

FIRE **AND** RESCUE INTERNATIONAL

Integrated fire, rescue, EMS and incident command technology

Volume 3 No 12



JAPAN: 5 YEARS ON

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Comment

We are proud to present our 36th edition of Fire and Rescue International (FRI), which provides some overviews of recent events, great practical advice and applied know-how. Enjoy the read!

Japan honours SA rescue team

In two separate functions in April 2016, the Japanese Ambassador to South Africa, Ambassador Shigeyuki Hiroki, presented certificates of appreciation to the members of the South African urban search and rescue team under the auspices of Rescue South Africa, who responded to the Great East Japan Earthquake in 2011.



Lee Raath-Brownie

International Fire Fighter's Day 2016 and BESAFE Expo

Overberg District Municipality hosted the Western Cape's commemoration of International Fire Fighters Day 2016 this year at Mega Park in Bredasdorp alongside the newly launched BESAFE Expo, providing a platform for a number of industry meetings and workshops, sporting events and challenges as well as fire safety programmes.

In the news

The recently launched memorial for fallen emergency services, 'new' airport fire fighting and rescue vehicles at Lanseria International Airport and upcoming fire seminars are featured in the news.

Winter fire season 2016

With the winter fire season on our doorstep, we look at the various landowners and fire protection associations' readiness plans for the upcoming season. We also showcase some wildfire and forest fire fighting equipment.

Hazardous materials

The second part of Colin Deiner's series of articles on hazardous materials, he looks at compressed and flammable gases (UN class 2). Deiner overviews the classification, transport and storage of compressed and flammable gases and discusses the challenges in responding to these incidents. He also details the unique characteristics of acetylene, liquefied petroleum, cryogenic, ammonia and chlorine gases.

Fire service

Walvis Bay Fire and Rescue gets a heads up this month and we profile this small but competent service and its CFO.

High-rise fires: initial attack

Ian Schnetler unpacks the initial attack during high-rise fires, detailing responsibilities, equipment and tactics

Fire station planning principles

In this second part of a five part series, Previn Govender provides research-based acumen into the importance of understanding the planning drivers when siting a new fire station.

Emergency Care Society of South Africa

We profile the Emergency Care Society of South Africa (ECSSA), providing insight into its history, objectives, milestones and challenges.

Your story

In the new regular to FRI, we introduce you our readers to Sandra du Rand and provide some lesser known insight into her inspiring career as the second woman to join the South African fire service.

SAPAESA AGM

The FRI team joined the South African Private Ambulance and Emergency Services annual general meeting in Limpopo. We provide a review of the discussions and events.

Rescue roundup

Neville van Rensburg and Julius Fleischman discuss practical methods for staying up to date with the latest extrication techniques and new car technology.

Thank you to all our contributors, readers and advertisers for their support. Fire and Rescue International is your magazine. Read it, use it and share it!

Lee Raath-Brownie
Publisher

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This month's FRI images winner!

Congratulations to

Aldus Smith for his photograph 'Airlift' taken with a Nikon D600 with a shutter speed of 1/10 of a second, ISO 100 and an aperture 10 F-stop. No digital manipulation.

Well done!

Aldus Smith wins this month's prize money of R 2 000!

Photo description:
Netcare1 airlifting a ill patient from Potchefstroom Medi Clinic to Johannesburg for further intervention

Submit your rescue, fire or EMS photo and win R2 000!

Fire and Rescue International's (FRI) monthly photographic competition is open to all its readers and offers you the opportunity of submitting your digital images of fires, fire fighters, disasters, emergencies and rescues.

The rules are simple:

- All photographs submitted must be in jpeg format and not bigger than 4 megabytes.
- Photographs must be in high resolution (minimum 1500 pixels on the longest edge @ 300dpi) for publishing purposes
- **Allowed:** cropping, curves, levels, colour saturation, contrast, brightness, sharpening but the faithful representation of a natural form, behaviour or phenomenon must be maintained.
- **Not allowed:** cloning, merging/photo stitching, layering of two photos into one final frame, special effects digital filters.
- Fire and Rescue International (FRI) reserves the right to publish (printed or digitally) submitted photographs with acknowledgement to the photographer.
- Winners will be chosen on the merit of their photograph.
- The judge's decision is final and no correspondence will be entered into afterwards.
- Brief description should accompany photo.



Entries must include:

- Name of photographer
- Contact details (not for publishing)
- Email: (not for publishing)
- Name of photograph
- Brief description of photograph including type of fire
- Camera, lens and settings used

All entries must be emailed to:
lee@fireandrescue.co

>>ENTER NOW!

South African rescue team to Japan 2011 earthquake recognised



The South African rescue team receiving their certificates in Tshwane

In two separate functions in April 2016, the Japanese Ambassador to South Africa, Ambassador Shigeyuki Hiroki, presented certificates of appreciation to the specialist members of the South African urban search and rescue team who served in Japan during the Great East Japan Earthquake in 2011. The Tshwane event took place at the Japanese Ambassador Shigeyuki Hiroki's official residence while the Cape Town function was held at the Taj Hotel with Mr Yasushi Naito, Consul of Japan in Cape Town as the program director.

On 11 March 2011, the north eastern coast of Japan was struck by an unprecedented earthquake with a moment magnitude of 9.0, leaving the region with more than 18 000 people's lives lost or unaccounted for and more than 400 000 displaced.

South Africa sent a 45-member urban search and rescue team comprising of fire fighters, medics, disaster response specialists and seven members of the press to the Miyagi prefecture in the aftermath of the Japan earthquake and tsunami. The Miyagi prefecture was the most affected, with a loss of 9 630 lives

and 83 000 houses totally destroyed. The Rescue South Africa (RSA) team served tirelessly in a demanding and difficult situation trying to save lives. "The whole nation is grateful for their professionalism, respect and friendship, demonstrated and expressed to the victims of the disaster," said Ambassador Shigeyuki Hiroki at the event.

"Five years since the earthquake, people's daily lives are gradually getting back to normal. Residents in the region are well aware of the fact that today's reconstruction is founded on the help of the many people from around the world, including South Africa. The presentation of certificates is to reiterate the gratefulness of the Japanese Government and people," added the Ambassador.

In his speech he said that the catastrophe of 11 March 2011 claimed a tremendous number of irreplaceable lives and caused unprecedented damage, resulting in a period of crisis that impacted the entire nation. Yet, at the same time, it had been a period during which Japan had received an outpouring of sympathy and goodwill from all over the world, including South Africa.

"It was only five days after the disaster that you departed South Africa. Upon arrival at Narita Airport in Tokyo, without taking any rest, you moved straight to the winter cold of Miyagi Prefecture, one of the most affected areas in the disaster. Your activities in the extremely difficult situation, showing your professionalism and passion to save lives, were all shared with us by the accompanying Japanese officers, K (Mr Yasuhisa Kitagawa) and Mawrie (Mr Masaki Morimoto). Your attitude of respecting local tradition and culture was gratefully appreciated by the locals," said the Ambassador.

"I wish to take this opportunity to also express my profound appreciation to the family members of the rescue team. Your feelings of sending your loved ones to such a disaster area must have been anxious but I believe your love and support to the rescue members gave them even more courage to make them accomplish their mission safely."

"I would also like to offer my sincere gratitude to all those other people who have supported us. It is true that most of life's strongest bonds are the ones we create when things are broken. With the support extended from South Africa and all over the world, I am grateful to report to you that the reconstruction process is on a firm path."

In his speech at the Cape Town event, Mr Yasushi Naito, Consul of Japan in Cape Town read a letter received from Mr Makoto Igarashi, Police liaison chief in charge of the South African team five years ago. "Dear members of the SA Rescue Team, their family members and the concerned officials of the South African Government. Five years have passed since the Great East Japan Earthquake. We are halfway through our reconstruction process but smiles have returned to our faces, all thanks to you. I will never forget you, no matter how many years pass. Taking this opportunity, I would like to express my sincere gratitude to you and your family. My dream is



Overberg hosts International Fire Fighters Day 2016 alongside BESAFE Expo



In commemoration of International Fire Fighters Day 2016, the Western Cape Province held its tribute honouring the fallen at Mega Park in Bredasdorp from 5 to 7 May 2016. Hosted by the Overberg District Municipality, the event partnered with the newly launched BESAFE Expo, providing a platform for a number of industry meetings and workshops, sporting events and challenges as well as fire safety programmes. A number of industry suppliers and services exhibited during the three-day event.



The BESAFE Expo brought together a number of emergency and protection services from all spheres with over 400 school children going through the schools programme.

The Western Cape Umbrella Fire Protection Association (FPA) executive meeting took place on Wednesday, 4 May 2016 followed by the Protection Services workshop,

Provincial Fire Workgroup meeting and the Greater Overberg FPA annual general meeting (AGM) on Thursday, 5 May 2016. The Western Cape Chief Fire Officer's

to see you all again one day. From a 'member' of the SA Rescue Team, Takeshi Igarashi, chief inspector, Miyagi Prefectural Police Headquarters."

In Ambassador Shigeyuki Hiroki's speech he added that, "Japan drew many lessons from the tragic experience, which showed us how solidarity was even more important than before. Countries, rich and poor, can be brought to their knees by the forces of nature. We believe, however, that the tragic event helped Japan to be at the forefront of international advocacy, especially in hosting a range of meetings including a conference titled: 'The Third United Nations World Conference on Disaster Risk Reduction' in March 2014 in Sendai, Miyagi Prefecture."

Ambassador Shigeyuki Hiroki elaborated, "Now it is our turn to share our experience with the rest of the world. In South Africa, we are working closely with the SA government, Cooperative Governance and Traditional Affairs (COGTA) and the National Disaster Management Centre (NDMC) in particular, provincial and local

governments and non-governmental organisations (NGOs), to strengthen the country's resilience to disasters. Such activities are now expanding throughout the southern Africa region. Our clear message is that we would like to continue and enhance collaboration

with the South African role players in disaster management."

He concluded with, "Siyaquba asimanga," a Xhosa phrase meaning we are moving forward; we are not stationary.



The Cape Town event: the team receiving their certificates



meeting took place on the Friday, 6 May 2016.

Fire and Rescue International attended the Western Cape CFO and Provincial Fire Workgroup meetings. The Provincial Fire Workgroup chaired by CFO Reinard Geldenhuys reviewed the recent summer fire season and discussed the efficiency of air attacks ie bombers versus choppers. Kishugu Aviation's Francois Weyers provided a review on aerial resources deployed during the past season and feedback from the Civil Aviation Authority (CAA). Etienne du Toit provided a review of his recent visit to Windhoek Fire Department in Namibia, presenting the Incident Command System (ICS). He also provided an feedback an update on the ICS Toolkit.

The Western Cape CFO meeting was chaired by CFO Joseph Johnston and although we agreed not to report on the meeting, I cannot help but mention the efficacy of the meeting. Matters are reported on and dealt with in the meeting with no room for a talk shop.

The industry challenges included the ever popular Fire Fighter Team Challenge, Inter-badge touch-rugby and the BESAFE 2,4km Run/Walk Challenge. Neville van Rensburg, chairperson of South Africa Metro Rescue Organisation (SAMRO), presented an extrication workshop and demonstration and Advance Fire Information System (AFIS) held a round table discussion.

Demonstrations included a Working on Fire heli attack, South African Airforce Dog Unit demo as well as a medical evacuation by the South African Airforce with the impressive Augusta A109.

Saturday saw the International Fire Fighters Day commemorations with a convoy of emergency services vehicles driving through Bredasdorp and ending at the fairgrounds after which a solemn ceremony followed with the tradition ringing of the bell.

Gala dinner

During the Mayoral Gala Dinner sponsored by Godiva, CFO Reinard Geldenhuys welcomed all and

provided an overview of the BESAFE Expo. Colin Deiner gave an insightful background to International Fire Fighters Day and the history of St Florian. Deiner also alluded to the Western Cape's five year plan, adding that the media-hyped 2015 fires highlighted the work done by fire fighters in the province, resulting in heightened attention to resource purchases and deployment. The province will also be investing in technology to assist with wildfires and thanked Minister Anton Bredel for his support. Deiner also made mention of the training centre at Wolwekloof and the province's proactive fire prevention programme, which included the future target of a smoke alarm in every shack. The event was attended by the majority of Western Cape fire chiefs and their wives as well as Theewaterskloof Local Municipality's Mayor Chris Punt and his wife, Overberg's Chair of Community Services, Councillor Andries Franken and his wife and the Southern Cape branch chairperson of the Southern Africa Emergency Services Institute, Wayne Josias and his wife.





Overberg District Municipality's Mayor Lincoln de Bruyn said that the event celebrates a service whose sole mandate is to serve and protect their communities. "In doing so and facing dangers, sometimes the ultimate sacrifice is made. We will also remember Bees Marais, Darryl Rhea and Justin Visagie who laid down their lives in service of the people of the Western Cape."

He added, "Overberg District Municipality remains committed to continuously improve our fire service to enable us to provide a safe environment for our communities. This is achieved through strong political will and leadership and dedicated officials on the ground. Together with our strategic partners like the

Provincial Government, whose input in so many ways are invaluable and other partners like the Overberg FPA, Working on Fire, neighbouring municipalities and fellow emergency services like EMS and the National Seas Rescue Institute (NSRI), we will achieve the goal of safeguarding our communities."

Competition results

Fire Fighters Challenge

First: Eden Invictus, Eden District Municipality – Time: 07:19,88
Second: 2bleve, City of Cape Town – Time: 07:50,25
Third: Air Force Base, Overberg – Time: 08:21,28

Touch Rugby

Winner: Survivor Hotshots (Working on

Fire Bredasdorp)
Runners up: Breede Valley
Runners up: Cape Town 2

2,4km Challenge

Individual

First: Fezile Klaas - Time: 8:55
Second: Werner Martin – Time: 8:59
Third: Thembaekthum - Time: 9:00
First lady: Lauren Visagie – Time: 11:50

2,4km Team Relay Challenge

First: Survivors Hot Shots (Working on Fire Bredasdorp) – Time: 06:54
Second: Working on Fire (Kleinmond) – Time: 07:02
Third: Bredasdorp Reds (Bredasdorp Fire) – Time: 07:07

Congratulations to all participants and especially the winners!



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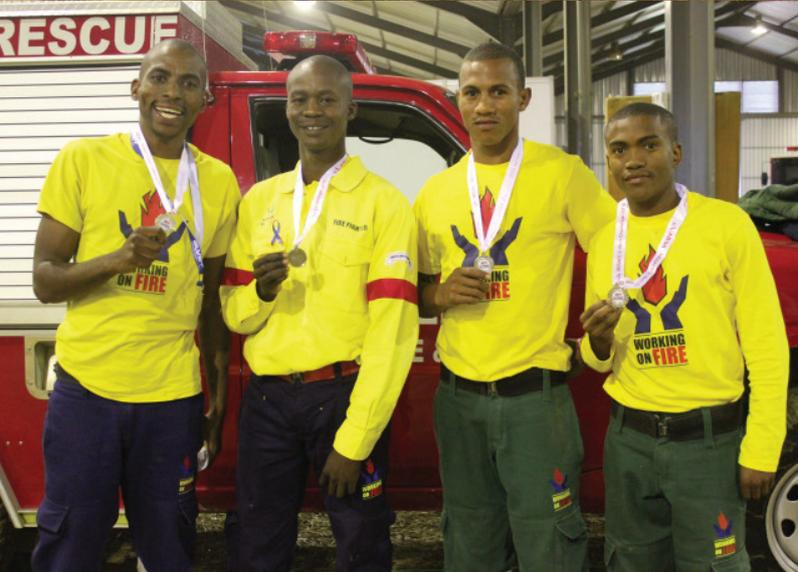
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SAESI 2017

Southern African Emergency Services Institute

29 Oct - 3 Nov

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The 31st SAESI Conference, Exhibition, Training Events and Challenges will be held at the Expo Centre, NASREC in Johannesburg from 29 October to 3 November 2017.

The programme will include:

- Conference
- Exhibition
- Gala dinner
- Cocktail evening
- SAESI EXCO meeting
- Fire Fighter Challenge
- Vehicle extrication
- High angle rescue
- Emergency medical rescue
- Badge swapping evening
- Fun run
- World record attempt
- Meet and greet
- And much more!!

Save the date!

Conference programme, exhibition layout and details on the training events and challenges will be released shortly.



Letaba Fire Protection Association celebrates IFFD, South Africa

Mopani Fire Service, Working on Fire teams, ER24 and Rescue 911 celebrate IFFD 2016



Convoy of about 17 vehicles drove through town while the WoF team paraded in front

The Letaba Fire Protection Association (FPA) in Tzaneen organised a celebration of the annual International Fire Fighters Day (IFFD) on 4 May 2016. The Mopani Fire Service, Working on Fire (WoF) teams, ER24 and Rescue 911 were invited to participate. The day kicked off with the WoF teams parading at the Mopani District Municipality. A convoy of about 17 vehicles drove through town with their lights and sirens on, while the WoF team paraded in front. The parade ended at the Tzaneen Lifestyle Centre where the teams spent the afternoon.

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Memorial for fallen emergency services unveiled in Stellenbosch

The memorial unveiled at the Stellenbosch Flying Club, Western Cape

On 29 April 2016 a memorial in honour of the emergency service personnel and volunteers that lost their lives was unveiled at the Stellenbosch Flying Club, Western Cape, South Africa. The memorial is the brainchild of Stuart Dobson and honours the fallen pilots, aircrew, doctors, paramedics, fire fighters, search and rescue, emergency services, volunteers and forensic and search and rescue dogs. Dobson is an ex South African Police Service (SAPS) reservist who was stationed at Ysterplaat, amongst others and reported to Hendrik 'Bees' Marais.

A number of agencies and organisations attended the event, which included South African Air Force (SAAF) 22 Squadron, National Sea Rescue Institute (NSRI), Air Mercy Services (AMS), City of Cape Town Fire and Rescue, Cape Medical Response (CMR) Department of Health, Kishugu Holdings, Working on Fire, Kishugu Aviation, Falsebay Emergency Medical Service EMS, Metro Emergency Services, Mountain Club of South Africa Search and Rescue, SAPS, SANParks, Stellenbosch Flying Club, Stellenbosch Fire and Rescue and Cape Winelands Fire and Rescue, The Helicopter Group (Titan) and Volunteer Wildfire Services (VWS).

Amongst the attendees were Stellenbosch Executive Mayor, Conrad Sidego and Deputy Mayor Henry Jansen; Dr Wayne Smith, head of disaster medicine and special events for Western Cape Provincial Government; Allisson Nevaro, chairperson of Stellenbosch Flying Club; Andy Connell, base commander NSRI station 29 airborne unit; Francois Weyers, Kishugu Aviation's Western Cape operations manager and the families of the fallen.

Dobson recalls, "I started the journey 11 months ago when the lives of Hendrik 'Bees' Marais, Darrell Rea and Justin Visagie from Working on Fire were lost in two separate helicopter accidents. After speaking to members of various emergency services ie fire, medical, search and rescue volunteers and pilots, I discovered that there is no memorial of this kind in South Africa, setting me on this journey to have the first memorial unveiled in South Africa."

"The site of Stellenbosch Airfield was chosen as aviation plays an important role in all emergency services, whether fire suppression duty, transporting a patient to a health care facility or performing a sea/mountain rescue."



The memorial honours emergency service personnel and volunteers that lost their lives

"We need to honour the men and women that have made the ultimate sacrifice, appreciate those that still serve with pride and dignity," said Dobson.

"Then to all the men, women and volunteers from those that keep watch over our shores, to the pilot assisting in a rescue or those fighting fires to the medical personnel responding, we, the communities throughout South Africa, thank you for serving our people with pride and dignity. To those we have lost, we salute and honour you; for those that are still serving, we appreciate and thank you for being our heroes," added Dobson.

"Now my journey is not finished and will take me to have the wall mirror imaged into all other South African provinces and to start collecting names of those that have lost their lives in the line of duty so that a roll of honour can be erected at each wall of those in that province. Organisations that would like to propose names of persons who died in the line of duty for the roll of



The memorial is the brainchild of Stuart Dobson

honour, including clear details of who and from what station/service, can send a proposal to rollofhonour@vodamail.co.za."

"There is a high quality print in a beautiful frame of the plaque available at a cost of R250. Please contact me details or to order the plaque a request can be sent to plaque@vodamail.co.za. Payment and bank account details will be provided on request.

"To complete my journey, I need to raise R143 000 to follow through on the other provinces and would appreciate any support whether financial or effort."

