sasol Synfuels, on their new Integrated System and Sasol Synfuels obtained a 95% Compliance rating

December 2001:

- Sasol Synfuels reached a mile stone of 3,000,000 man-hours without any disabling injury.

March 2002:

- Rory Hodgkinson the head of our training division was transferred and promoted to Fire Chief at the Natref Refining in Sasolburg.

July 2002:

- The first portions of the new information Management program "SAP" was implemented and Mims was decommissioned

April 2003:

- Two of our colleagues visited Europe to inter alia investigate training facilities, the environmental protection for fire training facilities as well as safeguarding of persons on site

June 2003:

- Pine Pienaar, our Area leader reached 30 year service in the fire services.

August 2003:

- Two of our colleagues Martiens van der Spuy and Leon Nel were seriously injured in a run away veldt fire under extreme windy conditions during August 2003. Martiens passed away on 22 August and Leon was still fighting for his life. Martiens was laid to rest with full honours on 28 August 2003.

September 2003:

- Leon Nel passed away on 9 September 2003 and he also was laid to rest with full honours on 16 September 2003.

July 2004:

- A major tank fire occurred at the Phenosolvan plant, on the western side of the factory EMS had to retrieve a fatality from the tank, (containing hazardous substances)after the fire was extinguished

September 2004:

- A major explosion occurred at the Ethylene plant

resulting in many injuries and a number of fatalities.

November 2004:

- The cylinder test station, which is part of the Breathing Apparatus was accredited by SANAS (South African National accreditation association) and may now perform all the activities related to a Hydrotesting station.

February 2005:

- As part of the restructuring actions all maintenance activities were incorporated in a new maintenance department, which was piloted during this month.

March 2005:

- Sasol Synfuels Emergency Management received recognition from international colleagues in the field of Fire Protection and as part of the recognition Hannes du Toit and Pine Pienaar were invited to act as guest speakers to two international conferences during March. Pine Pienaar delivered his paper at the JOIFF/IFJ conference in Manchester, UK during the week of 14 March and Hannes Du Toit to represented us at the Industrial Fire World Conference held in College Station, Houston, Texas

June 2005:

- As part of our ongoing strategy to improve the safety within the Sasol Secunda site, Sasol Synfuels embarked on a Behaviour based safety program (BBS)

July 2005:

- Pine Pienaar Area leader of Emergency Management was tasked to take up the roll of Area Leader of the Occupational Health division in addition the his current duties

August 2005:

- Hannes du Toit and Gert Lubbe was change responsibilities with Gert now heading the Engineering and Maintenance sections and Hannes heading the operational and training section.

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Wishing you all a very Happy Christmas and New Year.
Mr. R.

