FIRE AND RESCUE INTERNATIONAL

Integrated fire, rescue, EMS and disaster management technology

Volume 1 No 5

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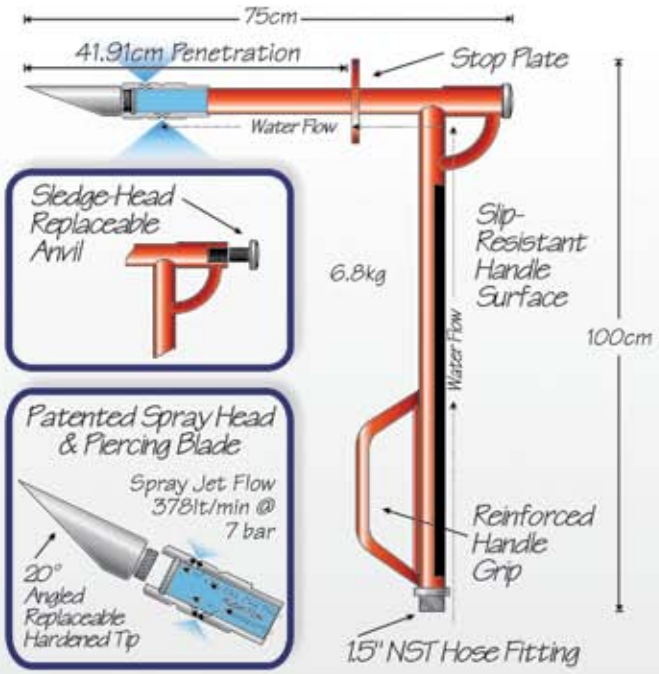

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Comment

We proudly present the fifth edition of **Fire and Rescue International**.

Lee Raath-Brownie

Cover profile

IFMS (Pty) Limited is featured on this month's cover and we profile this diverse company and its services. Its wide range of services includes all aspects of integrated fire management and the training of dedicated fire management personnel.

FRI Images photographic competition

Our second winner of the FRI Images competition is announced this month and won R2 000 cash! See page 3 for details.

CONGRATULATIONS!

Send in your photographs and you too could be a winner!

News section

Unfortunately, there is always mounts of news in the disaster management, fire, EMS and rescue services and this month is no exception.

We aimed to provide our readers with the most interesting and motivating news and events from around the globe.

Special operations

One of our contributors, Colin Deiner, chief director, Disaster Management and Fire Brigade Services: Western Cape Provincial Government wrote a thought-provoking article on the fire service special operations, challenging colleagues to make the most of their staff and best apply their unique skills.

Obituary

FRI honours a fallen fire fighter and well-known personality.

Letters to the editor

We introduced 'Letters to the editor" in our previous issue and received a very comprehensive debate this month. To make the debate just, we asked the writer of the article in question to submit his response in the same issue, so our readers could get an overview without having to wait for the next edition for a reply.

Other articles and features include a look into aircraft rescue and fire fighting (ARFF's), fire management strategies in Uganda's Kikonda Central Forest Reserve, a German case study on prescribed burning practices and the importance of on-going fire fighter training.

Fire and Rescue International is your magazine. We publish your experiences, ideas and suggestions.

Keep those suggestions, emails, photographs and phone calls coming!

We enjoy hearing from you!

Lee Raath-Brownie
Publisher

This month's FRI images winner!

Congratulations to

Photographer
N Khumalo

Name of photograph
Fire suppression

Photo description:
Fire started as veld fire and spread to tyres.

Camera:
Blackberry cellular phone

Settings:
Automatic

N Khumalo 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!

IFMS
first in integrated fire management

IFMS (Pty) Ltd is a member of the FFA Group of Companies which was formed by the original Forest Fire Association (FFA), a Section 21 Company, formed in the 1980s to supply aerial fire fighting services to the forestry industry.

FFA was awarded the government contract in September of 2003 to develop and implement an integrated fire management system know as the "Working on Fire Programme" for South Africa's fire prone regions. The group was formed with the amalgamation of FFA and various companies which supplied fire fighting services and was owned by the original share holders of FFA Holdings.

The National Veld and Forest Fire Act 101 of 1998 (NVFFA) has changed the face and market for fire management in South Africa. The Act requires all land owners to conform to the NVFFA which requires land owners to have trained and equipped personnel to implement fire management practices on their owned or leased properties. Failure to comply in the event of a fire spreading from their properties and

causing damage to a neighboring property would result in the land owner being prosecuted.

The vast majority of land owners within South Africa have limited capacity and experience in the implementation of fire breaks, fuel load reduction using prescribed fire and the suppression of wildfires. IFMS Commercial Services and Training Academy have developed capacity and products to assist land owners with developing their own potential as well as the supply integrated fire management services to rural land owners within South Africa.

IFMS Commercial Services have developed a pool of qualified and experienced fire managers who are based across all the fire prone regions of South Africa and are responsible for supervising any prescribed fire and suppression operations performed by the fire crews.

IFMS Training Academy have developed numerous training instructors from within the ranks, as well as utilising external training institutions, to carry out a wide range of fire management related courses. The instructors work nationally from the main academy based in Nelspruit, Mpumalanga, South Africa.

A new department, Research and Development, has been formed recently in the IFMS stable. This new venture will manage the continuing research in aerial ignition and open ended burning of fire breaks, together with a variety of other research products intended to be used within its operations. ▲

Services available from IFMS divisions

- Supply fully equipped hand crews to perform prescribed burning to reduce the levels of fine fuels on predetermined sites, whether in the form of burning fire breaks, veld management block burns and bush encroachment burns, slash burns, as well as aerial ignition burns, incorporating commercial plantation under canopy burning. FFA burning operations are covered by "Risk of Spread" insurance
- Supply a permanent team to the client, with people employed from the immediate area. This team is then totally dedicated to the client and may be used for working as per training on all properties belonging to the client. The period of contract one to three years. Transport and project manager is optional
- Supply hand crews for the purpose of standing by to react to and suppress runaway veld fires threatening land owners property
- Supply hand crews to cut and remove invasive vegetation by hand and machine. This includes slash burns if required
- Supply hand crews to carry out post fire rehabilitation operations for landowners
- Supply different size structural fire fighting teams, with HAZMAT training to the client's prescription – if additional specific training and equipment is required – these specifications can be met
- Supply additional 4x4 double cab LDV's with 500 litre fire fighting units, with four fire fighters and driver or project manager for wildfire suppression call outs.
- Supply a range of veld and forest fire personal protective clothing and fire fighting equipment.
- Supply a range of certified and accredited fire fighting and fire management training courses.
- Supply a professional service of carrying out veld and bush assessments followed with suggested management practices and actions. Reports and mapping available as part of the service. To execute the actual clearing / control operations on site with the necessary follow up operations as required.
- Assistance with land use plans, for under utilised land.

Letters to the editor

Thanks very much for the very interesting fire-related contributions in Vol 1 no 4 of the Fire and Rescue International magazine! If this is the type of material and standard you intent publishing in the future, this will indeed be a top-value magazine, that can only go from strength to strength!

I would like to comment about the very controversial subject published in the magazine, namely "The effect of different harvesting slash treatments on fire behaviour", by Tiaan Pool. Firstly, I would like to kick-off my comments by stating that the material in the magazine is most probably looking for, is high quality technical material and certainly not scientific articles, as there is a place for this elsewhere. As such, Tiaan's article is certainly qualifying in all respects, and is indeed of interest to the reader. That Tiaan is tackling such a high-tech and complicated issue is indeed recommendable, on which he can be congratulated. As he commented (and I filled in the rest, reading between the words): The subject is about a grey area in our research and development (R&D) history that the industry can actually "hang its head in shame" about the low R&D funding provided to forestry over the past few decades. It is amazing that some researchers still "pressed on regardless" under difficult circumstances, and that some of them even reached worldwide recognition in the process for their work.

Coming back to Tiaan's article, I will thus not refer to any scientific issues about eg the methodology used and the results provided, as I accept that this is most probably having a sound foundation, particularly from a statistical point of view. I would only like to raise a few more general questions of statements/issues raised, which I unfortunately cannot agree with.

Burning in pine mulch

Quote from article

"...fire losses within the commercial forestry sector of South Africa still escalate..."

Dr Neels de Ronde's comment

This is not the whole story, as this applies to the longer-term wildfire records only, and not to the reduction in wildfire damage experienced during the 2008 – 2011 fire seasons in the summer rainfall area. There was indeed a significant decrease in wildfire damage recorded in forestry regions during this period, in contrast to wildfire damage experienced in eg the agricultural sector, which spiralled to new heights and is indeed much more worrying! In the forestry sector this decrease in plantation fire damage is despite shortcomings at eg regional IFM fuel management level and I think recognition should be given for this, for the dedicated work done by our foresters (and by other fire and rescue organisations, such as FPA's and WoF), provided to the industry. This improvement was mainly achieved with the assistance of increased application of prescribed burning to reduce dangerous fuel levels. It is still early days, but the positive signs are there for all to see, which we can only feel proud about! Regardless the financial constrains experienced during the past few years, there is indeed light at the end of the tunnel in the forestry sector, with regard to the terrible wildfire problems experienced earlier.

Tiaan Pool's comment

I must agree with Neels. The industry certainly stepped up their fire management efforts and a lot of positive things have happened since the disastrous 2007 fires. Keeping in mind that mulching was one of the activities that increased significantly during this time (2008-2011). My investigation started in 2008 and took place after the industry indicated to me that there is a need to investigate mulching as an alternative slash management method. This request came after some foresters claimed that mulched compartments assisted significantly in their efforts to suppress out of control fires by providing a buffer where low intensity fire spread was experienced. Considering the long term fire statistics, they tell a 'not so nice' story, and the whole industry will watch anxiously to see if the 'down' trend continues over the next few years. To remain a sustainable industry, forestry cannot afford these losses.