Fire and Rescue International commends Stuart Dobson and the organisations and agencies involved in this worthy project.

For more information, please contact Stuart Dobson at email: airwing@vodamail.co.za or cell: 072 255 2692. ⚠

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Tempest Fire's First Attack RIV boosts ARFF fire fighting capacity in Sabi Sands



The new Tempest Fire First Attack RIV at Ulusaba Private Game Lodge



The First Attack RIV at Grand Central Airport

A unique and specialised rapid intervention vehicle (RIV) has been developed by Tempest Fire in conjunction with the South African Civil Aviation Authority (SACAA). Tempest Fire's First Attack RIV was specifically designed for airport rescue and fire fighting (ARFF) services. Its main purpose is to reach the aircraft and empty half of its content within the prescribed 90 seconds.

The First Attack RIVs have been deployed to a number of airports and game lodges across South Africa and abroad including Grand Central Airport, Lanseria International Airport, Rand

Airport, Wonderboom Airport, Richards Bay Airport, Ulusaba Private Game Lodge, Singita Private Game Lodge and Kulumbila Minerals in Zambia, only to name a few placements.



First Attack RIV at DeBeers



The new Tempest Fire First Attack RIV at Singita



FIRST ATTACK



SPECIALISED 'FIRST ATTACK' UNITS FOR AIRPORT AND INDUSTRIAL USE

The 'First Attack' fire-tender is based on the proven Toyota Land Cruiser 79 SC series pick-up featuring either a 4 litre petrol or a 4.2 litre V8 diesel engine and seating for a driver plus one crew. Fire-engineering includes a pressurised foam producing system, a 680 litre pre-mixed foam tank, 2 x side-lines delivering 50 lpm at a distance of 28 metres and a manually operated Protek roof mounted monitor fitted with a Tempest Foam Tip delivering 680 lpm at a distance of 44 metres.

This variant features a front mounted winch plus four spacious lockers stowing 2 x breathing apparatus sets, crash rescue apparatus, tools and various fire-fighting equipment.

The Tempest Fire "First Attack" series of fire-fighting vehicles are custom built to individual customer's specific requirements and are available on suitable chassis variations in aerodrome crash fire and rescue, road rescue and other specialist fire-fighting vehicle applications.



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Lanseria International Airport strengthens its fire fighting arsenal



Chief Bennie Vorster

on auction. The Bush Panthers were previously owned by Airports Company South Africa (ACSA), two of which came from OR Tambo International and two from Cape Town International after their recent upgrade to the latest Rosenbauer Panthers as previously reported by Fire and Rescue International.

We spoke to Lanseria International Airport's chief fire officer, Bennie Vorster, regarding the increase in fire fighting capacity. Chief Vorster reported that three of the four Bush Panthers had a complete overhaul before being commissioned. One of the Bush Panthers is kept in storage as a backup unit. "We acquired the four Bush Panthers on auction in order to strengthen our response capacity. Rosenbauer South Africa overhauled the vehicles and MAN

Centurion serviced the chassis," said Chief Vorster.

Lanseria International Airport is a licensed category seven airport for rescue and fire fighting purposes, which means that aircraft with a fuselage length of up to 48,9 metres may operate at the airport. The airport category is, however, upgraded to category eight on a regular basis when larger aircraft with a fuselage length of up to 60,9 metres make use of the facility. These include the wide body B-767 and United States of America Air Force C-17 aircraft. With the new acquisitions, Lanseria now has more than enough capacity to be upgraded to category nine airport, if necessary. "The airport is gearing up for an increase in domestic and international flights," added Chief

Lanseria International Airport (LIA) Fire and Rescue recently purchased four Rosenbauer Bush Panthers

Specifications

The Tempest Fire 'First Attack' series of fire fighting vehicles are custom built to individual customer's specific requirements and are available on suitable chassis variations in aerodrome crash fire and rescue, road rescue and other specialist fire fighting vehicle applications.

The First Attack RIV is equipped with an independent foam system

that could be either manually or electronically activated.

The vehicle is equipped to Cat 3 specification, which include pneumatic, hydraulic or e-draulic rescue equipment, small gear, self-contained breathing apparatus (SCBAs), a dry chemical powder (DCP) unit and first floor ladder.

The unit is able to deliver 7 800 litres fire fighting medium and its roof

mounted turret allows for a striking distance of approximately 47 metres. The two hand lines have a reach of approximately 28 metres. The versatility of the system allows for industrial and municipal application.

The vehicle is designed in such a way that it is a complete one man fire fighting operation allowing the second crew member to focus and concentrate on rescue. ▲



Netcare 911's RIV unit



Kalumbila Minerals' First Attack RIV



Lanseria International Airport's upgraded fire fighting and incident management capabilities

Vorster. FlySafair will start operating from Lanseria on 1 August 2016 joining Kulula, Mango and Majestic Air who operate daily domestic schedules. More domestic and regional scheduled operators will start flying from Lanseria soon.

Vehicle specifications

The Rosenbauer Bush Panthers are built on 8x8 configuration military MAN chassis with 12 000 litre water tanks, 1 500 litre foam tanks and 500 kilogram dry chemical powder (DCP) units. ACSA provided a full service history for all the vehicles.

Rosenbauer South Africa overhauled the superstructures including all the pumps, monitors and pneumatics. MAN Centurion services the engines, differentials, gearboxes and brakes and Rhino Panelbeaters resprayed the vehicles.

The overhaul included some upgrades, which included the fitment of self-contained breathing apparatus (SCBAs) to the custom-built crew seats, new LED warning lights and recovering of the seats. New VHF FM and AM radios were

fitted. The vehicles' lockers were reconfigured to accommodate hose lays and supply lines with shoulder packs and new hoses, branches, nozzles and BA sets were purchased.

The three 'new' Bush Panthers are commissioned as an engine company, rescue company and

tanker respectively. The tanker will support either the rescue company or engine company depending on the incident or as a water supply pick up point as a backup measure for the City of Johannesburg, servicing the current memorandum of understanding (MOU) that Lanseria International Airport Fire and Rescue has with the metro.



Pat Mapanga, Pierre du Toit, Fernand Kruger, Pamela Matsimela, Gary Kaufmann, Victor Maffa (crew commander) Sidney Malatsi



The refurbished Rosenbauer 8x8 Bush Panther Rescue Company



The refurbished Rosenbauer 8x8 Bush Panther Engine Company



The old rescue vehicle was refurbished and converted into a multi-functional incident command vehicle



The old engine company was refurbished and converted into a rescue apparatus

Since LIA is located on the North West border of the City of Johannesburg, the ARFF service responds to motor vehicle accidents, wildfires and structural fires in close proximity to the airport. “We are also neighbours to a

large informal settlement and deal with a lot of medical and trauma calls”, continued Chief Vorster.

The existing two rescue and engine company apparatus have been

improved . The upgraded rescue vehicle is now a multi-functional incident command vehicle, which has been geared to respond to hazardous material (hazmat) incidents including hazmat suits, decon chambers and showers as well as a triage unit fitted with extra medical equipment.

The previous engine apparatus has been converted into a rescue vehicle to assist with off-site fires and incidents such as vehicle and aircraft accidents and structural fires. Its capacity includes pneumatic extrication and rescue equipment and fire fighting gear and will also be a backup unit for the Bush Panthers on site.



The Tempest Fire RIV

FT-2 incident support truck is built on a MAN 33-464 and FT-1 rescue company is built on a MAN a 33-480. Both vehicles are fitted with 8 000 litre water tanks, 500-litre three percent aqueous film forming foam



NMMU/SAIF 11th Fire Management Symposium



The Nelson Mandela Metropolitan University (George Campus) and Southern African Institute of Forestry (SAIF) invites you to the 11th Fire Management Symposium to be held at Skukuza, Kruger National Park, South Africa on 24 to 26 October 2016. The focus of this year's event will be on scientific solutions and management of wildfire risk.

This event aims to streamline the efforts of natural resource managers, engineers and scientists through an integrated approach to ensure better management throughout the wildfire community by making the different role-players aware of each other's realities. You are invited to join fire managers and authorities from different disciplines and land uses ie nature conservation, agriculture, disaster management, forestry,

local authorities, etc for a range of informative presentations and exciting networking opportunities.

Programme

The 2016 Fire Management Symposium promises to be a once in a lifetime event. Not only because of the unique setting but because of the conglomeration of international and local fire specialists that will share their expertise in a very practical and applied manner.

Internationally renowned fire scientist, Prof Domingos Viegas, will deliver the key note address and will be supported by local fire specialists such as Prof Winston Trollope. Various international fire specialists from Canada, Australia, USA and Europe will be in attendance. The second and third days of the event will provide the opportunity to

visit fire trials within the Park that has in some cases been monitored for more than 50 years. Delegates may also make use of the opportunity to take part in guided walks within the park to experience the pristine nature of the South African savannah.

Due to the exclusivity of the event, only 150 delegates will be accepted for the first day of the event. For safety reasons only two groups of 50 delegates will be allowed to participate in the field visits on the second and third days of the event. Accommodation has provisionally been reserved in the Skukuza rest camp for the first 150 people registering for the event.

Contact:

Mpumalanga Promotions
Tel: 082 447 1570
Email dot@mpu.co.za. ⚠

(AFFF) tanks and 150 kilograms of DCP.

Other apparatus include the Toyota 4x4 Land Cruiser rapid intervention vehicle built by Tempest Fire in 2013 with 680 litres premix and 50 kilograms DCP; the 1981 'forever young' Mercedes Unimog 4x4 with 1 000 litre water tank, 50 kilograms DCP and responds to wildfires only; the 1996 Nissan 4x4, which is used for general response; the 2011 Hyundai H1 Ambulance and a 2015 Chevrolet Idv is used as an airport safety inspection and wild life management vehicle.

LIA Fire and Rescue run a four shift system with nine crew per shift. Each crew is managed by a platoon commander and supported by two crew commanders. The crew commanders are each responsible for an engine co and a rescue co respectively.

An administrative facilitator, also qualified as a fire fighter and ILS

paramedic, will respond as a tenth member of the crew, although she works office hours.

"Our new fire station is in the process of being built on the southern side of the airport and will include the new

control tower and communications complex. The station is 50 percent finished and should be launched in about October /November this year. The tower complex will only be completed in 2017," concluded Chief Vorster.



The 'old faithful' Unimog

Kwazulu-Natal Fire Protection Association expects difficult winter fire season



Aerial resources are in place from 1 June 2016

Simon Thomas, operations manager and provincial fire protection officer for the Kwazulu-Natal Fire Protection Association (KZNFFPA), provided some insight into the KZNFFPA expectations for the upcoming winter fire season. Thomas reported, "The 2016 fire season promises to be one of extremes, mainly due to the ongoing drought caused by one of the strongest El Niño events in many years being experienced over large areas of Kwazulu-Natal (KZN) Province. Conditions in Zululand and northern areas of KZN are probably the worst and there has been concerns raised as to whether there are going to be enough water available to fight fires.

Although not as hard hit, the rainfall measured at Shaffton clearly shows a decrease in the average rainfall over the past few years. KZNFFPA, together with the affiliated KZNFPAs, of which there are now 23 covering approximately 65 percent of the province, have been actively engaging with members to be extremely cautious over the next few weeks as they build up to the start of the winter period and have encouraged everyone to start fire season preparations sooner rather than later.

The start of the 2016 fire season saw a number of projects being completed to ensure ongoing improvements in the way in which KZNFFPA and its affiliated FPAs serve its member base and broader landowner base.

Aerial support

KZNFFPA has applied in excess of R12 million to aerial fire fighting resources in the province with airfields in the Karkloof, Richmond, Kwambonambi and Melmoth. Nine single engine air tankers (SEATS), one helicopter and five Cessna spotter aircraft are deployed at the various airfields over the fire season period 1 June to 31 October. Zululand and Zululand Inland FPAs play a pivotal role in supporting the Zululand airfields.

All spotter aircraft have been equipped with new improved headsets to ensure better clarity with communications, especially ground to air. The aircraft also have GoPro cameras monitoring all aerial fire fighting operations. The footage of these fires now forms part of the fire report submitted by the pilot to KZNFFPA management and in turn the member impacted by the fire. The footage will also assist with post mortem discussions and facilitate improvement in terms of coordinated ground and air support at fires.

Detection

KZNFFPA and its affiliated FPAs currently operate in excess of 50 electronic camera detection towers in Zululand and the KZN Midlands. Control centres are located in each of Kwambonambi, Richmond and Currys Post, operating 24/7/365 to ensure all unwanted smoke and fires are detected as early as possible and reported to subscribing landowners. These operations cost the private sector in excess of R9 million per annum.

Disaster management

KZNFFPA continues to participate on the KZN provincial disaster management forum. It is hoped that the relevant government structures will fully understand their responsibilities and understand what the private sector has established in the interest of landowners during fire seasons. Statistics reflect that over 47 percent of unwanted fires threatening KZNFFPA/FPA member properties originate from state or community owned properties.

KZNFFPA committees

The committees are well represented by all landowner categories, corporate and private timber, government, commercial agriculture and general landowners, as well as, by all registered FPAs, Working on Fire, Department of Agriculture and Forestry and Fisheries (DAFF) and other relevant stakeholders. KZNFFPA continue to engage with state landowner groups such as the Ingonyama Trust Board, Department of Rural Development and Land Reform, Eskom and South African National Roads Agency Limited (SANRAL) as these are the largest category of state landowners, which are not compliant with legislation. The Working on Fire programme has been actively engaging schools in the rural areas with their fire awareness programme.

"One small blessing is that due to the drought, fuel levels in the grassland areas are very low and as such the threat has been reduced. However, this is not the case in the forestry areas, where tinder dry fuels are in abundance. This can be attributed to the stress that the trees are under and as such, the needle and woody matter under the canopy has increased," added Thomas.

KwaZulu-Natal FPA has recently commemorated its 10th year of existence; the oldest umbrella FPA in South Africa!

The KZNFFPA hotline number: 0861 KZNFFPA (596 372). 

Sappi's 2016 winter fire season preparedness and strategy

By Steve Reynolds, forestry manager: fire management, Sappi Forests

Fire fighting strategies and tactics will need to be adapted in 2016, given the prolonged drought that is being experienced in most of our forestry areas leading up to the fire season. In wetter years, conventional fire fighting methods rely heavily on various method of 'direct attack', using water to extinguish the flames. Water is applied in a number of different ways, whether from knapsack sprayers, 'bakkie sakkies', fire trucks or aircraft. Water at present is a scarce commodity, however, a number of water bodies in our plantations have all but dried up and reduced streamflow and borehole capacity. Not a good situation from a fire fighting perspective. If there is insufficient water to fight fires by direct attack, what else can be done?

A focus on preventative, strategic and low water-use approaches will need to be employed. Strategies and tactics will include improved cooperation within fire protection associations (FPAs) and with neighbours. Fire fighters should attend FPA meetings regularly, discuss and implement cross boundary assistance plans and check compatibility of equipment with that of neighbours, for example, hose sizes, coupling types and so forth.

Fire incidence can be reduced by analysing historical data trends for identification of 'hot spots' (fire causes, area, day of the week, time of day etc) and mitigation measures put in place. Strategic fuel load reduction can also minimise losses and keep fires as small as possible. To do this, maps showing fuel loads are made, with areas on each farm being placed into one of five categories ie red (very high fuel loads), orange, yellow, green and blue (very low fuel loads). Managers can then plan their fuel load reduction so as to break up high risk areas into more manageable sizes. In the event of a fire, the fire fighting tactic would then be to push or direct the fire towards areas of lower fuel load, which should make it easier to control.

When fires do occur, various forms of 'indirect attack' can be used. So called 'Stemela Crews' can be used to construct a firebreak along the flanks of the fire; a well-trained crew of 20 people can construct a one kilometre by three metre break in 20 minutes. The fire can then be left to burn up to this break with crews guarding it to ensure it does not cross. Alternatively, once this firebreak is in place, it can be used to do a burn out. Back burning is often used but unfortunately more often than not, leads to greater losses when carried out by inexperienced persons. Back burns should only be attempted if this is your only option and you have a well-trained fire boss.

What water is available to fight fire must be used in a strategic fashion. As water refilling points may have dried up, a weekly check should be done looking at alternate sources



'Battle ready' crews trained, PPE provided, fire trucks and equipment checked and ready

or storage systems that can be put in place. In some areas it may be necessary to bring in bulk resupply tankers that can then move to a point close to any fire and refill fire trucks.

Available water can be 'stretched' using foams, fire retardants and the like. A number of foams and fire retardants are available but care must be exercised ▶

NORMAC

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Kishugu Aviation ready for winter fire season

By Mike Assad, national flight operations manager, Kishugu Aviation



Four AT802 fixed-wing bombers are ready for the upcoming season

Kishugu Aviation is implementing the aerial fire fighting component for the South African Government's Department of Environmental Affairs' Working on Fire programme. Over and above this, Kishugu provides aerial resource services to district municipalities, provincial disaster management centres, forestry corporations, fire

protection associations and other large landowners across the country.

These clients are serviced from twenty functioning air bases throughout the Mpumalanga, Limpopo, KwaZulu-Natal (KZN), North West, Eastern Cape and Western Cape provinces. Dispatch centres are strategically placed around the country to oversee aircraft dispatches, flight monitoring

and record keeping and through effective radio communication links they ensure the safety and welfare of the operating aircraft and pilots.

The winter fire season in Mpumalanga, KZN, Limpopo and Eastern Cape commenced on 15 May 2016 and Kishugu Aviation will provide 16 spotter C182/206 command and control aircraft, four AT802 fixed-wing bomber aircraft, 14 Hueys and 16 aircraft support vehicles (ASVs) to provide aircraft with fuel during fire fighting operations.

Kishugu's 10 air bases for the winter season stretch from Stutterheim in the east, Knysna in the south, Tzaneen in the north to Ermelo in the west.

Kishugu's management structure conforms to all of the Civil Aviation Authority's requirements and more. 90 percent of management personnel are commercially licensed and have many years of experience in the business of aerial fire fighting.

The company is currently strategically poised to expand its operations globally, continually seeking to increase its fleet and client base. 🔥

- ▶ when using them. Foams are good to stretch water supply especially when fighting fires in light fuels. 'Snot type' retardants are better used in heavier fuels where penetration is required. Long term retardants, although very expensive, can be extremely effective in creating 'wet lines' from which to fight a fire. Care must be taken when mixing any of these additives as an incorrect dosage put into a fire truck can clog the whole system and render the vehicle and its pumps unusable.

In drought seasons, a high level of fire readiness must be maintained. Fire crews must be adequately trained and fit, as tested by regular fitness checks. When a high fire danger period is forecast, it is advisable to have a brief planning session to ensure everyone is battle ready. Ensure strategic placement of equipment and proto

teams for the best coverage so as to have a crew at any reported fire within 10 minutes whilst also ensuring that they are closest to identified hotspots. This is also where neighbours can cover areas for one another. Everyone should know where potential hot spots are, where useable water points are and what is driving the high fire danger. For example, if it is a strong north westerly wind, then maximum effort is put into guarding north western boundaries, which may entail attending to and extinguishing any fires that are approaching your land holdings from this direction.

By planning strategically, preparing in advance, maintaining readiness and making best use of limited water resources, a drought-affected fire fighting season can still be a successful one. 🔥



BREAK GLASS



IN CASE OF FIRE

The backpack fire-management tool

The STIHL BR 600 professional-grade backpack blower offers maximum power with low fuel consumption. Its high air-throughput of 1210 m³/h quickly blasts away leaf litter and other flammable debris from new and previously constructed fire lines. User-friendly features include an anti-vibration system, reduced emissions, wide shoulder straps and a hip belt for comfort even during extended use. The upright translucent fuel tank enables operators to quickly check fuel levels before starting work. Lightweight yet efficient, the BR 600 is ideal for the long periods of work needed for clearing and maintaining firebreaks. A cost-effective and hard-working fire-management tool.

Like any superior item, STIHL products are only available at specialised dealers nationwide, for expert advice and matchless after-sales service.



taylor@redurnight_FR6937_E

Why buy a compressed air foam system for class A application?



Class A foam enhances the effectivity of water by 300 percent

Compressed air foam systems (CAFS) have been used internationally for many years and there are a number of world class fire fighting vehicles operating in South Africa that are fitted with CAFS, so CAFS are not new to South Africa. However, many departments are still to discover the effectivity and operational soundness in adding CAFS to their fire fighting toolbox.

What comprises a CAF system?

