

FIRE AND RESCUE INTERNATIONAL

Integrated fire, rescue, EMS and disaster management technology

Volume 1 No 8

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Comment

We proudly present the eight edition of Fire and Rescue International to our readers. Some readers might be receiving their publication a bit late due to the three month postal strike. We trust, however, that you still enjoy the magazine and find it informative.

Cover profile

This month's cover profile features Rural Fire Rescue (RFR) and profiles the company's products and services. With the approaching African forest and wildfire season in mind, RFR is also offering interested parties an opportunity of visiting one of its country-wide, product demonstrations, as part of its hands-on approach to equipment purchasing.

FRI Images photographic competition

Our sixth winner of the FRI Images competition is announced this month and won R2 000 cash! The winning photograph was submitted by a reader in the Western Cape. See page 3 for details.

CONGRATULATIONS!

Email us your high resolution photographs and you too could be a winner!

News section

The monthly news section features articles on various disasters, rescues and fires, some with a happy ending and some with a not-so-happy ending. We feature Tropical Storm Dando, the floods in Limpopo and Mpumalanga provinces and Mozambique, a major fire at a power station, floods and fires in Kenya, changes to the safety policies of the cruise ship industry and many more.

South African 2012 fire season

Ben Potgieter of Forestry Solutions provides us an overview of the South African 2012 fire season.

Trench collapse rescue

Our monthly in-depth technical feature focuses on trench collapse rescue and Colin Deiner discusses the misconceptions and fallacies related to trench collapse and the more appropriate methods for trench protection and support before rescue efforts could commence. As usual, his article is sure to trigger a response and we would appreciate your feedback on these issues.

Training

Lenny Naidoo discusses in his article the new internationally accredited fire and rescue programs for South Africa.

Disaster risk management

The City of Cape Town, South Africa, achieved 'Role model city' status in the United Nations International Strategy for Disaster Risk Reduction's World Disaster Campaign under the theme "Making Cities Resilient: My City is Getting Ready!" in collaboration with the United Nations International Strategy for Disaster Reduction (UN:ISDR). We detailed the programme and the event.

Case study

Our case study this month focuses on the question: Is fire green? Practicing fire ecologists, Lynne Trollope and Dr Winston Trollope, Working on Fire International, supplied FRI with an interesting explanation and reasoning for this global climate change debate.

Fire and Rescue International is your magazine. Share your views, experiences, ideas and suggestions with fellow readers.

We welcome your feedback, comments, submissions, emails and photographs!



Lee Raath-Brownie

Lee Raath-Brownie
Publisher

This month's FRI images winner!

Congratulations to

Photographer

Etienne du Toit
Deputy Director: Fire Brigade Services Provincial
Government Western Cape, South Africa

Name of photograph

Third floor fully involved and spreading

Photo description:

The photo was taken during July 2009 at a structural fire in the Johannesburg CBD. The fires depict a post flash-over early afternoon fire in an occupied building. Several persons were trapped in the building and had to be rescued. Three persons sadly died in the fire.

Camera: Nokia E71 3.2 MP cell phone camera

Etienne du Toit wins this month's prize money of R 2 000!

Well done!



Calling all budding photographers! We want your photographs!

Fire and Rescue International (FRI) has introduced a monthly photographic competition to all its readers. This exciting competition 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.za.



>>ENTER NOW!



Wildfire Environmental benchmark product range proves excellent choice for African forest and wildland fire fighting

Rural Fire Rescue specialises in forest and wildfire suppression equipment

Local fire fighting equipment specialist, Rural Fire Rescue, is the sole agent of Wildfire Environmental – previously known as Wildfire Equipment – for the Africa region. Managing director of Rural Fire Rescue (RFR), Marius Koekemoer, said in an interview

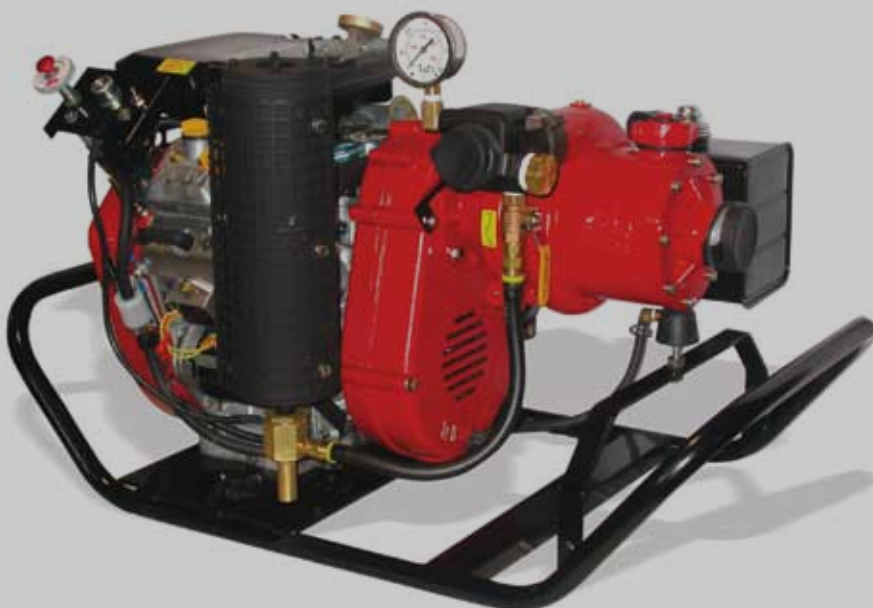
with Fire and Rescue International (FRI) that his relationship with the Canadian manufacturer of premium fire fighting equipment, spreads over a period of 12 years.

“Wildfire Environmental makes high-quality water handling equipment

specifically for wildland and forest fire fighters, agencies and governments worldwide. The company specialises in moving water economically over long distances and at high elevations. Its distribution network paired with branches in strategic locations throughout Canada and the United States together with its partners, agents and dealerships in international markets, provides the after-sales service which is of utmost importance in the wildland fire fighting industry”, says Koekemoer.

“Furthermore, the Wildfire Environmental range of specialised equipment is the benchmark product range in Northern American forest and wildland fire fighting apparatus and we are proud to represent them in Africa.”

Koekemoer also emphasised that Rural Fire Rescue (RFR) and its staff members are all specialists in their field and that their experience in the forest and wildland fire fighting industry is a vital benefit to their clients. RFR also specialises in the rural/urban ►



Wildfire water pumps



Inforest sprayers

► interface aspects of fire fighting and as such provides an invaluable service to the African market.

Best known for the Mark-3, the benchmark in high-pressure, portable, centrifugal pumps, Wildfire also manufactures a complete range of nozzles, skid units, fire line hardware, backpacks, forestry tools, portable water tanks and drip torches. Their product offering also includes specialty fire hose, foam and other forest and wildland fire related products.

The upshot of Wildfire's recent management buy-out is a return to its roots as a manufacturer, driving a renewed emphasis on being the water handling experts. Wildfire is committed to the development of innovative wildland and forest fire fighting products.

History

Wildfire enjoys a rich and diversified history. The company can trace its line straight back to 1925, in Montreal, Quebec, when Watson

Jack and Co began manufacturing a powerful, 200 psi, portable fire pump called the Wajax - a play on the company founder's name. The company prospered and it acquired a controlling interest in FH Hopkins in 1951. Watson Jack and Co and its FH Hopkins subsidiary were purchased by BJ Coghlin Co Ltd in 1954 and were then merged into a single subsidiary, Watson Jack Hopkins Ltd, later renamed Wajax Equipment Ltd in 1959.

Benchmark products

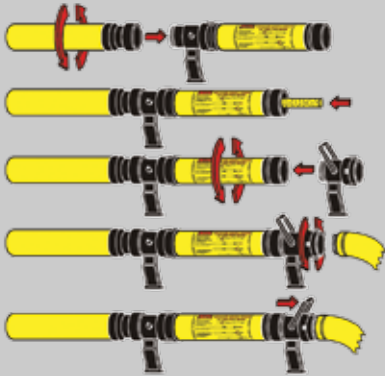
The Waterax series is the flagship in the product line-up and consists of a full range of lightweight, high-pressure, portable fire pumps.

These multi-stage, centrifugal pump systems allow for pumping from natural water sources — such as dams, streams, and rivers that often contain minor debris. A major advantage of high pressure centrifugal systems is that they allow ►



Green Dragon incendiary device

Cover profile



The new Scotty Foam-fast foam applicator

- ▶ for tandem pumping which enables users to move water over greater distances and elevation.

The time-tested quality, reliability, and durability of Waterax pump systems are what have made it the most trusted pumps in the industry today and the benchmark of excellence in forestry water handling systems.

The range includes the Waterax Mini-striker, a medium pressure,

low volume pump; Striker II -Plus and Ultra-Striker, both medium pressure, medium volume pumps; Waterax BB-4 and BB4-B2 are high pressure, high volume pumps while the Waterax Mark-3 and B-2 are high pressure, medium-high volume pumps, completing the range.

Precision tools for the serious fire fighter

The Cordova brand manufactured by Wildfire, include premium nozzles and fire line hardware that has stood the test of time. From its inception over forty years ago to its modern day form, quality and precision have remained the key principles behind Cordova's reliability and ensures flawless performance in the field. The Cordova product line-up includes the Feather-Lite range of nozzles, smooth bore tips and ball shut-off valves.

Other products

Wildfire Environmental also supplies various other forest and wildland fire related products including a complete range of Niedner forestry hoses.

Local agent, RFR, stocks the complete range of Wildfire pumps and equipment and will gladly arrange a demonstration for any interested party. The high performance levels of these pumps and the ability to move water over

high elevations and distances has, in some cases, caused clients to re-think the necessity of buying additional water tankers.

With the approaching African forest and wildfire season in mind, RFR is offering a hands-on approach to equipment purchasing by presenting country-wide product demonstrations. The combination of decades of expertise in manufacturing of wildland and forest fire suppression products added to the comprehensive range available and complemented by the hands-on experience of its supplier in Africa, makes Wildfire equipment an indispensable source of specialised products for the forest and wildfire professional. "By representing the Wildfire range in Africa, we believe we can offer our clients a benchmark product range and by so doing, raise the bar on technology and techniques within the industry", concludes Koekemoer.

In order to offer customers a complete solution for fire fighting equipment, a one-stop-shop, so to speak, Rural Fire Rescue, in addition to Wildfire, also represents SEI Industries, manufacturers of world-class portable water tanks; Green Dragon, manufacturers of incendiary devices, Inforest and Scotty knapsacks and Stormking Mountain's burn-over protective products. ▲



Inforest knapsack sprayers

Cruise ship industry adopts new safety policies



The \$450 million Costa Concordia cruise ship had more than 4 200 passengers and crew on board when it slammed into the reef off the tiny Italian island of Giglio after the captain made an unauthorised manoeuvre

In the wake of the deadly Costa Concordia cruise ship accident off the coast of Italy in January 2012, the cruise industry is implementing new safety standards.

Cruise Lines International Association, the world's largest cruise non-profit organisation representing 26 companies, recently announced that it's putting in place standards it says will "achieve concrete, practical and significant safety dividends in the shortest possible time."

Officials say each ship will now be required to provide additional adult life jackets in excess of the legal requirements within a ship's most-populated zone. This will ensure the number of life jackets carried by a cruise liner will exceed the actual number of passengers on board.

At least 30 people were killed and two others are still missing and presumed dead after the Costa Concordia struck rocks and turned on its side on 13 January 2012 off the Italian island of Giglio.

Some survivors said they returned to their rooms to get their life jackets a half hour after the accident and

struggled to climb many levels in dim emergency lighting on the listing ship to reach lifeboats.

The industry also adopted a policy to "minimise unnecessary disruptions and distractions" on the bridge. The change will limit access to the bridge "to those with operational functions during any period of restricted manoeuvring or when increased vigilance is required."

The captain of the Costa Concordia faces allegations of manslaughter, causing the shipwreck, abandoning ship and failing to report the accident. Some media outlets reported that Captain Francesco Schettino had a woman with him on the bridge just before the accident.

Schettino has previously said managers of the cruise line instructed him to sail close to Giglio. He said the ship hit a rock not indicated on charts of the area.

A third safety policy adopted involves passage planning procedures, which is the complete description of a ship's movement from departure to arrival. The new standard will change what was simply guidance

for years and make it a mandatory minimum requirement. All bridge team members will be briefed on the voyage "well in advance of its implementation" by a designated officer and approved by the master.

"As the Concordia incident demonstrates, there is no such thing as perfect safety," said Manfredi Lefebvre, chairman of the European Cruise Council. "We do strive for a perfect commitment to safety." ▲



Italian rescue workers had to suspended operations several times as the stricken cruise ship shifted on the rocks near the Tuscan coast, creating deep concerns about the safety of divers and fire fighters searching for the missing people



The stricken Costa Allegra was towed to the Seychelles Islands



The region where the cruise ship was adrift has seen a rash of attacks by Somali pirates

Fire aboard Costa liner leaves cruise ship adrift

An Italian cruise liner, carrying more than 1 000 people, was adrift without power in the pirate-infested Indian Ocean on recently after a fire erupted in its generator room. Emergency crews on-board managed to put out the fire after a few hours and nobody was injured, but the passengers were moved on to the stricken ship's outer decks to ensure an easier evacuation if needed.

The fire aboard the Costa Allegra occurred only six weeks after one of its sister ships, the Costa Concordia, hit a reef and capsized off Italy, killing 32 people and leaving seven missing and presumed dead. Both ships are operated by Costa Crociere SpA, which is owned by the Florida-based Carnival Corp.

Tug boats from the island nation of Seychelles were steaming to the powerless Costa Allegra, which was carrying 636 passengers and 413 crew members.

The officials, who stayed in regular contact with the Allegra's crew members, said emergency generators kept the ship's command room illuminated and instruments such as its radio functioning. The rest of the ship was dark at night, however. The officials also reported that the cruise liner had to cope with one and a half metre waves in the area and that the passengers were being kept in the ship's big communal rooms, not their cabins.

The general region where the cruise ship was adrift, off the coast of

Tanzania, has seen a rash of attacks by Somali pirates, but they have never hijacked a cruise ship.

Italian Coast Guard Commander, Cosimo Nicastro, said armed anti-piracy military personnel were aboard, but added that there was no immediate danger of pirates. The main attention was focused on rescue efforts, he said.

Helicopters ferried food and flashlights to the stranded passengers and crew stuck aboard the cruise ship disabled by fire, as it was towed to the Seychelles Islands.

The ship was at the start of a cruise which would have also taken it to Oman, the Red Sea and the Egyptian Mediterranean port of Alexandria. ▲

Salvage of Costa Concordia wreck to be biggest ever

Salvage crews will employ huge cranes and air tanks to refloat the half-submerged Costa Concordia cruise liner in the largest ever operation of its kind, according to a plan unveiled recently.

Estimated to cost at least 300 million Dollars, the work is expected to begin shortly and last about a year, said the ship's operator Costa Cruises, owned by Carnival Corp and Plc.

Representatives of Titan Salvage of the United States and Italian firm Micoperi, who was chosen to handle the removal, told a news conference they were confident the plans would succeed even though they have never been tested on a

ship this size. "This will be the largest refloat in history but we think it's entirely possible," said Richard Habib, president of Titan Salvage, owned by US group Crowley Maritime Corp.

The head of Italy's Civil Protection Agency, Franco Gabrielli, said the ship would be stabilised by the end of August to prevent it from shifting down a rocky ledge and plunging into the deep waters of the surrounding marine reserve.

Two cranes, attached to an underwater platform beside the 114 500 ton vessel, will pull it upright, along with big water-filled tanks that will be fitted on the part above water. Once upright, tanks will be fitted to

the other side of the hull and then all the tanks will be emptied and filled with air to refloat the huge liner.

Micoperi manager Silvio Bartolotti said the ship would be refloated by February 2013.

It will then be towed to an Italian port and broken up. The port of Livorno may be chosen in order to compensate the Tuscany region by creating jobs, regional president Enrico Rossi said. Some 2 300 tons of fuel were removed in March 2012, averting an environmental disaster. Once the ship is towed away, the seabed will be cleaned of debris and work will be undertaken to restore marine flora. ▲

Intense flames caused part of the roof to collapse as fire crews worked to fight the blaze

Fire at Boston duplex caused building to collapse

A recent fire at a building in Boston, Massachusetts, USA, caused the roof and parts of the building to collapse just after fire fighters were ordered off the roof and a collapse zone were established.

Sixteen people, including three children, were left homeless after a fire raged through their homes.

When fire crews arrived at the scene, they were confronted by a heavy fire showing and flames coming out of the top floor windows.

About 160 fire fighters went to work on the flames, pouring massive amounts of water on the three-story brick building. "Many, many deck guns and hand lines in use," the fire department said on its Twitter feed.

As the fire continued to rip through the building, fire crews were ordered off the roof and outside. Shortly after the roof collapsed. Fire officials were worried about the structure and established a collapse zone around the building.

They were also concerned about the fire spreading because of the close proximity of homes in the neighbourhood. The closest door was approximately one metre away, fire officials said. The flames managed to spread past a fire wall and into the other side of the building.

The intense flames caused part of the roof to collapse as fire crews worked to fight the blaze.

Besides the roof, part of the front of the building also collapsed — sending bricks crashing down on to the sidewalk below.

Families on either side of the duplex were left homeless. Some families weren't home and those who were home were checked out by emergency technicians.

There were no reports of serious injuries. However, one fire fighter was treated for an injured shoulder and a resident was treated for anxiety.

Fire officials estimated damage at \$2,5 million.


Building inspectors were expected to arrive at the scene and look over the damage to the building. It was unclear whether or not the top floor would have to be knocked down for safety reasons.

The American Red Cross was called to assist the people displaced by the fire.▲


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Essex fire fighters battled a fire at Europe's biggest biomass plant

Fire fighters spent more than 15 hours tackling a major fire at the Tilbury power plant on the banks of the River Thames in Essex, United Kingdom.