Quote from article

"...poor silvicultural practices on plantations leading to fuel accumulation..."

Dr Neels de Ronde's comment

This statement is in my opinion misleading, as fuel accumulation can only partly be attributed to this problem and occurrence of such practices is today actual decreasing to insignificant levels. In the past, the ▸

most important contributing factor to high fuel loadings in plantations, was complete fire exclusion in plantation ecosystems, where the origin of the trees, as well as the natural ecosystem-base in their relative countries of origins where these trees were established and the natural South African ecosystems where the trees were established, have clearly proved that fire is required in some form for the survival of sustainable tree growth: an obvious dominant reason for this problem in most cases. This aspect (complete fire exclusion) was then also identified as the main cause for the fuel accumulation problem in our country. However, the dramatic increase in the use of prescribed burning inside plantations (under the tree canopy) over the past few years have reduced wildfire damage in certain plantations significantly because of successful fuel management now being applied. I am also of the opinion that most of our professional foresters cannot be blamed for "poor silvicultural practises" today, at least not anymore.

Tiaan Pool's comment
I acknowledge the fact that Neels partly agrees with the statement. Poor weed control leads to a heavier biomass on the land where these weeds grow, and whether it is removed by burning (an activity that stimulates dormant seeds of many of these weeds to germinate in their millions and also an activity that is regarded as a silvicultural tool), slashing, mulching or by applying herbicides - lack of weed control contributes towards fuel accumulation. The art of dealing with weeds lies in selecting the appropriate method that will be both cost effective, and won't have any negative effects on the growing site - such as lost of nutrients, damage to soil texture and structure and erosion. In natural areas like riparian zones, under power lines and open areas, we don't have a choice but to apply fire as fire forms part of the natural cycle needed to keep these areas healthy. In an altered environment – such as commercial plantations where our crop increases the fuel type (grasses to woody material) and fuel load (tenfold) as compared to natural fuel loads, fire might not always be the best possible option. Making this statement, I must add that I am a supporter of under canopy burning (although this activity can only be implemented under some species and only once they have reached a certain age). The cliché: "To burn or not to burn" has, and will remain a controversial topic for many years and even scientists don't always agree on the desirability of this action everywhere. Like Neels said, we need more research to be done in this regards. One of the problems that foresters quite often face with regards to prescribed burning is a limited time window where environmental conditions are suitable to do a 'scientific' burn that will be beneficial. This either calls for alternative fuel load measures or forces foresters to take risks when they burn.

There are also other silviculture activities that can contribute to fuel accumulation such as failure to apply an access prune in compartments (Including 'brashing" of eucalypts) and failure to manage pruned branches afterwards. Thinning operations also account for added available fuel loads on the forest floor and the slash from thinned trees are often not managed.

Quote from article
"Burning of post-harvesting slash provides a means of managing hazardous fuel and remains of popular and affordable solution to the fire threat in commercial plantations, but may at the same time have negative effect(s) on the nutrient budget and soil characteristics on forestry growing sites…"

Dr Neels de Ronde's comment
Slash burning remains popular and affordable. I agree to that. I also know that there is still a lack of training in (particular) forest floor dynamic and slash burning application after clear felling (and related fire behaviour predictions), and that this shortcoming sometimes causes slash fires becoming too hot. It is also a fact that negative effects of fire on sites are directly linked to fire intensity (particularly "heat per unit area") as well as the length of "residence time" (the time a site/soil surface is exposed to hot fire temperatures).

It is thus clear that wildfires can have the most serious detrimental effect on forest sites, on both physical and chemical properties (can refer to a range of references to confirm this). Slash burning (properly applied by experienced burners) should never have such a negative effect on sites, and (in contrast) normally presents a slight improvement in nutrient budgets and availability ("ash bed effect"), with significant increases in tree growth rates having been recorded over a period of at least seven years (numerous authors can be quoted confirming recording similar results, but this was also the result of a slash burning experiment conducted by myself and Prof Zwolinski, eg de Ronde and Zwolinski, 2000, unpublished. Also refer to my PhD thesis, 1992). I can write a few pages of why this is the case and how this was achieved, but will leave it at that. The only soil type where slash burning should be avoided is on sandy soils, such as on the Zululand coast, which have poor nitrogen levels. Slash burning is applied to reduce slash levels, and will subsequently reduce the occurrence of extreme wildfire effects, and I think this should be our focus.

Tiaan Pool's comment
Agreed. See my previous paragraph.

Quote from article
"…One of the fuel load management activities under scrutiny is prescribed burning (for FSC compliant)"

Dr Neels de Ronde's comment
FSC certification is mainly based on ecological (sustainable) principles and it is a proven ecological principle that fire has a very significant ecological role to play in sustainable plantation forestry in this country, whether we like it or not. The correct application of controlled fire within plantations then subsequently also has (mostly) ecological advantages if applied correctly (I spend a lifetime on researching this subject, and can provide numerous references to confirm this, as well as of work done abroad). I am sure if one sees the end result in plantations – moving from a sterile heavy forest floor loading to a much-reduced forest floor/slash level with returning forest floor vegetation, mushrooms, etc. and sustained tree growth rates, one can only agree to this, and this will automatically lead to less fuel loading problems.

From another viewpoint: The world is waking up to the role of prescribed burning (including slash burning) as the only solution for sustainable forestry. Recent strategic decisions all over the world (including in the USA and Europe) clearly point to this being the only solution to our slash accumulation problem (again, I can provide references). In many cases the world decision-makers had to re-think the use of fuel reduction by means of prescribed burning completely, in natural ecosystems as well as in man-made systems such as industrial plantations.

Tiaan Pool's comment
Agreed, the key words here being sustainability and natural environments.

Quote from article
"…Da Costa (2008) argues that removal of organic material through fire application leads to losses of nutrients and enhances the chances of soil erosion on sensitive growing sites…"

Dr Neels de Ronde's comment
In full agreement, accepting that this writer now most probably refers to a very high intensity fire with a long residence time, because such fires are generally detrimental on forest sites. The most serious occurrence of such affects is after extreme wildfires, and this is exactly what we are trying to avoid in South Africa, by means of selective, effective (safe) slash burning application. No mention is made in this article of the beneficial effects of lighter intensity fires (eg under crown canopies), where a significant portion of the forest floor is retained and no nutrient losses occur, and the fact that neither does erosion occur under such conditions (again the number of references confirming this is overwhelmingly). The picture provided in this article insinuates that fire "is all bad", which (as I explained earlier) is not true.

Tiaan Pool's comment
I just want to point out that the purpose of my research was to investigate fire behaviour when a wildfire burns in an area where post-harvesting fuels have been treated differently. I did not investigate the merits of prescribed burning. The ideal conditions to have executed my experiment under would have been under a red FDI – unfortunately the foresters did not agree to this and I had to do the burning under milder conditions that they agreed to. If the article insinuated that fire "is all bad" I must correct this. I simply reported back on the results obtained during my research. I once again want to confirm that I believe that there is a place for prescribed burning in our commercial plantations as there are for alternative slash and fuel treatment activities.

Quote from article
"A lack of scientific results regarding fuel load management strategies led to renewed interest to investigate different fuel load management practises in the forestry industry."

Dr Neels de Ronde's comment
This is partly true, particularly with regard to "disturbing the plantation ecosystems with heavy machinery, manipulating and reducing fuel loading (pro's and con's)". However, I believe this is not true with regard to fuel load management strategies using fire, with related forest floor dynamics and related effects recorded (again I can provide references if required). I spend a lifetime on researching this subject, which resulted in completing my post-graduate degrees as well as a number of scientific articles, some of which were published abroad. My PhD in particular provides a few hundred references in this respect, mainly referring to work published by overseas researchers (part of the literature study conducted). I think this article would have been less biased towards the use of fire as a management tool, if this database was properly assessed first before embarking on a discussion about fuel load management by mechanical means only. In my opinion this information source is thus not "inconclusive", but of course researching it should never stop, and can always be improved! Point is, the results of these studies are indeed (at least in my opinion) very important, particularly as this work will certainly not rule out the use of fire: On the contrary, it proved beyond doubt that prescribed burning at all levels (applied under tree canopies and in the form of slash burning) can only be recommended, as long as it is applied correctly and selectively.

To conclude this section, I just want to correct the (negative) mention of fire-use in general, because this is not what the reality is, and remember that we researched this over decades! However, please take note that I am not anti-mulching at all, and feel that it has a role to play in forestry alongside prescribed burning application.

Tiaan Pool's comment
Despite all the positive results coming forth from prescribed burning if done correctly, foresters are still looking into finding alternative fuel load management methods for various other reasons – some I mentioned before.

Quote from article
"Methodology" and "results"

Dr Neels de Ronde's comment
I have one question with regard to the selection and application of the treatments used. Why was the treatment "broadcasting the slash plus burning the slash" not included as a treatment? It would obviously (i) have reduced slash levels most effectively and (ii) it would have presented the mostly-used treatment (and would probably be far cheaper) than the mechanical slash treatments.