CAFS consists primarily of the following components, either fitted directly to the onboard pump or on a transportable pumping system:

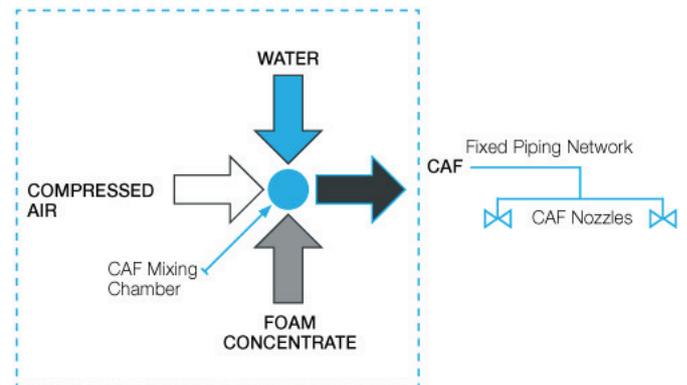
1. Water – from the tank, open source, portable dam or hydrant
2. Foam concentrate – from a foam tank or an external source
3. Fire pump, vehicle mounted or portable
4. Induction system to measure and introduce the correct volume of foam concentrate to water
5. Air compressor

Note: There are a number of portable single load CAF systems available on the market but, for the sake of this article, we are addressing the CAFS fitted to a vehicle and that offers sustainable operations.

How do CAF systems work?

CAFS work by operationally combining all the above noted components. Water is pressurised through the pump, foam is injected in the water stream and air is added to the foam solution in order to generate finished foam. By introducing air into the foam solution, a stable foam structure is produced that is more durable and is capable of absorbing the caloric output of the fire.

Furthermore, because of the addition of air, the foam quality can be selected from wet (0,2 percent induction for overhaul); fluid (0,5 percent for initial attack) and dry (1,0 percent for exposure protection).



Why CAFS?

The technical reasons why CAFS are so effective is best demonstrated live, following a classroom theory introduction. Fire Raiders would welcome the opportunity to visit your department for in-depth presentations that finitely show how and why CAFS work and work so effectively. For the sake of this article, we will only cover the very basics of CAFS.

Although water remains the primary choice for the fire service to suppress fires, there are many factors that you might want to consider when deciding to use only water for your suppression efforts. The limiting factors of using water independently are, amongst others:

- Water has a high surface tension thus preventing penetration

- When used independently, large volumes of water are required for knock down (of course depending of the size and state of the fire) and these volumes are a contributing factor to structural collapse (with an application rate of 950l/min, 450kg of weight is added to the structure for each minute of application)
- Larger fires require higher volumes to achieve the required rate of delivery (application rate). This results in larger diameter hoses that are heavier and more difficult to handle thus impacting on fire fighter fatigue
- Water is a conductor of electricity

Because of the above limitations, we have learnt to use Class A foam in conjunction with water to increase the effectivity of the suppression efforts, break down the surface tension of the water for material penetration and spread, lasting knockdown, reduction in fire fighter exposure and fatigue, reduced water damage, enhanced cooling efforts, suppressing flammable vapours and reducing smoke content, amongst others.

There are countless tests that have been concluded to show the absolute advantage of utilising Class A foam with water for all Class A type fires. These tests have shown that Class A foam enhances the effectivity of water by 300 percent!

We are now in a position to take this advantage to a much higher level by introducing compressed air into a water foam solution. Many tests have shown that CAFS enhance water by up to 500 percent as well as offering many added advantages. The major advantages of CAFS can be summarised as follows:

- Increases the cooling capacity of a Class A foam bubble by seven times
- Dramatic reduction of water usage
- Offers knockdown times that are 78 percent better than water and 66 percent better than Class A foam (Fig 1)
- Uses 79 percent less water (Fig 2)
- Offers 76 percent enhanced cooling compared to water and 17 percent compared to Class A foam application (Fig 3)

Please contact Trevor Fiford at Fire Raiders on Cell: 082 651 2580 for further discussions and a presentation on how CAFS can enhance the fire fighting capability of your department and save you money.

Time To Knockdown

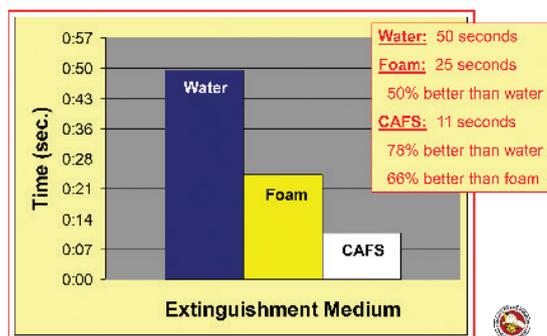


Fig: 1

Litres Required for Knockdown

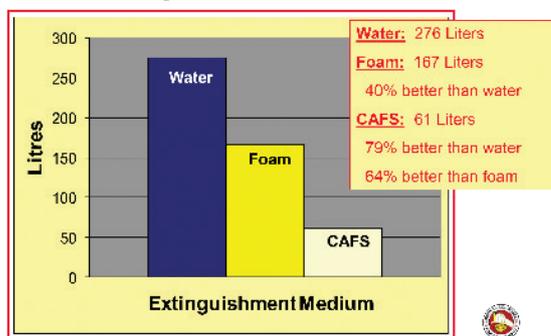


Fig: 2

Total Litres Used

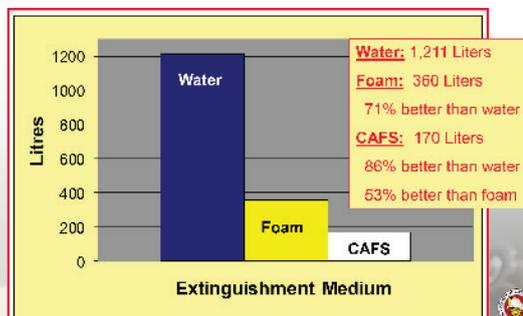


Fig: 3

Time to Cool: 316°C To 93°C

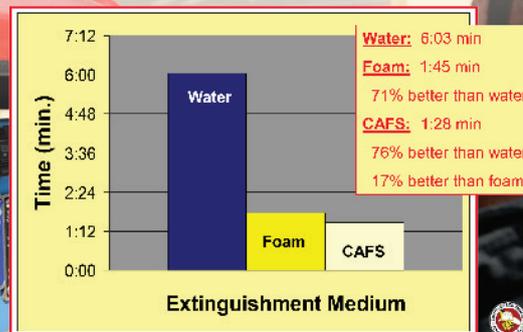


Fig: 4

There are a number of world class fire fighting vehicles operating in South Africa that are fitted with CAFS

Finalise your 2016 fire management plan



The Husqvarna 580BTS blower

Wildfires are a necessary part of nature's life cycle but if they are uncontrolled or occur too frequently, they can destroy forests, farmlands and homes and may cause severe damage to our biological diversity. In an effort to limit fire damage, South African (SA) legislation has set out a number of preventative measures to help reduce the number and severity of wildfires.

It is now a legal requirement that every landowner must establish a system of firebreaks and must have personnel and equipment at their disposal to fight fires.

With Autumn and the start of fire burning season on our doorstep, now is the time to consolidate your fire management plan, which should detail the following:

- All fire hazards on your property
- The best location for establishing fire breaks
- A schedule for controlled burns
- An inventory of fire-ready equipment and trained personnel

who are qualified to carry out fire management tasks

- Communication with neighbours regarding all fire management activities

Work fast and stay safe with Husqvarna

As an industry leader in research and development and product innovator, Husqvarna recognised years ago that the challenging and potentially dangerous job of fire management could be costly and labour intensive, which is why the company set out to find a smarter way to execute controlled burning than the traditional method of using rakes and fire beaters.

"The answer clearly lays in the speed and efficiency of mechanised equipment, which is why the introduction of commercial Husqvarna blowers into the South African market six years ago, elevated fire control to the next level," says Bronson Gunter, general manager product support, Husqvarna SA.

One of the most powerful commercial backpack blowers in the world, the Husqvarna 580BTS,

has earned its reputation as a highly effective fire control tool for foresters and farmers. Gunter explains, "With its powerful X-Torq engine, the 580BTS produces the highest air flow of all backpack blowers on the market today, pushing out close to 26 cubic metres of air per minute. The 580BTS is also equipped with Air Injection, which cleans the in-take air before entering the engine, an important function when working in dusty, sooty environments."

Don Robertson, owner of Timberwise Trading, has been working as a fire management contractor in KwaZulu-Natal for sixteen years. He first introduced Husqvarna blowers into his fleet four years ago. When asked what impact mechanised blowers have had on the efficiency of his operation, Robertson explains, "One operator using a Husky blower is equivalent to six to eight of my staff using traditional fire beaters. There's no doubt that my team is much more efficient with the use of such powerful blowers."

The Husqvarna 580BTS, however, is not the only product in Husqvarna's fire control line-up. Recent in field research has shown that whilst the volume of air exiting the nozzle of the Husqvarna 570BTS is lower than the 580BTS, the higher air velocity achieved by the 570BTS, which exits the nozzle at 378 kilometres per hour, means that it is also an effective tool in fire control applications. So depending on the size and scope of the fire you need to control, the 570BTS may well cater for your needs, especially if cost is a determining factor.

Robertson has also recently started using a Husqvarna 325S25 motorised sprayer to burn tracer lines. He explains that one operator using a Husqvarna sprayer is as effective as three operators using manual knapsack sprayers. ▲



WORKING FAST



STAYING SAFE

HUSQVARNA 570BTS BLOWER

65.6 cc • 2.9 kW • 378 km/h • 11.2 kg

Husqvarna 570BTS is a powerful commercial back pack blower designed for demanding tasks. Large air flow and high air speed are provided by an efficient fan design together with the powerful X-Torq® engine. Commercial grade air filter gives long operating time and trouble free use. The harness has wide shoulder straps.



HUSQVARNA 580BTS BLOWER

75.6 cc • 3.1 kW • 330 km/h • 11.8 kg

One of the most powerful back pack blowers in the world, the Husqvarna 580BTS has earned its reputation as a highly effective fire control tool for foresters, farmers and land owners. Boasting the highest air flow of all blowers on the market today, the 580BTS also has one of the highest air velocities, making it ideally suited to extinguishing small or short grass fires as well as fuelling a wet or slow burning fire.



DESIGNED FOR TOUGH WORK

- Commercial grade air filter
- Robust air filter ensures longer operating times



HIGH PERFORMANCE

- Air velocity of 330 km/h to 378 km/h
- Air flows of 27.5m³ / min to 29m³ / min
- Powerful X-Torq® engine

Letaba Fire Protection Association ready for the upcoming fire season

By Rouan Snyman, fire manager, Letaba Fire Protection Association



The Letaba team: Wynand Strauss, relief chopper pilot; Simon Venter, spotter pilot; Zoutpansberg; Fanie Venter, dispatcher; Paul Bester, chief chopper pilot; Siem Venter, spotter pilot; Rouan Snyman, fire manager; Trevor Phillips, chairperson and Maritza Swanepoel, public relations officer. In front: Zayin Vermaak, secondary chopper pilot and Quentin Steyn, relief spotter pilot

The 2015 fire season was a challenge with the drought and the grounding of the aerial support but the Letaba Fire Protection Association (LFPA) managed well and contracted in a smaller helicopter. We also had great support from our members.

A lot of work, time and money was put in to assure a safe and well prepared fire season. We had roughly 329 controlled fires burning around 1 400ha to secure firebreaks. We also have a strict gentleman's agreement regarding a burning prohibition as from 1 August to 31 October every year and we, as the LFPA, may extend or shorten that time depending on the weather.

We lost about 192ha in our area due to about 134 uncontrolled fires, which mostly started from unmanaged power lines and no firebreaks around the transformers. We have communicated this with the local municipality to take this matter seriously.

Electrical fires pose a greater threat this year because no real effort has been

put into cleaning under the powerlines and transformers are still overgrown.

As the rest of the country we had very little and isolated thunderstorms and beyond normal temperature days, which sparked a growth sprout in weeds and grass. Our fuel load is very high and dry. Many landowners have started with their firebreaks at the end of March already. There is still a lot that needs to be done before our fire prohibition period so we urged our landowners to prepare their firebreaks.

We have managed to secure a third helicopter in Limpopo. Two helicopters, one spotter and two aircraft support vehicles will be based at the LFPA. There will also be a spotter based at Louis Trichardt. These will be dedicated resources with a national resource at Bela-Bela with a spotter and an aircraft support vehicle.

We have one dedicated Working on Fire (WoF) ground team with a state-of-the-art fire truck. There are five other WoF teams in our close proximity that we can call if the need arise.

Landowners and managers receive training and we make sure the landowners have the right fire fighting equipment needed to do the job.

We have created 'WhatsApp' groups to communicate fire incidents, controlled and uncontrolled as well as recorded radios and land lines. We then post the information on Facebook and Twitter so people can follow us on social media.

Furthermore, we are well trained in the incident command system (ICS) and have a trailer equipped with five two-way radios, plugs, lights, solar panel etc that we pull to a fire to erect an incident command post. There are marked ICS boards to keep track of personnel on the ground as well as staging areas, divisions etc. We are also pushing our landowners to implement ICS to better manage incidents that may arise on their farms.

Although a lot of preparation has been done on the LFPA and the members' side, there are still landowners that are not members of the LFPA nor comply with the National Veld and Forest Fire Act.

We know this year is going to be a busy one with the drought we are face to face with. Everyone knows the challenges arising in the near future and we communicate them as well as in our monthly committee meetings.

We have a lot of support and a lot of eyes on the ground.

We urge everyone in and around our area to be safe this winter and make their fire preparation early. Fire can bring so much joy and security and in the same breath destroy life as we know it. We urge everyone to stand together and fight our friend when he turns and become our biggest enemy. ⚠

Firebreaks: construction and management in a forestry environment

By Steve Reynolds, forestry manager: fire management, Sappi Forests

As with all landowners in the country, forestry companies are guided in their fire preparations by applicable laws and regulations, particularly the Veld and Forest Fire Act No 101 of 1998. Chapter 4 section 12 (1) of the act states that "every owner on whose land a veldfire may start or burn or from whose land it may spread must maintain a firebreak on his side of the boundary between his or her land and any adjoining land." Section 13 of the act goes on to stipulate that such firebreaks must be made with due regard to weather, climate, terrain and vegetation of the area. In addition, they must be wide and long enough to have reasonable chance of preventing a veldfire from spreading to or from neighbouring land, must not cause soil erosion and must be reasonably free of inflammable material capable of carrying a veldfire across it.

In order to ensure that a firebreak is 'wide enough and long enough to have reasonable chance of preventing a veldfire from spreading', forestry companies have developed their own recommended firebreak widths according to crop or fuel load types as per the example in the table below.

		Recommended additional width on high Risk boundary breaks										
		Your Property										
Neighbouring Property		Grass veld / Sugar cane	Wattle compartments	Any high fuel load situation	Gum comp - planted	Gum comp - coppiced	Wattle jungles	Villages	Commercial activities	Charcoal kilns	Peelie compartments	Elitli compartments
		Grass veld / Sugar cane	50	18	100	70	100	100	50	50	50	100
	Wattle compartments	18	18	30	30	70	70	18	18	18	18	30
	Any high fuel load situation	60	30	100	100	100	100	100	100	100	100	100
	Gum comp - planted	50	30	70	100	100	100	50	50	50	70	70
	Gum comp - coppiced	60	30	70	70	100	100	50	50	50	100	100
	Wattle jungles	60	30	70	70	100	100	50	50	100	100	100
	Villages	40	30	30	40	60	60	50	50	50	100	70
	Commercial activities	40	30	70	40	70	70	40	50	50	100	100
	Charcoal kilns	40	30	70	60	70	70	40	40	50	100	100
	Peelie compartments	60	30	80	70	70	70	40	70	70	100	100
	Elitli compartments	60	30	80	70	70	70	40	70	70	70	100
		The total recommended width between the two properties										

Recommended additional width on high risk boundary breaks

Firebreaks can be prepared in a number of ways such as grading, ploughing, discing, hoeing, raking burning or a combination of these and normally have a 'fuel free' width of no less than nine meters on either side of a boundary. The 'optional additional width' should be managed in such a way that it will ensure a low intensity fire whenever a fire should get into this section of the external firebreak. This section of the break

should not necessarily be without any trees but should be managed in such a way to comply with the 'low intensity fire' requirement. This could be achieved by regular chemical weeding, raking, mechanical discing, mowing or mulching, by species selection (wattle trees are generally good for this purpose) or by under canopy burning.

As well as external firebreaks that exist between plantations, use is also made of buffer zones within the plantations. These buffer zones are areas with low fuel loads and low fire intensity that are strategically placed and which effectively split the plantation into smaller management units. These zones can be generated using internal firebreaks, normally burnt or mowed annually or can follow power lines – these are normally burnt or mowed annually; conservation areas (burnt for environmental reasons but often form part of buffer zones) or public roads or railway lines (verges burnt/ mowed annually often form part of buffer zones).

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Sappi's Stimela crew constructing a fireline

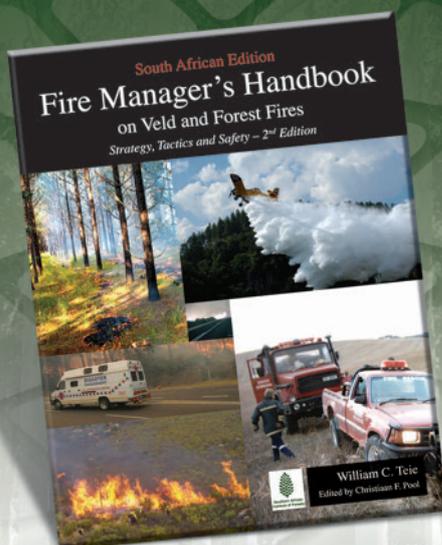
Burning of firebreaks can be a risky operation if not carried out correctly. As such most forestry companies have standard operating procedures for burning firebreaks, an example of which is seen below:

Standard operating procedure for burning a firebreak

- Obtain a burning permit from the local fire protection association (FPA).
- If the firebreak is underneath a high voltage power line, contact Eskom to switch off the line before commencing with the burning operation.
- The person in charge of the burning operations shall either be a qualified forester or a contractor manager with at least three years' experience of firebreak burning.
- If it is a boundary firebreak, ensure that the relevant neighbour(s) has been notified in writing. The neighbour or his authorised representative should be present when burning a boundary break.
- Ensure all relevant stakeholders are notified before commencing with the burning operations.
- Before commencing with the burning operations, the person in charge shall ensure that proper radio communications are in place. If not ensure compliance with the 'dead communication spots' action plan.
- The person in charge of the burning operations shall check the firebreak register to ensure that he has all the relevant details with regards to the burning of the specific break (eg dangers, recommended time of burning, etc)
- Ensure that the fire danger index (FDI) does not exceed 50. If it is necessary to burn with a higher FDI, ensure written permission has been obtained from the regional manager. No burning will be allowed if the FDI is higher than 54.
- The person in charge of the burning operations must ensure that sufficient resources are available. The minimum requirement is one fire tender and one bakkie sakkie or strike unit with 15 trained crew members. If the FDI is between 50 and 54, 50 percent additional resources should be available.
- The person in charge of the burning operations must ensure that all the traces are to the required standard before commencing burning.
- No burning will be allowed on the day before a public holiday or weekend.
- If a forester is not in charge of the burning operations, permission must be obtained from the forester before burning.
- Ensure that a minimum additional 50 percent of resources are available immediately if required.
- When burning, the FDI shall be measured infield (and recorded) every hour or as soon as the weather condition starts changing. Stop when FDI exceeds permissible limits.
- Always ensure that sufficient resources are guarding and mopping up the rear while burning breaks.
- After completion of the burning operations, ensure that the burned area is properly mopped-up before leaving the area. If in any doubt, leave sufficient resources to guard the burned area.
- Notify all relevant stakeholders when the burning is completed. ⚠

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NMMU George graduation, South Africa



Nelson Mandela Metropolitan University's (NMMU) April 2016 graduation season commenced on a high note at the Civic Centre in George with no less than three graduation sessions on 6, 7 and 8 April 2016. A record number of students were awarded postgraduate degrees, undergraduate degrees, national diplomas and higher certificates. These were obtained in

four faculties namely, science, business and economic sciences, education, engineering as well as built environment and information technology. Overall about 10 percent of NMMU George graduates gained their qualifications with distinction.