More than 120 fire fighters from across Essex tackled the fire at the biomass power station. Fire fighters were called at 7h46 am to extinguish the blaze, which started in a hopper that contains the wood pellets used to produce power.

15 fire engines, three aerial ladder platforms and a mass foam attack unit were used to extinguish the fire.

The fire was described by a senior fire fighter as the most challenging task he had dealt with in his 20-year career.

RWE npower stated that no injuries had been reported with all staff accounted for.

The incident commander, chief fire officer David Johnson said "we have the best equipment in the country in Essex and it was used to maximum effect".

CFO Johnson also said that fire fighting operations were hindered by the fact that the fire was high up in the main structure of the building, making it difficult for crews to reach it.

He described how the whole of the building was heavily smoke logged

and crews were assisted by a police helicopter in devising a tactical plan to look at the safest possible way of getting special foam onto the fire to suffocate oxygen from reaching the flames.

CFO Johnson described how fire fighters had to isolate several high-voltage power cables that were affected by the fire.

He furthermore explained the incident briefly: "The fire involved between four and six thousand tonnes of biomass high up in the power station building. The fuel goes into vats and is taken into the plant on a conveyor belt. The fuel cells were designed to carry dry fuel so pouring water on to them and making them significantly heavier could have had potentially damaged the structure of the building. There was an added complication that when the cells got wet, then dried by the fire, a crust would develop which would have made it impossible for more water to penetrate the fire underneath. That's why we used foam", Chief Johnson added.

The fire crews were sent into the building to tackle the blaze using specialised, high-expansion foam on the burning hoppers to starve the fire of oxygen and create a safety blanket.

The 750 megawatt station, opened in 1969 and located in the east of

Tilbury Docks on the river Thames, is the first dedicated biomass plant in the UK. It previously operated as a coal-fired power plant. However, now it generates power from 100% sustainable biomass until its scheduled closure, which is expected by the end of 2015.

Biomass plants burn wood pellets, generally made from compacted sawdust or other wastes from sawmilling and other manufactured wood products.

Essex Fire Authority chairman, Councillor Anthony Hedley, praised officers and fire fighters and said: "I have been very impressed by the way officers formulated a highly technical plan to tackle the blaze and the way in which fire fighters on the ground went to work. This was a particularly challenging incident and one which demonstrated to the public the breadth of appliances and equipment available to our fire fighters to deliver a top flight response."

A spokesman for RWE npower, which owns the power station, said: "Emergency services arrived on site very quickly and we would like to thank them for their swift response".

Fire investigators believe a spark from machinery triggered the huge fire that swept through the biomass power plant. ▲

Teenager rescued after 28 days adrift in the Pacific

An 18-year-old hotel worker from Panama, who went on a fishing expedition with two friends, arrived home after being rescued from a small boat that drifted on the high seas for nearly a month.

The three-metre boat containing Adrian Vasquez had travelled more than 1 000 kilometres in 28 days when it was found off Ecuador's Galápagos Islands by a commercial fishing vessel.

His two friends had died more than a week earlier, and Vasquez survived by eating raw fish. He told his rescuers that a sudden rainstorm towards the end of his ordeal saved his life as he had run out of water.

Dozens of people turned out to welcome the noticeably-thin teenager home when he arrived back in Panama to be reunited with his relieved parents. The visibly exhausted teenager wept as he embraced his relatives. He did not speak to journalists other than to say he had never given up hope of being rescued.

Captain Hugo Espinosa of the Ecuador coast guard, whose patrol boat picked Vasquez up from the fishing vessel, said he was suffering from malnutrition and severe dehydration when he was found. The Coast guard gave him medical attention. The captain said: "He didn't know what was happening. He was quiet, looking lost. Little by little he began to react. But the

subject of his dead friends made him stay silent and lower his gaze. It cost him a lot to discuss the matter."

Retelling Vasquez's extraordinary story, Espinosa said the three friends were returning to their hometown of Rio Hato on the south coast of Panama in their boat, when its motor failed. It was approaching dusk, but the group could see land and so were not unduly concerned. They had a large jug of water with them, and had caught a lot of fish, some of which they grilled on the boat during their first few days adrift.

Panama's coast guard launched a search, but as the days passed, the fish became rotten and the men were forced to throw them overboard and live off what they could catch in their net.

After two weeks, Vasquez told his rescuers, his friend Oro-peces Betancourt, 24, stopped eating and drinking. He died on March 10, and Vasquez said he threw his body overboard three days later because it had begun to decompose.

Sixteen-year-old Fernando Osorio died on March 15, apparently of dehydration, sunburn and heat stroke, and Vasquez was again forced to push his body into the sea after three days. Out of water, and with unrelentingly sunny skies, Vasquez assumed he would himself perish when, the next day, the skies opened up and it rained. ▲

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Tropical storm Dando

By Bernardine Altenroxel

The annual tropical cyclone season of the South West Indian Ocean usually runs from mid-November until the end of April the following year.

In these waters, defined as the area west of 90°E and south of the Equator in the Indian Ocean, cyclones are monitored by the Regional Specialised Meteorological Centre at Réunion. Amongst the systems already tracked thus far this year in this basin were Severe Tropical Storm Alenga, Tropical Depression 02, Subtropical Depression 03, Tropical Cyclone Benilde, Moderate Tropical Storm Chanda, Subtropical Depression Dando and Severe Tropical Storm Ethel. At the time of writing this article, Intense Cyclone Funso in the Mozambican Channel, a Category 3 cyclone, was being closely monitored as it tracked slowly southward down the Channel.

Put simply, tropical cyclones usually arise from areas where tropical disturbances have occurred. These tropical disturbances occur frequently during the annual tropical cyclone season and either dissipate under adverse atmospheric conditions, or strengthen to form tropical storms. Under favourable conditions, a tropical storm can intensify further to form a tropical cyclone, which is characterised by a low-pressure centre, strong winds and heavy rain. All these storms can pose danger to human lives, infrastructure and livestock, and careful monitoring is essential to issue warnings in time to communities which may be affected. Cyclones are classified on a scale of one to five, depending on their intensity – five being the strongest. The differences between these various storm categories, as far as wind speed is concerned, are as follows:

Along coastal areas where tropical storms occur, of particular danger are high waves and storm surges which can result in flooding of low-lying areas. The movement of these tropical systems are governed by steering winds in the troposphere which are monitored closely to determine the probable path the storms will take. It should however be noted that these storms can be extremely erratic and are difficult to predict over the long-term, which is why such close attention must be paid to their daily movement. Coastal areas are usually those most frequently affected by tropical systems, but on rare occasions, conditions become ripe for a system to track inland. Upon interaction with land, a tropical system will quickly start to weaken as it is deprived of the warm water it needs to power itself. These systems then usually become low pressure systems which are capable of causing heavy rainfall further inland.

On 12 January 2012, a subtropical depression deepened in the Indian Ocean to the east of Madagascar and tracked towards the African mainland. By 15 January, the storm was named Dando when it reached the equivalent of cyclone strength. The system made landfall close to Quassico on the Mozambican coast, approximately 145 nautical miles (NM) east-north-east of Maputo and continued to track in a north-westerly direction inland as a low-pressure system. The system brought heavy falls of rain to inland areas, which included the Lowveld and Escarpment regions of Limpopo and Mpumalanga. The subsequent flooding resulted in severe infrastructure damage in places and media reports indicated that many people had to be rescued where they had become trapped by the rising flood waters. Rainfall figures released by the South African Weather Services



Photo: NASA Goddard MODIS Rapid Response Team

NASA's Terra satellite passed over Dando on 16 January 2012. The MODIS instrument aboard Terra captured a visible image of the storm, and showed that it had good circulation with an identifiable centre of circulation

(SAWS) showed that rainfall of up to 269mm was recorded in Limpopo on the morning of the 18th of January and 238mm in Mpumalanga. There were also reports indicating measurements even higher than this across both provinces. By the 19th of January, the system had weakened substantially and lower rainfall figures were reported across the affected area. In the southern regions of Mozambique, it was reported that some 3 000 people were displaced by the flooding which affected a region of approximately 269 445,71 km².

Dando was the first storm to hit the area since Tropical Storm Domoina hit southern Africa around the 26th of January 1984. With the scale of flooding caused by Dando, many have been prompted to compare this storm to Domoina which caused heavy rainfall over what is now known as northern KwaZulu-Natal, Mpumalanga and Swaziland. Domoina is said to have brought rainfall of over 600mm over a three-day period and caused extensive infrastructure damage. Thankfully, Dando did not cause the heavy loss of life that Domoina was reported to have caused, but it certainly did cause severe infrastructure damage to roads and bridges across the affected region.

Similarly, in 2000, Cyclone Eline made landfall along the Mozambican coast, after which it tracked inland leaving a path of destruction in its wake across parts of South Africa, Zimbabwe and Mozambique.

All these storms clearly illustrate why it is so important to keep a careful watch on tropical systems which develop in the southern Indian Ocean. ▲

Strength	Category	1 Minute maximum sustained winds		
		Knots	Mph	Km/h
Tropical depression	TD	Less than 34	Less than 39	Less than 63
Tropical storm	TS	34-63	39-73	63-118
Tropical cyclone	Category 1	64-82	74-95	119-153
Tropical cyclone	Category 2	83-95	96-110	154-177
Intense tropical cyclone	Category 3	96-113	111-130	178-210
Very intense tropical cyclone	Category 4	114-135	131-155	211-250
Very intense tropical cyclone	Category 5	More than 135	More than 155	More than 250

How to avert future disasters in Nairobi's slums



Members of the Kenyan Red Cross carry the remains of a man killed during a landslide at the Mathare valley slum

Nine Kenyans recently lost their lives in Nairobi's Mathare 4A slum, due to the landslide that occurred as a result of the torrential rains that fell overnight.

Geoffrey Omedo, a climate change adaptation expert at the United Nations Development Programme's (UNDP) Africa Adaptation Program wrote that the enormity and the logistical nightmare of the rescue mission, the lack of equipment and inaccessibility of the affected areas could only make for a tragic case study of how to respond to disasters of such magnitude.

While this single incident has shattered the livelihood of these families, it has also cast into serious doubt the safety of residents living in informal settlements.

In the same week, a fire gutted down more than three floors of Kimathi House, one of the most scenic buildings situated right in the centre of the central business district (CBD) in Nairobi. Authorities are still reviewing it to establish if it will be allowed to remain standing, and should it fail the fitness test, it may have to be demolished.

It took fire fighters close to three hours to manage the fire that had engulfed the buildings three floors and the concerns raised by the community is if such a fire would break out in the highly populated informal settlements at night, the catastrophe would be of unimaginable proportions. Adding to the concerns, the slums have no cogent land use plan in place. The residents simply move into a waste land, sometimes areas that are clear flood plains; next to treacherous

rivers; in abandoned quarries; close to dumpsites and areas that are generally avoided by the real estate players, government and the local authorities.

They then set up camp, always anticipating to be relocated, but with time, these become their homes. In no time, a vibrant informal micro economy emerges. The residents in these slums provide affordable labour to the adjacent industries and suburbs and in turn eke a living to sustain their families.

Many studies have been conducted in Africa to assess the vulnerability of urban informal settlements to hazards. In a study done in Korogocho and Mukuru Kwa Njenga in 2010 by Oxfam GB, it was established that informal settlements are exposed to numerous hazards that can easily develop into full-fledged disasters due to lack of planning that leads to a slow response rate in times of crisis.

From the foregoing, the study found that the communities in these settlements are highly vulnerable to a number of environmental hazards such as floods, landslides, fires and the long term effects of droughts. The study identified a number of challenges in disaster risk identification, management and reduction.

These include the fact that urban disasters and risks have been neglected; the lack of an early warning plan; weak institutional arrangements to support informal settlements; lack of political good will and insufficient knowledge, experience and capacity to handle such disasters.

Reflecting on this year's Mathare 4A landslide and last year's Sinai fire, Omedo feels it's time to move from reactive to proactive leadership to save the residents of informal settlements and that efforts by the Ministry of Housing under Kenya Slum Upgrading Project, should be fast-tracked.

Some positive developments are on-going in Korogocho, where roads and other features of slum upgrading are on track, albeit at a slow pace. Omedo also suggested that the Kenyan Government should react rapidly to ensure all people living in precarious zones are humanely evaluated, fire hydrants installed at central points in the slums, encroachers on public utility spaces deterred and investment in cheaper and durable housing technology for such settlements encouraged. These are only short term measures but they would avert further fatalities in cases of disaster.

Adaptive capacity

In the long term though, the government will have to deal with the issue of land ownership and occupancy in the slums. A proper tenure system for such lands will encourage the real owners to invest in proper housing and safety features that will spur sustainable livelihoods in informal areas. As long as no one can claim ownership of such land, no one will be interested in longer term investment that will safeguard livelihoods.

This will go a long way in enhancing the adaptive capacity of slum dwellers in Africa's rapidly expanding cities, Nairobi included. ▲



Photo WO1 N Klopper

Delivering of a patient to the AFB Hoedspruit Hospital

SA National Defence Force assists with rescue during floods

Hundreds of people, including primary school children, left destitute and stranded by days of heavy rain and flooding in Mozambique, Mpumalanga and Limpopo, have been airlifted to safety by South African Air Force (SAAF) and South African Police Service (SAPS) helicopters.

The two-day, high-risk, aerial and ground rescue, which developed into a humanitarian relief mission, was launched after heavy rain caused flooding of large sections of the eastern parts of the South Africa and Mozambique recently.

A number of rivers burst their banks, flooding large tracts of land in low-lying areas.

Pilots and aircrew from the SA Air Force's 17 and 19 helicopter squadrons in Pretoria and Hoedspruit took off to airlift a large number of people to safety from various parts of Limpopo, Mpumalanga and the Kruger National Park, where several

tourists were washed away in their cars or trapped overnight.

The floods have left three people seriously injured and compelled authorities to shut the Kruger National Park's border posts.

The Pretoria News reported that Police, driving Casspirs, crossed flooded rivers repeatedly to reach

trapped villagers, often bringing them across on the roofs of the armoured vehicles because of the height of the water, while civilians rescued people trapped in two buses.

Civilians also made use of private helicopters and specialised off-road vehicles to rescue guests stranded at game lodges in and around the Kruger National Park.

In scenes reminiscent of the 2000 floods that struck Mozambique, the rescue saw mothers with young children being airlifted from trees and the tops of partially submerged houses.

The rescue was not without risks, however. SANDF spokesman, Lieutenant-Colonel Piet Paxton, commented that a flight engineer from Hoedspruit's 19 Squadron fractured a leg while trying to rescue a mother and her child from a tree. "He was flown to 1 Military Hospital in Pretoria. Fortunately the aircrew from a police helicopter were able



Lieutenant-Colonel Hatting with a rescue



A large area in the eastern parts of South Africa was flooded



A number of roads were washed away

Photo: WOI N Kloppe



Patient being rescued from a tree by the SAPS

► to rescue the mother and her child," Paxton confirmed.

Paxton said that the rescue mission had been intense. Pilots and aircrew went to the aid of 53 primary school children trapped by rising flood waters at their schools in the Acornhoek area of Bushbuckridge.

Six helicopters rescued people from trees, tops of buildings, stranded vehicles, partially submerged houses and land cut off by rising waters, he said.

"The airlift rescue, which had to be called off several times, was extremely dangerous. Adverse weather conditions had made getting to some people very difficult. But, despite these trying conditions, our aircrew have persisted in aiding as many people as possible; often putting their own lives in danger."

Describing some of the rescues, Paxton said an Oryx helicopter crew had rescued a family, who included a young child, from a steep valley where they had been hiking near the Blyde River Dam wall.

He also described how 130 villagers, 40 of them children, also had to be airlifted to safety from Moloro Village near Bushbuckridge to Bolang Village. "This was done as a preventive measure after fears arose of the potential of more flooding," he said.

Paxton said that the SANDF airlifted more than 250 people in three days and that the search and rescue mission had evolved into a humanitarian relief mission.

"We had to airlift food and water supplies to villages in remote areas cut off because the roads had been washed away.

Limpopo police spokeswoman, Ronel Otto, said that the province's search and rescue teams had been activated, The Pretoria News reported. They included divers and K9 unit members.

"Police from stations in the affected areas had all been called up to help with the rescues and assisted Limpopo's disaster management personnel in reaching communities

cut off by flood waters." Otto confirmed that more than 200 people had been rescued by the SAPS, SA Air Force, disaster management personnel and civilians.

Limpopo Disaster Management spokeswoman Tseng Diale said that 13 major roads had been extensively damaged, along with several bridges, cutting off entire villages.

South African National Parks chief executive David Mabunda said: "Of the 1 800 guests in the Kruger park 80, including 10 staff members, were evacuated. Four tourists were trapped in their car overnight and were rescued, while six tourists were washed away in their car near the Hamilton's tented camp while crossing a low bridge. They were not seriously injured and were taken to the Nelspruit Hospital. Sixty tourists, including foreign guests, were trapped in camps and lodges around the park but were safe. No animals were killed or hurt. Our anti-poaching operations continued, and SANDF members were protecting the borders." ▲



MAN Truck and Bus

South Africa shows solid growth

In the two years following the global economic crisis of 2008/2009 which saw commercial vehicle markets around the world plummet by as much as 40%, the MAN Group has successfully consolidated its international operations, registering positive growth in all its operational

sectors, particularly in its commercial vehicles division.

during 2012 is projected to increase to 12,4%.

Business resilience and commitment to employees

Another significant milestone in the group's history was the signing in February 2012 of an International Framework Agreement between the MAN Executive Board and employee representative organisations. The Agreement aims to create a reliable set of minimum standards that all MAN employees worldwide can refer to while also laying the ethical foundation for the actions of MAN SE and its employees.