Tiaan Pool's comment
As mentioned before, the purpose of the study was not to investigate the use of fire, but fire behaviour in different post- harvesting treatments. (If – like Neels mentioned - burning was one of the treatments that I had to test, it would have been impractical. You cannot burn the same area twice in close succession)

Dr Neels de Ronde's comment
The only problem with the above additional treatment would then be that fire application (and related results) would then have been distorted because - in the proposed (new) treatment - there would be too little fuel left to be burned (for a second time that is). This would then have proved a very important point: That only the broadcasting of slash - with burning thereafter - can provide a fuel-free area, which cannot be burned over again during wildfires. This is in contrast with the results from other treatments, where in all cases some (burnable) fuel would remain after the initial treatments. This might

have "disturbed" the objectives of the experiment in the process, but is this not the reality?

I have to point out that such an experiment (slash treatment after clear felling of pine trees) was in fact applied during the early 1990's in the Tsitsikamma forest region, when four aspects of slash treatment at the time (no slash treatment, stacking slash in rows, broadcasting slash with slash burning and stacking slash in heaps and burning the heaps) were applied and measured over a period of seven years, where the proposed additional treatment (broadcasting slash with burning application) came out best in terms of (i) costs, (ii) effectiveness (slash reduction) as well as (iii) effect on tree growth improvement (de Ronde and Zwolinski, 2000; de Ronde, 1992). Knowing the results of this medium-term experiment, might indeed have changed the R&D approach used in this trial and resulting article, unless there is another explanation for the selection of treatments used, as well as the assessment of the results. The significant improvement on tree growth of the fire-treated slash would then also have proved that the use of fire would not only have resulted in sustained tree growth, but even improved it.

Tiaan Pool's comment
As mentioned before, the purpose of the study was not to investigate the use of fire, but fire behaviour in different post- harvesting treatments.
Quote from article

"…the only explanation for the significant lower fuel loads within mulching treatments is accelerated mineralisation of the organic material"

Dr Neels de Ronde's comment
I do not buy that. Even though I do not know the time span between the pre- and after-treatment measurements of fuel loading, this would have been over a relatively short period of time (at the most one or two years?) and after having studied the dynamics of decomposition rates in some depth (de Ronde, 1992), increasing the rates of this process to such enormous levels is just not possible, after whatever fuel manipulation. I do not have an immediate answer for this drastic fuel reduction, but this could well have been the manner in which the fuel particles were measured after treatment and/or the volume calculation of the "re-shaped" fuel particles.

Tiaan Pool's comment
The time span between the pre- and after-treatment was nine months for the eucalyptus treatment and eight months in the pine treatment. I reported what I have measured. After I found these results, I questioned the forester (Gustav McMaster) about his experience in this regard. He then took me to other eucalyptus compartments that were mulched two years before and we could barely find any remaining mulch particles in the compartment. Similar results have been reported where mulching was done under the canopies of trees to reduce the litter layer.

Quote from article
"…Conclusions: fire behaviour"

Dr Neels de Ronde's comment
If the broadcast-and-burn treatment would have been included, the measurement of fire parameters after fuel manipulation would thus have been meaningless in some way, because the "no-fire" resulting from this treatment would obviously have been the best and most effective (and probably also the cheapest for such a significant fuel reduction level). All the other related fire effects discussed would then also have fallen away.

Tiaan Pool's comment
Refer to the purpose of my research

Quote from article
"…positive effect of mulching on fuel and soil moisture retention…and accelerated tempo of mineralisation of organic litter…"

Dr Neels de Ronde's comment
I accept that the mulching treatment (with its higher forest floor density) will during most of times have a higher moisture content, and that this could have a significant decreasing effect on fire behaviour in the case of light-to-medium fires. However, under extreme wildfire conditions the pre-heating process of a raging fire front will fast reduce these relatively high moisture levels to become "burnable" (or "available" if you like). This might then still have reduced the flame height, rate of spread (ROS) and fire line intensity, but would have increased the 'heat per unit area' as well as the fire residence time, in the process thus "slowing down" fire spread significantly (also because of the higher fuel density) and also exposing the soil surface to high fire temperatures for a longer period, which could be very harmful to physical and chemical soil properties. The fire-related recordings in this experiment were applied during "mild" conditions, making it impossible to record (or extrapolate to) such high fire parameters under extreme conditions (would also have been too dangerous to apply anyway). I appreciate that. However, my experience with fuel and fire modelling provided me with a pretty good idea of simulated results of such fires.

The "broadcasting of slash with burning" application, already proved to be by far the best slash reduction treatment and detailed work studies of the financial implication applied on site (de Ronde and Zwolinski, 2000, unpublished; de Ronde 1992) also proved it to be the most cost-effective. Of course this method would also have been the most effective for fire protection purposes (as part of buffer zones), because it provides fuel-free areas.

Tiaan Pool's comment
I need to mention that there are still foresters as well as scientists from different parts and areas of our industry (nationally and internationally) that are still looking for fuel load management methods that are safer and poses a lower risk to possible harmful effects on the growing sites of trees as compared to burning. This does not mean that prescribed burning is not cost effective.

Dr Neels de Ronde's conclusion
The following positive results of Tiaan's experiment can be mentioned:
1. Of all the fuel treatments (excluding broadcasting slash and burning), mulching appears to be the most effective fuel reduction method. Chopper-rolling might provide too much mechanical damage of the forest floor and this could have longer-term ecological implications, as it disturbs the decomposition components (and processes) severely.

2. Mulching could offer a safer method to apply in the case of: (i) all sandy forest soils, (ii) in the case where slash loading is too high for comfort (too dangerous to apply fire in, with an acceptable degree of safety) in slash loading after clear felling.

3. It has also been confirmed in this experiment that stacking of slash in rows or is meaningless, produces very high fire intensities if burned produces a detrimental (long) residence time. It also doubles re-establishment costs (de Ronde, 1992). This treatment should thus be avoided at all times (contrary to some popular beliefs).

Tiaan Pool's conclusion

I want to applaud scientists and specialists like Dr de Ronde who are constantly questioning and prompting our industry to strive to higher, more effective levels of fire management in our local and international fire arenas. His work on prescribed burning took a long time to be recognised and I am of the opinion that numerous fire managers still don't recognise the value or have acquired the skills needed to use fire as a safe, ecological sound and cost effective management tool. He has been mentor to many of the leading fire managers known in South Africa today and has through his opinions and research opened up many debates regarding fuel load management. At the same time he has raised relevant questions that stimulated numerous research projects (some results still unpublished) that investigated the effects of fire behaviour. ▲

53 dead in attack on casino in northern Mexico

Two dozen gunmen burst into a casino in northern Mexico, doused it with fuel and started a fire that trapped gamblers inside, killing 53 people and injuring a dozen more, Mexican authorities said.

The fire at the Casino Royale in Monterrey, a city that has seen a surge in drug cartel-related violence, represented one of the deadliest attacks on an entertainment centre in Mexico since President Felipe Calderon launched an offensive against drug cartels in late 2006, Associated Press reported.

"This is a night of sadness for Mexico," federal security spokesman Alejandro Poire said in a televised address. "These unspeakable acts of terror will not go unpunished."

Calderon said that the attack was "an abhorrent act of terror and barbarism" that requires "all of us to persevere in the fight against these unscrupulous criminal bands."

"But we could find more," said state Attorney General, Leon Adrian de la Garza, adding that a drug cartel was apparently responsible for the attack. Cartels often extort casinos and other businesses, threatening to attack them or burn them to the ground if they refuse to pay.

State police officials quoted survivors as saying armed men burst into the casino, apparently to rob it, and began dousing the premises with fuel from tanks they brought with them. The officials were not authorised to be quoted by name for security reasons. De la Garza said the liquid appeared to be petrol.

With shouts and profanities, the attackers told the customers and employees to get out. But many terrified customers and employees fled further inside the building, where they died trapped amid the flames and thick smoke that soon billowed out of the building.

Workers continuing to remove bodies well into the night.

Monterrey Mayor, Fernando Larrazabal, said many of the bodies were found inside the casino's bathrooms, where employees and customers had locked themselves in to escape the gunmen.

In an act of desperation, authorities commandeered backhoes from a nearby construction site to break into the casino's walls to try to reach the people trapped inside.

Initial reports said 11 people had been killed, but the death toll climbed as emergency personnel and fire fighters searched the casino building. Medics treated survivors for smoke inhalation.

State police officials initially said witnesses reported hearing three explosions before the fire started, but later said a flammable material was used. The reports of explosions may have been the sound of the ignition of the liquid. ▲

Fighting wildfires with computers and intuition

The recent fires that Arizona experienced, some surging forward faster than expected, tested the mathematical models that behaviour specialists use

While thousands of fire fighters were combating wildfires using hand tools and hoses, Drew Smith gazed into a computer screen at a command centre near one of the fiercest blazes in the Southwest USA to try and determine which way the flames would veer next.

Some wildfires are aggressive. Some are cunning. Some show exceptional endurance or fierceness. The most difficult among them are assigned to behaviour analysts like Drew Smith — fire whisperers, as it were — who act as fire psychologists delving into the blazes' inner selves.

"This fire is an exceptionally aggressive fire based on how large it has become and how fast it's growing," said Smith, who was assigned to the Wallow Fire, which became the biggest blaze in Arizona history after burning more than 215 000 hectare in the eastern part of the state.

Fire behaviourists work alongside meteorologists, given that the weather, especially wind patterns, plays a pivotal role in how a wildfire grows. The topography is also important as fires burn differently depending on whether they are going up a steep slope, across a valley or through a developed area. Then there are the different types of fuel ie the vegetation and other materials that give fires energy as they spread.

With a large number of significant fires burning through the Southwest, the fire whisperers are busy. None, though, is listened to as intently as that of the behaviorist, who uses computer modelling and intuition to try to predict how the fire will burn that day.