In an inspiring address, Professor Derrick Swartz, NMMU vice-chancellor, appealed to the graduates to look

beyond their own self-actualisation and to use their ideas or careers to help build a better future and create opportunities for the next generation. To change the world so that it becomes more socially just and inclusive of all the peoples who live in it. He urged the graduates to "uncompromisingly stand for the values of Madiba" and to give back to society as brand custodians and alumni.

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Higher Certificate: Veldfire Management

NMMU George Campus added a specialised programme on Veldfire Management (one year full-time or two years part-time) to its already impressive list of programme offerings in Natural Resource Management, which will prepare fire managers throughout sub-Saharan Africa to effectively manage veldfires.

What do Veldfire Managers do?

Students will learn how to manage resources, vegetation and human activities in the natural environment in such a way that nature, human life and assets will be protected from fire; and how unwanted fires can be prevented and/or suppressed to curb fire impact and cost.

They will also gain an understanding of legislation relevant to wildfire management, and master the effective use of technology, engineering concepts and infrastructure for veldfire management. This qualification will strengthen the competency of any natural resources manager as well as managers in the public sector who have to manage veldfires.

For an application form or more information:

- To apply** contact NMMU George Campus • Tel: 044 801 5111
- E-mail: george-info@nmmu.ac.za or apply online.
- For programme information** contact Mr Tiaan Pool • Tel: 044 801 5024
- E-mail: tiaan.pool@nmmu.ac.za



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Chemsystems, a proud history in South African fire fighting

Chemsystems, one of the operating companies of AECL, is proud of their involvement in the fighting of fires since 1967 in South Africa when its first foam RLF 4 was formulated. The product is still sold with major success as a general A class foam together with the high expansion foam, Chemsolve Super HI – EX.

Chemsolve RLF 4 is a general-purpose, synthetic fire fighting foam concentrate suitable for use with low, medium and high expansion foam making equipment. It has a long shelf life, is non-toxic and non-corrosive. It is designed for fighting fires of hydrocarbon liquids

and class A materials and can be used with either fresh or sea water. Use at two to five percent induction dependant on prevailing conditions and type of equipment.

Over a period of 40 years, Chemsolve Airmaster has been used effectively in cooperation with Working on Fire as a concentrated synthetic compound to fight forest fires in the eastern parts of Mpumalanga, KwaZulu-Natal and the Western Cape. Airmaster can be used for aerial bombing or as an agent for compressed air foam systems (CAFS) as well as with conventional low, medium and high foam making equipment.

Chemsolve Flame-Bloc is also a very efficient wetting agent for use by ground crews to fight fires on the ground and to assist with the production of firebreaks. It is designed for fighting class A fires and can be used with either fresh or sea water. It works by significantly lowering the surface tension of water thereby creating finer water droplets at the nozzle exit. The heat transfer rate is therefore greatly improved leading to quicker extinguishing times and deeper substrate penetration whilst using considerably less water. Use at a dilution rate of 1 to 500 with water. It can be added directly to a

► New higher certificates

The introduction of new qualifications at the NMMU George campus during the past two academic years also saw the first set of students qualifying with the Higher Certificate Information Technology (IT) in User Support Services as well as the Higher Certificate in Veldfire Management (HCVM) where 16 percent of the students, mostly part time candidates, achieved the qualification cum laude.

The respective graduates of the Higher Certificate in Veldfire Management are: Bennie, Sthokozisile; Fredericks, Frank; Jokazi, Zamokuhle; Kula, Siphosethu; Kwake, Esihle; Kwaza, Vuyolwethu; Luzipo, Siyabonga Esetu; Mashigo, Gift Siphesihle; Mkhize, Nozipho; Mkize, Anita; Mngadi, Thandazile; Mvumbi, Esethu; Nduku, Siphesande; Nkambule, Nonzuzo; Oosthuisen, Wiaan; Pedro, Franco; Phetha, Lungile; Riley, Kayleen; Van Wyk, Annalize.

The graduates that obtained the qualification cum laude are: Bezuidenhout, Ian; Chingwaru, Cleopas; Govender, Navashi; Hendrikz, Jacob; Phenethi, Tlalane.

NMMU Veldfire Management course going strong

The Higher Certificate in Veldfire Management is the only course of its kind in the country and has been going from strength to strength since its launch in 2014.

The course, which is a one year fulltime or two years part time course, is offered by NMMU at its George campus, situated in the heart of the southern Cape forestry belt. This year the course is fully subscribed with 12 fulltime students and 19 part time students. Most of the fulltime students who complete the course will go on to study forestry or nature conservation. Part time students include several from local authorities, including the fire chief of Buffalo City and the fire protection associations (FPA).

According to the programme coordinator, Tiaan Pool, the Higher Certificate in Veldfire Management was specially developed in collaboration with land managers involved in forestry, agriculture and conservation, local authorities and FPAs to address a specific need for professional veldfire managers in South Africa.

"In a dynamic environment where experience alone is not enough to

address the veldfire challenges faced by fire managers and authorities who are often criticised for their lack of understanding of the science of veldfires," commented Pool. "This programme is a custom made qualification designed to bring theory and practice together," concluded Pool. There are plans in the pipeline to register the course as a three-year diploma in 2018.

The course includes the following modules:

- Fire ecology and conservation
- Fuel management techniques
- Human resource management
- Incident command
- Integrated fire management
- Fire management planning
- Financial management principles
- Veldfire legislation
- Urban interface management
- Veldfire suppression management
- Veldfire management engineering

NMMU George campus principal, Professor Quinton Johnson, expressed his pride and joy at the outstanding achievements of the young 'Madibaz' for attaining this special milestone in their lives. He also thanked all NMMU staff for the important role they play in shaping 'sustainable futures leaders'. ▲

water tank or premix to provide a solution that can be induced by conventional foam indicator, eg one litre of Chemserve Flame-Bloc made up to 25l with water, yields a solution that should be induced at five percent.

Chemsystems also manufactures a whole range of synthetic foams under licence from Dr Sthamer, which includes AFFF and AFFF-AR foams at various induction rates from one to six percent. The latest environmentally friendlier C6 surfactants are used and there is also a fluorine-free range available.

Some of the major refineries in South Africa and the world have changed over to the Moussol range, an alcohol-resistant AFFF fire extinguishing foam concentrate. It is based on special surface active agents, polymer film formers, aqueous film formers, co-tensides as well as foam stabilisers and antifreezing compounds, which are partially made of re-growing raw materials and are very ecological. Moussol-APS combines

the effectiveness of both polymer and aqueous film forming foam concentrates within itself. Fluorinated surfactants enhance the flowability of the foam on non-polar hydrocarbons. The polymer film formed on polar solvents effectively prevents destruction of the foam. The products ensure rapid and safe extinction by film formation preventing reignition and developing a stable foam, which is gastight and resists flames and heat radiation. Preventatively, it is used to cover spills of volatile liquids. The foam blanket suppresses evaporation preventing emissions of flammable and toxic gases. The fire risk and environmental impact thus are reduced considerably.

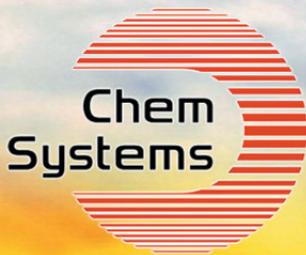
Chemsystems is also responsible for bringing Dr Niall Ramsden out to South Africa to do the FHM training.



Helicopter with a Bambi bucket during resent fires in Clanwilliam, Western Cape



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- STHAMER HAS DEVELOPED A NEW ENVIRONMENTALLY FRIENDLIER MOUSSOL PREMIUM RANGE.
- ALL CARRY EN 1568 APPROVALS



Hazardous materials: compressed and flammable gases (UN class 2)

By Colin Deiner, chief director, disaster management and fire brigade services,
Western Cape Government



This is the second in a series of articles dealing with the nine UN classes of hazardous materials. This month we will cover the second class in the UN classification, emergencies involving gases. Instead of providing you with an unnecessary (and particularly boring) chemistry lesson, I will mostly focus on the hazards you and your department might face when responding to a gas emergency and hopefully provide some ideas on how to manage such an incident.

Classification and hazards

According to the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG), gases are classified as follows:

- Class 2.1 – Flammable gases
- Class 2.2 – Non-flammable, non-toxic gases

- Class 2.3 – Toxic gases
- Class 2.4 – Substances when in contact with water emit flammable gases

We know that gases are stored in a compressed state in various forms of cylinders, depending on the specific properties of the gas. Should these cylinders be compromised in any way that causes the gas therein to escape into the surrounding atmosphere, it could give rise to a wide range of potential hazards. Pressurised vessels can be a potential source of high energy and can fail if over-pressurised or exposed to heat. A leaking gas cylinder can also cause the expelled gas to disperse into the surrounding atmosphere with relative ease and cause extremely volatile conditions. Odourless gases can disperse over a significant area without being detected. It must never be assumed that built-in safety systems such as ▶



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Dealing with a fire impingement on an LPG vessel will require immediate and massive cooling of the entire surface

- ▶ pressure relief valves are working perfectly (especially after an accident). A compromised valve might not release as designed, which might give fire fighters a false sense of safety resulting in them being exposed to its risks for too long.

Cylinders are designed to withstand high internal pressures but if they are involved in fires, this pressure will increase exponentially and coupled with the weakening of the cylinder walls, could fail spectacularly resulting in a blast pressure wave, fireball and cylinder fragments flying in all directions at great velocity. All these events could lead to severe damage to structures in its proximity.

With the exception of helium, acetylene, hydrogen, ammonia and methane, gases are denser than air and will therefore accumulate at low levels before dispersing over various distances where they are at risk of finding a possible ignition source. Gases that are lighter than air can accumulate in high spaces such as ceilings unless they are ventilated.

In addition to the inherent dangers of compressed gases and specific hazards of flammable gases, toxic gases could cause harm to whoever it comes into contact with either through inhalation or skin absorption. Escaping cryogenic gases such as liquid oxygen and liquid nitrogen present a thermal burn hazard if released rapidly.

Transport and storage

The storage of gases in South Africa is governed by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) of the Department of Labour, which regulates the storage of dangerous goods. A series of national standards (such as SANS 10263-2:2008: The warehousing of dangerous goods Part 2: The storage and handling of gas cylinders) cover all aspects governing the safe handling of hazardous gases.

Gas storerooms should be of fire-proof construction and so designed that in the event of fire, the cylinders are easily removable. They should be well ventilated, top and bottom and must never be below ground level. This is due to the properties of most gases, which make them heavier than air.

Any light fittings and electric switches in stores containing acetylene, LP gas or other flammable gases should either

be of the flame-proof type or should be placed outside the building lighting the interior through fixed windows.

Oxygen cylinders may be stacked horizontally provided that they are firmly secured at each end to prevent any uncontrolled displacement.

Strict rules exist for the storage of cylinders away from any heat sources such as furnaces, boilers and radiators.

Transportation of gases must take into account the properties of such gases such as transporting cylinders in a vertical position as well as the legal quantities that may be transported on a single load. Generally, all safety mechanisms for the storage of gas must be adhered to when it is transported.

Responding to a gas emergency

As with any hazard risk it is important that you identify any businesses in your area of response that store significant quantities of gas on their premises. Also consider the fact that if your primary response area is a suburban residential area, you could find various types of gases ranging from acetylene to liquid-petroleum-gas (LPG). Your preplanning should indicate safe areas where you might be able to set up master streams for cooling large volume cylinders and approach routes, which will assist in avoiding any explosive risks.

All the information gained from your preplanning exercise must be available to the initial incident commander (IC) en-route to the incident. This information will assist the IC in determining the initial staging points for all units (outside the potential blast zone) and which areas might need to be evacuated. If an area is indeed to be evacuated, close liaison with law enforcement agencies on scene will be necessary. Should it not be possible to evacuate a particular area, the public must be warned of the potential dangers related to the incident and must be advised to stay away from any openings and to occupy structures as far away from the risk as possible.

Personnel tasked with operating in close proximity to the incident site must utilise as much shielding as possible and wear full structural personal protective equipment (PPE) including a flash hood and breathing apparatus if there is a risk of a fire erupting due to a rapid gas release. Eye protection must also be worn.

In the initial (rapid) size-up, the incident commander must try to ascertain if any (and how many) cylinders are involved in the fire, whether they are exposed to direct fire or radiated heat, are any cylinders venting, bulging or leaking and what gases are involved.

In determining your safety zones also consider the size and number of cylinders, what shielding is available and what the effect of a possible blast pressure wave might have. Also consider the possibility of cylinders becoming projectiles and being thrown long distances if not contained inside a building. Other projectiles such as cylinder fragments and glass can cause considerable damage to fire fighters not adequately shielded.

Although the marking of cylinders are well regulated, it is possible that cylinders could be imported into the country with markings that may differ from South African standards and therefore need to be assessed to ensure what you are dealing with. Command should make use of as many sources of information as possible to identify the cylinders involved. This could include the cylinder markings, verification by the owner/operator, any documentation available and any visual signs such as the cylinder connected to an oxygen cylinder or strapped to a welding machine.

Cylinders involved in fires will obviously heat up and thereby cause the pressure inside them to increase. Direct flame impingement onto a cylinder will also weaken its walls. If the maximum safe working pressure is exceeded, the cylinder could fail in a violent manner resulting in the release of a significant amount of energy. Further hazards could prevail depending on the type of gas involved. Cylinders containing oxidants, toxic or flammable gases may lead to further risks manifesting in the surrounding area. Continuous measurement of the ambient atmosphere must continue until it has been declared safe.

When it is discovered that a cylinder is involved in a fire, the incident commander must initiate all efforts to bring the situation under control. This will most likely entail the extinguishment of the fire that is impinging on the cylinder (if possible) and directing water streams to cool the cylinder(s) down. Cylinders that have been involved in a fire for a prolonged or unknown period of time must be handled defensively and the possibility of using monitors must be considered to remove staff out of harm's way.

If a cylinder is burning at the valve group, try to ascertain if the fire is not at the cylinder neck or at the hoses that are connected to the valve group in which case it can be simply turned off. If the fire is at the cylinder neck, it will not be possible to simply turn it off and will have to be cooled off. Cooling off might just be sufficient to bring the internal pressure down to such a point that it can be safely vented to a point where it is safe and under control. Always remember to do this from a defensive position. Remember the golden rule and that is to never extinguish the gas fire with a water stream. With LPG it can happen very easily and therefore great care must be taken not to direct the nozzle directly onto the fire whilst cooling the cylinder down.

Specific hazards

Certain gases such as acetylene, LPG, cryogenics, ammonia and chlorine have unique characteristics that need to be considered if involved in an emergency. We will deal here with some of them.

Acetylene

Acetylene has a unique characteristic to continue to heat itself after the fire has been extinguished (or it has been removed from the heat source). This is because when acetylene is exposed to extreme heat it begins to decompose into its constituent elements of hydrogen and carbon and thereby causes an exothermic reaction. Acetylene cylinders are designed to inhibit decomposition;

however, if left unchecked this decomposition could lead to cylinder failure. The other hazards of acetylene are:

- Highly flammable
- Asphyxiation risk in high concentrations
- Low concentrations may have narcotic effects
- When used with oxygen the risk may increase

When responding to an incident involving a single acetylene cylinder, a hazards zone of 200 metres should be established if the cylinder is in the open; if indoors a suitable defensive position should be identified. The cylinder should be cooled for approximately one hour or until it has reached the ambient temperature. Using a thermal imaging camera will be useful here. Once the cooling phase has been completed, the cylinder should be monitored for a further hour with temperature checks done every 15 minutes. Under no circumstances must the cylinder be moved at this time.

Leaking cylinders will increase the possibility of decomposition and should be vented safely with due consideration of the additional risk caused by the escaping product.

When multiple cylinders are involved, the cooling may not be as effective if they are closely stacked. If the incident commander detects that the water streams are not reaching more than 50 percent of the cylinder's surface areas, the cooling time must be increased to a minimum of three hours.

Cylinders in close proximity to a fire may be moved out of harm's way. However, it is important to check their

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Old propane gas cylinders

- ▶ temperature before attempting to move them. A thermal imaging camera or the use of a water spray onto the cylinder will help you to determine that.

When a cylinder has been sufficiently cooled, it may be approached with caution if there is no gas still leaking from it. Moving a still heated cylinder may accelerate the decomposition of the acetylene, which could result in a catastrophic failure. It is therefore important to ensure sufficient time is spent on the cooling process.

Liquefied petroleum gas (LPG)

Certain hydrocarbons exist as a gas at normal atmospheric temperatures but can be liquefied under moderate pressures. These liquids would occupy 250 times less space than they would in their gaseous state and therefore it is commercially more viable to store and transport them in this state. LPG is colourless and odourless and heavier than air, which will result in released gas to accumulate in low-lying areas. In areas where air movement is limited, this gas could form pockets of extremely hazardous environments and react violently to any ignition source. LPG is as a rule odourised enabling detection (by smell) down to one fifth of its lower flammable limit.

Escaping LPG has a major cooling effect on the surrounding air and causes condensation and a freezing of the water vapour, which could present as ice at the area surrounding the leakage. It can also cause severe burns to any unprotected skin it may come into contact with at this point.

LP gas is highly flammable and when pressurised containers are heated without sufficient cooling, a boiling liquid expanding vapour explosion (BLEVE) could occur. This usually happens when a vessel containing LPG suffers flame impingement from an external fire. The contents of the vessel are heated to above their boiling point and the pressure inside the vessel increases. If the flame impingement is towards the part of the vessel still containing liquid, the over-pressure will be transferred to the built-in pressure relief valves (PRV) situated at the top of the construction. The escaping gas will ignite once it is vented and comes into contact with the external fire. The PRV outlets are sufficiently high enough to direct this fire away from the vessel; however, it is also important to direct water streams to the area directly below the PRV without extinguishing its fire.

In the event that the flames impingement reaches the vapour space of the vessel, it could sufficiently weaken the vessel wall to the point that the vessel could rupture violently and propel parts of the vessel over great distances. The vessel could still contain overheated liquids causing a massive fireball. Incident commanders have in the past been misled by the fact that PRVs have not activated and subsequently believed that the vessel had not reached sufficient pressure to set them off. These PRVs may have been damaged due to a rollover accident or some other fault and quite simply failed. Do not rely on the PRV to inform your tactics. BLEVEs may occur several hours into an incident.

Another major hazard event involving LPG is when an escaping gas/air cloud migrates over a considerable distance before reaching an ignition source of some description. The resulting ignition will generate shock waves and a flame front accelerating from a low initial velocity to sonic velocity. This phenomenon is known as an unconfined vapour cloud explosion (UVCE) and differs from a BLEVE in the sense that the escaping gas/air cloud could travel a significant distance before igniting. The fireball caused by an UVCE could also ignite flammable materials in its way causing a number of secondary fires that will have to be dealt with.

Dealing with a fire impingement on an LPG vessel will require immediate and massive cooling of the entire surface with special attention being given to the area of flame contact. Ground monitors are a definite consideration and the strategy of flame-bending ie utilising attack teams to direct the flame away from the vessel, may be implemented. This can also be utilised to get close to the open valve and to turn off the supply of gas feeding the fire. Many hours are spent by both industrial and municipal fire services to perfect this tactic. Operationally, it must only be used when the objectives are clear and when there are enough fire fighters to carry out the task.

When responding to a gas leak that has not ignited, the incident commander should take into account the possible size of the leak, wind strength and direction and possibility of a vapour cloud ignition. All personnel and public located downwind from the leak should be evacuated and all possible ignition sources removed. Also initiate water streams to disperse the vapour clouds to a point below its flammable range. Deploy detectors into the surrounding area to measure the effectiveness of the dispersion operation.

Fire fighting teams should only enter the gas cloud under extreme situations such as rescue or to isolate the leak. In such an event they should all be in full protective gear including flash-hoods and move behind a protective water spray.

Cryogenic liquids

Cryogenic liquids are gases that are liquefied and keep in their liquid state at extremely low temperatures. In their normal state they are gases and must be cooled to well below room temperature before an increase in pressure can convert them into a liquid state. If these liquids are released from their containers they remain extremely cold and also present a highly visible fog cloud.

Cryogenics are broadly divided into the following classifications:

- Inert gases: These gases do not burn or support combustion, they are not able to react chemically to any significant extent. Nitrogen, helium, argon, neon and krypton are examples of inert gases.
- Flammable gases : This category includes nitrogen, methane and liquid natural gas (LNG)
- Oxygen: Many materials that are 'non-combustible' can burn fiercely in the presence of liquid oxygen. Organic materials can react explosively with liquid oxygen.

Cryogenics are stored and transported in thermally insulated containers that are specifically designed to withstand rapid changes in temperature and extreme temperature conditions.