MAN's empowerment rating currently stands at Level Three with on-going initiatives that finance and support black-owned fleets consistently improving its BBBEE status.

Operationally, MAN Truck and Bus SA has entered 2012 with two key new strategic developments to enhance its customer proximity and service delivery.



Marcus Geyer, CEO, MAN Truck and Bus SRM

Solid growth in southern Africa

Apart from its strong investment focus on the BRIC states (Brazil, Russia, India and China), MAN considers South Africa and the sub-Saharan region as a key growth area for new commercial vehicle sales. Notably, 2011 marked MAN Truck and Bus SA's 50th year in South Africa while the 5000th new MAN bus rolled off the bus-body production line at Olifantsfontein.

"The streamlining of our national centre structure from three business units to two; namely MAN Centre North (headed by management board member, Mike McDonald) and MAN Centre South (headed by new management board member, Brenden Duthie), will enable us to leverage synergies that exist within these broader markets more effectively," says Marcus Geyer, CEO, MAN Truck and Bus SRM.

"Furthermore, MAN Truck and Bus SA has implemented a new customer relationship management program that will monitor customer complaints from a centralised point and ensure swift resolution of issues arising from all areas of our operation. These developments, in conjunction with our class-leading products, form a solid platform from which we can continue to offer unprecedented service to our clients, helping promote their business efficiency in an increasingly stringent commercial transport environment," concludes Geyer. ▲

The inclusion of Volkswagen trucks and buses to its product portfolio has assisted MAN Truck and Bus SA in improving its overall market share in both segments.



Bruce Dickson, Deputy CEO, MAN Truck and Bus

MAN's market share in the new truck segment of the southern African Customs Union (SACU) has increased steadily since 2009, registering a 10,6% market share in 2010, rising to 11,1% in 2011. MAN's new truck market share

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Swedish plane crash rescue ends as body parts are found

The Swedish hunter battalion searching for the Norwegian Hercules in Kebnekaise, Sweden

Photo: Norwegian Armed Forces

A Royal Norwegian Air Force Lockheed Martin C-130J Super Hercules military transport aircraft crashed into the western wall of Mount Kebnekaise in March 2012. The aircraft disappeared from radar over the Kebnekaise mountain range near Kiruna in Sweden. All five on board were killed.

Swedish police called off the rescue operation after searchers recovered human remains from the site of the Norwegian military plane crash on a remote peak in Sweden's high north. A total of five people (a crew of four plus an extra officer) were aboard the aircraft when it crashed. All of them were Royal Norwegian Air Force officers and "among the most experienced" in the Norwegian military, according to the head of the Norwegian Armed Forces.

"We have found some body parts and we have made the overall decision that there is no chance to find anyone alive after this accident," said Boerje Oehman, information chief for Sweden's northern police district.

Following the accident, a search effort led by Swedish rescue service was launched, but was hampered by snow, wind and cloud cover, impeding helicopter reconnaissance. A Norwegian P-3 Orion aircraft, participating in the search, spotted an orange or red object on the ground in the Kebnekaise mountain range. Danish helicopters attempted to locate and identify the object, but due to the weather conditions, the search was called off before any finds were made. Later thousands of pieces of wreckage and debris were located at the site identified by the Orion aircraft. Some of the parts showed burn marks and smelled of kerosene. Footage recorded by the Orion plane showed what appeared to be soot and ashes spread over the side of the mountain. Through the use of search dogs, human remains were discovered and relocated for DNA testing, and subsequently the search for survivors was called off since it was believed that all five people on board had been killed and the aircraft destroyed. Efforts were refocused on an accident investigation.

"Parts of the airplane were strewn over a large area," said General Harald Sunde, Norway's armed forces chief.

Heavy snowfall, fierce wind, glacial crevasses and the risk of avalanche hampered rescue teams and delayed discovery of the impact site. Norwegian patrols assisted Swedish rescue climbers rappelling into the glacier area where the wreckage was spread.

The Hercules, built in 2010, had been en route to Kiruna, Sweden, from Evenes air base in northern Norway when it disappeared. It was taking part in Cold Response, an exercise organised by Norway involving over 16 000 military personnel.

The plane left Evenes Airport at 13h40 and was scheduled to arrive at Kiruna Airport at 14h30. The aircraft was participating in the "Cold Response" military exercise, which also involved forces from Germany, Britain, Canada, Denmark, France, the Netherlands, Sweden and the United States. The aircraft appeared to have flown straight into the western

Modern fire fighting facility launched in Gujarat, India

Asia's first modern facility for live fire fighting demonstrations, at an oil-fired zero discharge prop, has recently been launched.

The new facility has been set up at the Institute of Fire Safety and Disaster Management Studies (IFSDMS), in collaboration with the Fire Science Academy (FSA), University of Nevada, Reno, USA. Vadodara and Bharuch districts have emerged as hubs for the chemicals, petrochemicals and pharmaceuticals industry over the last few decades.

Spanning an area of 40,5 hectares, the Institute would provide advanced emergency response training at the flammable liquid fire fighting training centre, said Vikram Mahurkar, chairman and managing

director of the Checkmate Group, which has set up the Institute. The group offers safety and security to over 800 industrial clients across India.

The Institute has also tied up with the Indira Gandhi National Open University (IGNOU) to offer diplomas in fire fighting and protection, crisis and disaster management, rescue, hazardous materials management, incident command and instructor training.

Officials from various industries across the hydrocarbons sector, petrochemicals and other industries watched the live demonstration organised by the FSA experts.

The 14-year-old Institute has so far trained over 2 100 firemen, providing 90 per cent of them campus placements.

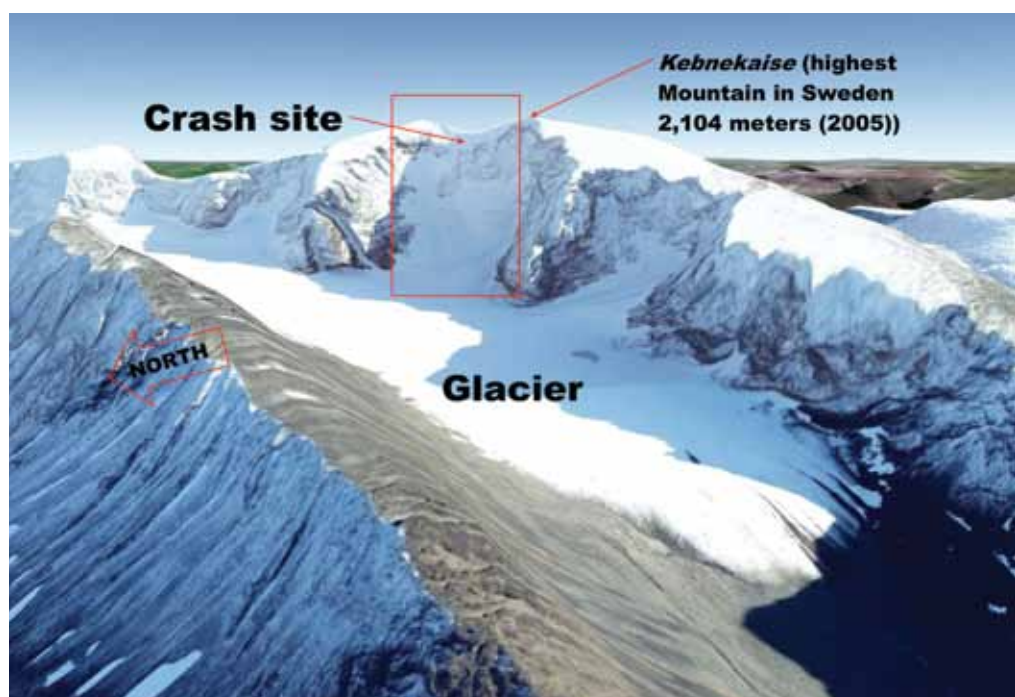
The Gujarat Chief Minister, Mr Narendra Modi, commented that the western State has emerged as India's petrochemical hub because of its sound disaster management policy. The policy was put in place following the devastating temblor that hit the state in 2001, causing massive damage to its infrastructure.

Speaking after inaugurating Asia's first modern facility for live fire fighting demonstrations, at an oil-fired zero discharge prop here, he said following the earthquake, Gujarat became the first state to formulate a Disaster Management Act, equipped local organisations with fire fighting equipment and created awareness in schools. Gujarat's moves were later considered by the centre, which then requested the other states to follow suit. ▲

- wall of Kebnekaise, Sweden's highest mountain. According to a police spokesperson, the aircraft probably exploded after crashing, setting off an avalanche. Human remains were found in the avalanche area.

The radar plots show the aircraft maintained a straight course over the last 50 km of the flight until impact, in line with the planned route. The plots did not indicate tactical low-level flying, although that was an optional plan for part of the route if weather conditions allowed. Just prior to the crash, Swedish air traffic controllers at Kiruna cleared the Hercules to descend to 2 134 meters. This altitude is just 20 meters above the height of the top of the Kebnekaise Mountain. The altitudes for the continuous radar plots remain in the possession of the accident investigation board and have not been released.

The State and War flag of Norway was flown at half-mast while His Majesty the King of Norway, fellow officers and a chaplain led a memorial service at the Evenes Air Force Base, commemorating the loss of five fellow officers.



It seems that the aircraft was travelling at high speed when it struck the top of Kebnekaise, a double-peaked mountain jutting 2 100 metres above sea level

The investigation was headed by the Swedish Accident Investigation Authority with participation of the Norwegian Accident Investigation Board. Work began on moving debris from the temporary investigative

base in Nikkaluokta near the crash site to an aircraft hangar at Kiruna Airport, but efforts were hampered by adverse weather and the discovery of further cracks in the glacier on which the debris were located. ▲



City of Cape Town's Disaster Risk Management Centre (DRMC) officially opened

The City of Cape Town, South Africa, recently officially opened its Disaster Risk Management Centre (DRMC) situated at the Goodwood Fire Station.

Greg Pillay, manager (head), DRMC, welcomed all at the official opening of the centre which included the relaunch of the DRMC website that also provided for an early warning system notification to the public.

Pillay said in his welcome address that his planning for this centre started just after his appointment as head of the centre of the amalgamated City of Cape Town in July 2005. At the time, limited funding was available for capital projects of this nature, and this led to incremental funding being allocated to this project, spread over a number of financial years. Building plans were also upgraded when ambulance service staff transferred to the centre and when additional staff were appointed with the approach of 2010 FIFA World Cup™ Event. Despite the building operations during this time, a high functionality of the Disaster Risk Management Centre continued throughout.

Pillay further explained that the purpose of a municipal disaster management centre is best summed up by the National Disaster Management Framework of 2005's key performance areas ie:

- Institutional capacity
- Disaster risk assessment
- Disaster risk reduction and
- Response and recovery

Add these key areas to the three enablers of information management and communication; education, training, public awareness and funding arrangements for disaster risk management.

These seven imperatives, seen against the background of what constitutes the purpose of a municipal disaster management centre, provides one

with tangible means to evaluate performance of such a centre.

The support by political principals in preparations for the 2010 FIFA World Cup event, has seen the institutional capacity of the Disaster Risk Management Centre of the City of Cape Town expand to 83 personnel, with 60 vehicles and 35 specialist trailers, as well as adequate offices and buildings, that included headquarters, four regional offices strategically situated throughout the city, an alternative disaster operations centre and a training centre.

Pillay elaborated and stated that the centre also maintained an active Disaster Management Volunteers Corps of 224 persons that was spread throughout the city into 11 volunteer units. These volunteers received continuous training in first aid, basic fire fighting and were also being trained as traffic wardens to undertake point duty in times of emergency.

"A comprehensive Disaster Risk Assessment that consisted of a scientific hazard analysis as well as a community-based risk assessment was recently undertaken for the City by a national service provider over a period of 16 months," said Pillay. The information obtained in this study was being used to prioritise



Greg Pillay, manager (head), DRMC



Chris Konings, Head: Corporate Planning and IDP, DRMC



George Killian



Chris Konings explained the procedures and workings of the 'Koeberg' ops room

▶ the disaster risks of the City, and a strategy was being put into action, ensuring the formulation of hazard-specific, disaster management plans, after wide consultation with relevant role-players in the public and private sector, through task teams, that identified leading and supporting functionalities.

Three flagship projects were detailed by Pillay ie: the Winter Preparedness/Flooding Task Team, the Festive Season Planning Committee and the Koeberg Nuclear Emergency Plan. He said that these working groups consisted of multi-disciplinary role-players that undertook detailed analysis of the issues surrounding the hazards applicable, and implemented remedial action through line function departments and role-players that resulted in collective risk reduction for the respective seasonal situation and the nuclear power plant.

Pillay concluded that the DRMC co-ordinated and managed a number of emergency incidents and disasters over the years, such as the 2008 xenophobia crisis, stranding of the SELI 1 vessel at Table View, Metrorail strike, large scale vegetation and mountain fires, flooding incidents, implosion of the Athlone cooling towers etc. The centre also monitored the 2010 FIFA World Cup event and played an important role simulating the implementation of urgent public protective actions during the national nuclear regulatory exercise, as well as the annual station exercise of Eskom's Koeberg nuclear power station.

George Killian thanked the PDP's in his speech. When questioned, he stated the PDP's stood for Passionate Disaster Practitioners.

Chris Konings presented the revamped DRMC website, which also provided for an early warning system notification to the public.

The keynote address was delivered by Alderman JP Smith, Mayoral Committee Member for safety and security. Alderman Smith said that the DRMC played an integral and important role in maintaining the safety and security of the citizens of Cape Town.

"Over the past five years, a capital investment of R62,1 million with an operating budget total of R362 million was allocated to the Disaster Risk Management Centre. The operating budget figure provided was influenced and inflated by the costs to the City of the xenophobia crisis in 2008 that amounted to R206 million, of which National Treasury only reimbursed R17,3 million of this cost," stated Alderman Smith.

"An example of international best practice worth mentioning was that in the light of recent fire disasters at old age homes/retirement facilities elsewhere in the country, the Centre made the decision to take pro-active action and implement an integrated approach to disaster risk reduction at these facilities. This involved a full review and update of emergency plans undertaken by the City's Disaster Risk Management Centre, fire inspections to ensure compliance

with recent legislation undertaken by the City's Fire and Rescue Service, and public awareness sessions conducted by the City's 107 Public Emergency Communication Centre," said Alderman Smith.

"The DRMC also boasts a fully equipped Geographic Information System (GIS) that assists with mapping of hazards and risks and representing this information geospatially. "

"A total of 569 public safety and disaster risk reduction planning initiatives were implemented. A total of 473 candidates from commerce, industry and institutions were trained in the Fire Warden's and Emergency Co-ordinator's Training Courses, and 39 candidates were trained in crowd management at the event safety courses."

"Public education and awareness campaigns included a total of 68 sessions at 40 pre-identified informal settlements, raising awareness of the hazards of fires and floods", Alderman Smith concluded. ▲



The official opening of the DRMC by Alderman JP Smith



One of the Working on Fire dispatch and coordination centres

Dispatch and coordination: bedrock of the fire fight

By Carol Campbell

Dispatch and coordination in South African wildfire fighting have evolved in tandem with the Working on Fire Programme into a skilled and respected profession within the emergency services. It is a part of the incident command system (ICS) that is globally acknowledged as the most effective way to tackle major incidents. Yet the dispatch and coordination function, now considered an indispensable support function, is a new profession in South Africa.

In 1985 three devastating wildfires destroyed 12 500 hectares of plantations in the old Eastern Transvaal. Four people died on September 12, a day that would come to be known as Black Thursday. Afterwards the foresters and the spotter pilot who had fought

the fire, met in the Nelspruit library to talk about what could be done to prevent such devastation from happening again.

The biggest problem they identified was their inability to communicate with the land owners during the fire fight. Out of that meeting one of South Africa's first fire protection associations was born. Johan Heine, now Managing Director of the FFA Group, was among those in the library. As a spotter pilot he had first-hand experience of how frustrating it was to see where resources were needed but no way of efficiently conveying what he saw to people on the front line. To address the communications shortfall, his wife, Lizette was put to task and the first dispatch centre was established.

Taking her baby daughter along she set up office in a room the

size of a broom cupboard at the Nelspruit airfield where her husband was based. Lizette had limited equipment and little experience to fund her one-woman dispatch centre.

"To test the wind direction and speed I tied a strip of toilet paper to a wire," she laughs, remembering back. Using a notebook and a pencil she made graphs and documented manual Fire Danger Index (FDI) calculations. She rang the weather service to find out whether they were expecting rain or gusting berg winds. She listened to experienced weather forecasters, fire fighters, foresters and pilots to build her understanding of wildfire. The Australian MacArthur Fire Danger Rating system was adopted and adapted to calculate and forecast fire weather. The same system is still in use today. ▶

►“I was tasked to listen in on the frequency used by the isiZulu and Swati-speaking forestry workers,” she said. By recognising only two words “makhulu mlilo”, which mean big fire, she was able to alert the pilots of a forest fire - the only “early warning” system available at that time.

In 2003, with the birth of the Working on Fire Programme, which is administered and run by the FFA Group, the critical role of dispatchers was established as a core function in fighting wildfire. There were still very few dispatchers in a male-dominated, emergency-driven environment. It was a 24/7 job, but, out of the fire season, there was no work.

“Even now it’s hard for people to commit to a vocation and gather much needed experience that only pays for five months of the year during the wildfire season,” Lizette said.

It remained a job that drew women. All of South Africa’s founding dispatchers were women although the number of men is increasing.

“Women do well as dispatchers,” says Lizette, who heads the department. The ability to multi-task, keep calm and firm in an emergency environment with a high emotional intelligence are female traits, she adds with a wink.

As the Working on Fire resources expanded, a coordination function became necessary to support the developing integrated fire management system and provincial coordinators were appointed. To be able to escalate the liaison from ground level through to a national level, a national coordinator was also appointed.