"They seem to get inside the head of the fire, sort of like a Dr Phil for a fire," said Helen Snyder, who attended the daily strategy sessions that fire fighters held as the Horseshoe 2 Fire threatened her home in Portal, Arizona. "Everyone hung on their words as they drew mental pictures of the fire."

The recent fires that Arizona experienced, some surging forward faster than expected, tested the mathematical models that behaviour specialists use. Tom Zimmerman, a fire behaviour expert at the National Interagency Fire Centre for the United Forest Service in Boise, Idaho, said that the Wallow Fire, had on occasion, advanced more rapidly than the models predicted. "We use each fire to verify the models and make them more accurate," he said.

Even with all the data crunching, fires are still full of surprises resulting in fire fighters having to constantly be ready for the unexpected and that residents insistent on knowing whether a fire is moving their way or when an evacuation order will be lifted, may not get the definitive answer that they seek from fire officials.

Scrutinising a fire means thinking about it constantly, sometimes even in one's sleep. Fire specialists say they ask themselves what the fire is trying to tell them on a given day, as if it is communicating through its flames. And some of them speak of fires as though they were living, breathing things.

"One of my colleagues used to compare wildfires to coyotes ▸

New US fuel standards
for trucks impact fire apparatus

Fire trucks and concrete mixers, semis, heavy-duty pickups (bakkies) and all trucks in between will, for the first time, have to trim fuel consumption and emissions of heat-trapping gases under new efficiency standards recently announced by US President Barack Obama.

The White House said the standards will save businesses billions of dollars in fuel costs, help reduce oil consumption and cut air pollution. The standards apply to vehicle model years 2014 to 2018.

Three categories are affected ie big rigs or semis will have to slash fuel consumption and production of heat-trapping gases by up to 23 percent. Petrol and diesel-powered heavy-duty pickups and vans will have to cut fuel use by 10 percent with petrol, or by 15 percent with diesel fuel.

A 9 percent reduction is set for fuel consumption and greenhouse gas emissions for work trucks, which includes everything from fire trucks and concrete mixers to garbage trucks and buses.▲

because you can see them off in the distance but as soon as you take your eye off them they will come up and bite you," said Ben Newburn, also a fire behaviour specialist who was analysing the east side of the Wallow Fire.

So vast had that particular fire grown, that it has been divided up into three parts and scrutinised from different perspectives. "Early on, this fire was moving 16 to 20 kilometres in a single day, and we consider that extreme fire behaviour," said Newburn, who works for the Forest Service.

There is a warlike aspect to fighting wildfires, and the fire behaviour specialists have all spent considerable time as grunts, digging trenches, chopping down trees and setting off controlled burns to keep runaway flames in check. They have also managed fire crews and made the tough calls on when to advance and when to retreat. Now, though, they are like intelligence analysts trying to outthink the enemy.

Despite learning the laws of thermodynamics that govern fires, behaviour specialists say there is still plenty of unpredictability to each blaze, which requires them to draw on their long experience. Fires can produce their own weather patterns, for instance, which can then end up altering the course of the fires.

The analysts' critical judgments have significant real-world consequences. They acknowledge that not every call they make is perfect.

Two blazes could have nearly identical characteristics in two subsequent years and act quite differently because of the weather patterns leading up to them. One of the factors fuelling this year's fire season, experts say, is the long drought that preceded it, which left the forest floors dry and susceptible to fire.

"You learn after you've been around fires that they are like people, in a sense," said Smith, who is a captain with the Los Angeles County Fire Department when he is not on assignment at a wildfire. "No two of them are the same." ▲

Photo: Hiro Komae

A police officer in protective suit searches for missing people in Minami Soma, Fukushima Prefecture, north eastern Japan

Experts: Fukushima 'off-scale' lethal radiation level infers millions dying

Fukushima nuclear power plant radiation recordings of external gamma radiation have been so high in August 2011, they went off scale said veteran nuclear expert, Arnie Gunderson, after the famous physicist, Dr Chris Busby, told the Japanese people recently that radioactive air contamination there is now 300 times that of Chernobyl and 1 000 times the atomic bomb peak in 1963, inferring that hundreds of millions of people are now dying from Fukushima radiation, including people in the United States.

As Fukushima radiation data retrieval and interpretation had been so complex or non-existent for the concerned public, citizen reporters in Japan and United States have established easily accessible ways to view radiation levels on the internet, Deborah Dupre, Human Rights Examiner, reported.

Fukushima radiation depopulation unfathomable

Dr Janette Sherman, a highly respected physician and acknowledged expert in radiation exposure who has reported a north-east United States 35% baby death spike since Fukushima fall-out reached the nation, concurs with estimates that world-wide, the Chernobyl Kill is one million people killed to date reported NOVA News. Extrapolating, world-wide deaths by Fukushima radiation could eventually be hundreds of millions of people, becoming the most significant depopulation event to date.

Dr Chris Busby, world famous physicist, said tests conducted at the respected Harwell Radiation Laboratory in England demonstrate that airborne radiation in Japan is 1 000 times higher than radioactive "fallout" at the peak in 1963 of H-Bomb detonations by nuclear powers. In March, Busby had estimated that Fukushima radiation to be 72 000 times greater than what the United States released at Hiroshima.

Thirty-nine year nuclear industry veteran Arnie Gunderson of Fairwinds stated, "There will continue to be enormous spikes for at least ten years."

Dr Busby advocates not only independent studies of the nuclear catastrophe. He received a resounding applause when he told the Japanese people this week that in his opinion, scientists who said this accident was not a problem must be prosecuted.

"Many nuclear scientists said it was not a problem when they knew it was a serious accident. People who listened to those scientists and did not run away when they should have. Because of that, people will die." ▸

The Fukushima nuclear power plant's radiation recordings went off the scale in August 2011

▸ Busby explained that the World Health Organisation is tied to the Nuclear Industry so their research is bogus. In studying Fukushima, the World Health Organisation expects to find no effects "and so that's what they'll find," he said.

Latest nuclear 'peace, health and prosperity' spike

TEPCO discovered a hot spot location on the Fukushima nuclear power plant site recently with lethal levels of external gamma radiation.

How the latest radiation spike at Fukushima might have been deposited and also how similar radioactive material would have been released off-site was presented by Arnie Gunderson, with over 25 years' experience in nuclear decommissioning oversight, co-author of the first edition of the Department Of Energy (DOE) Decommissioning Handbook. Arnie Gunderson, Fairwinds)

Gunderson noted that over 1 000 REMs were released according to TEPCO, an amount that, "if there, would mean death within a couple of days."

"Those kinds of exposures cause extensive neurological breakdowns that can't be reversed medically," Gunderson reported. "To be anywhere near that for a couple of minutes would be a death sentence." Gunderson has questioned how this hot spot could have been missed over 100 days.

"Earlier site maps do not show this high concentration of radioactivity in that area," he said. "More likely that this event happened over time. This radiation built up over time."

Gunderson said he wanted to put that into perspective and let the public know what is happening, saying the key is that it occurred in a vent.

It contained caesium and hot water that ran down the outside of the pipe and collected in the bottom, so the concentration got higher and higher as more water containing caesium came down. It was found in a stack condensing.

"Air was being pulled over that and exhausted into the air for a long period of time," he said.

Radiation screening in progress

"It speaks to how much radiation was released over the last 140 days, only a small amount compared to the total amount being released to the environment."

According to Gunderson, over the next ten years, there will be continued spikes in radiation on-site, first where places bulldozed actually come to the surface in excavations.

"There will continue to be enormous radioactive sources that are unearthed," he said. "When they get into these buildings to actually try to dismantle the plant, they are going to find even higher radiation levels than this one."

"At the bottom of the plant, the nuclear core has leaked out and is now lying like a pancake on the concrete floor, working its way down, but probably not through the concrete."

According to Gunderson, the bottom of the plant has even much more radioactive material leaking than the recent off-the-scale recordings.

"It's going to take ten or twenty years to clean up," he said.

The Japanese government has called for a voluntary cease of using compost materials from fallen leaves due to humus registering cesium over the government's acceptable radiation limits according to MSNBC World News Asia Pacific.

Following criticism of government radiation data being too difficult to interpret, organizations started collecting their own data. Now, the government is helping to interpret radiation readings found in air, water, grass, farm soil, trees and food. ▲

Idaho wildfire
results in evacuation of nuclear facility

Fires have burnt more than 4 000 ha across Idaho

Fire fighters recently struggled to control a fast-growing 11 330 hectare wildfire which raged within several kilometres of spent nuclear fuel stored at a US Energy Department lab in the high desert of eastern Idaho, USA, Reuters reported.

The growth and intensity of the blaze, which was the nation's largest active wildfire at the time, prompted the Idaho National Laboratory to order a key facility on the 1 435 square-kilometre site evacuated of all nonessential personnel, lab officials said.

The Materials and Fuels Complex consists of facilities for handling, processing and examining spent nuclear fuel, irradiated materials and radioactive wastes, according to the lab's website.

Technicians perform this work with remotely operated tools and equipment placed inside shielded chambers to contain contamination and radiation.

Fire crews were taking preventive measures to safeguard the facility's buildings, which are also surrounded by buffer zones of gravel or sand, lab spokesman Ethan Huffman said.
Nearly 50 fire fighters from the lab and the US Bureau of Land Management, focused their efforts on protecting a separate facility where spent nuclear rods are stored, according to the lab. Additional radioactive rods are kept cooled in storage ponds farther to the south at a site called the Idaho Nuclear Technology and Engineering Centre.

The centre's workers "took shelter at the facility as a precaution," the lab said in an update without further explanation.