Bulk cryogenic containers are stored in specially designed, pressurised cylinders. These cylinders are able to dispense either gas or liquid only or both. The cylinders have valve configurations for filling and decanting, pressure relief valves and a frangible disk as an added protection.

The extreme cold at which cryogenics are stored poses the risk of severe (and extremely painful) thermal burns.

An asphyxiation risk also prevails when the liquids form a gas, which is heavier than air. These gases will accumulate at low levels and although non-toxic, has the ability to displace oxygen. The capacity of liquid-nitrogen to expand from one litre to 659 litres of nitrogen gas underlines the risk of asphyxiation.

Cryogenics such as hydrogen, methane, LNG or carbon monoxide can burn and in large volumes, even explode. Due to its high flammability range, hydrogen is a particularly high risk product.

A high pressure release of liquid oxygen can create an extremely flammable situation if it saturates materials it comes into contact with. Clothing saturated by liquid oxygen can remain a flammability risk for hours.

The enormous pressures generated inside a cryogenic container can lead to a BLEVE if the pressure relief valve configuration is inadequate for any particular reason.

When responding to a cryogenic gas release incident, you must accept that the product that has escaped will absorb enough heat from the atmosphere to boil and form a vapour. This can then be dispersed. Water may, however, react violently with some liquids and therefore it is vital to know what product you are dealing with and what the hazards thereof are.

Finally, never have anyone enter the vapour cloud if they are not wearing the appropriate protective clothing.

Ammonia gas

Ammonia is a corrosive, toxic gas that is lighter than air and although it has a narrow ignition range and will only ignite

at high temperatures, is still regarded as a flammable gas. It can, however, ignite if it comes into flame contact in high concentrations. Ammonia has a severe irritating effect on the eyes, nose and throat and skin contact with ammonia can cause burns.

Responding to an unignited ammonia gas leak, the main priorities should be to isolate the leak and use water streams to disperse the escaped product. A safety perimeter of approximately 100 metres should be established before any operations are commenced. People directly affected by the leak might present with severe discomfort brought about by the irritating effect of the gas.

In the event of a fire, the main objective should be to prevent the gas from interacting with surrounding materials and cooling down the container. Again, do not extinguish the fire if it is not possible to isolate the source of the leak. As with virtually all compressed gases the heating of the container will lead to an increase in the internal pressure and could result in an explosion.

Chlorine gas

Mainly used for water purification, sanitation and as a bleaching agent, chlorine is a very reactive pale-green gas two-and-a-half times denser than air. Chlorine is a gas in its natural state but can be cooled and pressurised into a liquid state for storage and transport.

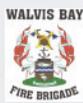
In addition to being toxic when inhaled, chlorine gas is also corrosive to the skin and could cause severe damage to the eyes. Chlorine is not flammable but can react explosively or form explosive compounds with other chemicals such as ammonia.

In the event of a spillage, the first objective should be to plug and control the leak if possible. Do not spray water onto a spillage or leaking cylinder. Due to its relative density, spilled chlorine will accumulate in low lying areas and for that reason any possible areas of contamination must be evacuated and isolated while being monitored with gas detectors until the gas has been sufficiently dispersed.

In a fire situation, all fire suppression activities should be done from a maximum distance or using monitors. Prevent any run-off of fire water from reaching drains or watercourses. The same procedures to prevent overheating and over pressurising cylinders and a possible BLEVE are relevant here.

Conclusion

Responding to compressed and flammable gas emergencies is complex and challenging. You will need to, in most cases, be able to flow large quantities of water over fair distances and also have access to sufficient ground monitors. You will also have a myriad of 'unknowns' to deal with ie how long has the cylinder been involved in the fire, what is the condition of the pressure relief valve and where has the escaped gas accumulated. A clear direction must be given by incident command at the very beginning of the incident and followed through until its successful conclusion. Gas emergencies will require you to be alert and demand your respect. ⚠



Namibia's Walvis Bay Fire Brigade



The main station has been operational at its current location since 2005

Walvis Bay Fire Brigade was established in 1962 and is situated on the coast of Namibia in Walvis Bay, a city that carries the name of the bay on which it lies. The town has 95 000 inhabitants and has a total area of 29 square kilometres of land. However, the fire brigade's jurisdiction stretches another 150 kilometres inland ie east into the Namib Desert to allow for incidents caused by tourism. It also services the main road from the Walvis Bay Airport up to the bridge

where Swakopmund's jurisdiction begins in the north and 50 kilometres south along the coastline.

Walvis Bay is also resident to Namibia's main port and is known as the jewel of the Namib Desert. The town is located on the southwest coast of Africa or central coast of Namibia, along the Atlantic Ocean, surrounded by the golden dunes of the Namib Desert. Walvis Bay is often referred to as little Dubai. With its strategic location as gateway for imports and exports, Walvis Bay is also a growth hub with great potential for expansion and investments.

The Authority was headed by two chief executive officers, Nangolo Mbumba, then Secretary to the Namibian Cabinet and Carl von Hirschberg, former South African Ambassador to the United Nations.

In August 1993, prior to the end of apartheid, the Multiparty Negotiating Forum in South Africa passed a resolution calling for 'the incorporation-reintegration of Walvis Bay and the Off-Shore Islands into Namibia'. The Transfer of Walvis Bay to Namibia Act was passed by the Parliament of South Africa that year. Following the signing of a treaty between the two countries, South Africa formally transferred sovereignty of Walvis Bay and the Penguin Islands to Namibia on 1 March 1994.

Fire brigade

Although the service was established in 1962, a fire chief was only appointed in 1984 when the disaster control officer Willie van Zyl was appointed as the fire chief. He retired in 2014 after 30 years' service.

The Walvis Bay Fire Brigade comprises of a chief of protection services and three fire officers. Dennis Basson was appointed as the acting chief fire officer after the retirement of Willie van Zyl in 2014. Chief Basson is responsible for the following functions:

The Municipality of Walvis Bay is categorised as a Class 1 Local Authority. This means that Walvis Bay is considered a city and therefore the local authority has much more autonomy and decision-making power over the development of Walvis Bay.

History

In 1990, South-West Africa gained independence as Namibia but Walvis Bay remained under South African sovereignty, with South Africa increasing the number of troops. However, in 1992, the two countries agreed to establish a transitional Joint Administrative Authority for Walvis Bay and the Offshore Islands.



Chief Dennis Basson

- Fire protection
- Occupational health and safety
- Security
- Disaster risk management
- Life guarding

As Walvis Bay Fire Brigade is a small service with an annual budget of N\$9 million, serving a relatively small community, the deputy chief and three fire officers manage all operations, fire prevention, training, logistics and also assist with security and life guarding with the assistance of 23 volunteer fire fighters.

The main station has been operational at its current location since 2005, prior to which the fire service was managed out of parking garages at the Walvis Bay Civic Centre since its establishment.



Snr fireman David Ndjuluwa, snr fireman Werner Namiseb and Chief Basson

Risk profile

Walvis Bay is unique in the sense that almost all aspects of fire fighting have to be catered for by the fire brigade. Although Namport has recently launched an independent fire service as part of its expansion programme, Walvis Bay Fire Brigade still provides a backup service for the port and as such responds to vessel fires, industrial fuel fires, fishing factories, the formal buildings in the town as well as informal settlements and airport fire and rescue services.

The majority of callouts are to tend to fires in the informal areas where backyard shacks are most commonly built with combustibles like wood, plastics, etc.

The most dangerous fires occur in the vessel repair yard where engineering companies perform hotworks, like cutting, grinding and welding. Operations during these calls mostly entail confined space operations and fire fighting.

This resulted in the current fire station being built in 2005 after 43 years of existence. More fire fighting equipment and trucks have been acquired, although 90 percent of the equipment (vehicles) was donated by the Namibian Government, BP and the South African Government.

Staff

Walvis Bay Fire Brigade employs four

permanent staff members and 23 volunteers; 27 members are trained in fire fighting, 15 in rescue and six in hazardous materials (hazmat). "The volunteers have 25 years' experience, which is what makes us so successful," said Chief Basson.

The recruitment policy states that all applicants are required to have a grade 12 secondary school qualification with 23 points. Subjects such as biology and mathematics are an advantage. Applicants also need a Fire Fighter One Certificate obtained through a certified and accredited institution, must be a Namibian citizen and have a valid Code B licence.

Candidates have to pass an aerobic fitness test as well as a phobia and height test.

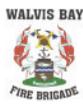
We asked Chief Basson whether the brigade has enough competent staff for the incidents at hand, "No, the service depends basically on voluntary fire fighters and the permanent staff is not enough to maintain a full time 24 hour at the fire station."

Training

The three permanent fire fighters with the Chief Protection Services provide training inhouse as the need arise. The brigade managed to obtain a piece of land, approximately 500 square metres next to the fire station that will serve as future training centre. The plans are to establish a



One of the Volvo urban medium pumpers



▶ modern training facility that will stay abreast with the latest technology and training methods.

Due to the lack of internationally certified trainers and training centre, all professional training for fire fighters is currently outsourced by the Council.

The inhouse training regime is, however, regular and takes place in the stations tower and training hall.

Operations

The Walvis Bay Fire Brigade staff has been trained internationally in a number of competencies. They received training in Norway in vessel fire fighting. All fire fighters have been part of aircraft rescue and fire fighting (ARFF) teams for a period and are thus

skilled in airport fire fighting. They also received ARFF training in Singapore. The team received rescue and extrication training up to instructor's level at Rescue South Africa as well as hazmat and high angle rescue training. They also completed intensive training in structural, industrial and petrochemical fire fighting in Norway and their emergency medical training is at basic life support (BLS) level.

The most common emergency scenarios that the service responds to annually are informal settlement fires, vessel fires and vehicle rescue and extrications.

Walvis Bay Fire Brigade does not have a dedicated ambulance service and relies on services such as E-Med Rescue and St Gabriels local

ambulance companies to render ambulance services.

The city of Walvis Bay has relatively low buildings with the highest only four storeys in height. The Town Council does not have aerial appliances for rescue at height so the fire service has agreements in place with local crane companies to supply cranes that can reach up to thirty metres high to assist when needed.

Biggest incidents

As Walvis Bay Fire Brigade has to deal with a variety of incidents, their major incidents are also quite varied. One such incident was a vessel fire where a fishing trawler with the name 'Hope' caught fire. Fire fighters started slipping on the deck of the vessel while fighting the fire because of the intense heat. The trawler sank after a fierce fire fight.

Apparatus

The fire fighting and response vehicle fleet consists of:

- A 1972 Unimog off-road fire truck built by the South African Army
- Three Volvo urban medium pumpers donated by BP UK in 2006
- A water truck (pumper), which serves as a support vehicle during fires in the informal settlement where fire hydrants are sometimes damaged
- A Mercedes Benz road rescue truck acquired in 2013; donated by the Namibian Government
- A Mercedes Benz urban rescue pumper acquired in 2013; donated by the Namibian Government

The total mileage of the vehicles is 410 000 kilometres.

We asked Chief Basson what operational equipment shortfalls there are, "Walvis Bay's biggest obstacle is the shortage of funds and insufficient equipment. We do not have aerial platforms and we would like to increase our hazmat capacity. Walvis Bay is not equipped to handle petrochemical fires at the fuel storage facilities in the town. It currently relies on the fixed installation systems in the storage farms.

When asked what his ultimate apparatus would be, Chief Basson said, "It would not be wise to build an all in one vehicle for Walvis Bay as the town is confronted with a variety of



The Mercedes Benz rescue vehicle was donated by the Namibian Government



The 1972 Unimog off-road fire truck was built by the South African Army



The Walvis Bay Fire Brigade has only one station, which opened in 2005

incidents making it impossible to have all your tools in one box. I would prefer a couple of specialised vehicles. The point remains that we have a shortage in hazmat gear, petrochemical fire fighting equipment and high-rise fire fighting appliances.

Fire safety

Fire safety is the responsibility of all permanent fire fighters and is dealt with as the need arises. Amongst others, the fire service visit schools in the town on a program basis to conduct safety awareness talks as well as assisting schools in their evacuation drills.

The service distributes safety brochures as well as emergency numbers and provides safety presentations at institutions and the business community. The fire fighters also inspect premises in town to ensure compliance with the building regulations and have a close relationship with the building inspectors of the municipality.

Statistics

- Population: 95 000
- Size of area covered: 150km²
- Emergency calls: 8
- Incidents:
 - Number of MVAs: 5
 - Total number of fires: 72

- Number of structural fires (formal): 3
- Number of structural fires (informal): 17
- Number of industrial fires: 4
- Number of vehicle fires: 14
- Number of other fires: 24
- Number of hazmat incidents: 6
- Number of structural collapse: 1

Challenges

The biggest challenge faces by Walvis Bay Fire Brigade is the shortage of

fire fighting staff, apparatus and specialised equipment. Walvis Bay is one the fastest developing towns in Africa and that makes it very difficult for the service to cope with the demand.

The city of Walvis Bay, the Port of Walvis Bay and industries are far outgrowing the development of the fire brigade, resulting in a major challenge for the fire service to deal with incidents.



The self-contained breathing apparatus (SCBA) truck is fitted with a compressor for onsite refilling



Meet Chief Dennis Basson



Chief Dennis Basson

Walvis Bay Fire Brigade's chief fire officer, Dennis Basson, joined the fire service in 1988 as a first generation fire fighter dedicated to making a difference in his community. With a career spanning over 28 years Chief Basson was appointed as the chief of the protection service in February 2016. "After the first ten years of service I still felt the same as I did on my first day, even now," said Chief Basson.

We asked Chief Basson what made him want to become a fire fighter, "I initially wanted to be a teacher because I wanted to work with people. I completed two year compulsory national service

and decided to continue in uniform as a fire fighter. The physical challenges were also very exiting for me as I was a very active and sport loving person since my childhood days."

"I started in the service in 1988 as a recruit fire fighter at the Hosea Kutako Airport, currently Windhoek International. I advanced to a leading fireman and then a platoon officer (shift leader)," continued Chief Basson.

"The Namibian Government had to take over the Rooikop Airport in 1993 when the South African Government withdrew from Namibia. I was assigned to take over the fire and rescue services at the time. My position then was the fire chief: airport fire and rescue services"

Chief Basson added, "In 1999, I was appointed as the deputy chief position at the Walvis Bay Fire Brigade under the then Chief Willie van Zyl. I served the community of Walvis Bay in this position until 2014 when Chief van Zyl retired and I was appointed as the acting fire chief. On 1 February 2016 I was appointed as the Chief Protection Services.

Mentors

Chief Basson cited ex Chief Willie van Zyl as one of his mentors saying, "I have always looked forward to provide a dedicated service to the public. In my time with Chief Willie van Zyl, I learned to come out of your environment and

do the job/task to the best of your ability and worry about the criticism that you will face afterwards."

Management style

When asked to describe his management style, Chief Basson said, "I believe in setting an example, which sometimes takes me away from my immediate responsibilities."

The factors that kept him in the industry through the years was the satisfaction when he returned from an incident and he knew that he made a difference.

His chance of becoming a CFO became a reality at a crucial point in his career. "I took the opportunity because I came from a disciplined environment and I still wanted to make a difference and deliver a service to the community."

"If you have the ability and will to walk the extra mile for the next person, then this career is for you. A big influence for me was mostly the way in which I was brought up. My mother used to be very active in church and community service and I was exposed to this environment on a daily basis," said Chief Basson.

His advice for future fire chiefs and fire fighters is, "Stay as healthy as possible, study hard and stay on the ground. Be open to advice and learn from others. Always endeavour to keep a unified household.



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Fires in high-rise buildings – initial attack

By Ian Schnetler, chief fire officer, City of Cape Town Fire and Rescue Service

A dynamic metropolitan local government environment constantly pursues the best models for service delivery

In this third part of the five part series of articles focusing on 'Fires in high-rise buildings', we detail the initial attack during high-rise fires. Fires in high-rise occupancies continue to be perilous resulting in loss of life and property, despite the advancement in technology and equipment as high-rise buildings are generally tightly sealed and present a great potential for the occurrence of backdrafts.

Initial attack

During the initial attack in high-rise fires, the forward fire commander leading the attack will be responsible for selecting the method of ascent to the reported fire area ie elevator or stairs, depending on conditions and safety concerns. The annunciator panel must be checked for additional information prior to ascending to fire floors.

The initial attack companies need to go upstairs with full personal protective equipment (PPE), self-contained breathing apparatus (SCBAs), spare cylinders, portable radios, flashlights, hose packs and basic forcible entry tools. If access is via an elevator, an extinguisher should also be taken. Other equipment will be pooled in the lobby until a resource sector is established.

As soon as the fire floor is reached and identified, the officer would need to give the incident commander a progress report of conditions on the fire floor, immediate needs and a confirmation of the actual fire floor(s) number. The incident commander should then establish the fire floor as a sector ie floor 16 equals sector 16.

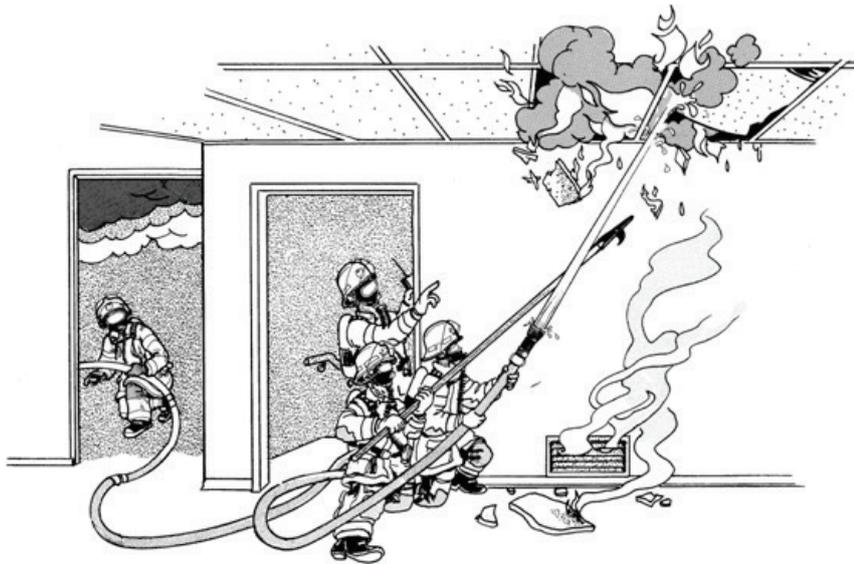
When a building has multiple standpipes, the forward fire commander must advise the incident commander where water is needed and the incident commander will confirm the availability of pumped water to that particular riser.

Crews preparing to enter the fire floor should be aware of the floor layout, including the locations of elevators, stairs and floor subdivisions or zones. They should also be aware of the distribution pattern of the supply and return air systems. Smoke and heat under pressure will migrate to the lesser pressure of open shafts and return air ducts, usually located in the core. Crews may be crawling at floor level in limited vision and the officer must select the most unobstructed approach, with the flow of heat away from the fire fighters as much as possible.

Only members trained in the operation, use and methods of escape from elevators will operate the lifts.

Crews will most likely be advancing from a stair located in the 'core' of the building. If the core is surrounded by an open, unsubdivided, floor plan, the potential for fire wrapping around the core exists. To protect against this, the officer in charge of the fire floor should create a back-up line in the opposing direction to protect the point of entry/egress. Fire can also communicate overhead in the plenum space above the dropped ceiling. An additional line may be required to cool and protect this area.

Crews advancing on a high-rise fire should employ a straight stream or narrow angle fog when possible. This is both to reduce the amount of local steam production and to provide the maximum reach and volume for hose streams. The objective of the attack line is to create the greatest amount of steam conversion at the point of fuel gas generation (the seat of the fire), benefiting from cooling and smothering at that point. Steam created by directing fog streams ▶

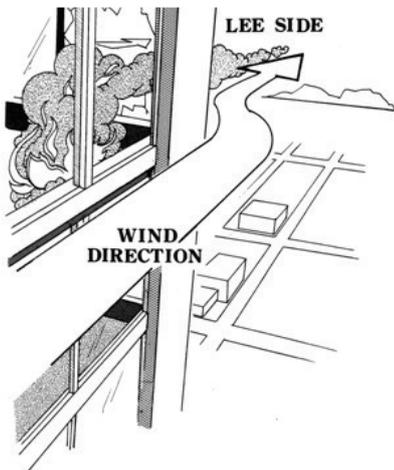


As fire can also spread overhead in the plenum space above the dropped ceiling, an additional line may be required to cool and protect

- ▶ into other heated areas will serve to reduce the overall heat on the floor but will also penetrate the turnouts and hoods of the fire fighters, making their progress toward the seat of the fire slower, if not impossible.