In 2007 Michelle Kleinhans, a former traffic officer, was appointed as the national coordinator to work with the team. For four years she was the calm voice on the other end of the phone who could provide operational information about Working on Fire resources, their deployment, fire status and weather outlooks. She was also tasked to coordinate

the national support efforts during escalating major events.

Due to the continuous dispatch staff turnover, an inevitability of seasonal work, as well as the growing need to



The dispatch and coordination centres are the bedrock of the fire fight

supply trained wildfire dispatchers, it became necessary to establish a full time training portfolio to maintain the standards of the departmental personnel. In August 2011 Michelle was appointed the dispatch and coordination training and development manager.

Lizette and Michelle, with inputs from their team, are now consolidating their combined knowledge in a training manual, the first of its kind in South Africa, for wildfire dispatch and coordination staff.

“Continuous training of dispatchers will support the full spectrum of emergency service call centres in South Africa,” says Michelle. It will also be a way for dispatchers to find year-round work in other disciplines.

With international exposure to the wildfire dispatch and coordination functions in leading first world countries, knowledge transfer and exchange programs, it is evident that South Africa will need to consider, in the long term, a national dispatch and coordination system, similar to the American 911 model.

Michelle handed the reins of national coordination to Chris Barnard who is based at the Centre for Scientific and Industrial Research (CSIR) in Pretoria, from where he also interacts internationally. The

role of the national coordinator is now supported by information and communication technology with access to early warning and detection, a far cry from its humble beginning.

“We receive our information from two satellites moving over Africa which are used by the Meraka Institute. These satellites provide imaging that enables WoF to locate wildfire and identify fire endangered areas. They can provide information on the availability of water and the size of fuel loads,” he says. This information is of exceptional value as it also covers the outskirts of the rural communities.

The availability of real time mapping and information on wildfire, known as the Advanced Fire and Information System (AFIS), means that the WoF Programme can respond effectively locally and is also ready to move beyond the borders of South Africa. There is a trilateral pioneer project running, where one component can offer a dispatch and coordination function to other countries in the Southern African Development Community (SADC). ►

Elephants flee Mount Kenya fires



Major fires on the slopes of Kenya's tallest mountain sent big game animals like elephants fleeing for their lives, as wildlife agents and British troops were fighting to put out several fires, officials said.

The flames consumed hundreds of hectares of forest on Mount Kenya, said Paul Udoto, a spokesperson for the Kenya Wildlife Service. The fire covered the spiky mountain in a haze of smoke. Mount Kenya is the second-highest peak in Africa, at 5 199m. Strong winds fuelled the fires and harsh weather hampered the suppressing efforts. The fires engulfed the Kenyan tropical rain

forest belt and destroyed most of the indigenous trees, thousands of acres of dry grasslands at moorlands and endangered thousands of wild animals in the area. Thousands of indigenous trees and bamboo, which are over 100 years old, were reduced to ashes and millions of micro-organisms killed.

"There were fires all over the place," said Iain Douglas-Hamilton, the founder of the group Save the Elephants. Fires were also burning in the nearby Aberdare National Park. Douglas-Hamilton said the fires will deprive animals of food and that he expects some to get caught in the flames.

Simon Gitau, deputy warden of Mount Kenya National Park, said the cause of the fires was not known, but 90% of the fires in Mount Kenya are caused by human activity, either poachers or honey gatherers. "Sometimes it's accidental like a cigarette butt that hasn't been completely extinguished," he said.

Captain Maz Kingston, a spokesperson for the British army training unit Kenya, said the British military helped carry out an aerial assessment of the fire, and provided command and control for the fire fighting response. British military vehicles assisted in moving fire fighters close to the flames. ▲



The WoF dispatch and coordination centres are linked to the fire detection centres

▶ Working with the WoF Programme, as part of the project, is Professor Johan Goldammer, a senior scientist at the Max Planck Institute for Chemistry, Biogeochemistry Department. He is head of the Fire Ecology Research Group and the Global Fire Monitoring Centre (GFMC) which is Germany's contribution to the United Nations International Strategy for Disaster Reduction (UNISDR).

With the support of the GFMC, two components of WoF and the CSIR are taking tentative steps into Africa to set

up inter-continental collaborations that allow for knowledge sharing on issues relating to wildfire.

"The first country that has expressed interest and opened political channels to allow a flow of information is Tanzania," says Chris. Information and technology generated by AFIS at the CSIR, means the whole of the SADC region is poised to benefit from what started as a South African government job creation initiative.

An additional milestone in the technological support to the dispatchers, are the roll out of phase one of the newly developed dispatch software, that was created as a wildfire add on component to an existing software program developed by Umoyo. The program called Fire Web, is web-based, and is being developed with the inputs of the accumulated experience of the dispatchers and coordinators. The beauty is this program will talk to other components and software applications within the fire environment and has the capacity to be adapted to serve other developing countries where there

are partnerships with the FFA Group "The dream is for all of us in sub-Saharan African to work together on a regional approach to wildfire and the environment," says Chris.

"What we need now is for political leaders to open the doors so that relationships and agreements can bear fruit."

The days of one woman with a strand of toilet paper on a wire are long gone. Lizette's function has been expanded into two teams of well-trained seasonal dispatchers, typed according to the training they have received and levels of experience, reporting into a system supported by provincial coordinators, overseen by the national coordinator. New technology has given wildfire dispatchers and coordinators access to some of the most advanced and specific information ever available. The experience, dedication and passion of individual people who share what they know, exists. The door just needs to be opened and the red tape snipped so that the whole of Africa can walk the trail that was blazed by a handful of dedicated South African women. ▲

2012 fire season – are we ready?

By Ben Potgieter

“When weather and fuel conditions are at their worst, fires will burn when and where they want to. Once a fire starts to spread, no force of fire fighters, regardless of the size of that force, will control it.”

Fire is a good servant but a poor master

The statement above sketch the 2007 fire season environment, now five years later, we approach the 2012 fire season with changing weather patterns and high fuel concentrations. Did landowners fully implement the proposed recommendations and suggestions for improvements after the disaster fires during 2007?

In preparing for the worst-case scenario, it would be beneficial to refresh memories.

Some fire prevention and fire readiness critical success factors are:

- Understand local fire risks and hazards
- Mitigate high-risk scenarios in conjunction with neighbours and local fire protection associations
- Strictly follow the standard operating procedures of local FPA's
- Train staff and communities in fire risk management
- Ensure that resources match the risk scenario
- Closely monitor local weather conditions and fire danger indexes
- Act according to the local standard operating procedures as set out by the local FPA
- Work together with FPA's in developing a radio communication plan
- Develop cooperation procedures with neighbours

- Respond to smoke reports during high FDI periods in an over kill mode

The current international emphasis on climate change suggests that extreme events will become more frequent. Weather is out of our control but the drumbeater for the fire season.

Changes in weather patterns is a given.

- Do we understand what is happening?
- How do we respond towards the changing environment?
- Do we understand the implications?
- How do we change our strategies

to ensure the sustainability of the forest industry?

- Or do we fall back on our old habits?
- Landowners must closely monitor local weather conditions!

Fires must be contained while they are still small; this is only possible through early detection and quick response. Readiness of all resources is the remaining tool in the toolbox to ensure quick response and to keep fires small. Follow the drumbeater, ensure readiness of all resources, and take no shortcuts during high fire danger periods.

Fire is a good servant but a poor master! ▲



Weather is out of our control but the drumbeater for the fire season



Trench ventilation should be on-going throughout the trench rescue operation

Trench collapse rescue – no place for short cuts

By Colin Deiner, Chief Director, Disaster management and Fire Brigade Services, Western Cape Provincial Government

If you take a drive through your city, you are likely to come across a number of construction sites which will have various levels of excavating operations taking place. In these excavations you will most likely find a fair number of workers going about their specific tasks oblivious to the fact that the trench they are in could collapse at any second, without warning, and kill them instantly or place their lives at great peril. As emergency services, we are expected to respond to these incidents, in most cases as a first response capability. Although most first-response organisations may not be trained in this area, they can take specific actions to help ensure a successful rescue.

In the course of this article, I will attempt to provide some useful tips on how to go about doing just that.

What is a trench?

There are a few definitions for a trench. The construction industry and occupational health and safety types will generally have their own definitions for the various types of trenches they work in. The most important thing for them is to adhere to the OHS Act regulations which do

not allow any employer to require or permit any person to work in an excavation which has not been adequately shored or braced.

For emergency responders the simple definition of a trench is “an excavation that is deeper than it is wide”.

Trench collapse – the truth

As in many rescue disciplines, a number of misconceptions and fallacies related to trench collapse are out there. Many of them have been sprouted by contractors or rescuers choosing to take a short-cut when working in a trench or conducting rescue operations. Some of the more common fallacies you are likely to encounter are:

- Accidents only occur in deep trenches
- Most incidents occur in bad weather
- Clay is the least dangerous soil type
- Once a collapse occurs, the trench is safe and
- “He’s just buried up to his legs, let’s just yank him out”.

The truth of the matter is unfortunately mostly the opposite:

- Most accidents occur in trenches of two metres and less ►

- ▶ Incidents generally happen in good weather
- Clay is deceptive
- A collapsed trench has a fifty percent chance of a secondary collapse and
- The forces of moving earth are huge. The patient must be totally uncovered before being removed.

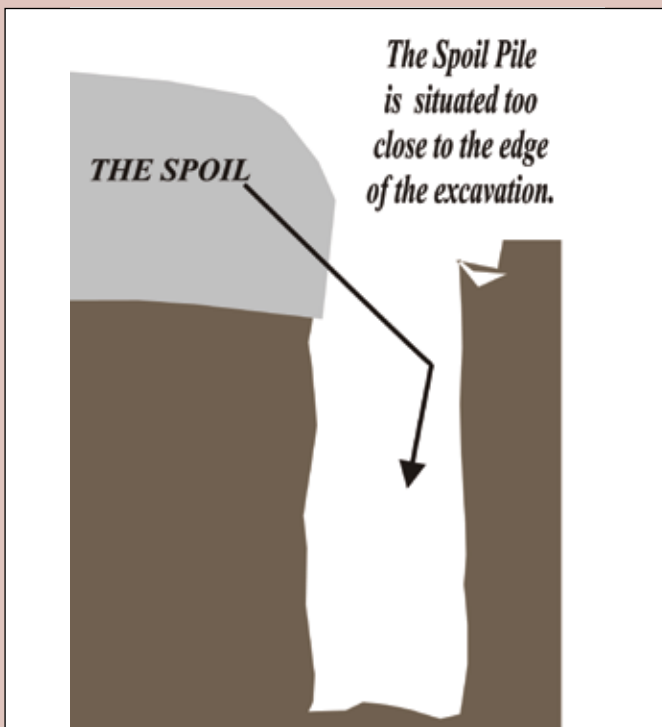
The main thing to understand here is that a trench collapse happens at a great speed (around one-tenth of a second). You can't outrun it. The weight of a collapse must also not be underestimated. A simple lip slide could drop up to a half ton of soil on your chest. More people die from the force of the collapse than from suffocation.

Why do trenches collapse?

People enter and work in trenches for a variety of reasons. There are therefore a number of reasons that trenches may collapse, the most common being due to soil disturbed by earth moving equipment or hand tools. In a trench network configuration you will also find weaknesses of the system at areas where trenches intersect. The vibration of nearby heavy plant and machinery has been another reason for trench collapse. There are also recorded cases of trench walls drying out and collapsing after being left open overnight or for an extended period of time. Seepage of subsurface water and inclined layers of soil too close to the lip of the trench are other factors that could have an influence on trench stability and need to be managed carefully.

In the main there are five ways in which a trench can collapse:

The spoil pile slide



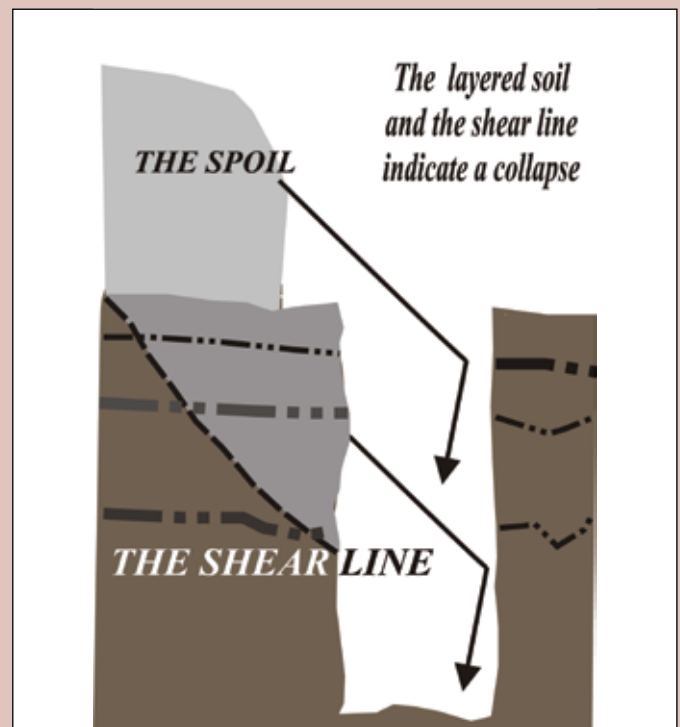
These types of collapses are very common and occur when soil is piled too close to the edge of the trench. A number of factors can cause this type of collapse such as the pile reaching a critical height or slope, becoming saturated with water or being disturbed by heavy machinery vibrations. This type of collapse might



The entire area surrounding the trench must be made safe before any rescue operations can commence

not cause serious injuries initially but could cause further collapse of the trench wall through its weight. Rescue operations on this kind of trench are initially difficult since the remaining spoil pile will need to be cleared from the area and trench protection must be laid down before rescue efforts can commence. Conducting a rescue is relatively simple as you don't have any collapsed walls that need to be stabilised before inserting trench sheeting around the victim.

Shear wall collapse

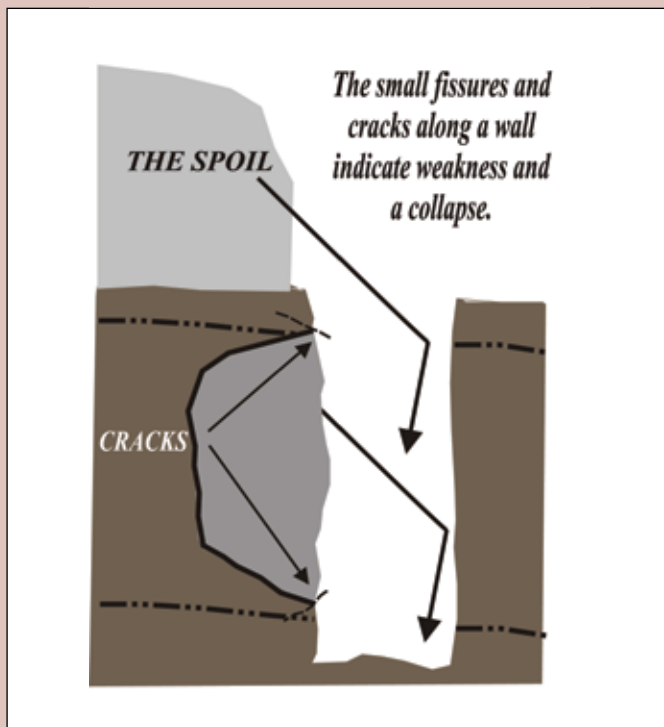


These occur mostly in clay or layered soil. They usually are catastrophic, happen very quickly and cause death or serious injury to the victim. Rescuing victims from this time of collapse can be extremely difficult and time consuming.▶

Trench collapse rescue

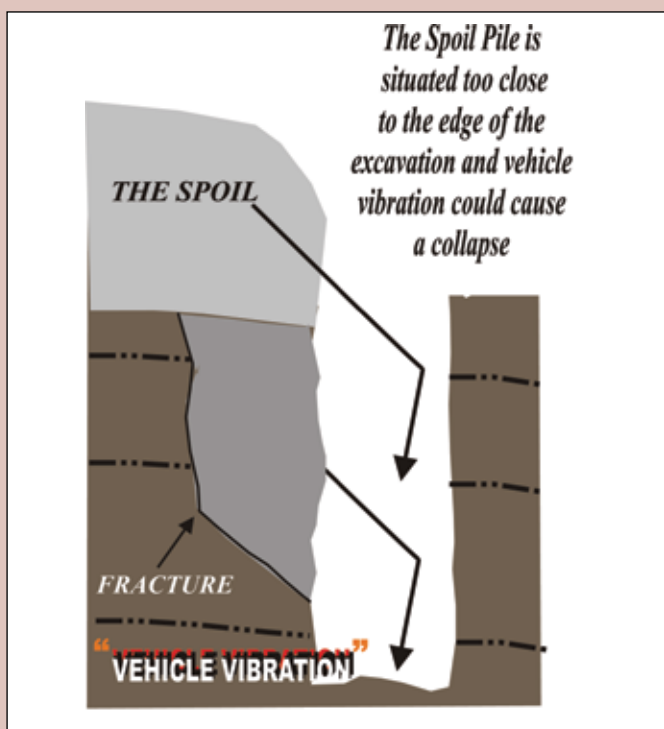
- ▶ This is due to the challenges encountered in shoring up the slope of a wall where the collapse has occurred.

Slough-in



This normally occurs in areas close to underground utilities or where moving water is present in the trench. This type of collapse is usually rapid and buries the victim, often suffocating the victim. Rescuing victims is very challenging and dangerous due to the shoring problems caused by the overhanging wall and indentation of the wall.