"They had to fight the fire from all directions as the winds were changing every minute," lab spokeswoman Sara Prentice said.

The exact distance between the leading edge of the rapidly spreading blaze and various facilities on the laboratory grounds, which also includes three working reactors, was not precisely known, lab officials said. But flames did reach to within several kilometres of sites where spent nuclear fuel is kept, including the Materials and Fuels Complex and the so-called Naval Reactors Facility.

The recent blaze at the lab came three days after crews extinguished an earlier fire that burned through sagebrush and grasslands on the northwest edge of property.

Government officials said that blaze was sparked by a vehicle with a blown tire dragging its metal rim along the pavement of a state highway near the laboratory.

The cause of the new blaze was under investigation. It is one of five wildfires that erupted in eastern Idaho amid lightning strikes, high temperatures and strong winds.

Fires have charred more than 4 000 hectare across Idaho and the Northern Rockies, including parts of Montana, Yellowstone National Park and northwestern Wyoming.

Hot, dry, windy conditions also posed difficulties for the 170 fire fighters assigned to a separate fire which blazed out of control in forested high country of east-central Idaho and western Montana.

The Saddle Complex blaze, which scorched 8 540 hectare in Idaho's Salmon-Challis National Forest and the Bitterroot National Forest of Montana, burned with such intensity and in such rugged terrain that fire bosses deemed it unsafe to launch an attack except by air.

"These aren't the kind of conditions you put people in," US Forest Service spokesman, Bob MacGregor said. ▲

Two Albatross aircraft crashed into a mountain

The Albatross aircraft took off from Tzaneen Airport in Limpopo, South Africa in August 2011 at approximately 10h30. Both planes were bound for Rand Airport in Johannesburg, after participating in the Tzaneen air show. They were reported missing at 13h30 on the same day, authorities said.

Two ex-South African Air Force (SAAF) Piaggio P-166S Albatross aircraft took off from Tzaneen airport on 14 August 2011 after having participated in a display at the Tzaneen Air Show the day before. The hour and a half flight to Rand Airport, Germiston, Gauteng was to be conducted under Visual Flight Rules (VFR).

Shortly after take-off they formed up in loose formation and headed south west towards Johannesburg. The weather was cloudy over the mountains to the south west of Tzaneen, but clear beyond. It is presumed that at some point the two aircraft entered Instrument Meteorological Conditions (IMC) and lost visual contact with the surrounding terrain. Some two and a half hours later it was ascertained that the aircraft were overdue in Germiston and contact could not be established with any persons aboard either aircraft. At 13h30 a full scale search and rescue operation swung into action involving South African Search and Rescue SASAR), Air Rescue Co-ordination Centre (ARCC), the South African Police Service (SAPS), the mountain club and various volunteers.

Inclement weather hampered the search, which continued through to the morning of Tuesday, 16 August 2011, when the wreckage of the two aircraft was spotted by a police helicopter at around 08h15 lying against the slopes of the Mamotswiri Peak region about 35m from the top and about 100m apart. Both aircraft had sustained a post impact fire.

Bad weather and low cloud conditions initially hampered the search for the missing aircraft.

The bodies of 13 people who died in the accident were to be flown to Pretoria on Wednesday for post mortem examinations, Limpopo police said.

"The bodies also needed to be identified," Brigadier Hangwani Mulaudzi said. "Some of the bodies were burnt beyond recognition. We are going to have to do DNA testing."

Those on board the aircraft with registration ZU MMI were pilot Brian Gruar and passengers Marrion Anderson, Maddison and Alexandra Doak, Tess Spence, Louise Warden and Kevin Woolacott.

On board the other plane, registration ZS NJX, were pilot Pieter Geldenhuys, and passengers Stuart and Peter van Oldenburg, Frans Dely, Marietjie de Witt, and Linda Pierce. Dely was a well-known Johannesburg aviation photographer.

Police spokesperson Brigadier Hangwani Mulaudzi said members of the Bakgaga royal village saw the aircraft go down and heard a crash. They helped the search teams find the wreckage.

Flew straight into mountain

Hannes Steyn, head of disaster management in the Mopani district, said the planes flew straight into a mountain about 15 minutes after take-off. There were six occupants in one of the Albatrosses and seven in the other. Their bodies were scattered over a large area.

Steyn said the two wrecks were found about 150 metres apart.

"The area is inaccessible and the helicopters couldn't land. Rescue workers had to be lowered from the helicopters by rope." The bodies were carried from the mountains on stretchers.

Aviation expert Brian Emenis said if the two planes had been flying about 200 metres higher they would have cleared the mountains.

The pilots, Brian Gruar and Peter Gildenhuys, spoke on their radios for the last time just after take-off on Sunday. Steyn said no distress signal was received from either of the aircraft.

He also said no flight plans were filed before the two Albatrosses departed on Sunday morning. "There is no official air traffic control system from the Tarentaalrand airport."

While the weather was fine during the air show on Saturday, it suddenly started deteriorating on Sunday morning and thick fog moved in over the mountains.

Mopani District municipal mayor Joshua Matlou said earlier that the planes were flying in formation when they crashed at an altitude of 1 570 metres.

"They flew directly into the cliff. There was no mid-air collision," he said.

There was also no mayday broadcast before the crash and indications were that the occupants of both planes died on impact.

Limpopo police spokesman, Brigadier Hangwani Mulaudzi, said police and the CAA would work together during investigations.

Transport Minister, Sibusiso Ndebele, thanked search and rescue teams, as well as volunteers involved in the search and rescue operation.

A crisis centre was set up at Rand airport to assist the families affected by the tragedy. Mulaudzi said families of the victims were receiving trauma counselling. ▲

Stage collapsed
at Indiana Fair

The collapsed stage at the Indiana Fair

A gust of wind of more than 112 km per hour, toppled a stage at the Indiana State Fair in August 2011, killing five and injuring dozens of fans waiting for the country band Sugarland to perform. The freak storm was called a "fluke" that no one could have anticipated, the governor and meteorologists stated.

The wind was far stronger than that in other areas of the fairgrounds, said Dan McCarthy, chief meteorologist for the National Weather Service in Indiana.

Just hours after lights and rigging on a concert stage at the state fair in Indianapolis toppled into a crowd, killing five people and injuring at least four dozen more, Indiana officials opened an investigation to learn the cause of the calamity and what role the weather, including a wind gust that topped 112 km per hour, may have played.

Governor Mitchell E Daniels Jr called the accident "freakish," and officials linked it to a wind gust that passed through the area moments before the stage collapsed.

Along with checking for any evidence of structural problems with the stage setup, investigators will also be looking into whether fair officials acted swiftly enough or paid appropriate heed to a severe thunderstorm watch that was issued nearly three hours before the scheduled concert.

The rigging collapsed at 20h49 Saturday, minutes before the country duo Sugarland, the featured act, was to take the stage. The musicians were not injured.

Videos posted online shortly after the accident show plumes of gravel and sand lashing through a nearly pitch-black sky. The tarp roof and backdrop of the stage flaps violently moments before the steel rigging slumps and topples onto a screaming crowd in front of the stage.

"It could have been prevented if the place had been evacuated properly," a concert goer reported. "They knew the weather was coming. They should have evacuated it fast."

The Indiana Occupational Safety and Health Administration and the state fire marshal's office were investigating what caused the collapse, said Cindy Hoye, the fair's executive director. Officials said that according to weather reports, a highly localised windstorm with a gust that topped 112 km/h, hit the concert site just before the stage collapsed.

The rigging was assembled by local workers and supplied by an outside company, the Mid-America Sound Corporation, which is based in Indiana, Hoye said. In a statement the company said: "This is a devastating tragedy, and we want to express our sympathy to the families of those who were killed or injured last night at the state fair. We have already started an independent internal investigation to understand, to the best of our ability, what happened."

Video footage showed a scene of chaos.

Stagehands operating lights and equipment high above the stage plummeted into the crowd along with the rigging, according to concert goers.

Witnesses said that concert goers, who initially fled as the rigging collapsed, rushed back moments later to help those caught in the debris as the thunderstorm rolled in.
At a news conference the next morning, first sergeant David Bursten of the Indiana State Police, confirmed that four people died at the scene and that a fifth person died overnight at Methodist Hospital in Indianapolis. Some of the dozens who were hospitalised had life-threatening injuries, he said, asking for people to pray for the victims.

Forty-five people were taken to hospitals, and some may have gone on their own, Bursten said. Indiana University Health said 12 of the 26 ▸

Five people died and forty-five people were taken to hospitals

people treated at its hospitals were still there (at the time of print), including three at its children's hospital.

Daniels, who also attended the news conference, praised the hundreds of people who remained at the accident site pulling trapped concert goers from under the collapsed rigging.

They "ran to the trouble, not from the trouble," the governor said, before seeming to become overcome with emotion. "That's the character that we associate with our state."

Daniels said his wife, Cheri, and one of their daughters had attended the concert.

David Imy, a meteorologist with the National Weather Service, said a severe thunderstorm watch for all of Indiana was issued just before 18h00 on that Saturday, almost three hours before the winds struck the concert venue.

"When we issue a severe storm watch, it means precautions need to be taken," Imy said. "People need to get inside and not stay outside."

Concert goers returned to assist with rescue trapped victims

As emergency crews worked to carry victims out on stretchers, returning audience members and others lifted the giant metal scaffolding off people pinned beneath it, according to witness accounts and photos and video posted online. Around 22h30 pm, police dogs were brought in to help search the debris for any people who might still be trapped.