For safety reasons, the initial line should be equipped with a fog nozzle. High-rise buildings are tightly sealed and present a great potential for backdrafts. In addition, the increasingly volatile loads created by synthetic furnishings and materials have accelerated the rate and intensity of burn.

At the same time the structures are becoming more lightweight and decreasing in total mass. The result is an increased potential for rapidly rising temperatures and flashover



Ventilating on the lee side reduces the potential for gusts pushing flame into the attack crews

before arrival. The loss of windows can also suddenly accelerate the fire as driving winds bring new oxygen to the flame.

The plenum space above the dropped ceiling may represent the largest unobstructed space on the floor, as much as 25 percent of total floor volume. If fire conditions permit, crews should check the space for fire extension by pushing up one of the panels but not in an area where impinging heat will impede the progress of the attack line. If high heat prevents standing and visually inspecting this space, hose streams can be used to rip down the panels, however, crews must assess whether this will aide or impede their attack.

Fire fighters advancing on a fire may find their progress blocked by partial walls or other subdivisions of the floor. Space dividing panels sometimes can be knocked down and permanent walls of gypsum on steel studs may be breached to provide nozzle access to the fire.

Where possible, crews should attempt to flank the fire and convecting gases. Core area fires are the most difficult because the fire often involves both stair areas. Fires near the exterior walls are easier to flank and confine but are more prone to rapid extension to the next level through broken glass.

It is important to verify auto stair door unlocking.

Verify air handler status. Shut down if not known to be beneficial. Rescue on the fire floor is most difficult when the core area is involved. The core fire may have prevented occupants from reaching the stairs. Fire fighters removing occupants may have to remove them through the flame back to the stairs.

Fire fighters should search any involved floor with a charged line and use it as a reference point when searching. If the smoke is dense, return to the line after sweeping each room or area to orient yourself.

Providing ventilation on the fire floor is extremely difficult. Every effort must be made not to break the glass with hose streams until knockdown is achieved or wind conditions are known, as the sudden addition of wind driven oxygen may accelerate the fire beyond the limits of the attack line. Building exhaust systems, if present, may be employed to some advantage and the windows may be broken from above or below in a coordinated manner after wind direction and intensity are verified or after fire control.

Crews on the upper or lower floors are not moving in smoke or heat and can determine the location of the lee side of any winds by removing a panel.

Ventilating on the lee side reduces the potential for gusts pushing flame into the attack crews but winds acting upon a high-rise are unpredictable and frequently change direction and speed. Be cognizant of conditions in the building and achieve ventilation as soon as possible when crews are in hot, vulnerable tactical positions or pull the crews out. Crews must use extreme caution to protect against falling if windows have been removed. Some glass panels extend to the floor level.

The severity of the heat in a serious fire may limit the time a fire fighter can be on the fire floor to ten minutes or less. First units arriving should provide for rotation of crew from the less exposed

positions on the floor above and in the stairs, to taking a turn on the attack line. Command must provide for the immediate and continuous relief of these initial crews until fire control is achieved. Crews rotating off the floor and through rehab can be assigned to the less demanding sectors and tasks remaining to be accomplished, such as beginning a property conservation effort on the floors below.

Floor above

The objectives of the crews operating on the floor above are to evacuate the floor, to assess and control vertical extension of the fire and when possible, to provide ventilation for the floor below. In a protracted fire, the floor above will be subjected to intense heat and any occupants must be removed as soon as possible to safe refuge.

Vertical extension must be checked in:

- Elevator shafts
- Supply air ducts/return air ducts make up air ducts
- Utility shafts (pipes, electrical chases)



The increasingly volatile loads created by synthetic furnishings and materials have accelerated the rate and intensity of burn

- Dumbwaiter/trash chutes/mail chutes
- Auto-ignition through failed window glass or mullions
- Around floor slabs at spandrels
- Auto-ignition through floors or raceways and expansion joints or cracks caused by floor failure
- Floor materials directly above fire area

All rooms and closets on the floor above must be opened for inspection. Dropped ceiling panels should be removed to locate the supply/return ducts and observe conditions in the plenum. Hollow columns and pipe chases may be checked by making small holes with a halligan tool.

A hose stream must be introduced at each point of extension including ▶

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High-rise fires

- ▶ flooding the floor if the fire is communicating to the carpet and padding. Caution must be observed in putting water into electrical distribution areas, including raceways in the floor. Hoselines on the floor above can be introduced from the evacuation stairs if the floor is clear of smoke. If not, bring them down from upper landings in the attack stairway. The numerous points of possible extension require multiple lines. If present, hoselines can be utilised for areas requiring a reduced volume, such as duct shafts.

Care must be exercised not to breach shaft openings, breach spandrel panels or break glass until necessary and hoselines are in place. If fire extends through the lower windows and melts the mullions or breaks out a window on the floor above, direct a fog stream into the opening but avoid hitting the remaining glass if possible. The sudden cooling would cause the loss of additional panes and expose the entire floor to flame impingement.

Before ventilating from the floor above, the fire fighters must first determine the direction of any winds. Winds at altitude can be many times stronger than at ground level and the introduction of wind gusts and new air on the fire floor could overwhelm the attack crews. The direction of wind at surface level may or may not be the same at higher elevations due to the effects of stratification or disruptions in flow caused by other buildings.

If no wind is detected at ground level and the location of the fire on the floor below is known, then fire fighters should begin the ventilation operation directly over the fire.

Crews on the floor above should place pressure tape, if available, on the window to be broken (if not tempered), advise command that glass will be falling, break the panel by tapping and pull the majority of the glass onto the floor.

After verifying that no significant wind is present and checking with the officer on the attack line and command, they may then break

out the lower panels with specialised tools, if available. Tempered and even double-pane, insulated glass is very difficult to break with lightweight tools such as a pike. Recessed windows and decorative screens will make this task even more difficult.

If strong winds are encountered at the upper level, crews must first locate the lee side of the wind by breaking out additional panels. If the lee side proves to be at the unburned end of the floor, it is inadvisable to vent until fire control is achieved, as smoke and heat will flow to the reduced pressure at the opening; quite possibly right over or through the attack team(s). Again, if ventilation is not possible and there is excessive heat on the fire floor withdraw the fire fighters.

Stairwells

A first priority for command/lobby is the identification of the attack and evacuation stairwells and a size-up of smoke conditions in each. If the stairs exit into the lobby, the size-up can be made by lobby sector. If the stairs exit to the exterior, command/lobby must send runners with keys to assess each stair condition and can determine the location of the lee side of any winds by removing a panel.

At the time of arrival to a significant fire, the occupants may be descending both stairs, as most high-rises require both stairs for effective evacuation. Any smoke in the stairwells at this point is probably the result of smoke pressure on the fire floor escaping into the stairs as the occupants exited the fire floor.

If the building is equipped with automatic stair pressurisation, it may be effective at this point if most of the other doors in the stairwell are kept shut. In practice, a mass evacuation will cause most of the doors to be open a substantial amount of the time, with the result in a loss of pressurisation and significant smoke accumulating in the stairs. It is doubtful that with the fire loading now encountered in a high-rise, that the pressure created by building stair pressurisation will be sufficient to contain the smoke pressure generated by a fully involved floor fire.

The purpose of built-in stair pressurisation is to maintain a positive

pressure in the stairwell and impound the smoke on the fire floor. Experience has shown that a small fire will be accelerated by the incoming air if the door is left open but that most of the smoke will be held on the fire floor.

A primary objective of the first arriving units is to maintain a smoke-free exit way, both for occupants leaving the building and for fire fighters staging and preparing to extend hose.

A large volume fan should be placed at the opening to all stairs to pressurise the stairwell and to provide an upward current of air. This will help to hold the smoke out of the stairs and will allow the occupants to descend into a cleaner environment with every step. In buildings where the stairs continue to the basement level(s), the fans should be placed at that location to keep the noise out of the lobby.

Evacuation of the smoke trapped in the upper stairwell requires a roof opening. If the building is not equipped with stair pressurisation but the stairwell is either open to air or has a dampened opening at the top, the smoke can be fan exhausted by fire department crews using positive pressure ventilation (PPV) with large volume (22 000 CFM) fans. Do not leave the fans unsupervised.

A crew with radio, keys and spare BA cylinders should be sent to the roof door as soon as possible as roof sector. Their task is to open the stair door or hatch at the roof and provide an outlet for smoke.

When fire fighters open the stairwell door to advance hoselines on the fire floor, significant smoke will enter the stairwell. Occupants descending from upper floors must be allowed to pass before opening the door and exposing them to hot gases and flame. Persons entering the stairwell after the door is opened and fire attack is initiated, should be directed across the building to the evacuation stairs when possible.

In the next edition of Fire and Rescue International, we will focus on water supply, extending hose lines for initial attack, accountability and safety when dealing with high-rise incidents. 

Fire station planning principles: the importance of understanding planning drivers

By Previn D Govender, divisional head: strategy and planning, City of Ekurhuleni Disaster and Emergency Management Services

A dynamic metropolitan local government environment constantly pursues the best models for service delivery

In this second part of the four part series on fire station planning principles, we focus on the importance of understanding planning drivers, including the South African National Standards (SANS) category 1 rating, urban complexity factor, consulting spatial development frameworks, optimal siting of fire stations, the importance of time and alignment to standard.

The importance of the SANS Category 1 rating

The South African National Standard on Community Protection against Fire (SANS 10090) provides advice on the measures that should be taken by a controlling authority to ensure that the provision of fire services is done according to desired levels of efficiency.

SANS 10090 includes a schedule against which the performance potential of each aspect as well as of the whole of a fire service can be judged. A fire-risk rating based on this schedule will indicate the extent to which loss of life and property can be avoided in any particular given area.

Under SANS 10090, fire brigade services are classified according to the ability to meet specific performance criteria of:

- Risk profile of area of jurisdiction
- Weight and speed of response
- Call receipt and processing requirements
- Vehicle/equipment availability and maintenance
- Incident management procedures
- Pre-fire planning and risk visits
- Training/personnel
- Water supplies
- Fire safety functions

In order to meet the criteria of a Category 1 fire brigade service, a brigade has to have adequate arrangements and provisions in place to meet the relevant performance indicators or statistics or both and performance criteria for staff availability per appliance availability, predetermined attendance (PDA), manning levels and attendance times, 35 to 45 percent of the time, more than 75 percent of the time when measured annually.

Whilst SANS 10090 therefore implies and calls for a continuous

improvement strategy in order to meet, sustain and enhance the levels of protection against a variety of risk variables, the shortcoming may be that it allows for a 55 percent deficiency in maintaining (at a continuous level) the most critical aspects of an emergency service response, ie staff availability, crewing levels and attendance times.

This allowed flexibility, whilst understood in the context of a developing country, may be contrary to the intention of the total intention of community protection against fire.

Furthermore, the one major critique of SANS 10090 is that its approach centred on a central business district (CBD) as the major risk factor in fire station placement and disregarded to a large degree the extent of the built-upon area of integrated human settlement, which is now the predominant factor in a post-apartheid South Africa.

The importance of the urban complexity factor

Major South African cities cannot claim to be any different from other ►

Fire station planning principles

- ▶ international major cities in terms of baseline risks and some local cities can, in fact, claim more diverse risk profiles in the context of the complexities and complications of the mergers and impacts of municipal re-demarcation, rapid urbanisation, urban sprawl and the mushrooming of informal settlements in the fringes of developed nodes.

The uniqueness of the urban complexity factor in South African cities and towns compounded the demand for tenancy and service in areas that were used to certain built environment capacities has without doubt overwhelmed the coping ability of even the noblest of efforts.

Factors such as traffic congestion, ever expanding street networks, building densities, suburban development, etc, are common urban complexity factors that must be considered in planning, locating and siting of fire stations.

Considering the influence of economic and other forms of human migration as it occurs in southern Africa, the urban complexity factor is often made more significant by added stand-out factors such as:

- The patterns of unregulated (informal) human settlement around established economic hubs that creates high population densities and complexities of other risks
- The range of unregulated business activities that change building occupancies and create new risks overnight

- The decentralisation of central business districts (CBD) and creation of new scattered 'mini CBDs' in suburban spaces that may result in scattered distribution of high risks
- High motor vehicle collision rates on major routes, which create additional first response demand
- The advent of 'gated' communities and security villages/complexes that may impact on emergency services accessibility.

It therefore becomes important to consider these influences in planning location parameters as distribution of risk becomes wide-spread, as opposed to confined in previous established locales and it may not always be possible to have a fire station in an exact geographic centre of the area to be serviced.

The importance of consulting spatial development frameworks

A spatial development framework (SDF) within a municipality seeks to guide overall spatial distribution of current and desirable land use with the aim of promoting sustainable functional and integrated human settlements and maximisation of resource efficiency.

SDFs primarily dictates the parameters and underlines the important elements of future growth and can provide key data in terms of expected long term population densities and major development

plans for the area of jurisdiction, which ultimately drive the formation of built-upon areas.

Therefore, in the context of constantly changing and growing population centres, a spatial development framework and the development planning components that attach themselves to the SDF, are inherently important sources of future spatial and land use development information that must be consulted and incorporated as a planning driver, when deciding on the future siting of fire stations.

The importance of optimal siting of fire stations

SANS 10090 requires that the objective of meeting the required response times for a category of fire risk as a component of the total attendance time, can only be achieved by proper siting (locating) of fire stations and further directly influenced by the size of turnout areas taking into consideration complexities of street grid networks, speed of appliances, terrain, traffic conditions, etc.

Using an 'as the crow flies' methodology and to simply draw a circle to indicate a linear response coverage area, does not effectually represent the topographical area that a single fire station can cover nor does it allow for the urban complexity factor. Both SANS and international studies have shown that a polygon better represents the response area in terms of square kilometres that may be possible from a fire station. The use of the polygon instead of a circle also accounts for the urban complexity factor when calculating the area. The limitations of either are that it assumes the uniform distribution of resources in the jurisdictional area and the formula does not allow for geographical barriers that dissects the area. However, in terms of application it may be better suited to use a polygon rather than a simple circle.

In siting of fire stations, the significance of overlap of turnout areas must never be overlooked as overlap keeps response times low by reducing travel time and avoiding delayed dispatches.

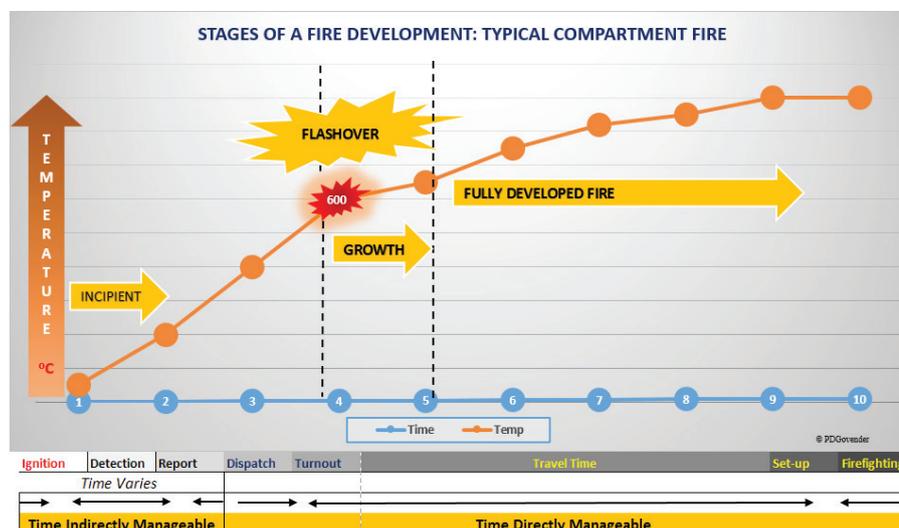


Figure 1: Stages of fire development showing sequences of events that may occur from ignition, discovery and response

In a highly urbanised metropolis, it would therefore not be unique nor out of the ordinary to have fire stations within a few kilometres from each other (as measured in straight line distances).

The turnout overlap is also a factor that becomes critical in ensuring adequacy of predetermined response support for second arriving and specialist appliance units, which will have a significant impact on the consistency of ability to meet performance criteria for a Category 1 service.

The importance of time

To provide an effective service, response must be initiated in a smallest amount of time after the incident has been reported and with sufficient resources to initiate fire, rescue or emergency medical actions.

Fire station location planning must take into account a number of variables including, the importance of time in responding to fire and medical emergencies, fire development and total reaction time sequence.

The three main variables related to the importance of time, provides clarity on the influence on the importance of the optimal locating of fire stations.

Variable 1: Time is the life-threatening element during a reported fire emergency. Fire growth can develop at a rate of many times its volume per minute (fig 1). The time between fire outbreak and the start of fire suppression and rescue activities has a direct relationship to fire and life loss. All fires go through the same stages of development and growth. Fire growth occurs exponentially ie fire doubles itself every second of free burn duration. A significant stage in fire

development is when the flashover phenomena occurs. This is a stage when essentially all combustibles in the room simultaneously reach ignition temperature after undergoing thermal decomposition as a result of intense heat build-up.

The factors that determine when flashover may occur is dependent on variables of the type of fuel, fuel load, fuel layout and size of enclosure, etc and consequently suggests that the exact time to flashover cannot be predicted. However, in most typical enclosure or compartment layouts, a flashover can typically occur from less than four to beyond 10 minutes after free burning starts. A post-flashover fire burns with intensified temperatures and spreads faster and adds more complexity and difficulty to the fireground operations, whether fire fighting, search and rescue, etc.

Variable 2: The delivery of time-critical emergency medical services leads to better outcomes

In emergency medicine, the golden hour principle refers to a time period lasting for one hour or less, following traumatic injury being sustained by a casualty or medical emergency, during which there is the highest likelihood that prompt medical treatment will prevent death.

It is generally accepted that the chances of survival for out-of-hospital cardiac arrest has an association with the activation of the emergency response system and the response time intervals of emergency medical services. The chance for positive outcomes for victims of some types of medical emergencies is also influenced by rapid intervention by trained emergency medical personnel.

Variable 3: Total reaction time sequence is manageable

Essentially, there are five phases in the emergency services total reaction time sequence from time of an alarm being raised, to the time that an emergency crew arrives and starts to work at the scene of the alarm. These phases are:

- (i) Call receipting time. This is the amount of time that it takes an operator to process an emergency call ie (1) receive the call, (2) establish what the emergency is, (3) establish the address of the emergency
- (ii) Dispatch time. This is the amount of time it takes to sound the alarm to response units, ie (4) determine the appropriate response units and (5) determine the nearest station that is able to respond to the emergency
- (iii) Turnout time. This is the amount of time from when units receive and acknowledge the dispatch ie (6) the time they are actually enroute to the emergency
- (iv) Travel time. This is the amount of time taken by the responding unit to reach the emergency scene ie (7) the time from when the responding units turnout to the time of arrival on scene
- (v) Set-up time. This is the amount of time required for units to set up the scene location to begin intervention ie (8) the time from when units arrive on scene till the time crews actually start fire fighting, rescue or emergency medical intervention.

Most important in the sequence of response reaction time, will be the travel time, which can be significantly impacted by better informed fire station location.

The table below illustrates the response time sequence (RTS).

Table 1: Response time sequence

Response time sequence								
(i) Call receipting time		(ii) Dispatch time			(iii) Turnout time	(iv) Travel time	Total attendance time	(v) Set-up time
1	2 and 3	4 and 5			6	7	Calculated from time of call to time of arrival	8
Time of call (TOC)	Call processing time (CPT)	Dispatch handover time (CPT)	Dispatch pending time	Time of dispatch (TOD)	Time of response (TOR)	Time of arrival (TOA)		



It may not always be possible to have a fire station in an exact geographic centre of the area to be serviced

The importance of alignment to standards

The SANS 10090 Standard contains maximum prescribed attendance times (total reaction time sequence) for the various categories of fire risk (table 2).

Time objectives for fire departments are also contained in the US National Fire Protection Association Standard (NFPA) 1710, Standard for the Organisation and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments (table 3). In detailing the time objective requirements fire suppression response, no differentiation is made in terms of fire risk but rather the focus is on life risk within an urbanised environment.

► Whilst the time from ignition to discovery to reporting of a fire is indirectly manageable (but can be influenced to direct alarms, public education, etc), there are a number of critical time frames in the five phases of total reaction time that can be managed by the

emergency service to positively impact on required emergency services deliverables ie better call taking processes, partial dispatches once the 'what and where' has been established and improved turnouts all can buy much needed added time in the reaction sequence.