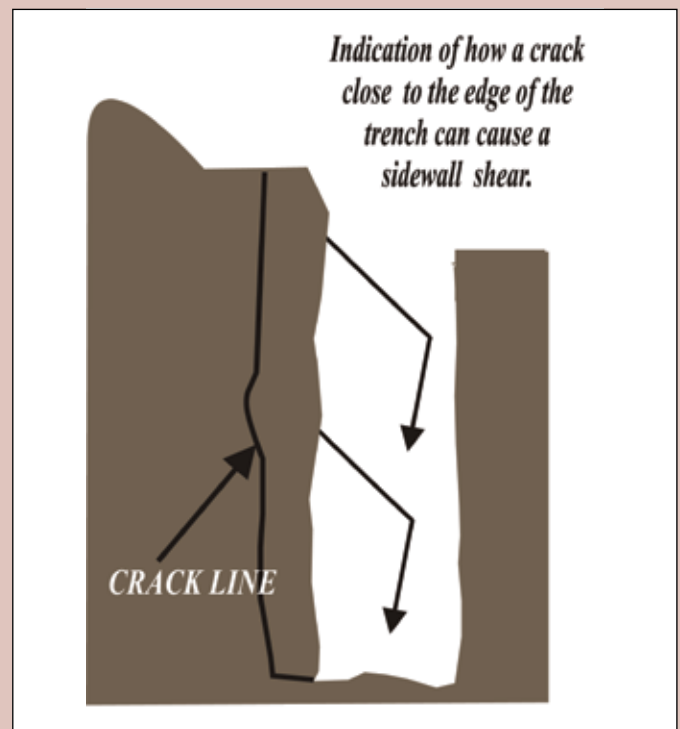
Lip slide



This is similar to the shear wall collapse but smaller and less severe. The lip slide normally occurs when the spoil pile is placed too close to the trench and its weight causes

the lip of the trench to fracture and allow the spoil pile to run into the trench. Rescues from this type of collapse are relatively simple but care must be taken to recognise signs of a secondary collapse.

Side wall shear



This collapse is caused when an entire wall of earth shears away from the side. Depending on the size of the separated wall, this is an extremely dangerous collapse.

First-response units: actions

One thing any rescuer who has responded to a trench collapse will tell you is to be prepared to be there for a long time. Trench collapse rescue operations require a strong incident commander with a good understanding of the many dynamics of such an incident. He/she must understand the safety implications of the victim and rescuers, the degree of entrapment, when to rotate rescuers working in the trench and always be a step ahead of the activity in progress.

The first unit responding to a trench collapse must immediately establish an initial command post and position it no closer than fifteen metres from the collapsed trench (if possible). All working plant and heavy machinery in the immediate vicinity needs to be turned off and secured and an off-site staging area for later arriving units must be identified and clearly indicated.

They can now perform an inner and outer survey of the collapse area. This entails designating an imaginary "circle" around the collapse and moving around the circle, all the time collecting information while at the same time performing certain safety precautions.

The outer survey should initially be focused on eliminating all sources of vibration such as shutting down construction equipment and deviating traffic flow. Next on the list should be to identify witnesses and find the site supervisor. They can provide useful information such as the number of ▶



Trench rescue training conducted by Portland Fire and Rescue



Collapsing side walls were a common feature at this location

- ▶ people that were in the trench at the time of the collapse, the location of the victim(s) and any other details that may be important to note. The site supervisor may also be able to supply sheeting which can be used to lay out around the top of the trench as a safety platform for rescuers.

It may also be worth it to consider using the site office as a command post. This would be especially helpful during bad weather.

Once the outer survey is completed, an incident perimeter should be established that should be kept clear of all non-essential personnel.

The inner circle survey should firstly focus on establishing approach lanes to the trench. This is done by laying down plywood boards, starting from a safe area and working towards the location of the victim(s). At this point the number and position of the victims should be ascertained. Rescuers can also try to establish the condition and level of entrapment of the victim but should take care not to lean into the trench due to the possibility of secondary collapse.

Trench collapse unit operations

The arrival of the trench collapse unit should escalate operations to a higher level and will commence with the clearing of excess ground around the trench and laying of plywood trench boards to create a safe working area. This is achieved by spreading the weight of the rescuers working around the trench over a larger area by means of the trench panels. This area will never be perfectly safe and rescuers must take care in not crowding onto a particular spot. They should also be vigilant and note any soil abnormalities (such as stress cracks), the composition and moisture content of the soil.

In certain cases the trench might be contaminated with methane gas or could present various levels of oxygen deficiency. The air in the trench should be monitored at least two levels and, if necessary, ventilation should be initiated.

Incident command is as important in trench rescue operations as anywhere else and your initial command staff should consist of an incident commander, a rescue sector officer (who should be responsible for the actual extrication), an EMS officer (who will be responsible for patient care), a shoring officer (who will oversee the measuring, cutting and placement of the shoring timbers) and a safety officer who will be an extra set of eyes and ears for everyone. The safety officer will monitor everyone in the hot zone's actions, soil conditions and check for signs of secondary collapse. He/she is also responsible for on-going gas monitoring inside the trench.

The incident command staff should ensure clear command sectors and make sure that all people working on the site adhere to it. The command sectors should consist of the following:

- Hot zone: the trench
- Warm zone: equipment staging area, briefing area and command post
- Cold zone: rehabilitation area, apparatus staging media and victim's relatives or friends

Medical considerations

My very poor knowledge of all things medical will limit my input here to only a few thoughts. It will be extremely difficult to do a thorough medical report early on due to the fact that your medic might not be able to reach the victim and may have to do it from a short distance without actually making contact. The medic will have to make certain assumptions based on the type of collapse as well as the position of the victim.

Even in the most dire situation where a patient is in imminent danger of losing their lives, a medic should never enter an unshored trench to administer emergency care. Almost as many people die in secondary trench collapses than in the initial collapse. There is no place for short-cuts.

There are a number of conditions that can affect a victim of a trench collapse including hypothermia, respiratory▶

Trench collapse rescue

► distress, spinal injuries, crush syndrome, head injuries and suffocation. When dealing with a badly trapped, live victim, a strong possibility of crush syndrome will exist. A medical doctor or at least an advanced life support paramedic should be available in the trench with the patient for the entire duration of the extrication. The medic's prime responsibility will be the administration of sufficient fluids to counteract the release of toxins during the release. You don't want to spend hours extricating a patient only to find that they have died from crush syndrome a short while later.

Hypothermia can become a problem at night or in cold weather and will be exasperated by wet soil. Considering the fact that many trench collapse rescue continue for many hours, it will be necessary to keep the patient warm for this period.

As mentioned earlier, many people think that it is possible to yank a victim out of the trench if he/she is only trapped up to their knees or ankles. Never do this!! There could be a possibility that a rock could be causing a foot entrapment or the victim could have suffered a fracture or dislocation which will only worsen his/her current situation. I have, on a few occasions, fallen victim to this temptation, only to meet with no success and ended up still digging the patient out two hours later.

Shoring the trench

Before anyone can enter a trench, it must be adequately stabilised and this is done by means of mechanical shoring or using timber. The concept of shoring is based on the "double-funnel" principle which entails the collection of the load (and force) and then redirecting that force against another load. This concept provides a system that is strong enough to prevent soil from starting to move, but not strong enough to stop moving the moving dirt.

Mechanical shoring has a number of advantages over timber shoring as it is lightweight, quick to deploy, versatile and very strong. The versatility is really important when adaptations have to be done in the length of the timbers (you can't increase the length of a piece of wood). Unfortunately mechanical shores are expensive and have a limited working range.

Although timber shoring is heavy and can only be used once it has a relatively low cost and virtually limitless application. The ideal solution is to have a combination of the two which will allow you a rapid shoring ability to make the immediate area around the victim safe while also allowing you to prepare a more stable working station and address any difficult angles that may present themselves.

A trench rescue team must be used to working with each other and be able to communicate clearly. Especially when the person measuring the size of the trench is relaying the length requirements of the timber to the cutting station.

When planning the shoring operation a size-up must be done this must take the following into account:

- Depth of trench
- Width of trench
- Soil type
- Entry point
- Weather conditions

- Spoil pile
- Exit point

Other possible impacts such as the water content in the trench, impact of nearby loads, location of victim(s) and the angle of the collapse must also be considered at this time.

The most important thing for any incident commander to understand is that the shoring operation is going to take a long time. Other than ensuring effective patient care for this time, you should also consider providing rehabilitation facilities for all involved and ensure sufficient water and food as well as cooling and heating (depending on the weather). Make a note of the time of day and try to benchmark the various objectives and the time it will take to achieve them. Order lighting early if the incident is going to run into the night and make arrangements for any changes in weather. Also plan for relief crews and arrange for cover companies to staff fire/rescue stations that might be depleted due to this lengthy operation.

During a lengthy trench collapse incident you might encounter large crowds, media and even family members in close attendance. Make sure that they are kept in an area a safe distance away from the collapse area and make sure someone in your command system is looking after them.

A serious mistake made by incident commanders is that they allow scene discipline to lapse after the victim has been removed. There are a fair number of accidents recorded where secondary collapse has occurred while rescue teams have been removing the shoring after removing a victim. All shoring must be removed in reverse order of the way they were placed in the trench. If the removal of certain shoring struts or panels could lead to a further collapse, it might be advisable to leave them in place and attempt removing them at a later date with the help of earth moving machinery. If timber shores were used you might not have to bother.

10 steps for successful operations

In closing, I include a quick checklist of 10 steps which need to be followed to ensure a successful operation.

1. Preparation: train often and prepare your equipment for a rapid deployment
2. Response: respond with all you need. You can always cancel unnecessary units later
3. Assessment: determine number of victims, their condition and what they were doing at the time of the collapse. Determine your mode of operation (rescue or recovery). Assess the type of collapse. Establish command
4. Hazard control: park off-site. Stop nearby heavy machinery. Establish inner and outer-circle. Take air samples
5. Support: additional resources, crowd and traffic control, rehabilitation considerations
6. Gaining access: sheeting and shoring
7. Extrication: have cutting and hydraulic rescue equipment on hand for possible entrapment in utilities such as pipes or cabling
8. Patient care and packaging
9. Removal
10. Termination: be careful ▲

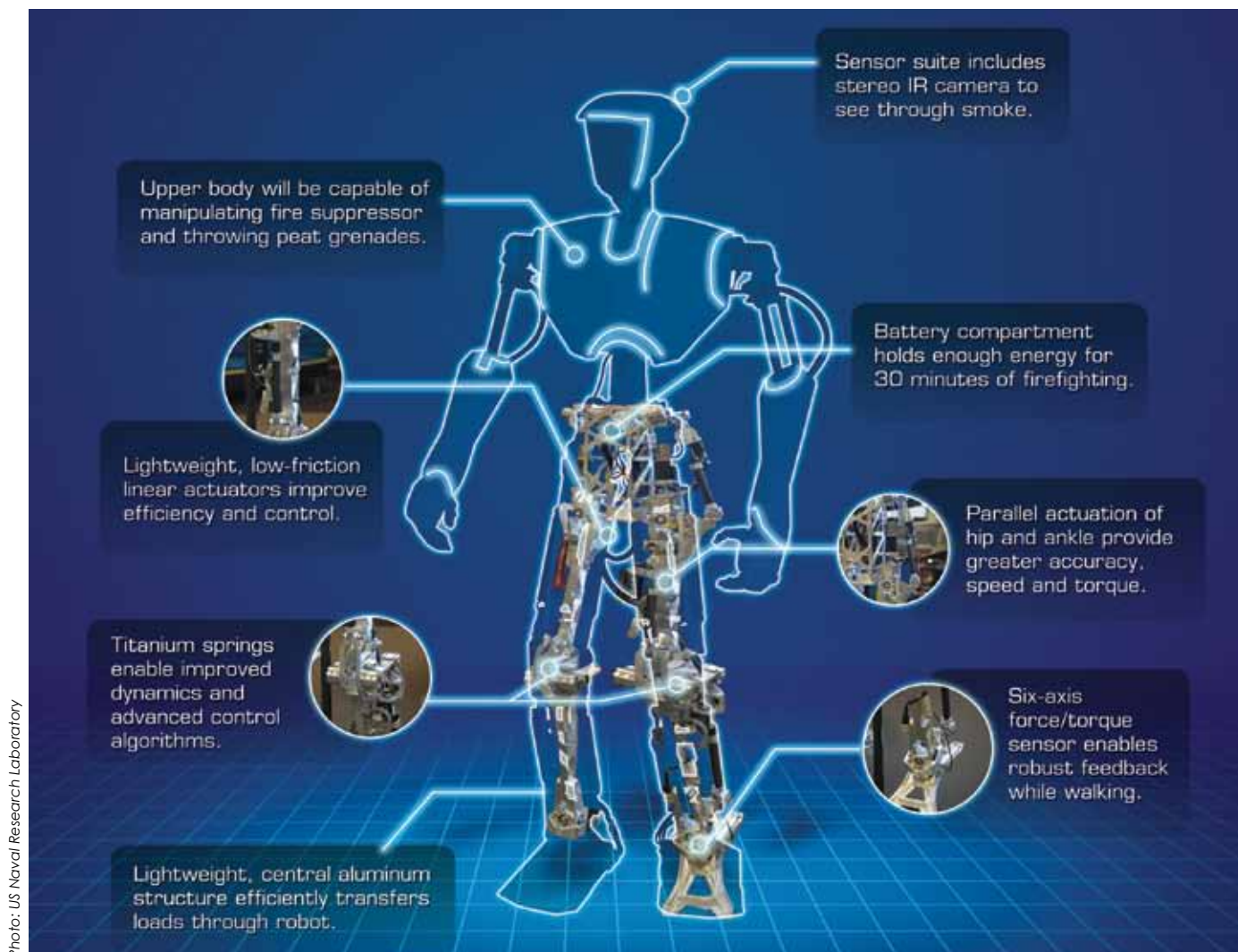


Photo: US Naval Research Laboratory

The Naval Research Laboratory's shipboard autonomous fire fighting robot (SAFFiR) is a humanoid-type robot being designed for shipboard fire fighting

Naval fire fighting robot designed

In both war and peacetime scenarios, fire in the shipboard environment is serious and frequently results in excessive damage and high repair costs because the fire is not detected or controlled adequately. To help further improve future shipboard fire fighting capability, scientists at the United States Naval Research Laboratory have formed an interdisciplinary team to develop a humanoid robot that could fight fires on the next generation of combatants.

A humanoid-type robot was chosen because it was deemed best suited to operate within the confines of an environment that was designed for human mobility and offered opportunity for other potential war fighting applications within the US Navy and Marine Corps.

The fire fighting robot, called the Shipboard Autonomous Fire Fighting Robot (SAFFiR), is being designed to move autonomously throughout the ship, interact with people, and fight fires, handling many of the dangerous fire fighting tasks that are normally performed by humans. The humanoid robot should be able to manoeuvre well in the narrow passages and ladder ways that are unique to a ship and challenging for most older, simpler robots to navigate.

The robot is designed with enhanced multi-modal sensor technology for advanced navigation and a sensor suite that includes a camera, gas sensor, and stereo IR camera to enable it to see through smoke. Its upper body will be capable of manipulating fire suppressors and

throwing propelled extinguishing agent technology (PEAT) grenades. It is battery powered that holds enough energy for 30 minutes of fire fighting. Like a sure-footed sailor, the robot will also be capable of walking in all directions, balancing in sea conditions, and traversing obstacles.

Another key element of the SAFFiR development is to allow damage control personnel and the robot to work cohesively as a team. Algorithms are being developed to allow autonomous mobility and decision making by the robot as a team member. To enable natural interaction with a human team leader, the robot will have multimodal interfaces that will enable the robot to track the focus of attention of the human team leader, as well as to allow the robot to understand and ▶

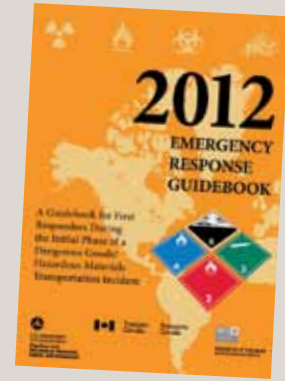
New 2012 Emergency Response Guidebook released in USA

The USA Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) recently released an updated version of its "Emergency Response Guidebook," a go-to manual to help first responders deal with hazmat accidents during the critical first 30 minutes.

"Taking the proper action during those critical first minutes has a huge impact on the safety of both first responders and the people they

serve," PHMSA administrator Cynthia Quarterman said.

PHMSA will distribute more than two million copies of the guidebook to fire fighters, EMTs and law-enforcement officers across the nation, who can use the manual to identify specific risks associated with compromised hazmat items, measures they should take to protect themselves and procedures for containing the incident as quickly and safely as possible.



The guidebook contains an indexed list of dangerous goods and the associated ID number, the general hazards they pose, and recommended safety precautions. The 2012 update includes general revisions, reorganized general information pages and new tables such as 'initial isolation' and 'protective action distances' for large spills involving six common toxic inhalation hazard gases. ▲



► respond to gestures, such as pointing and hand signals. Where appropriate, natural language may also be incorporated, as well as other modes of communication and supervision.

Researchers from Virginia Tech and University of Pennsylvania are also working with NRL on the project. They plan to test the fire fighting robot in a realistic fire fighting environment on board the ex-USS Shadwell in late September 2013.

The Navy Technology Centre for Safety and Survivability, located at NRL in Washington, DC, carries out research aimed to solve current and future Navy problems regarding combustion, fire extinguishment, fire modelling and scaling, damage control, and atmosphere hazards. The Centre has unique fire research facilities that include pressurable chambers up to a 283 cubic metre capacity at the Centres test site at NRL's Chesapeake Bay Detachment in Calvert County, Maryland. The Centre also has custody of the world's unique fire test ship, ex-USS Shadwell (LSD-15) located in Mobile Alabama, where full-scale fire and damage control tests are conducted using the reality conformations of active duty sailors. Using the ex-USS Shadwell, NRL scientists are able to enhance their technology base for introducing advanced damage control concepts to the fleet. The ship provides a unique opportunity to realistically experience a true damage control environment, to create a partnership between the technical and fleet communities, and to take advantage of new insights gleaned during full-scale experimentation. ▲

Virginia Tech and the University of Pennsylvania are working with NRL on the fire fighting robot project. NRL's fire fighting robot will be a follow-on version to the existing Virginia Tech CHARLI-L1 robot, pictured here.