Indiana's position in the Midwest has long made it prone to volatile changes in weather. In April 2006, tornado-force winds hit Indianapolis just after thousands of people left a free outdoor concert by John Mellencamp held as part of the NCAA men's Final Four basketball tournament.

And in May 2004, a tornado touched down south of the Indianapolis Motor Speedway, delaying the start of the Indianapolis 500 and forcing a nearly two-hour interruption in the race. ▲

Photo: NIST

The remains of what was once a home improvement store in Joplin showing the destructive power of the tornado that struck the area in May 2011.

Technical study on impacts of Joplin tornado

The USA's National Institute of Standards and Technology (NIST) recently announced that it will conduct a full technical study on the impacts of the May 22, 2011, tornado that struck Joplin, Missouri, USA.

The massive tornado was rated category EF5, the most powerful on the Enhanced Fujita scale. According to the US National Weather Service (NWS) and the US Federal Emergency Management Agency (FEMA), the multiple-vortex storm impacted an area approximately 1,2 km wide by 22,5 km long, destroyed some 8 000 structures in its path, and killed more than 150 people. This makes it the single deadliest tornado in the United States in the 61 years that official records have been kept.

"The widespread destruction across a range of building and construction types, along with the tragically large death toll despite a comparatively substantial warning time, makes the Joplin tornado a unique event to research," says Marc Levitan, leader of the NIST study. "The lessons learned will be extremely valuable to national efforts aimed at reducing losses of lives and property from tornados."

NIST sent four engineers to Joplin in May 2011 to conduct a preliminary reconnaissance of building performance and emergency communications during the tornado. Based on the analysis of the data collected and other criteria required by regulation, NIST director, Pat Gallagher, established a research team under the National Construction Safety Team Act to proceed with a more comprehensive study of the impacts of the disaster.

The objectives of the NIST technical study are to:

- determine the characteristics of the wind hazard from the tornado;
- determine the pattern, location and cause of injuries and fatalities, and how these numbers were affected by emergency communications and the public response to those communications;
- determine the performance of residential, commercial and critical (police stations, firehouses, hospitals, etc) buildings;
- determine the performance of lifelines (natural gas, electrical distribution, water, communications, etc) as they relate to maintaining building operation; and
- Make recommendations, if warranted, for improvements to building codes, standards and practices based on the findings of the study.

The same engineers who performed the preliminary reconnaissance will conduct this more extensive study. They will be joined by an expert on ▸

Johannesburg's emergency services head resigns

Johannesburg's suspended emergency services head, Audrey Gule, resigned with immediate effect on Friday, 5 August 2011, a city spokesman said.

She quit before the start of a pre-dismissal hearing at the Commission for Conciliation, Mediation and Arbitration, Gabu Tugwana said in a statement.

Gule was suspended by the City of Johannesburg, Gauteng, South Africa, in June pending the outcome of a disciplinary hearing. She was accused of fraud and corruption.

One of the allegations was that she allegedly pocketed R200 000 in city funds, and allegedly failed to renew the contracts of three long-serving finance department officials who had discovered this.

She was appointed to the job in 2004.

Tugwana said both parties agreed that money owed to the city by Gule would be set off against any money due to her, SAPA reported.

Audrey Gule

severe storms from the Commerce Department's National Oceanic and Atmospheric Administration (NOAA).

Observations and findings from the preliminary reconnaissance suggest the following:

- The current tornado rating procedure, the Enhanced Fujita intensity scale, lacks adequate indicators for estimating the intensity of tornadoes such as the one in Joplin
- The 24-minute warning time for this event was nearly double the national average reported by the NWS as 13-14 minutes
- The Joplin siren-based warning system was not intended to alert people who were indoors
- There were no designated public safe rooms or tornado shelters in Joplin
- Most buildings in Joplin did not have basements
- A large number of residential and non-residential buildings in Joplin sustained complete loss of function, requiring either major repair or replacement
- Critical and high-occupancy buildings in Joplin did not perform better than buildings of similar construction type in lower-risk categories with regard to loss of function or damage
- Reinforced concrete frame and steel frame buildings that were surveyed also suffered total loss of function and major damage to the envelope and interior; however, the structural frame remained largely intact
- Most other buildings, including those constructed with pre-cast concrete, metal, concrete and brick masonry, and timber-frame, suffered partial or complete collapse

Both the NIST preliminary reconnaissance and the upcoming technical study led by NIST build on a partnership between the agency's Disaster and Failure Studies Program and the interagency National Windstorm Impact Reduction Program. NIST boasts 40-plus years of experience studying structural failures and fires. ▲

The tornado that struck Joplin was rated a catogory EF5

The tornado killed more than 150 people

Threat of propane blast

averted in California, USA

Thousands of evacuees in Lincoln, California, returned home after fire crews allowed a burning propane rail tanker to burn itself out, ending the threat of a major explosion, authorities said.

The raging blaze from the tanker burned out, but then crews reignited it to allow vapours caught in the tank to also burn away, Lincoln Fire Chief, Dave Whitt, said.

He told The Associated Press that the threat of a major explosion no longer existed and an evacuation order for Lincoln was lifted.

Between 4 000 and 5 000 homes in the northern California city of 40 000 people had been evacuated, and more than 6 000 students missed their first days of classes after the tanker caught fire recently.

Whitt said fire fighters filled the tanker with water and a small amount of foam.

After preparing to undertake a bold manoeuvre to drain the propane from the burning car, Whitt said crews opted instead to let the fire burn itself out after determining the car held less propane than previously thought.

"They saw the flames on top get lazier and lazier," he said. "They said, `you know what, this may be out of product.' Sure enough that's exactly what happened."

Officials had worked throughout the day in trying to head off the potential failure of the 110 000 litre tank. Whitt said crews were concerned at the time that a build-up of heat could lead to an explosion that could produce a fireball several hundred yards wide.

An explosion also could have thrown metal shards up to two kilometres away.

It was unclear how the tanker caught fire in the Northern Propane Energy yard in Lincoln. It was surrounded by trucks, other rail cars and storage tanks containing at least 645 000 litres of additional propane that Whitt said were at risk as the fire burned. A gas pipeline also runs through the area.
One worker at the rail yard was injured in the initial fire and suffered flash burns but has been released from a hospital.

A similar fire in 1973 in the Arizona town of Kingman killed 11 fire fighters and a gas company worker when a rail car carrying a propane tank exploded. The resulting fireball injured more than 100 others and showered the surrounding area with shrapnel. The propane tanker flew a quarter of a mile and its impact dug a crater three metres deep.

Whitt, who was the first to respond to the fire, said crews were successful in keeping the tanker cool since it caught fire.

"If we didn't put water on tank, and protect integrity of tank, outcome would not have been as positive," he said.

He added the crews used up to 19 000 litres of water per minute to keep the tank cool. ▲

SafeQuip launches

Davey pumps for water transfer

SafeQuip, subsidiary of Rovic International Group of Companies, has designed their FireKing mobile water transfer and fire pumps to meet the diverse needs of plumbers, farmers, residential home owners and fire services.

This has come from research, resulting in development of a range of cost effective skid units. The low pressure economy unit comes with a Hoffman pump and engine, 500 litre tank, five-metre external suction hose with three-way valve and strainer and 10 meter delivery hose and nozzle, offering versatile applications in low volume markets.

Optional on the economy unit is a high pressure Hoffman pump, delivering 25 litres per minute at 40 bar pressure.

Next in line is the medium pressure unit with single or twin-stage Davey pump, a 30 metre high-pressure hose on reel and a five-metre suction hose for medium to high volume applications, delivering 500 litres per minute at seven bar with choice of Honda, Yamaha or diesel engines. The high-pressure unit has a five-metre suction hose and a 20 meter delivery hose which pumps 30 litres per minute at 180 bar via a high-pressure Ruby pump.

Extras include night lights, glass fibre or PVC tanks ranging from 400 litres to 1 000 litres, stand pipes and drip torch holders, including lifting frame and trailer mounted options. Due to its national distribution agreement with Davey Pumps, SafeQuip is able to supply self-priming engine driven and electrical pumps, and high power and general purpose pumps including the PG 20 Muck Mover which is ideally suited for heavy duty agricultural slurry.

Davey's patented Toruim system is an additional 'intelligent' pressure control component for harvesting rain water, regulating delivery from rainwater tanks.

Water purification systems can also be supplied. Due to its acquisition of CamQuip earlier this year, the company is able to configure pump sets and supply dependable solutions and advice, supported by a customer service ethos from its six branches nationally. ▲

Tanker stranded

off the east coast of South Africa

The 164 metre long Mt Phoenix was on its way to a scrapyard in India when it started dragging its anchor as a storm moved into the area. Despite attempts by the crew of the salvage tug Smit Amandla to reconnect its tow line, the vessel ran aground.

Helicopters from the South African Air Force, the SA Police Service and the National Port Authority (NPA) rescued 15 Indian sailors aboard the vessel.

A SAPS Air Wing Eurocopter AS350 B3 Squirrel light utility helicopter (LUH) rescued eight sailors using its winch, a SAAF Denel Oryx medium utility helicopter saved four more and the NPA AgustaWestland A109 LUH helicopter, from Richard's Bay, hoisted three to safety.

Several attempts were made to remove the vessel from the rocks but unfortunately all were unsuccessful.

On the last attempt maximum power restrictions of the tugs were exceeded in the attempt to free the vessel.

The Phoenix was stranded off Salt Rock, a residential area, and would be complicated to salvage. The tanker was not insured and it was unlikely the cost of removing the 420 000 litres of marine fuel and refloating it would be recovered by the government.