Interestingly, the NFPA 1710 is a normative standard in the SANS 10090, which thereby also constitutes provisions of the SANS 10090.

The next article will focus on the methodology for calculating optimal siting.

Table 2: Attendance times at fires as per SANS 10090

1	2	3	4
Risk category	Maximum call receipt and turn-out time min	Maximum appliance travel time min	Maximum attendance time min
A	3	5	8
B	3	7	10
C	3	10	13
D	3	20	23
E	Within requirement of appropriate risk category		

Table 3: NFPA Time objectives for fire department response (adapted in table format from NFPA 1710)

	Direct Alarm Handling Time	Call Processing Time	
Communication Centre /Public Safety Answering Point	15 seconds for 95 % of alarms received	60 Seconds for 90% of calls processed	
		Turnout Time	Travel Time
Fire and Special Operations (rescue, hazmat, etc.)		80 seconds for turnout time for fire and special operations response	240 seconds (4 minutes) or less travel time for the arrival of the first arriving engine company at a fire suppression incident, and 480 seconds (8 minutes) or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident
Emergency Medical Services		60 seconds turnout time for EMS response	240 seconds (4 minutes) or less travel time for the arrival of a unit with first responder with automatic external defibrillator (AED) or higher level capability at an emergency medical incident, and 480 seconds (8 minutes) or less travel time for the arrival of an advanced life support (ALS) unit at an emergency medical incident, where this service is provided by the fire department provided a first responder with AED or basic life support (BLS) unit arrived in 240 seconds or less travel time.



ECSSA focusses on prehospital emergency care

Due to the need for a representative organisation within the prehospital emergency industry, the Emergency Care Society of South Africa (ECSSA) was launched in 2010. ECSSA is an organisation with the aim of representing the profession of prehospital emergency by attainment of industry specific objectives and liaising with all respective divisions within the industry. The society strives to achieve this ideal by addressing the needs of the profession through engagement with stakeholders at various levels in both the public and private sectors.

ECSSA also has a very important role to play in the scientific and continuous professional development of prehospital emergency care by collaborating with other national and multi-national professional bodies. Founded by Dr Christopher Stein, Raveen Naidoo and Padarath Gangaram, ECSSA was registered as a non-profit organisation in 2009 and launched in 2010.

History

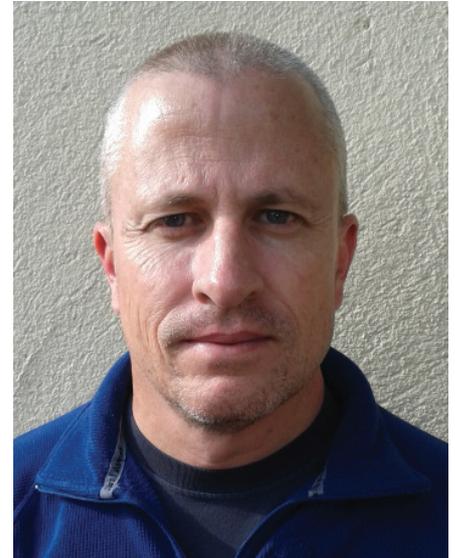
The organisation was established to advocate the advancement

of prehospital emergency care in South Africa and serve as a representative organisation for the profession. A number of attempts have been made at such organisations in the past, however, none of these have been met with much success. ECSSA was formed out of the perceived need for a professional society in the prehospital emergency care space around 2008-2009 and officially launched in 2010. The board of directors was expanded from five to eight directors in 2013 and several new portfolios have been added since 2014. A number of special interest groups have been established since 2012. The most recent being the Critical Care and Transport interest group.

Objectives

ECSSA focusses on the following objectives with regards to prehospital emergency care:

- Ensure the wellbeing, safety and proper medical treatment of the patient
- Identify, communicate and promote the general wellness of the patient



ECSSA's President, Dr Christopher Stein

- Identify, communicate and promote the general wellness, professional interests and the honour of emergency care providers
- Work with the medical profession and other professional groups in furthering emergency care
- Encourage research in the field of emergency care in South Africa
- Cooperate, in partnership with the

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- ▶ medical profession, government, employers, practitioners and representatives of education, in the delineation of minimum standards for and accreditation of educational programmes for emergency care providers
- Maintain a secured central registry of members meeting the defined competency standards, whether qualified by virtue of completion of an accredited programme, by certificate or examination or other means specified by the society
- Establish or have representations on bulletins, newsletters and professional journals and to establish a Code of Ethics as required to assist professional dialogue and the continuing professional development of members; to establish or cooperate in conferences for the same purpose
- Assist in the promotion of measures designed to improve standards of emergency care in the interest of the public
- Promote the interests of the society and to advocate on its behalf both nationally and internationally

Management

Dr Christopher Stein is the president and acting secretary of ECSSA as well as a senior lecturer for the department of emergency medical care at the University of Johannesburg. Michael McCaul, a researcher at Stellenbosch University for the centre for evidence-based health care is vice-president. Treasurer of ECSSA and lecturer at University of Johannesburg is Andrew Makkink.

Other directors include Martin Botha; training manager at International SOS, Lloyd Christopher; head of department of emergency medical science Cape Peninsula University of Technology, Simpiwe Sobuwa; lecturer at the department of emergency medical care and rescue, Durban University of Technology, Nico Louw; Head of Department of Emergency Medical Care Nelson Mandela Metropolitan University and Willem Stassen; senior flight paramedic at ER24. The directors of ECSSA are based throughout South Africa.

Partnerships

"We have good working relationships with the Emergency Medicine Society of South Africa, the Trauma Society of South Africa, the African Federation for Emergency Medicine (AFEM) and the Health Professions Council of South Africa (HPCSA) as well as the College of Paramedics in the United Kingdom," said Dr Stein.

Milestones

ECSSA established a professional magazine called Sanguine in 2011, however, the magazine has been discontinued now in preparation to launch a peer-reviewed scientific journal in the area of prehospital emergency care. However, members still have access to the previous issues of the Sanguine magazine. "We offered our own online continuing professional development (CPD) platform for members in 2014. We have had inputs in a number of important activities such as the Ministerial Emergency Medical Services (EMS) Review in 2012 and are part of the advisory panel for the HPCSA/AFEM clinical guideline review process, which is currently underway. We have hosted very successful conferences in 2011 and 2014, with another one happening in September this year. We have also established a number of special interest groups. ECSSA has also published position statements on the HPCSA decision to stop registration of short courses, and on the future of clinical practice guidelines," said Dr Stein.

Membership

Members of ECSSA have access to the peer-reviewed scientific journal, ECSSA conference membership benefits, access to online continuing professional development questionnaire, points and certificates, discounts on local ECSSA events, benefits of other society memberships, such as African Federation for Emergency Medicine (AFEM) and involvement and contribution towards future ECSSA outputs and those of special interest groups.

ECSSA is multi-disciplinary organisation for anyone who works

in the prehospital emergency care environment and its membership consists mostly paramedics of all qualifications as well as doctors and nurses. The membership fee is very reasonable at only R100 per annum and provides representation in and a platform to participate in the development of South African prehospital emergency care.

Membership available

Ordinary

ECSSA membership is open to any healthcare professional with an interest in prehospital emergency care.

Corresponding

Those who would qualify for ordinary membership but who permanently reside outside of South Africa

Honorary and life persons

Those who have rendered distinguished service to the field of prehospital emergency care or to the society may be elected for honorary and/or life members

Challenges

"One of the most significant challenges is a general apathy in the profession, for belonging and contributing to a body such as ECSSA. Many people view it as a "value-for-membership" only, which is fair but this ignores the important platform that this kind of society is for advancing and improving the profession. This requires the time and effort of members that always seems to be in short supply," said Dr Stein.

Mission statement of ECSSA

"The Emergency Care Society of South Africa is an organisation of emergency care professionals who are focused on advancing and developing the practice of prehospital emergency care throughout South Africa."

"By way of professional advocacy, research, policy development and continuous education, our core focus serves to grow the emergency care profession with the underlying goal of benefitting all health care users in need of effective and professional emergency medical services," concluded Dr Stein. ▲

Meet Sandra du Rand, executive manager at Ekurhuleni Disaster and Emergency Management Services

Sandra du Rand's fire fighting career started in September 1982 when she joined Benoni Fire Services. She was only 21 when she joined the emergency services, putting on her fire fighting gear, hard hat and boots, to serve the community. "There were no women in fire and emergency services in the 1980s. My boyfriend was expecting to be called up to the army but joined the Springs Fire Department instead. During this time, a newspaper article about the first female fire fighter in South Africa been appointed by Benoni Fire Services, caught my attention and I was intrigued. I decided to also apply for a position at Benoni Fire Services," recalled Du Rand.

"Only one lady was employed by Benoni Fire Services at that time, namely Lea Roos and I thought that fire fighting would be an exciting and fulfilling career. My application was successful and I was appointed as a fireman, not a 'fire lady' or ambulance assistant but as a fireman. I was the second woman in South Africa to be appointed as a fireman," said a proud Du Rand.



Du Rand was the second woman in South Africa to be appointed as fireman

She added, "I had to complete all physical fitness tests and courses that the firemen were expected to do. I was not promoted all though I complied with all the necessary qualifications and had the years of experience as the then management had doubts about the performance of female fire fighters.

I completed the National Diploma in fire technology and applied for a position as divisional officer at Bedfordview Fire Station. Consequently, I became the first woman in South Africa to be appointed in a managerial position. From 1990 to 1995 I served as the divisional officer for fire safety at Bedfordview Fire Station. Although no additional women were appointed at Bedfordview Fire Station during that period, a number of women were appointed at emergency services such as Springs, Boksburg and Germiston."

"In 1995 I was appointed at the Kempton Park Fire Station as senior divisional officer. I also completed a Higher National Diploma in Business Management and in 1997 completed the Masters Diploma Fire Technology at Pretoria Technicon, now Tshwane University of Technology. During the formation of the Ekurhuleni Metropolitan Municipality, the chief fire officer (CFO) position in Kempton Park remained vacant due to the amalgamation of the nine towns that formed the City of Ekurhuleni. ▶



Sandra du Rand was the architect of the postage stamp launch commemorating fire fighters in 2105



She is the longest serving female member in the SA emergency services sector



Sandra du Rand



Du Rand was part of a team who broke the Guinness world record for continuous CPR

► I was nominated as acting CFO for extended periods during the absence of the CFO. From 1995 to 2008, I was based in Kempton Park serving as an executive manager: proactive services before relocating in 2008 to the current headquarters of Ekurhuleni Emergency Services' in Bedfordview, still my current position," said Du Rand.

"In the position as the executive manager: proactive services, I am responsible overall for all fire safety related matters, including emergency planning, public information, education and relations (PIER) activities and risk management."

Highlights

Du Rand's career sports many highlights, which includes projects such as the Gautrain, Aerotropolis, 2010 FIFA Soccer World Cup and the recent launch of the International Fire Fighter's Day stamps in June 2015. She is also the longest serving female member in the emergency services sector in South Africa and proudly achieved all relevant qualifications required for both fire and ambulance services. She also cites the couple of times she was promoted, especially when she was the first woman to be promoted to executive manager and the first woman to complete the Master's Diploma Fire Technology.

A passionate career

Although she is passionate about her career in the emergency services, Du Rand said that, "I don't think there is a person in the world that doesn't have a passion or certain level of commitment to impact on the lives of their community or understand the importance as well as responsibility of the role the entire emergency services plays, both fire and ambulance. In fact, I have never got to a stage in my career where I said, "I have had enough, I have achieved all the professional and personal goals or reached the peak of this wonderful career, seeing that there are always new opportunities or challenges. I still adore and cherish every minute of my career and believe that it is a blessing and privilege."

She continued, "Serving other people results in authenticity. From the very beginning of my career as a fire fighter, I understood that you are responsible not only for yourself but the next fire fighter or member of the public. As such your code of conduct should be of a high standard at all times. In essence, fire fighting or the emergency medical services never became just a job but a great passion, commitment and dedication. I have a never-fail attitude towards this wonderful career."



A project highlight of Du Rands was the 2010 FIFA Soccer World Cup

Mentors

During her career, Du Rand saw each and every woman she worked with and who excelled in their careers, as mentors.

SAPAESA presented its annual general meeting at Zebula

South African Private Ambulance and Emergency Services Association (SAPAESA) held its annual general meeting (AGM) from 13 to 15 April 2016 at Zebula Golf Estate and Spa, Limpopo. The event was sponsored by Medicare Hospital Equipment, Webfleet TomTom Telematics and Emergency Vehicle Conversions (EVC).

SAPAESA, a non-profit, member organisation with the aim of improving the standards of pre-hospital emergency medical care in South Africa has a national footprint of 51 members, of which all are ambulance services. All SAPAESA members were invited to the AGM. These members collectively cover 116 locations and include 51 inter-facility



She highlights Lena van den Merwe who emphasised that responsibility and discipline form the core of your career. "I see each woman in the service as a mentor but most importantly, my husband and sons. The support of your family is paramount when you serve people in a career such as the emergency services. It is assumed that this industry will have a negative impact on your family life. It is a blessing to have such a supportive family. They are very proud of me!"

A career in the emergency service

Du Rand added, "The emergency service is a dignified career that is diverse and allows for specialisation in various fields such as fire safety, fire operations, public awareness, rescues services and advanced life support. There are copious opportunities for personal and career growth and development. New recruits must understand that commitment, dedication and discipline are key factors to a successful career. Stay truthful, authentic and professional because the responsibility is immense. Be an outstanding reflection of what the service stands for. Make the

people proud of the service when you don the uniform."

Challenges

Du Rand quoted her first couple of years in the emergency service as her most challenging as there are only a few women who tried to excel and adapt in this very male-dominant environment. "I believe it was difficult for both men and women, though. The general perception was that women would not last in the fire or emergency services. However, I kept assuring myself of my commitment and that I will complete all the relevant qualifications necessary. I was adamant to perform the duties required of me as a fire fighter to the best of my abilities. It also proved to be an ideal opportunity to demonstrate that anybody can excel and that gender is not career limiting. The real challenges as well as opportunities lie within women. Opportunities are there for women to seize and currently women have so much going for them. I have personally noticed many dedicated, career orientated women in the

emergency services, especially the younger generation. However, it is critical to find the balance between their careers and family lives."

She added, "Women entering the service must strive to contribute positively by actively enhancing the image of the emergency services as a professional, dedicated, disciplined workplace. They need to be fire fighters on the ground when there are fires and they must be women, mothers and wives when there are no incidents."

Du Rand had a long term vision from the beginning of her career and she was adamant that she wanted to study in both fire and ambulance fields of service. She wanted to ensure that she obtain all relevant qualifications, not only to better herself but to ensure a better service to the community she serves. "I enjoyed being a trail blazer and making it easier for my fellow female officers. I am very proud and thankful for the people I work with, especially the women. Everyone worked hard and deserves recognition." Salute! 



Oliver Wright, CEO of SAPAESA



Neil Gargan, chairman of SAPAESA

Oliver Wright, chief executive officer (CEO), commenced his report by presentation of Dispatch Cube operating system. SAPAESA hopes to use the Dispatch Cube system in their proposed call centres. The SAPAESA call centre is a new venture undertaken by the association and it will open its doors within 30 days to three months, depending on a few finalities to be concluded. "The call centre will have its own emergency number and will partner with a few relevant companies to ensure the utmost efficiency of the call centre," said Wright. The potential companies are still in the process of final agreements with SAPAESA and this too will be reported back to members.

transfer services, 48 first aid training providers and four air ambulance services.

The itinerary ran as follows, on 13 April 2016, members were welcomed with lunch at Waterberg Lodge Restaurant. Thereafter, entertainment followed and members were shuttled to Elephant Interaction and served dinner afterwards, which concluded the day. On 14 April 2016 the conference was held at the Rhino Run Conference Centre. At the start of the conference, the SAPAESA AGM 2016 sponsors held demonstrations on their respective equipment, by 9h30, the AGM was underway.

SAPAESA in the long run. The member fees for SAPAESA were not increased as it has not been for the last three years. Emslie concluded by stating that every year the association has managed to increase their financial status. "These financial reports are transparent and available to any member of SAPAESA", concluded Emslie.

Guest speakers included John Postmus and Jean Batista of Medicare Hospital Equipment and Justin Manson of TomTom Telematics. The guest speakers were given an opportunity to present their respective businesses to the members of SAPAESA.

Thereafter, he initiated the official CEO report. Wright thanked the executive board for their service and noted that it has been a productive past 12 months for the association. Wright informed members of the potential business partnerships of SAPAESA, which is currently being finalised and which will greatly benefit members. "SAPAESA is promoting the use of our members as preferred service providers to medical aid schemes as well as insurers," said Wright.

Due to these future business endeavours, members were assured

Discussions

Neil Gargan, chairman of SAPAESA welcomed all members. Thereafter, Gargan presented his report as chairman. He highlighted the primary topics of the conference and assured members that SAPAESA is growing and becoming recognisable within the industry at a government and private level. Gargan also introduced the focal points of the meeting, some of which were of a private and confidential nature.

The treasurer, Terence Emslie's report followed. It was disclosed to members that the financial position of SAPAESA is of a healthy nature, however, various income streams have been put in place to ensure the financial viability and growth of



Presentation on the Dispatch Cube system

that SAPAESA inspectors will be visiting each of the members' respective ambulance services to ensure full compliancy with the standards of the association. It further offers mediation to all members to run their businesses at optimal level. Wright mentioned that these audits are necessary to market SAPAESA members as preferred service providers.

Wright discussed some industry related issues as "there are concerns that it may be anti-competitive for one, a company to provide both an operational ambulance service as well as an assistance company, that controls payment of claims and cash flow to competitors, within the same operational ambulance industry," said Wright. Conclusion on these issues will be reverted back to members in due course.

Questions and answers session

After all agenda topics were finalised, members were given an opportunity to discuss any concerns or debate any other relevant topics.

One of these topics included the prospect of ambulance services tapping into the market of rescue units. More specifically, who would be responsible for payment of such services, should it be established



Members' discussions

and who should be responsible for funding rescue operations within the ambulance service industry. Some ideas included the Road Accident Fund as well as provincial health departments. SAPAESA assured members that they would collect as much information as possible and reply thereon to members.

Another prominent subject matter, which seems to be an issue at a provincial level, is the registration of response vehicles. Many ambulance services seem to have the same issue as "there is currently

no specific definition of a response vehicle in the national legislation," said Wright. Consequently, many response vehicles are deemed to be incorrectly registered and thus they are having their registration discs removed. However, the board of SAPAESA will be taking this up to a national level to resolve the issues on registration of response vehicles and once more, revert back to members.

Executive board nominations

The AGM concluded with the nominations of SAPAESA's executive board. Neil Gargan was re-elected as chairman of SAPAESA and all delegates were in agreement that Clint Ruggunan remain vice chairman. The nominations and voting for the two general directors were unchanged as Dave Gardner was re-elected as corporate secretary and Terence Emslie remains treasurer of SAPAESA. The executive committee is made up of Glen Preston, Alan Leicester, whom served on the board previously, with the welcoming of a new executive member, Owen Mabunda.

Gala dinner

Delegates met for pre-drinks at Bush Willow Lodge, after which the gala dinner and entertainment for the evening was underway. A lucky draw took place with some great prizes up for grabs. 🎁



Hospital equipment on display at the AGM

Extrication: staying up to date

By Neville van Rensburg and Julius Fleischman,
World Rescue Organisation (WRO) assessors and members

According to the book, 'Vehicle extrication techniques' by Holmatro's Ian Dunbar, the last 25 years have seen great advances in technology, which has greatly changed the way vehicles are constructed. This technology also means that safety systems such as airbags and other supplementary restraint systems have increased substantially.

Although the advancement in technology has made for stronger and safer vehicles, it has had a huge impact on the rescuers and medics who attend the scene of a road traffic collision. With all the development that takes place with new vehicle technology, it becomes more challenging every year for fire fighters, rescuers and medics to keep their training updated to enable them to professionally extricate patients trapped in new car technology vehicles involved in accidents.

It all starts at the training centres to ensure that fire fighters, rescuers and medics understand new car technology; especially the extrication challenges created by the new B-post during B-post rips or side swaps.

A major problem in South Africa is the availability of new car technology for students to train on. The majority of times the only vehicles that are available for training are older models from scrap yards, sometimes just a shell with

some doors on. So, what can we, as professional emergency services, do?