Photo: Virginia Tech

The teams are trained in fire fighting and advanced search and rescue, in order to assist disaster management agencies when called upon



The High Altitude Teams pride themselves on their levels of fitness and discipline



Zandile Simama

FFA Group launches High Altitude Teams (HAT) project

The FFA Group of Companies recently formed a business partnership with Working for Water's High Altitude Teams (HAT) project, to assist in the removal, control of invasive problem plants, advanced fire fighting and mountain search and rescue.

The teams are trained in fire fighting and advanced search and rescue, in order to assist disaster management agencies when called upon. All their training is of international standard and all their courses are internationally certified. The High Altitude Teams pride themselves on their levels of fitness and discipline. HAT's core business will be to remove invasive plants from water stressed catchments, conservation areas and any area deemed important by the conservation authorities.

During March this year, four HAT project managers from around the country underwent an industrial rope access course at FFA's Nelspruit head office. They were Lourence Chiloane, Mpumalanga; Jason de Smidt,

Western Cape; Henry Nene, KwaZulu-Natal; and Rob McQueen, Eastern Cape. The week of intense training definitely paid off as everyone got excellent reviews on their assessment, which was done by Alpinist Safety Consultants in Cape Town. It was also a proud moment when one of their assessors from the United Kingdom announced that it was the best group he had assessed in 15 years.

Although these project managers are not accredited trainers, they will be able to assist new recruits with pretraining before attending the International Rope Access Trade Association (IRATA) course.

IRATA is accepted throughout the world as the number one rope access standards body.

A HAT team consists of a crew leader type 1, a health and safety representative, and seven team members, all trained in first aid.

Potential candidates are required to pass a selection process that includes

a basic fitness test, an entry level medical course and an interview. The employment of women is promoted by adapting the selection process to make it more achievable for them and also to meet the National Resident Matching Program (NRMP) standards. The fitness test is done according to the Working on Fire standard Type 1 crew physical selection where men have to complete a 2,4km run in 12 minutes and women in 14 minutes. Both genders also need to do 40 push-ups and 40 sit-ups in one minute.

Once candidates are selected they undergo 14 days of intensive training at the WoF Training Academy in Nelspruit and an IRATA course close to their area of work. This training includes all induction, life skill, advanced fire fighting, plant identification, herbicide training and environmental search and rescue courses.

To date 18 teams have been trained successfully and are undertaking projects in Western Cape, Eastern Cape, KwaZulu-Natal and Mpumalanga.

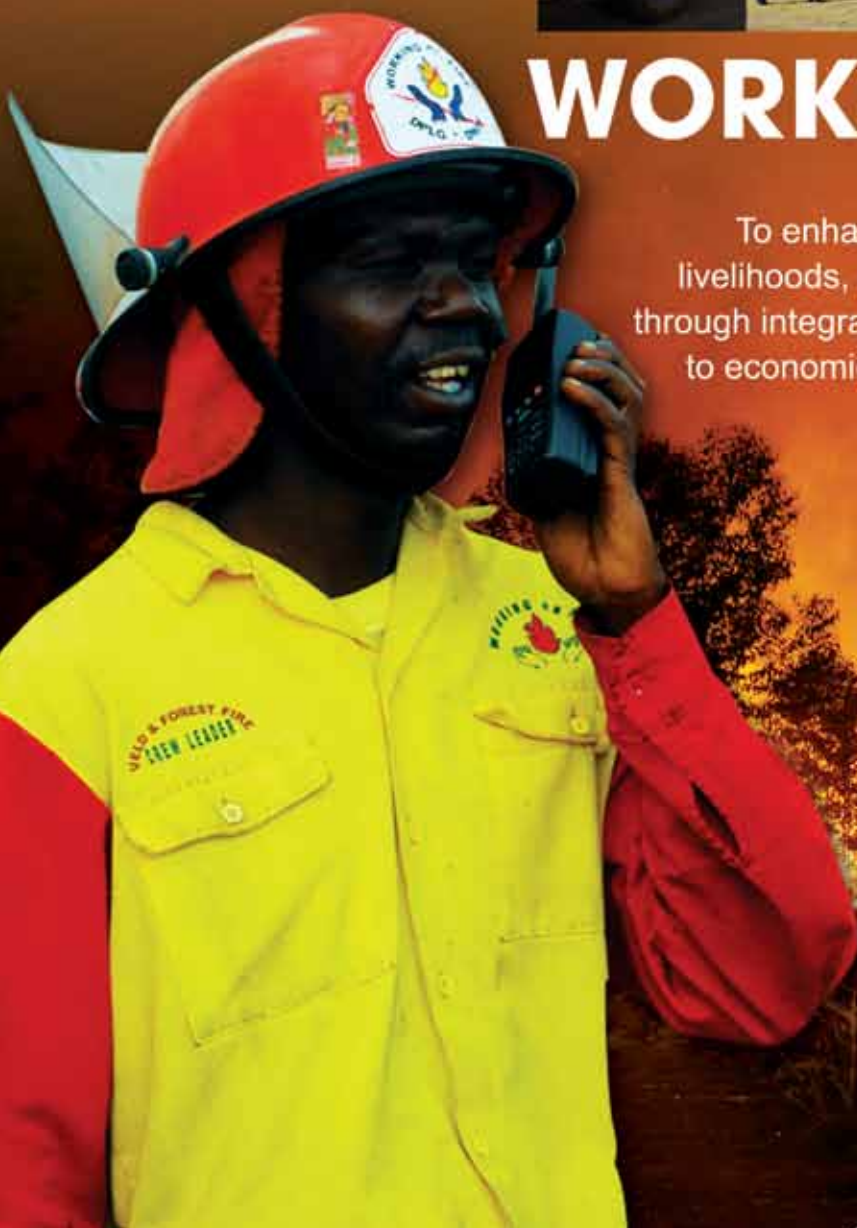
The HAT team is also proud to announce that one of their team members, Zandile Simama has been elected to assist with plant removal, mice capturing and invasive Isopod (sea lice) removal on Marion Island, situated in the Indian Ocean off the southern coast of Africa. Zandile will also be helping scientists and researchers on the island with their day to day tasks. ▲



WORKING ON FIRE

SCHOLARSHIP FUND

To enhance the sustainability and protection of life, livelihoods, ecosystem services and natural processes through integrated fire management in order to contribute to economic empowerment, skills development, social equity and accelerated service delivery.



The **WORKING ON FIRE (WOF)** Programme is one of the most successful components of the South African governments Expanded Public Works Programmes designed to alleviate poverty through skills training and the creation of job opportunities. The WOF Programme draws beneficiaries from impoverished communities and transform formerly unemployed and in some cases unemployable youth into fit, disciplined and trained veld and forest firefighters, which are deployed at over 100 bases in fire prone areas across South Africa. South Africa has created a world record proportion of women in the ranks of these firefighters, where some 30% are young women.

The impact of this programme has been widely recognized through the accolades which it has been awarded over the years. Not only has the WOF Programme made a huge contribution to South Africa's veld and forest fire fighting capabilities, but the modest remuneration which the WOF Programme beneficiaries receive is a critical relief measure from the depths of poverty experienced by so many in South Africa. Their income represents a real contribution to the lives of the beneficiaries, their families and communities where they live.

WOF beneficiaries not only receive specialized training in various fields related to their veld and forest fire fighting work but are afforded to progress in the ranks of the WOF structure to become Type II then Type I crew leaders as well as branching out into the management and administration functions in the programme. Some 84 former fire fighters have already progressed into such positions such as instructors, regional managers, media and community liaison officers, financial clerks, stores and procurement administrators, etc.

The WOF Scholarship Fund is intended to provide resources to aspirant current and former wildland fire fighters still engaged by WOF to pursue further formal training to improve their skills and knowledge. The fund will be managed by a committee consisting of former fire fighters and programme managers, chaired by the executive chairman of FFA Operations, the company implementing the WOF programme.

Contributions will be solicited from the general public, both domestically and abroad, corporate social investment resources and public and private institutions both in the form of general contributions and targeted funding initiatives. Individuals or institutions may also choose to sponsor a WOF beneficiary pursue their further studies or training. The intention will be to register the WOF Scholarship Fund as a public benefit entity to allow for tax deductible contributions from the corporate sector. All contributors to the WOF Scholarship Fund will receive annual statements on the utilization of funds and beneficiary progress.

You are urged to make a contribution to this fund which will greatly enhance the ability of the WOF Fund beneficiaries to improve their skills and knowledge and in so doing improve their employment opportunities and contribution they can make to their communities. Contributions can be made via the enclosed pledge form.

For further information, please contact:

The Executive Chairman,
FFA Operations T/A WORKING ON FIRE,
Email: Abrahams@iafrica.com
Tel: +27 (0) 82 557 5069.

Also see the WOF website at www.workingonfire.org

Or deposit your donation in the following Bank Account:

Account Name: FFA Section 21
Account Nr: 405 953 7280
Branch code: 632005
Bank: ABSA Nelspruit
Ref: Scholarship Fund



EXPANDED PUBLIC WORKS PROGRAMME
Creating opportunities towards human fulfillment



New internationally accredited fire and rescue programs for South Africa



Trench rescue training in action

The professional abilities and recognition of our fire and rescue practitioners are destined for positive change in the near future. South Africa is entering a new era with regards to fire and rescue accreditation on an international level. The International Fire Service Accreditation Congress (IFSAC) team will be visiting South Africa later this year to re-accredit the existing fire and rescue programs in South Africa and will also be considering new programs to be implemented in South Africa.

Up until 1996, trainee fire fighters in South Africa were placed on a 12-week preliminary certificate, fire fighting course. The course was designed by the Southern African Emergency Services Institute (SAESI) and consisted of 34 modules which included theoretical and practical competencies. This program served our fire fighters well; however, there was one serious shortcoming. Successful candidates were not 'portable' as this program had no international recognition. This meant that a South African fire fighter that was applying for positions abroad would have to start his/

By Lenny Naidoo, chief fire officer, Rural Metro Emergency Management Services, South Africa

her training from the beginning again. The training and certification system thus prejudiced our fire fighters so SAESI approached IFSAC in 1994 to evaluate the South African programs and equate them to the internationally recognised IFSAC programs which are based on the National Fire Protection Association (NFPA) standards.

The IFSAC site team was satisfied that the South African programs exceeded the NFPA standards and then

equated the existing South African programs. SAESI also became an accredited IFSAC entity in 1996. The 12-week preliminary course was then replaced by the IFSAC programs. SAESI was now eligible to certify against the following courses accredited by IFSAC:

- Fire fighter I based on NFPA 1001
- Fire fighter II based on NFPA 1001
- Hazmat awareness based on NFPA 472
- Hazmat operations based on NFPA 472
- Fire instructor 1 based on NFPA 1041
- Fire officer 1 based on NFPA 1021

During previous IFSAC site visits the following programs were also accredited:

- Hazmat technician based on NFPA 472
- Fire and life safety educator 1 and 2 based on NFPA 1035
- Public information officer based on NFPA 1035

This year, SAESI will seek reaccreditation of all the above programs and add the following programs to the list:

- Driver operator
- Rescue technician
- Fire investigator

- Airport fire fighter
- Industrial fire fighter
- Wildland fire fighter
- Fire officer II
- Fire instructor II

The greatest achievement will be in attaining accreditation to present the rescue technician program as it incorporates high angle rescue; vehicle extrication; trench rescue; swift water rescue; confined space rescue; structural collapse rescue; surf rescue; wilderness rescue; dive rescue and cave rescue.

The 2012 visit will be the fourth by the IFSAC site team and this year's visit could prove to be the most fruitful for South African fire fighters to date. The SAESI accreditation team is hard at work, putting together all the IFSAC prerequisites for reaccreditation.

The new IFSAC programs will ensure that the South African fire services are trained and certified in accordance with international, professional standards. Mention must also be made of the good work being done by the Institute of Fire Engineers (IFE) in South Africa. The IFE has over the years, been playing a pivotal role in the development of fire fighters and fire officers in South Africa. The new Quality Council for Trade and Occupation (QCTO) system is also improving qualification development. At this stage the QCTO, in conjunction with LGSETA and expert practitioners, are scoping a qualification for entry level fire fighters. The Department of Cooperative Governance and Traditional Affairs (COGTA) is also developing a "Career path for fire fighters".

It will be imperative to ensure that these qualifications become mandatory for all fire fighters in the occupation of fire and rescue, once all programs and qualifications are developed and in place. This positive change will be of benefit to all South African fire fighters.▲

City of Cape Town

achieved 'Role model city' status

The United Nations International Strategy for Disaster Risk Reduction's Secretariat in Geneva decided to launch the 2010-2011 World Disaster Campaign under the theme "Making Cities Resilient: My City is Getting Ready!" in collaboration with the United Nations International Strategy for Disaster Reduction (UN:ISDR).

The overall campaign goal is to achieve resilient, sustainable urban communities, with a growing number of local governments that are taking decisive actions to reduce and mitigate against the risk of disasters. The City of Cape Town was approached by the International Council for Local Environmental Initiatives (ICLEI) to sign up as a role model.

The Director of Disaster Risk Reduction of the Western Cape, Schalk Carstens, welcomed all at the media launch of the event and said that people didn't want to hear that disasters will happen, but the City has to be ready.



Schalk Carstens, Director of Disaster Risk Reduction of the Western Cape

A presentation on the Basic Educational Toolkit, presented by Prof Dewald van Niekerk, director of the African Centre for Disaster Studies, followed. Prof van Niekerk said that the project was close to his heart as children don't understand disasters and the impact thereof. The logic behind the toolkit was to reduce

the risk and to lessen the impact of disasters, starting at school level so that children could play a part in the promotion of safety. One in every six children is affected by disasters and in order to reduce their risk level, a board game was developed in conjunction with the ISDR. A guide to teachers was also developed to assist teachers in promoting the toolkit. Prof van Niekerk said it was a good product but that it has a long term focus and needs at least 15 years before it will create the envisaged culture of safety.

The keynote address was delivered by Minister Anton Bredell, Minister of Local Government, Environmental Affairs and Development Planning. Minister Bredell said that since 2005, the Western Cape has had to endure ten declared disasters, which resulted in more than R2,5 billion being provided for in disaster recovery funding. Recent research has confirmed that more than 40% of the natural disaster events in South Africa have occurred in the Western Cape over the past century.

He also announced that the Overstrand Municipality had been granted "Resilient City Participant" status by the UN.

Minister Bredell further stated that the City of Cape Town's Disaster Risk

Management Centre contracted an industrial theatre company to convey key messages regarding climate change and how to reduce one's impact on the environment. He said that the programme engaged schools in an interactive and hands-on learning experience, which provided for real life risk assessments by school age learners and positive behavioural changes in their families' daily lives. He explained that during the 2010/2011 financial year, the Provincial Disaster Management Centre had its own extensive campaign in the rural areas of the Western Cape, where 52 theatre shows were conducted in schools and communities that educated and created awareness on how to deal with fires and floods. Approximately 15 000 people were reached in the province. "Public awareness in disaster risk reduction is and continues to be one of the most effective disaster risk reduction enhancing measures", stated Minister Bredell.

Schools should be regarded as focal points for raising awareness about disaster risk management and disaster risk reduction. Therefore, at the initial stages of this process, the pilot toolkit programme will be rolled out at three schools namely Observatory Junior and Helderkruin Primary, City of Cape Town and Hawston Primary, Overstrand Municipality, concluded Minister Bredell. ►



Minister Donald Grant, Minister of Education; Minister Anton Bredell, Minister of Local Government, Environmental Affairs and Development Planning and Prof Dewald van Niekerk, director of the African Centre for Disaster Studies



Alderman JP Smith officially welcomed the delegates on day two of the event



Modiegi Sethusha, acting head for the National Disaster Management Centre (NDMC)



Alderman Patricia de Lille, Executive Mayor of the City of Cape Town

► Minister Donald Grant, Minister of Education, also addressed the media and said it was imperative that disaster risk reduction programmes reached schools and that nutrition and safety knowledge would assist children in being ready to face adversities in life.

Children from the designated primary schools joined the function and participated in an educational workshop and a play presented by the Jungle Theatre.



The Jungle Theatre entertained the media, delegates and children by presenting the play that will be featured at schools in the Western Cape

A seminar on eight of the ten essentials met by the City of Cape Town followed the next day and Alderman JP Smith officially welcomed the delegates.

The main objective of the seminar was to propose a checklist of the 'Ten Essentials for Making Cities Resilient' which could be implemented by local municipalities. The checklist was derived from five priorities of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters – a key tool for implementing disaster reduction.

Modiegi Sethusha, acting head for the National Disaster Management Centre (NDMC) presented the purpose of the event and said that "it was important that our programmes and budgets were focused on disaster risk reduction as opposed to disaster risk response".