Operations went ahead to pump fuel into 100-ton bladders on the beach, to hold the fuel until it can be emptied into tankers. The removal of the fuel would cost about R10m, Maritime Safety Authority regional manager Nigel Campbell said.

"We won't get much change from R10m. She is sitting on the rocks which can punch a hole in the ship. We have been very lucky given the weather conditions."

The stricken Mt Phoenix tanker

If the weather worsens and the ship is damaged to the extent that it cannot be refloated and sold to salvers who will tow it to a scrapyard, it could cost R30m to cut the ship up where it lay. The authority obtained a court order to detain, seize and sell the vessel.

SAMSA with Smit Amandla Marine and the Department of Environmental Affairs (DEA) attempt a re-flotation. Smit Amandla Marine will keep a team on site to monitor the integrity of the vessel and regular patrols will be undertaken to monitor and react to any traces of oil. ▲

A special response unit in Kuwait

Fire service special operations

By Colin Deiner, chief director Disaster Management and Fire Brigade Services, Western Cape Provincial Government

During a recent discussion with a former colleague, who is now a chief fire officer of a fairly large fire department, I was interested to hear his thoughts on the dilemma facing many emergency services which have come about following the widespread personnel cuts and resulting staff shortages.

His opinion was that due to the fact that emergency services have to deal with an increased number of "routine" incidents such as informal structural fires and motor vehicle accidents, there are not always sufficient resources available to concentrate on specialised operations such as technical rescue and hazardous materials response.

In most services it has led to a situation where almost anyone can respond to a complex emergency and be expected to bring it to a successful conclusion. "We just don't have the capacity to deal with special operations" is the call. Problem is… it is still going to happen, and we are expected to respond to it.

With this in mind I will attempt in this article to come up with a solution to this challenge.

What are special operations?

A special operations unit is made up of highly trained emergency responders who are able to respond to and conduct operations of a technical nature, usually in extremely dangerous situations. Special operations staff is generally experienced fire fighters who have been trained to a high level of proficiency in rescue and HAZMAT response and are able to operate as a small team separate from other units on the scene but still stay within the command system. They can however also be utilised to take command of groups of fire fighters/ rescuers and use their expertise to guide the lesser experienced people generally at task level.

My personal experience of this methodology happened in 1999 when as part of a South African Urban Search and Rescue response team to the Izmet earthquake in Turkey; we delegated each team member to a number of Turkish soldiers who, through the direction of the rescue specialist, performed selected debris removal tasks on a collapsed eight storey residential structure.

The notion that a special operations unit is one team made up of "supermen" who are able to successfully deal with any type of emergency is false and should not even be considered as an option. A special operations division generally forms part of a fire services operations division and is comprised of several specialised response teams that handle a wide variety of both high-risk and low-frequency type events.

Many fire services in the USA initially employed a special operations capacity to complement their 'engine and truck company' philosophy. These teams were called 'rescue squads' and used to assist structural fire fighting ▸

A special rescue vehicle carrying hydraulic spreaders and cutters at a NASCAR race

teams by conducting search and rescue operations at fire where persons were unaccounted for and possibly still trapped inside involved structures. With the increased focus on hazardous materials response in the 1980s, special operations divisions were expanded to include HAZMAT response into their area of responsibility. Over the years, other specialised units, such as the marine response and technical rescue units were added. In certain services, where a combined fire and EMS service are provided, special operations units will also include medical response teams (medical strike teams).

Let us take a closer look at each function:

Technical rescue

Technical rescue can be described as any type of rescue other than light motor vehicle rescue. Light motor vehicle rescue should be seen as an initial response activity and should be within the capability of any first response fire/rescue unit.

Examples of technical rescue incidents are:

- Structural collapse
- Trench collapse
- High angle rope rescues
- Swift water rescues
- Confined space emergencies
- Heavy machinery and transportation incidents.

Rescue squads are proficient in a wide range of equipment which is usually carried on a custom built vehicle. These "rescue squad" or "heavy rescue" vehicles carry an array of special equipment such as the hydraulic rescue tools ie jaws-of-life, wooden shoring and sheeting (for trench rescue), generators, winches, hi-lift jacks, cranes, exothermic cutting torches, circular saws, rope rescue equipment, confined space entry and ventilation equipment and other forms of heavy equipment unavailable on standard engines. When planning and scoping a vehicle of this nature, it is vital to ensure that sensitive pieces of equipment such as rescue ropes and confined space air monitoring probes are stored away from abrasive equipment or chemicals that may compromise its integrity. Equipment may be unused for a fair period of time and, if not regularly checked and maintained, could fail you when you least need or expect it.

The shear bulk of shoring timbers creates a challenge when loading a technical rescue unit which has led to many departments employing heavy duty trailers, marine containers or modified, de-commissioned fire trucks to carry this resource. A fine example of this ingenuity was a department in the USA who once modified a ladder truck and refitted it to carry a large stock of long timbers and trench sheeting panels. An important consideration here is the inclusion of a mobile cutting station with the necessary grips and measuring tools.

HAZMAT response

Typically your HAZMAT response team should be able to respond to any of the following three types of incidents:

- Intentional releases

A response to an intentional release would routinely be when hazardous chemicals are knowingly and illegally dumped into waterways, drains, rubbish dumps, unlicensed landfills and the environment in general. It could also include the burning of products that may release toxic smoke and vapours into the atmosphere. A major risk, which has become more prevalent in recent years, is the proliferation of clandestine drug laboratories (labs). These labs cause serious health and safety issues within communities and require a large amount of time and resources to dismantle them and decontaminate the area. Many of these labs are set up in populated residential areas and booby trapped which increase the risk exponentially.

- Accidental releases

This is the most common type of HAZMAT incident and includes all types of spills and leaks of toxic agents resulting from collisions, container failure, fires, floods and human error. The phrase "knowledge is power" is of great importance when dealing with such incidents. A common sense approach by a few well trained HAZMAT technicians is far more valuable than a large uncoordinated response.

- Acts of terrorism

Chemical, biological, radiological, nuclear and explosives (CBRNE) related terrorism is the intentional release of deadly biological or chemical agents, such as Anthrax or nerve gas, into the general population. It may also include the detonation of a range of improvised explosive devices. The threat of such an incident would prompt the expansion of the department's incident command system to include a medical strike team.

The HAZMAT team would be responsible for initial site safety, the rescue of any trapped victims, neutralisation of the hazardous agent and product run-off control (if required). The medical strike team would conduct the medical treatment of the victims that this type of terrorist attack targets.

The Volvo FL urban search and rescue vehicle during training

The HAZMAT response unit at Rustenburg

Since the 2010 Football World Cup most metropolitan (and other host city) emergency services have established an integrated HAZMAT response plan with the South African Police Services (SAPS) and South African Defence Force (SANDF). The SAPS would mainly be responsible for securing the scene, crime scene investigation and the disposal of explosive devices while the specialised SANDF teams would assist with detection of hazardous chemicals, sampling and mass casualty decontamination. This programme was deployed with great success during the 2010 World Cup and should be encouraged to continue and improve. The theory that terrorists don't attack prepared events or on significant days still holds true (remember that 11 September was just another day until 2001).

Marine/water response

Marine response is mainly employed in coastal services but a fair number of very effective water rescue units have been established in inland regions. The proliferation of informal settlements close to waterways in many cities and the subsequent flooding of dwellings in these settlements have made the establishment of swift water rescue teams a necessity. A major challenge confronting many emergency services is where to place these teams in relation to the most severe, localised flooding risks. In most cases the risk is too widespread for services to cover and it is then important that first responders are trained in the fundamentals of river safety and at least be able to perform a safe shore based rescue. The optimum placement of sufficient swift water rescue technicians is however still the first prize.

In coastal cities, marine response team personnel provide technical support to incident commanders at marine incidents. These include search and rescue at shipboard fires, dive rescues and body recoveries, confined space rescues, hazardous material releases aboard ships, flooding and pollution incidents.

The versatility of marine response personal coupled with the low frequency of water related incidents, make them an ideal support resource

for incident commanders during confined space, hazardous materials and fire search and rescue incidents.

Some of the more enterprising fire chiefs along the South African coast have tapped into the high quality resources of the National Sea Rescue Institute (NSRI) to complement their own water rescue capacity. This is an example of using all available and relevant resources as a force multiplier for special operations.

Medical strike team

This unit consists of advanced life support paramedics who will provide support to technicians during hazardous materials, technical rescue and water rescue incidents as well as providing advice to incident command during mass casualty incidents. Once again, this group does not perform all medical treatment activities during a mass casualty incident but is responsible for the overall triage and patient management. During a specialised technical operation they will however assume control over the patient(s) and should therefore, over and above their general paramedic training, specialise in the type of patient care that may be required for these types of incidents.

So how does it all come together?

Already I'm hearing people say "That's all very nice but I don't even have enough staff to respond to the routine calls in my city. Where am I going to get all these extra people to form a special operations unit?" I've also heard arguments like: "Why should I employ staff and train them at great cost to sit around and wait for the odd special operations response which only makes up a small percentage of my incident load?"

In the preceding paragraphs I have alluded to the ways that some services have gone about "doubling-up" on some of the specialised functions. The need for special operations response might be rare but it is necessary and unfortunately when they are needed, the incident is normally high profile and will be on the front page of tomorrow's newspaper and maybe tonight's television news (together with how well or badly the fire department managed it).

In your dreams, guys!

The answer therefore lies in optimising the scarce number of specially trained individuals in a number of areas to (a) substantiate their existence and (b) keep them interested (there is nothing more dangerous than a bored fire fighter).