We can learn from accident scenes that we attend. Many of these incidents involve new car technology vehicles and materials. These vehicles and scenes can form part of your evaluation of the accident scenes. We can observe the incident scene while we are busy doing the extrication, make mental notes as you work and what you see, hear and practical experience. Once back at your station, make notes on what challenges you found, what you experienced and learned at that incident.

During your assessment of the accident scene, analyse the scene by looking at the damage to the vehicle, the impact of the accident on the vehicle and the patients. Remember, the vehicle talks to you and will show you what it did to your patients. Look at the position of the patients in vehicle, type of vehicle, impact position and what the damage look like.

We can also learn by observe the following:

- Distortion of steering wheel
- Deployment of airbags (signs and deploy bags)
- Side impact damage
- Displaced front axle
- Starred windshield (laminated glass)

It's also important for example with a head on collision, to look at the front

of the damaged vehicle and to note what happened in the crumple zone area. If the patient was trapped by the dashboard, note how he was trapped and make a mental note why, what moved, what trapped the patient and how was the patient trapped.

Another method to assist with your training is to look at the different tensions, torsions and flexion on the vehicles involved, once the patient has been extricated. Note the type of safety systems you can see in the vehicle. If airbags deployed, what was the impact that caused its deployment. Imagine the vehicle as a clock and make notes were the impact was for example was the impact at 12h00 or 3h00 position? Try and identify new car technology in the vehicle and the result the impact had on it.

Notice whether the doors were difficult to open; look at the positioning of the side impact bars in the doors after impact. Ask for permission to take photographs for use in future training or to use in case studies. You can use the photographs back at the station to review your challenges and experiences at the accident scene and during the detanglement of the vehicle. Discuss the challenges with your colleagues.

This will enable you to learn from each incident and upskill yourself for similar future incidents. ⚠



Analyse the accident scene



Learn from experience

Doing the right thing

By Wayne Bailey

When I type the word 'Discipline' in the Google search engine, I find this; "The practice of training people to obey rules or a code of behavior, using punishment to correct disobedience. A lack of proper parental and school discipline". Synonyms are control, training, teaching, instruction, regulation, direction, order, rule and strictness."

Self-discipline is the core ingredient of self-respect. If a fire fighter lacks self-discipline, self-control or self-respect, even if he's the officer in charge, in fact, he will not be the true leader.

In my early teen years, discipline was not positive. When I was being 'disciplined' for something, it was because I had failed to return home on time or skipped school. Having discipline to be home on time would have kept me out of a lot of trouble. Learning discipline in my late teen years helped me be a better person and it was due to good parenting with discipline.

Jim Rohn said, "Discipline is the bridge between goals and accomplishment." You can write your goals on a white board, see them every day, however, if there is no action associated with your goals, it's just writing on the wall. When you set goals, write a date on when it will be accomplished. This will help you build discipline. Some thoughts to ponder:

Mental status

How do I mentally discipline myself? Taking on extra job duties and not expecting anything back in return like a promotion or money.

Emotional thinking

Thinking from your head and not from your heart. The work we do sometimes that involves children or vehicle crashes that are unbelievable to most, however, it's something you do every day. You have to have a mindset and discipline to do the job and the event should never keep you from doing the job. If so, it's time to move on. Your feelings

should not drive your actions. Use your head and occasionally use that gut feeling when nothing else make sense.

Actions are greater than words; always keep you mind sharp. Do a jigsaw puzzle, word puzzle found in a local newspaper, going back to school and developing study habits will also help keep you disciplined. The more actions one sees, tells the people you have a higher degree of discipline.

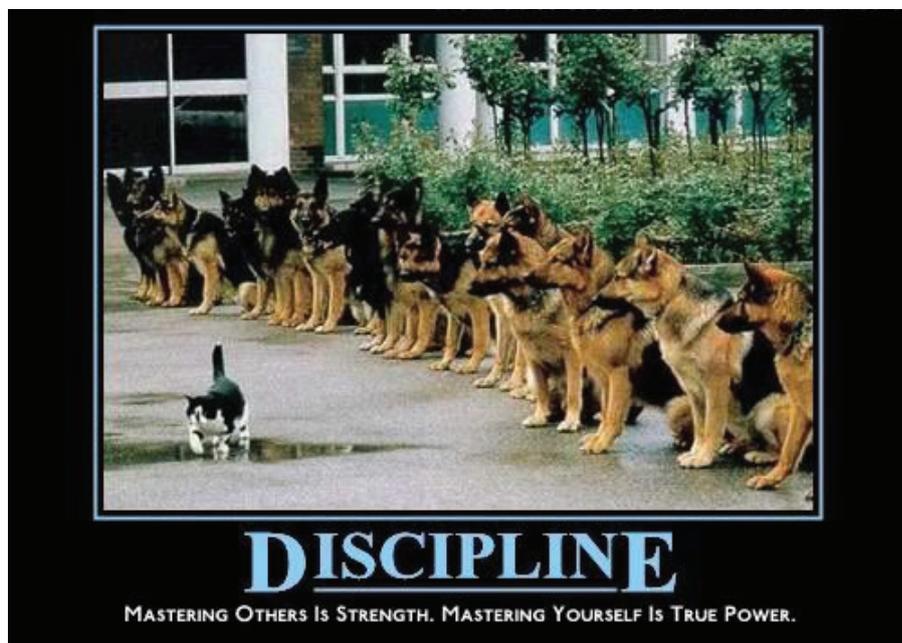
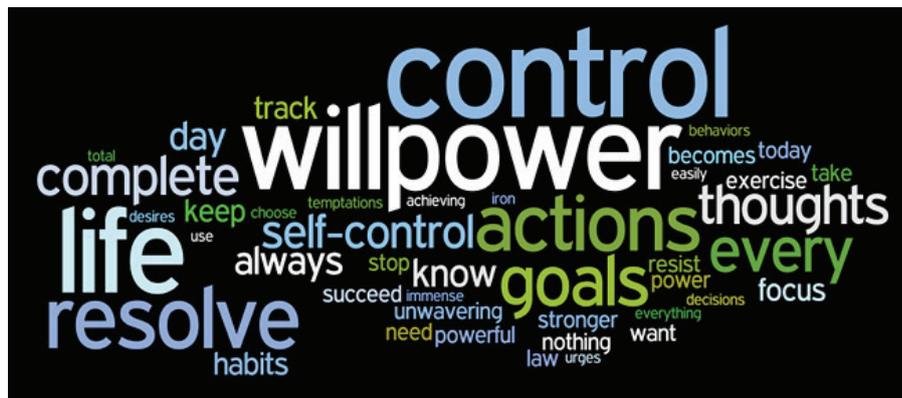
Lou Holtz, a successful football coach, college football analyst for ESPN, was elected to the College Football Hall of Fame with an overall college record of 249-132-7. He has been quoted hundreds of times and had this to say; "Winners embrace hard work. They love the discipline of it, the trade-off



Wayne Bailey

they're making to win. Losers, on the other hand, see it as punishment. And that's the difference.

Which are you? Doing the work now to make it happen or seeing discipline as punishment? Time will tell. ▲



Fireboats

The first recorded firefloat was built in 1765 for the Sun Fire Insurance Company in London. This was a manual pump in a small boat, rowed by its crew to the scene of the fire. A similar craft was built in Bristol by James Hillhouse for the Imperial Fire Insurance Office in the 1780s. All fire fighting in Bristol was carried out either by private insurance companies or the Docks Company until the formation of the Bristol Fire Brigade as a branch of the police in 1876.

In New York City, a small boat with a hand pump was used to fight marine fires as early as 1809. By the middle of the nineteenth century, self-propelled steam firefloats were beginning to be introduced. The Fire Department of New York (FDNY) leased the salvage tug, John Fuller, as the city's first powered fireboat in 1866. Prior to the 'John Fuller', as early as the late 1700s, the FDNY used hand-pumpers mounted to barges and large rowboats. The first purpose-built steam driven boats were introduced by Boston Fire Department ie William F Flanders and FDNY ie William F Havenmeyer in 1873 and 1875 respectively.

The first European fireboat to appear in Bristol was the Fire Queen, built by Shand Mason and Co, London, in 1884 for service in the city docks. The 16.61 metre long craft was equipped with a three-cylinder steam pump supplying two large hose reels; one of these was replaced with a monitor or water cannon, in 1900. Fire Queen served until 1922.

A fireboat is a specialised watercraft with pumps and nozzles designed for fighting shoreline and shipboard fires. The first fireboats, dating to the late 18th century, were



Toronto's William Lyon Mackenzie fireboat, Canada

tugboats, retrofitted with fire fighting equipment. Older designs derived from tugboats and modern fireboats more closely resembling seafaring ships can both be found in service today. Some departments would also give their multi-purpose craft the title of 'fireboat'.

They are frequently used for fighting fires on docks and shore side warehouses as they can directly attack fires in the supporting underpinnings of these structures. They also have an effectively unlimited supply of water available, pumping directly from below the hull. Fireboats can be used to assist shore-based fire fighters when other water is in low supply or is unavailable, for example, due to earthquake breakage of water mains, as happened in San Francisco due to the 1989 Loma Prieta earthquake.

Some modern fireboats are capable of pumping tens of thousands of gallons of water per minute. An example is the Los Angeles Fire Department's Warner Lawrence fireboat, with the capability to pump up to 2,4 cubic metres per second or 32 000 imperial gallons per minute and up to 122 metres in the air.

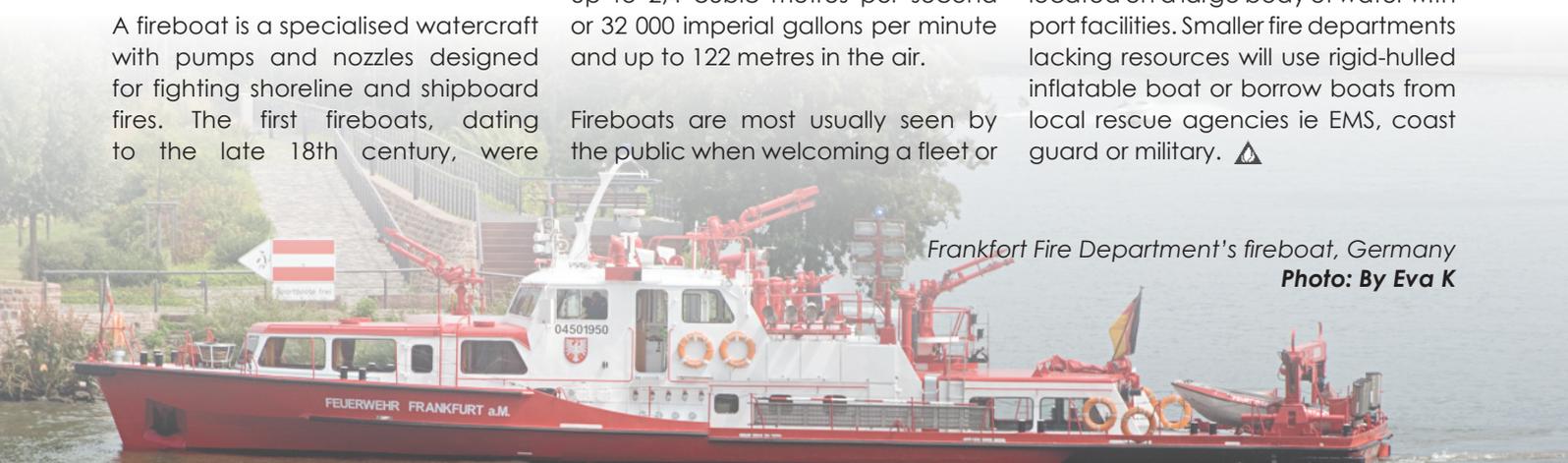
Fireboats are most usually seen by the public when welcoming a fleet or

historical ships with a display of their water moving capabilities, throwing large arcs of water in every direction.

Occasionally fireboats are used to carry fire fighters, emergency medical technicians and a physician with their equipment to islands and other boats. Some may be used as icebreakers, like the Chicago Fire Department's Victor L Schlaeger, which can break 20 to 30 centimetres of ice. They may also carry divers or surface water rescue workers. Passengers from ships in danger can be also transferred to various kinds of rescue boats. Rescue boats may also be used for oil and chemical destruction on rivers, lakes and seas. For example, the Helsinki Rescue Department in Helsinki, Finland has various kinds of boats for various kinds of fire fighting, rescue and oil destruction tasks.

Hydrocopters, rigid-hulled inflatable boats, fanboats and even hovercrafts and helicopters are also used in fire, rescue and medical emergency situations.

Cities with fireboats are usually located on a large body of water with port facilities. Smaller fire departments lacking resources will use rigid-hulled inflatable boat or borrow boats from local rescue agencies ie EMS, coast guard or military. ⚠



Frankfort Fire Department's fireboat, Germany
Photo: By Eva K

2016

May

2 May 2016

The Mountain Club of South Africa and Wilderness Search and Rescue

The Mountain Club of South Africa and Wilderness Search and Rescue in conjunction with members of the International Committee for Alpine Rescue Medical Commission will be presenting a Mountain Medicine Workshop.

Venue: Cape Town, South Africa

For more information visit:

<https://form.myjotform.com/60283467234557>

1 – 5 May 2016

The 23rd Annual Xtreme Industrial Fire and Hazard Training

Williams Fire and Hazard Control presents its annual XTREME Industrial Fire and Hazard training event which focuses on flammable liquids fire response tactics and equipment applications including transportable large-volume water supply and delivery logistics, foam and dry chemical applications

Venue: Beaumont, Texas, USA

For more information visit: www.williamsfire.com/

5 - 7 May 2016

BESAFE Expo 2016

As BESAFE is all about public safety you can expect to witness the amazing events that our safety forces face and to learn from these demonstrations on how to act in an emergency event helping yourself and possibly those around you.

Venue: Bredasdorp, Western Cape, South Africa

For more information visit:

<http://www.besafexpo.co.za/>

1 – 30 May 2016

Fire and safety expo Korea 2016

Trade exhibition

Venue: Daegu, South Korea

For more information visit:

www.fireexpo.co.kr/eng/index.asp

2 – 6 May 2016

2016 Pacific Northwest fire investigators conference

This conference offers an understanding of fire investigation from basic fire investigation to elevated fire origins and allows one to complete certification testing during the course of the conference

Venue: TBA

For more information visit: www.nwfire.org

4 May 2016

International Fire Fighters Day

For more information visit: www.firefightersday.org

21-25 May 2016

Fire-Rescue Med (FRM)

Fire-Rescue Med is a conference for fire-based EMS leaders, including new and aspiring chiefs, providing education and training on hiring and retaining EMTs, public and private integration challenges, embracing technology, billing for services, illness prevention programs and more

Venue: Henderson, Nevada, USA

For more information visit: www.iafc.org/frm

24 - 26 May 2016

Securix and A-OSH Expo

Securix will be the largest and most comprehensive show of its kind in Africa and the only show exclusively dedicated to the very latest developments in security, safety, fire and protection.

Venue: Gallagher Convention Centre, Johannesburg, South Africa

For more information contact Joshua Low

on email: joshual@specialised.com

24 – 27 May 2016

2016 Water Rescue Seminar

Presentations are currently planned to review lessons learned from actual incidents that have happened in bodies of water around the world. Learn how to safely and effectively plan, prepare and implement a full-scale water rescue exercise to ensure your organisation is prepared to manage this extremely challenging response

Venue: Westin Hotel, Boston, Massachusetts, USA

For more information visit:

<http://arffwg.org/2016-water-rescue-seminar/>

25 - 27 May 2016

International Conference on Forest Fires and WUI Fires

Following the first ForestFire conference focused on WUI fires in 2013, the second edition of the conference on fire risk assessment, modelling, mapping and management in wildland and WUI will take place in Aix-en-Provence.

Venue: Aix en Provence, France

For more information visit: <http://forestfire.irstea.fr/>

30 – 31 May 2016

Australian and New Zealand disaster and emergency management conference

The Conference theme 'earth, fire and rain' will continue to address planning, response and the introduction of innovative techniques in management of disasters, emergencies and hazards.

Venue: Jupiters Hotel, Gold Coast, Australia

Contact: Email: admin@anzdmc.com.au

For more information visit: www.anzdmc.com.au

June

8 - 10 June 2016

Africa Health Exhibition

Africa Health is the continent's largest healthcare exhibition and is a leading platform for the industry to meet, learn and do business.

Venue: Gallagher Convention Centre, Midrand, Johannesburg, South Africa

For more information visit:

<http://www.africahealthexhibition.com>

9 – 11 June 2016

EDURA 2016

11th international exhibition of fire and rescue technique

Venue: Kielce, Poland

For more information visit: www.targkielce.pl/index.html?k=edura_en&s=index

13 - 16 June 2016

NFPA conference and expo

This conference and expo showcases fire protection, life safety and electrical; widely regarded as the most comprehensive event in the industry

Venue: Mandalay Bay Convention Centre, Las Vegas, USA

For more information visit:

www.fireproductsearch.com

15 - 18 June 2016

Fire 2013 - NYS AFC 107th annual conference and expo

The NYS AFC conference and expo provides expanded educational programs, EMS CEU workshops, hands-on training exercises and exhibits.

Venue: Turning Stone Resort, Verona, New York, USA

For more information visit: www.nysfirechiefs.com

16 - 19 June 2016

International Hazardous Materials Response Teams Conference

The IAFC's Hazmat Conference provides the latest classroom, hands-on and field trip-based training on what's new in hazmat, covering all aspects of hazmat, including transportation, safety, WMD, gear, terrorism, mass decontamination, bioterrorism and more

Venue: Baltimore, Maryland, USA

For more information visit: www.iafc.org/hazmat

21 – 23 June 2016

FIREX International

FIREX International is the leading event for every professional involved in fire protection, prevention and detection, offering a comprehensive selection of the latest thought-leadership alongside the best networking in the industry. With 14,000+ visitors, comparing and contrasting a range of innovative fire safety solutions from 140+ major manufacturers, alongside hearing the most on-topic discussions in the 120+ hours of free educational seminars, FIREX International is the place to attend to discover and determine the future of the industry.

Venue: Excel, London, UK

For more information visit: www.firex.co.uk

August

14 - 16 August 2016

Queensland mining industry health and safety conference

This conference continues to be one of the largest health and safety conferences in the southern hemisphere. The purpose is to present the latest information on issues that are critical for the continuing health and safety of the workforce

Venue: Jupiters Gold Coast, Queensland, Australia

For more information visit:

<http://qrc.org.au/conference/>

September

5 - 6 September 2016

Aerial Fire Fighting Asia Pacific 2016

Tangent Link brings the third Aerial Firefighting Conference to the Asia Pacific region to discuss, debate, learn and acquire the skills and lessons-learned for safe aerial fire fighting.

Venue: Adelaide, Australia

For more information visit:

<http://tangentialink.com/>

7 - 9 September 2016

Intersec Buenos Aires

International fair displaying security, fire protection, electronic security, industrial security and personal protection.

Venue: La Rural Predio Ferial, Buenos Aires, Argentina

For more information visit:

intersec.ar.messefrankfurt.com/buenosaires/en/visitors/welcome.html

8 - 10 September 2016

UKRO National Rescue Challenge

Teams will be able to display their skills within the following disciplines: RTC extrication, trauma, USAR, rope, water rescue and for the first time animal rescue

Venue: HFRS Headquarters, Eastleigh, Hampshire, UK

For more information contact the Event Manager: Steve Barrow

Email: rescuechallenge2016@hantsfire.gov.uk

Chaplains for God

A few of God's children are chosen
To respond in a most unique way.
He blesses each one with the gifts they need
And prepares them from day to day

You might not take note as he leads you
And equips you for what lays ahead.
He knows it's a rough road to follow,
So he shows you the need, instead.

You will need to be filled with compassion,
For others in their time of need.
To be willing to drop what you're doing,
And step out to perform a good deed.

The roll God is calling you to play,
Is a call into Chaplaincy.
It's a task that will need your commitment and love
And use all your gifts, which came for free.

A listening ear and discernment,
Will help you to know what to say.
And wisdom will give you the confidence,
To speak with insight, when you pray.

There will be many distressing times,
When despondency fills your mind.
Call upon God's awesome power,
To put your feelings far behind.

Chaplains don't get paid for this,
It's a gift they give from their hearts.
We can call them in our time of need,
For comfort, support to restart.

A chaplain is a volunteer,
Committed and available to God.
Following in the footsteps made,
On the road which Jesus first trod.

God's richest blessings to each one of you

By Dave Turk

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