A key factor determining designation as a "role model" is for a city to demonstrate good practices in building resilience and safety in at least five out of the campaign's ten essentials for making cities resilient. Among eight essentials met by Cape Town were:

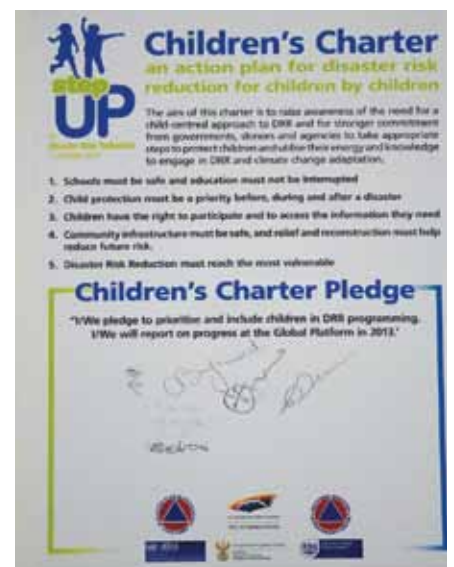
- Essential 1: Risk reducing organisation and coordination in place
- Essential 3: Risk assessment prepared
- Essential 4: Investment in risk reducing infrastructure
- Essential 5: Safe schools and health facilities
- Essential 6: Risk compliant land use regulation
- Essential 7: Education and training programmes in place
- Essential 8: Ecosystems and natural buffers protected
- Essential 9: Early warning system (weather)

These were explained in detail by various dignitaries including Alderman Patricia de Lille, Executive Mayor of the City of Cape Town.

Cape Town is the first City in the South Africa that was granted "Role Model City" status. It is also the second African city to be designated as a "Role Model City" by the UN: ISDR.

The Children's Charter was also signed by the dignitaries at the event, a further commitment from the Western Cape Government and the City of Cape Town to safeguard children against disasters.

The City of Cape Town, in partnership with the Provincial Government of the Western Cape and the National Disaster Management Centre, collaborated on this campaign. ▲



The Children's Charter was signed by the dignitaries at the two-day event

A new perspective on risk management

By Simon van Wyk, senior risk consultant, Aurecon

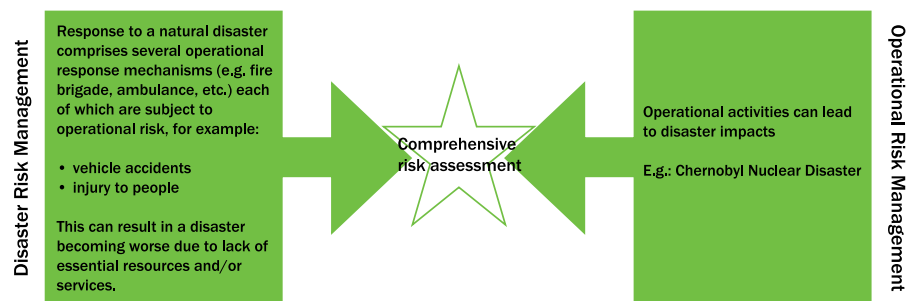
Risk management may, and often is, interoperated within the context of a particular risk application or niche. Examples could include disaster risk specialists considering only hazards that could result in catastrophic impacts such as natural hazards (eg earthquakes, hurricanes, tsunami's, etc.) or human induced hazards (eg rogue fires due to arson, bombs, explosions, acts of terrorism etc). As with disaster risks, so to do operational risk specialists tend to focus on risks as they relate to an organisations' activities (eg crane failure, conveyor belt malfunction, occupational injury, ergonomics, etc). This monolithic approach to risk assessment often results in gaps which are often a risk in and of themselves.

'Risk management' is much more than an assessment, evaluation or treatment of a particular risk niche (disaster or operational), but rather a compendium of both risk niche's which result in a comprehensive risk assessment within a certain context. As an example, responding to a natural disaster hazard comprises several operational response mechanisms (eg fire brigade, ambulances, rapid response units etc) each of which is subjected to operational risks such as vehicle accidents, injury to people and can result in a disaster becoming worse due to lack of essential resources and/or services. On the opposite side of the spectrum, operational activities can also lead to disaster impacts, such as the Chernobyl nuclear disaster and the Deepwater Horizon BP oil spill (Gulf of Mexico). These are prime examples of operational activities resulting in disastrous impacts. To illustrate the interrelatedness of both disaster risk and operational risk, reference is made to the recent Japan Earthquake (Fukushima Daiichi nuclear power plant) where the tsunami resulted in risks of both a disaster and operational nature.

A mind-set readjustment is required since risk management incorporates both disaster risk and operational risk (each of which can be viewed as a 'silo' niche) that are not mutually exclusive in the realm of risk management. As such, the "silo effect" needs to be negated in ones approach to assessing and dealing with risk. To depict this approach, the following simplistic approach is suggested:

risk management solution which provides the recipient with a comprehensive assessment of operational risks which culminates in a easy to understand risk profile as depicted to the left.

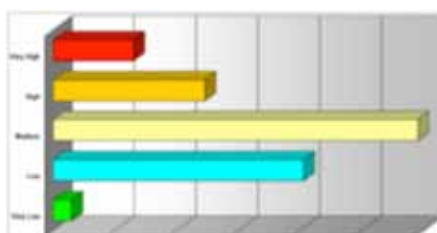
Unlike other complex risk methodologies, the Prorisk methodology makes use of a customisable criteria based on frequency, probability and severity.



In order to assess risk in a comprehensive manner, Aurecon has developed a unique user-friendly risk assessment tool called Prorisk. Aurecon is the leader in risk management solutions, most notably providing a unique risk assessment and management tool that addresses both operational and disaster risk hazards and impacts. Aurecon's Proactive Risk (Prorisk) management methodology is based on proactive assessment and management as opposed to reactive risk management. Prorisk has been extensively used in the following sectors with much success; ports, mining, electricity generation, railway safety and asset management.

The unique benefit of using Prorisk is its ability to assess an organisation's operations and interpret it into a prioritisation format that allows management to concentrate resources on the significant risks by means of applying intervention measures to reduce the assessed risk. Prorisk further makes allowance for setting objectives, targets and action plans to reduce risk over time which is the cornerstone of the Prorisk methodology which aims to achieve 'continual improvement'. Prorisk furthermore provides a revolutionary graphic that illustrates an organisation's return on investment by means of providing calculating the reduction in risk expressed as a Rand value as a consequence of intervention measures implemented. The net result is that a ratio is calculated for every Rand spent on risk intervention which ultimately translates to a risk saving over time.

Prorisk is much more than just an assessment tool, it is a total



Aurecon has a national and global footprint with trained professional staff to meet your organisation's needs in terms of providing proactive risk management solutions. ▲



The Pierce tactical water tender in service with the Garden Valley Fire Protection District located in California's El Dorado County

Garden Valley FPD, California, receives new Pierce tactical water tender fire fighting truck

Pierce Manufacturing, an Oshkosh Corporation company, has delivered a Pierce tactical water tender wildland apparatus into service with the Garden Valley Fire Protection District (FPD) located in California's El Dorado County, USA.

Engineered to meet National Wildfire Coordination Group (NWCG) approved specifications, the new apparatus will provide water support for wildland fire fighting operations for the District, as well as powerful fire suppression capabilities when called upon. The vehicle was purchased through a Fire Act grant.

"We believe vehicles such as our new Pierce tactical water tender are on the leading edge of a trend for wildland urban interface departments," said Bill Dekker, Garden Valley FPD fire chief. "It is flexible and very effective for wildland and structural responses; our new rig is fire attack ready and, in a few short months, has performed beyond our expectations on three major fires."

"This new Pierce tactical water tender has the capabilities to carry a large amount of water and, with its fire fighting systems, the firepower to provide suppression when needed," said Jim Johnson, Oshkosh Corporation executive vice president and president, fire and emergency. "Pierce has the commitment – and the expertise – to build wildland fire fighting vehicles of all types."

The Pierce tactical water tender is built on a Freightliner chassis with a 360 hp engine and seating for two fire fighters. The apparatus features a 7 950 litre water tank, a 180-degree quick dump rear discharge, and a 9 464 litre portable folding water tank. In addition, the vehicle is outfitted with a remote control front bumper turret, rear inlet, 335 metres of supply line, SCBA bottle storage above the wheel wells, and a hose reel.

"Having a new fire truck in Garden Valley has caused quite a bit of positive publicity throughout the community," adds Chief Dekker. "This

Pierce tender is helping the citizens of Garden Valley by providing a new level of fire protection – and it will even generate revenue when called upon by the US Forest Service or CalFire to fight wildfires. In tough economic times, that's a big deal."

The Garden Valley FPD, operating from three fire stations, is a combination paid and volunteer department providing fire protection, rescue, and initial response medical aid to a population of 7 500. Garden Valley FPD is located in approximately 155 square kilometres of unincorporated area in northern El Dorado County in the historic Gold Country region. Garden Valley FPD provides automatic mutual aid with the Georgetown Fire Department, Eldorado County Fire Protection District, CalFire, and the US Forest Service, depending on the location and type of call.

Pierce dealer, Golden State Fire Apparatus, and regional service provider, Burton's Fire Inc of Modesto, California, provide local support. ▲



Saudi Arabia orders 1 125 vehicles from Rosenbauer

Rosenbauer of Wyoming, USA, recently received the largest order for fire fighting vehicles in the company and industry's history. The order comes from the Saudi Arabian Ministry of Interior, and is worth approximately \$320 million.

The order includes 1 125 vehicles, comprised of pumpers, tankers, rescue trucks, aerials, fire fighting boats and other civil defence vehicles.

Rosenbauer of Wyoming will build more than 1 100 fire fighting vehicles for Saudi Arabia under a recently signed contract.

Due to the increase in Saudi's population over the past few decades, it was decided to launch an expansion program for improved fire protection, said Steve Reedy, vice president and general manager. The Saudi expansion involves construction of 180 new fire stations, mainly in urban areas of the country. Additionally, 6 000 firemen are being hired.

A total of 350 of the vehicle chassis will be manufactured at the Rosenbauer plant in Wyoming, with 500 bodies to be manufactured at the Rosenbauer plant in Lyons, South Dakota. The remainder of the vehicles will be manufactured at Rosenbauer facilities in Leonding, Austria; Karlsruhe, Germany; and Madrid, Spain.

The order will be produced over a period of 30 months, or until mid-2014.

"This success underlines the Rosenbauer Group's industry leading position yet again," said Executive Board Chairman Dr Dieter Siegel "Thanks to our high order intake over the past few months – and in contrast to the industry as a whole – we will experience full capacity at our plants for at least the next two years."

Rosenbauer's long-standing relationship with the Saudi clients is founded upon its high quality of products, which have been developed in close collaboration with the customer, company officials said. Some of the vehicles will be built to European Standards, while others

will be manufactured in accordance to US NFPA Standards.

Brazil contract

This order comes on top of another record breaking contract that was received by Rosenbauer last August. In August, Brazil ordered 80 airport crash trucks that will also be manufactured at the Rosenbauer plant in Wyoming.

The order from Brazil is the largest single crash truck order in the company and industries history. Crash trucks are large, high powered vehicles that are used at airports for fire fighting protection – the same vehicle that was supplied by Rosenbauer and used in the latest "Transformer" movie. Brazil is modernising its airports through-out the country in preparation for the upcoming Olympics and World Cup Soccer Tournament.

In North America, Rosenbauer incorporates the international strength and innovation of a global company with top American manufacturing firms. ▲

In the global climate change debate – is fire green?

By Lynne A Trollope and Dr Winston SW Trollope, research and development, Working on Fire International

As practicing fire ecologists and managers the question that arises in the debate on global climatic change is whether fire is green or not ie is it contributing to global warming? This is a particularly pertinent question as prescribed burning is widely recognised as an essential practice in the management of African grassland and savanna ecosystems. In recent years, devastating mega fires have been occurring on a more regular basis in areas like Australia, North America, the European Mediterranean basin and even during 1999 in South Africa. Therefore, as an organisation, the local and international components of Working On Fire, needed to address this question and take a position on whether fire is green or not. However, in investigating this topic, it is first necessary to obtain an overall understanding of global warming and its impact on global climate change before focussing on the possible contribution of fire to this major challenge facing the world in the 21st Century.

Background to global warming

In 1975, Wallace Broecker, latterly based at the University of Columbia, was the first scientist to predict global warming due to increased levels of carbon dioxide (CO₂) in the atmosphere. He had been involved in carbon dating ice cores from Greenland and sediment cores from the Atlantic sea floor which provided records of climates past. From data gathered thus far, he realised that climate is not stable. As he so succinctly put it "climate is a tetchy beast subject to large and abrupt mood swings." At the time, Charles David Keeling was a young scientist who was hired to document the first reliable measurements of CO₂ on the north slope of Mona Loa in Hawaii and became famous for the "Keeling Curve" of CO₂ measurements. Simple physics and Keeling's data

made it clear that global temperatures would rise at a rate parallel to that of atmospheric CO₂, and would continue to do so in the future, unless the problem was addressed (see figure 1). Broecker's biggest contribution to science is the fundamental idea that climate does not just change smoothly and continuously, but rather that it also shifts abruptly between discreet states ie it has tipping points. He reasoned that the massive emissions of greenhouse gasses into the atmosphere seemed like a good way of pushing climate towards a series of tipping points. Burning fossil fuels is not bad; what is bad though, is dumping the gaseous waste into the atmosphere (Broecker and Kunzig, 2008).

At the time that the global warming issue was coming to the fore, the climate change sceptics complained that the same scientists had been crying wolf about global cooling as there had been a thirty year cooling trend in climate data. Broecker explained that the science then was not the same and neither were the scientists, but great strides and developments had been achieved in global climate monitoring leading to a greater understanding of the incredible complexity of the subject.

Possible causes of climate change

The possible causes of global warming and the resultant climate change are:

- Elevated levels of CO₂ due to human activities preventing the reflection of infra-red radiation back into space, ie the greenhouse effect.
- Methane (CH₄) which has a twenty five times greater effect on global warming than CO₂ but which is currently present in smaller quantities. The sources of methane are increased numbers of livestock, burning natural gas and emissions from garbage in land-fills.
- Nitrous oxide (N₂O), a powerful greenhouse gas that has increased 15% since 1750 and which has a 310 times greater effect than CO₂. It is a by-product of plastics and fertiliser manufacture and use (World Resources Institute (WRI) Org, 2011).

Historical trends in the above gases are illustrated in figure 2.

In the complex equation of climate change the contributions of some of the different elements in the atmosphere to the greenhouse effect are as follows:

- Water vapour has the greatest effect, making a 36 to 72% contribution by trapping the infra-red radiation. Heating of the oceans caused by rising global temperatures results in greater evaporation and increased cloud cover and therefore global warming.
- CO₂ follows with nine to 26% contribution.
- Whereas methane, said to be 25 times more effective in influencing climate change than CO₂, is next with a four to nine percent effect. ▶

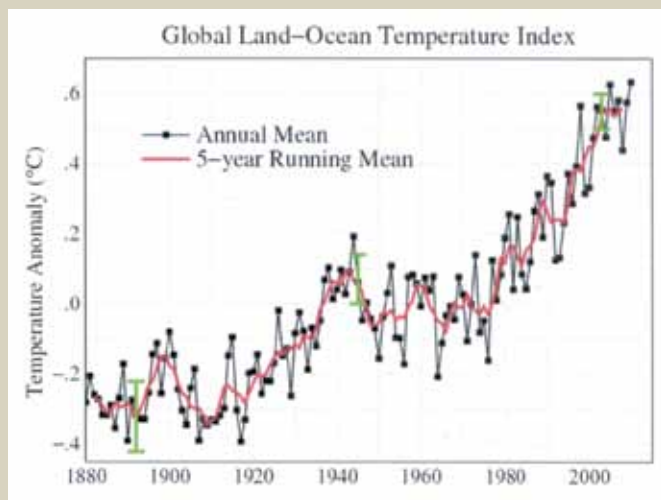


Figure 1: The Keeling curve of rising temperature and CO₂ concentrations in the atmosphere



Figure 2: Trends in rising greenhouse gases from 1978 to 2010 (WRI Org, 2011).

- Finally ozone also plays a role with a three to seven percent impact.

However CO₂ concentrations in the atmosphere remain the major cause for concern. Global emissions and concentrations are presented in figure 3.

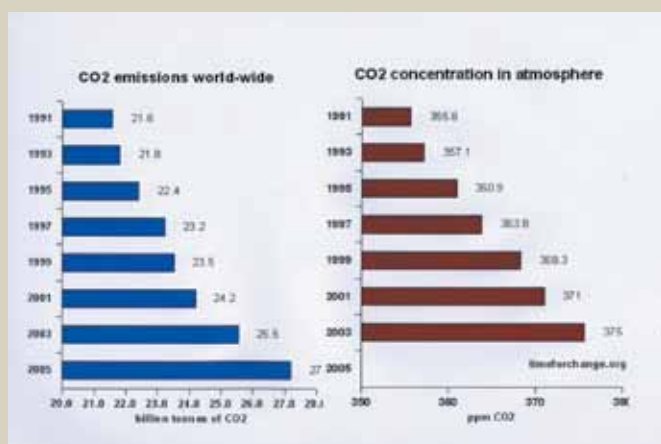


Figure 3: Global emissions and concentrations of CO₂ in the atmosphere (WRI Org, 2011)

Examples of the effects of global climate change

In spite of the scepticism about climate change like Bjorn Lomborg of "The Sceptical Environmentalist" fame, the general consensus of the main stream scientists involved in the global warming debate is that it is a major challenge for the world in the 21st century. Global temperatures are predicted by these scientists to rise 1,8 – 6,0°C by 2100. Mark Lynas, activist, journalist and author of the book *Six Degrees*, paints a chilling degree-by-degree scenario of the devastation likely to occur and issued a global warning – "Act now or risk mass extinction!" (Lynas, 2008). For many there is no doubt that global warming is occurring. This is borne out by the melting of glaciers the world over, rising sea levels threatening the Atoll nations and the disappearing ice caps both in the Arctic and Antarctic peninsulas. The plight of the polar bears with the melting pack ice highlighted the problem to the general public (Collins, 2007).

Closer to home, the major increase in bush encroachment in southern Africa, has been attributed to increased CO₂ levels in the last century (Buitenwerf et al, 2011). This is supported by the hypothesis that C3 plants (trees and shrubs) are favoured by increased levels of CO₂ compared to grasses which are C4 plants (C3 and C4 refer to the photosynthetic pathways involved in the metabolism of these plants). In this regard, Professor Tim

Hofmann at the University of Cape Town, has collected a vast number of photographs dating from the Boer War in 1899 to date. He is comparing old photos with current ones taken at the same sites to document changes in the vegetation in southern Africa that can possibly be attributed to increased levels of CO₂. Caution must be exercised though in relating bush encroachment primarily to global warming as many factors are responsible for changes in vegetation. For example, soils have a close association with which species of plants grows where and changes in the browsing factor of domestic livestock and wildlife impacts noticeably on the abundance of bush. The removal and absence of browsing animals, such as elephants, giraffe and goats, has had far reaching effects on the composition and structure of trees and shrubs in African savannas.

As mentioned earlier, there are the protagonists and the antagonists to global warming. Notably protagonists like Dr Phil Jones, from the Climate Change Research Unit at the University of East Anglia in the United Kingdom, the author Tim Flannery who wrote the "Weather makers" and the United States politician, Al Gore, who was involved in the DVD "An inconvenient truth", are all convinced that global warming is a major threat to the world, unless co-coordinated steps are taken at a global level to act together and reduce emissions. On the other hand the antagonists and sceptics such as Bjorn Lomborg, Professor of statistics and researcher at the University of Aarhus in Denmark, author of the "Skeptical environmentalist", and Steve McIntyre, a Canadian mathematician, challenge the climate scientists' integrity and believe that the changes in climate are part of long term climatic oscillations. While not being personally responsible, they set the stage for the publishing of the book the "Climate files" (Pierce, 2010) that details the acrimonious debate that developed between the two conflicting groups. Unfortunately, the debate has become highly politicised and personal as the sceptics are critical of the way in which environmental organisations make selective and misleading use of scientific evidence. Even the international panel of scientists known as the Intergovernmental Panel on Climate Change (IPCC) involved in assessing the impacts of, and guiding the world on climate change challenges, has come under suspicion due to the sceptics. As a result, the climate change conference in Copenhagen in December 2009 was not the resounding success that it was anticipated to be and public scepticism about anthropogenic effects and their role in climate change has increased. ►

- ▶ Assuming that anthropogenic factors are causing climate change then the main causes are burning fossil fuels associated with industry, generating electricity, airlines, automobiles and agriculture associated with land clearing for cropping and intensive livestock farming. It is also hypothesised that wildfires, especially the mega-fires currently occurring in different parts of the world, are caused by increased temperatures and drought conditions, resulting in significant contributions to global emissions. Current estimates are that 29,9 billion tons of CO₂ emissions are being released into the atmosphere on a global scale, of these emissions 21,3 billion tons (71%) are from burning fossil fuels while 8,6 billion tons or 29% are from other sources. But unfortunately there is apparently no detailed, quantified information currently available on emissions from prescribed burning which is a key and often essential range management practice in wildlife conservation and domestic livestock production systems.

On the agricultural front the conversion of tropical forests (conservative global estimate of 21 000 km² per year in 1989) (Molion, 1991) comprising mega-tons of standing biomass into cultivated areas for crop production with an average biomass of two to six tons, particularly in South America, Indonesia and parts of Central Africa, result in a significant net release of CO₂ emissions into the atmosphere. However, cropping is not the main cause per se for increased emissions into the atmosphere because crop production results in a cyclic release and re-absorption of CO₂ on a seasonal basis. It is rather the replacement of the mega-tons (biomass density of 300 metric tons per hectare) (Molion, 1991) of standing forest with a greatly reduced standing cropland vegetation (four to six tons per hectare) that are seen as the contribution of these activities to global warming.

In commercial beef production, especially feedlots with high concentrations of animals, there is a cyclic release of methane and nitrous oxide which is converted into CO₂ but is eventually reabsorbed by forage production of maize and hay necessary to feed these animals. A similar situation occurs in the dairy industry, where the emissions attributed to increased numbers of milk cows, are re-absorbed by the highly productive and nutritious pastures that are grown to support these high forage demanding animals. Some food for thought though, is "what contribution does the increasing numbers of elephants in the Kruger National Park and other areas such as Botswana, together with the two million plus wildebeest that migrate annually on the Serengeti Plains, contribute to increased levels of methane in the atmosphere and thus global warming?"

Role of fire and prescribed burning in global emissions

Fire has been mankind's companion and foe since the dawn of time. It is a fundamental element of the planet, like air, shaping the patterns of our lives. Peoples' opinion of fire has changed often, but fire itself remains the same (de Golia, 1993). The real challenge is to understand it and the role it plays particularly in tropical grassland and savanna ecosystems. Fire is a natural factor of the environment and certain plants like some protea species in South Africa and plants with serotinous cones like pine trees are fire dependent. A fascinating example of fire dependence is Australian grass trees (*Xanthorrhoea*

australis) that respond to ethylene gas released in the smoke during burning causing the initiation of flowering. Conversely there are plant species that are sensitive to and are destroyed by fire like *Cliffortia paucistaminea* (moist fynbos) in the Amathole Mountains in the Eastern Cape (Trollope, 1971). Both ecosystems however provide a range of benefits to society depending on the fire ecology of the area. It is important though to realise that the science of fire is not fully understood and is a highly complex phenomenon, similar to climate change.

In tropical savannas fires are considered a principle source of emissions to the atmosphere. However quantifying emissions from savanna fires is a highly complex process as the interplay of numerous factors, on both temporal and spatial scales can have either positive or negative effects. So whether fire can be classified as "green" – or not, is not a simple matter of conjecture or scientific calculation. Several factors affect the degree of emissions in a fire for example fuel composition, fuel curing, fire intensity and the degree of fuel combustion. Seasonality of the fires also contributes significantly to the amount and type of greenhouse gas emissions released during fires but information on the quantification of the different gases released during fires is not readily available particularly in Africa. Many fire ecologists are of the opinion that the reduction of emissions can be addressed by simply changing the seasonality of the fires from late season intense fires to early season cool fires (Trollope, 2010). However in the Dambo or "mini-wetlands" of south western Zambia, early dry season fires actually produce more smoke emissions from incomplete combustion, even though the combustion factors are half as much (Hoffa *et al*, 1999). Therefore, at this stage it is only possible to draw general conclusions about fire and emissions until further highly technical research has provided the answers we are seeking.

Based on the fact that fire is a natural factor of the environment, it is important to differentiate between the effects of wildfires and prescribed fires. Society and governments demand more sophisticated fire suppression or prevention technologies without conceding that many rural societies depend on the traditional use of fire for their livelihoods. Policies and programs have often been designed around the belief that rural people are the cause of fire related problems whereas rural communities could in fact provide part of the solution. For example, in indigenous African paradigms, prescribed burning is generally conducted at the height of the dry season resulting in high intensity fires that control bush encroachment in contrast to scientifically based fire regimes that originally recommended low intensity fires after the spring rains in summer rainfall areas. Subsequent research disproved this latter practice confirming that the indigenous African paradigm was correct (Trollope, 2009). Intense, wild mega-fires, burning down forests, result in a net release of CO₂, whereas the traditional use of fire as a means of maintaining productive habitats for livestock and forest products necessary for the survival of rural communities, involves the cyclic release of emissions. In the Okavango Delta in Botswana, tourism operators and tourists were of the opinion that the Okavango Delta, one of the largest remaining inland wetlands protected by the Ramsar Convention, was being ▶

► negatively impacted by high intensity wildfires. Rural communities were blamed. An extensive investigation by Working on Fire International found the criticism to be unfounded and that such an ecosystem required fire for ecosystem health as long as the fires were not too intense or too frequent. For instance, papyrus burnt by a wildfire in the Permanent Swamps in January had regrown to a healthy stand of the same size within three months. The occurrence of wild life in the swamps such as frogs, insects, sitatunga and pythons, was also clear evidence of the resilience of this ecosystem and its dependence on fire (Trollope *et al.*, 2006).

Fire is also responsible for promoting and maintaining grasslands at the expense of trees and shrubs (Trollope, 2007). Where fire and grazing are prevalent in higher rainfall areas like the rolling hills of the KwaZulu-Natal midlands, they are dominated by open, pyro-zootic grasslands. In contrast, where fire has been excluded in a protected area for 30 years, dense natural forest is developing (see figure 4).



Figure 4: The development of forest with protection from fire in moist grasslands of the KwaZulu-Natal Midlands

In the Kruger National Park, a comparison of the experimental burn plots in the Satara/Nwanedzi area highlights the role of fire in maintaining grasslands. A biennially burnt plot comprises open grassland whereas the adjacent control plot where fire has been excluded for 55 years has developed into tree dominated savanna community (see figure 5).

In southern Georgia and parts of Florida in the USA fire is used as a tool for habitat management for bob white quail. Plantation owners/managers regularly burn the natural pine forests using cool fires to prevent the invasion of hardwood trees such as various species of oak, thus promoting an open understory of grasses and forbs which are ideal habitat for the quail (see figure 6).

Ecologically acceptable reasons for burning veld/rangelands are to remove moribund or old unpalatable grass and to control and/or prevent encroachment of undesirable plants eg slangbos encroachment in the southern Free State. In the wild life sphere additional reasons for burning are to create and/or maintain the



Figure 5: Contrasting effects of fire in the Kruger National Park where biennial burning (left) maintains open grassland while the exclusion of fire has enabled the development of a tree dominated community (right).

grass/tree balance, to attract wildlife to less preferred areas to minimise overutilisation of preferred areas and to maintain and/or create biodiversity. The recommended prescribed fire regime for sourveld or higher rainfall areas is, depending on the rainfall or the problem (bush encroachment or invasive species), a burning cycle of one to four years whereas sweetveld or arid areas, that is more sensitive to perturbations such as fire, require a cycle of burning every 10 to 20 years.

In answering the question posed in the introduction “Is fire green?” the general conclusions that can be drawn are that burning fossil fuels and the conversion of forests and woodlands into croplands, results in a net release of CO₂ into the atmosphere. The physiological process of photosynthesis involves absorbing CO₂ so the emissions from livestock are counter balanced by the growing of grain and fodder crops to feed them. Fire in savannas and grasslands result in the release of emissions but these are reabsorbed the following season by the regenerating rangelands during the subsequent growing season. ▲



Figure 6: Under-storey burning in longleaf pine forests in Georgia, USA, for bob white quail habitat

July 2012

9 – 13 July 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover life safety, electrical, fire alarm codes and sprinklers

Venue: Indianapolis, Indiana, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

13 July 2012

Smoke Detection in High Spaces Conference

Recent research and new products

Venue: 169 Union Street, London, SE1, United Kingdom

Contact: email: info@ife.org.uk

For more information visit: www.ife.org.uk

16 – 20 July 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover life safety, electrical, fire alarm codes and sprinklers

Venue: San Francisco, California, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

16 – 21 July 2012

National Fire/Emergency Services Exploring Conference

Venue: Colorado State University, Fort Collins, Colorado, USA

Contact: email: exploring@lflmail.org

For more information visit:

www.exploring.learningforlife.org

17 – 21 July 2012

Firehouse Expo

The hot and classroom sessions at Firehouse Expo are saving lives with every event

Venue: Baltimore Convention Centre, Baltimore, Maryland, USA

Contact: Tel: 00 800 827 8009

For more information visit: www.firehouseexpo.com

21 – 24 July 2012

Environmental Systems Research Institute (ESRI) Homeland Security Summit

Knowledgeable experts from around the world will show case the latest innovations and share proven best practices

Venue: The Hilton Bayfront, San Diego, California, USA

Contact: email: hssummit@esri.com

For more information visit: www.esri.com

23 – 27 July 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover life safety, electrical, fire alarm codes and sprinklers

Venue: Williamsburg, Virginia, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

23 – 27 July 2012

Environmental Systems Research Institute (ESRI) User Conference

For emergency management, emergency medical services, fire fighting, wildfire management, homeland security and national security

Venue: San Diego Convention Centre, San Diego, California, USA

Contact: Esri Tel: 001 888 377 4576 or email: uc@esri.com

For more information visit: www.esri.com

25 July 2012

Aircraft Accident Investigation and the Fire and Rescue Service

By Adrian Cope, senior inspector of Air Accidents

Venue: West Midlands Fire Service Academy, Dartmouth Road, Smethwick, West Midlands, United Kingdom

Contact: Academy enquiries 0944 121 380 6620

For more information visit: www.ife.org.uk

25 – 27 July 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover electrical and various other topics

Venue: Hasbrouk Heights, New Jersey, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

30 July – 3 August 2012

National Fire Protection Association (NFPA) Training Seminar

Covers life safety

Venue: Quincy, Massachusetts, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

August 2012

1 – 3 August 2012

Department of Defence Fire and Emergency Services Conference

Official conference for the military fire and emergency service, including army, navy, marine corp, air force and coast guard fire service personnel

Venue: Sheraton Downtown Denver, Colorado, USA

Contact: email: IAFC@compusystems.com

For more information visit: www.s36.a2zinc.net

6 – 10 and 13 – 17 August 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover electrical, life safety, fire alarm codes and sprinklers

Venue: Philadelphia, Pennsylvania, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

6 – 10 and 13 – 17 August 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover electrical, life safety, fire alarm codes and sprinklers

Venue: Seattle, Washington, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

7 – 8 August 2012

Emergency Services and Disaster Management Conference

Find out what leading security professionals are doing to make their companies more resilient to climate change, terrorism, corporate governance, corruption and reputational risk

Venue: The Castle, Western Cape, Cape Town, RSA

Contact: Anne Greenhill Tel: 072 243 1443

For more information visit: www.saconference.co.za

14 – 18 August 2012

Torcon 2012

The Greater Toronto Multiple Alarm Association is hosting the 60th Annual International Fire Buff Associates Convention

Venue: Sheraton Centre Hotel, Toronto, North America

Contact: Mike McNulty Tel: 00 416 540 1075
email: torcon2012@gmail.com

For more information visit: www.torcon2012.com

20 – 24 August 2012

Harvard School of Public Health - Radiological Emergency Planning: terrorism, security, and communication

Latest principles and requirements to prepare for and respond to a radiological emergency

Venue: The Harvard School of Public Health 677
Huntington Avenue, Boston,
Massachusetts, USA

Contact: Tel: 00 617 384 8692
email: ptumolo@hsph.harvard.edu

For more information visit: www.ccpe.sph.harvard.edu

20 – 24 August 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover electrical, life safety, fire alarm codes and sprinklers

Venue: Orlando, Florida, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

21 – 22 August 2012

6th Australasian Hazards Management Conference

Will provide a forum to discuss the integration of hazard information into effective risk management

Venue: University of Canterbury,
Christchurch, New Zealand

Contact: email: ahmc@hazards-education.org

For more information visit: www.hazardseducation.org

22 – 24 August 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover electrical and various other topics

Venue: Anaheim, California, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

22 – 24 August 2012

Secutech Vietnam

International security, fire and safety exhibition and conference

Venue: Ho Chi Minh City, Vietnam

Contact: email: stvn@newera.messefrankfurt.com or
info@messefrankfurt.com

For more information visit: www.secutechvietnam.com

23 – 24 August 2012

World Society of Disaster Nursing Research Conference

To enable practitioners to network who share a commitment to delivering the highest of standards of care in the most challenging of environments

Venue: Cardiff, Wales, United Kingdom

Contact: email info@wsdn2012.com

For more information visit: www.wsdn2012.com

26 – 30 August 2012

4th International Disaster and Risk Conference (IDRC) Davos

Integrative risk management in a changing world – pathways to a resilient society

Venue: The Congress Centre, Davos, Switzerland

Contact: Tel: 0041 81 414 1600 email: info@grforum.org

For more information visit: www.grforum.org

27 – 31 August 2012

National Fire Protection Association (NFPA) Training Seminar

Will cover sprinklers and various other topics

Venue: Alexandria, Virginia, USA

Contact: Tel: 00 1 800 344 3555 or 00 1 508 895 8300

For more information visit: www.nfpa.org

28 – 31 August 2012

Australasia's Premier Emergency Management Conference (AFAC)

Knowledge sharing and learning culture within fire, land management and emergency service agencies, and across the broader industry

Venue: Perth Convention and
Exhibition Centre, Perth, Australia

Contact: For further information visit

www.afac2012.org/contact

September 2012

3 – 7 September 2012

Storage Tank and Associated Facilities Fire Hazard Management Workshop

Dr Niall Ramsden to lecture at storage tank and fire hazard management Workshop

Venue: The View Conference Centre, Doonside,
Amanzimtoti, Durban, South Africa

Contact: DoseTech Tel: 021 511 0840 or
email support@dosetech.co.za

For more information visit: www.dosetech.co.za

Our poem this month was written by an aerial fire fighters wife. Kelvin Cameron, a bomber pilot, sadly passed away after a long battle with cancer in 2006.

The fire fighters

That dry winter time is here again,
when fire fighting sorts out the boys from the men.
All communications must be really on the ball –
as they sit around waiting for “The Call”.

The FDI rating becomes way of life,
from early morning till late at night.
Yellow and orange, colours one learns to dread –
but far worse is that awful colour ‘Red’.

Pilots at least have some time to sleep –
for foresters this is a luxury which will have to keep.
They are on call twenty four hours a day,
and have to be alert – come what may!

A pumping wind and a very small flame –
is just the beginning of this dangerous game.
Ground and air must work as a team,
if any control is going to be brought to the scene.

Relief at last when a South Wester comes through,
and the FDI shows a lovely shade of Blue!
For a short while all can relax,
before those hot Berg winds come back.

Written by Margaret Cameron
Submitted by Karien le Roux of Vryheid Fire Protection Association



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- Incident Management
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- Fire Management Equipment
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- Development and Implementation of Aerial Fire Fighting and Dispatch & Coordination Systems
- Wild Fire Education & Awareness
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