Let's see how we do this for each discipline:

- **HAZMAT**

A general requirement would be a HAZMAT unit staffed with five technicians which the possibility of downscaling to four for off-peak periods when less road and rail transportation is happening.

These technicians can also staff a rescue pumper for routine fire/rescue response. The rescue pumper can be supported by a hazardous materials support truck which carries all the required equipment including level A, B and C personal protective equipment (PPE), decontamination equipment, spill and leak kits, foams and detection equipment. For a hazardous materials response, the rescue pumper and support truck respond together.

- **Technical rescue unit**

The technical rescue unit can be staffed with a minimum of four members on each shift. These members can also be utilised to staff an aerial device (ladder truck) where a lot of their skills can also be employed. As with a hazardous materials support truck a technical rescue support truck can be provided which carries all the required equipment to support rope rescue, trench rescue, confined space rescue, swift water rescue, elevator rescue and structural collapse. For a technical rescue response, the support truck can respond with all crew members on board or the crew can split and respond with the ladder truck as well. The ladder truck can provide a height advantage point as well as those rope rigging anchor points which are never anywhere close to where you need them.

- **Marine response team**

Marine response team personnel are usually recruited from fire fighters who have undergone basic and intermediate (sometimes advanced) fire/rescue training and should regularly cross train with the other special operations units. For example, they should also respond to confined space incidents along with the technical rescue team. They can also respond with the hazardous materials team and provide assistance with decontamination.

Conclusion

The ideas put forward in this article are definitely not a concise solution to the challenges facing fire services in South Africa when it comes to providing special operations response. I have tried to throw some ideas into how to optimise limited staff to establish an effective special operations system which is both cost and operationally effective.

I hope this article will stimulate further debate on a subject which we do not dare leave by the wayside.

Unless of course we want to be the idiot on the seven o'clock news. ▲

Thousands of tiny pieces of debris from the plane where scattered over the site

Officers where astonished that anyone lived through the crash

Three survivors
in Arctic plane crash

Twelve people were killed and three others injured after a chartered Boeing 737-200 plane crashed in Canada's Arctic region.

The First Air Boeing 737-200 crashed as the aircraft was approaching the airport in Resolute Bay, home to one of Canada's most northerly communities.

Residents of the tiny hamlet in the Arctic territory of Nunavut and soldiers from a nearby military exercise rushed to the scene to try and pull survivors from the flaming wreckage.

First Air, which flies to some of Canada's most remote communities, said the plane had 15 people on board, including four crew members, and was travelling from Yellowknife, capital of the Northwest Territories.

The injured - two adults and a child - were flown to a hospital in the territorial capital of Iqaluit for treatment, police said. One of the adults was in critical condition.

Aziz Kheraj, the owner of the South Camp Inn, in Resolute Bay, told the Associated Press news agency that his two granddaughters were on the plane, but only one of them survived.

She was airlifted to a hospital in Iqaluit, the capital of Nunavut.

A passer-by, who saw the wreckage of the plane as she was returning to town from a camping trip, said: "It's in three different pieces. The wings are still attached. The front and back are separated. And they were picking up pieces of bodies."

An airport worker, who would not give his name, said there was a low cloud ceiling at the time of the crash. It lifted about 10 minutes later.

Police said that they had recovered two black boxes from the crash site, and that they were sending six forensic identification officers to Resolute.

Four of those officers will identify the deceased, the release said, while the remaining two will be dedicated to the accident investigation.

Canadian investigators are trying to determine why a chartered Boeing 737-200, operated by a carrier familiar with harsh Arctic conditions, crashed on a hill offset from the runway centreline shortly after declaring it was on final approach.

The passengers on First Air Flight 65-60 didn't know anything was wrong until the plane hit the ground near Resolute, Nunavut, one of the three survivors reported.

Police have been able to talk to at least one survivor about the flight's final moments, says Superintendent Howard Eaton of the Nunavut Royal Canadian Mountain Police (RCMP). Eaton said the crash site is one of the most challenging Nunavut RCMP have ever dealt with.

Thousands of tiny pieces of debris from the plane and cargo were scattered over the site, leaving officers astonished that anyone lived through the crash.

The crash was the focus of Prime Minister Stephen Harper's visit to Resolute during his annual Arctic tour. He met with Nunavut leaders, community members and first responders to discuss the emergency response to the tragedy. He also dismissed as impractical a suggestion that full emergency response resources be established across the North.

Polar bears getting close

The plane crash has been a tough case for the Mounties, and wind and rain have made the work difficult, Eaton said. Officers have even had to frighten away polar bears.

The Transportation Safety Board of Canada is now taking over the crash scene to try to determine what went wrong.

In Ottawa, meanwhile, investigators at a lab have been retrieving information from the aircraft's flight recorders, which were flown to the capital for analysis. ▲

Panther is MAN's
top fire fighter

Clive Naidoo, manager, fire and rescue services at OR Tambo International

Friend or foe, fire is an everyday reality and whether it is used for productive purposes or ignited unwittingly, fire fighting equipment should always be close-at-hand to prevent human injury and costly damage to property. For all large organisations around the world, fire management is a top priority and as such, teams of highly-trained fire fighters are on standby around the clock, armed to the teeth with state-of-the-art fire engines and fire-fighting gear, ready to put their lives on the line to save the lives of others.

One such entity is Airports Company South Africa (ACSA), managing 10 South African international airports, including OR Tambo International, Cape Town International and King Shaka International in Durban. As a member of the International Civil Aviation Organisation (ICAO), ACSA is governed by several safety regulations to ensure safety for passengers and airliners at all its airports.

OR Tambo International is a Category 9 airport (according to ICAO grading, capable of accommodating the world's largest passenger airliner, the Airbus 380) and therefore, must be equipped with at least three fire tenders, with a combined water-carrying capacity of 24 300 litres and a dry chemical powder capacity of 450kg with a water/foam discharge rate of 11 900 litres-per-minute.

To comply with ICAO regulations, ACSA has deployed the world's finest fire tenders at all its airports, the Rosenbauer Panther fire body, built on an MAN SX 43.1000 chassis-cab. The 8x8 Panther is a 1000 hp, all-terrain vehicle with a top speed of 135 km/h. It has a water-carrying capacity of 12 000 litres and a foam-concentrate carrying capacity of 1 500 litres. The Panther can discharge its payload in under two minutes and is fitted with both a hydraulic and electric power-take-off (PTO) to ensure zero-failure of the hydrant-pump system.

According to ACSA's Clive Naidoo, manager, fire and rescue service at OR Tambo International, "the Panther is 3,5 metres wide and 13,5 metres long and complies with all local bridge height restrictions. It has two steering axles up front and the cab is fitted to comfortably accommodate three emergency response personnel. The Rosenbauer body is equipped with all the necessary rescue equipment, including 'jaws of life', extra lighting gear, cutting equipment, ladders and breathing apparatus."

ACSA fire fighters at the ready

Weighing in at a fully-laden 42 tons, the is able to reach a speed of 80 km/h in less than 40 seconds, safely satisfying a stringent ICAO 'rapid speed/response' criterion.

"The Panther has a host of other features that set it apart from other fire trucks and for this reason, ACSA only runs MAN-Rosenbauer fire tenders at its airports, with its Panther fleet now numbering 25 nationwide," adds Naidoo. "With all-wheel drive, differential locks on all axles, inter-axle locks and single tyres, together with the NATO-approved coil spring suspension system, the 8x8 MAN Panther is very well suited for on and off-runway operations. A roof turret can discharge water at a rate of 6 000 litres-per-minute with a range of 70 metres, while a bumper turret discharges 1 000 litres-per-minute with a range of 40 metres. A 500 kg dry chemical system on the MAN Panther discharges 2,5kg per second with a throwing range of eight metres."

Additional safety systems include seven under-body water nozzles that discharge 75 litres of water per minute to protect the Panther's tyres and chassis from fire. 'First-Aid' or 'Rapid Intervention' 40-metre long hose reels capable of discharging 400 litres-per-minute are fitted to both sides of the Panther.

"Contrary to popular belief, it is not fire but smoke that is the number-one killer in an inferno," explains Naidoo. "The Panther has several hi-tech features to prevent asphyxiation including a high-reach extendable turret fitted with a thermal imaging camera that searches for hotspots inside the plane's fuselage, obviating the need for personnel to enter the aircraft. The turret can pierce the fuselage and discharge water and foam to extinguish the blaze and release heat and smoke." ▶

80 Rosenbauer Panther

ARFF's for Brazil

Brazil's state-owned airport operator, Infraero Aeroportos, recently signed a contract with Rosenbauer, manufacturers of premier fire fighting vehicles to supply 80 Panther ARFF's, worth 42,9 million US Dollars.

By undertaking this fleet renewal program, Infraero Aeroportos is bringing fire protection standards at Brazil's airports right up to date especially in view of the approaching 2014 Football World Cup and 2016 Summer Olympics.

All the country's international airports, such as Antônio Carlos Jobim Airport in Rio de Janeiro and Guarulhos Airport in São Paulo, will also benefit from the new equipment as part of this program. This will ensure compliance with the – increasingly closely monitored – international airport certification regulations of the ICAO (International Civil Aviation Organisation).

The Panther will be manufactured at the two US plants, Rosenbauer Minnesota and Rosenbauer Motors in Wyoming, MN, and the fire fighting systems will be supplied from the main plant in Leonding. The vehicles will be supplied and commissioned in several tranches by January 2014. A prototype will be handed over to the client before the end of this year.

The vehicles that will be supplied to Brazil are Panther 6x6 configuration with 665 hp Detroit Diesel engines. The Panthers have a top speed of 120 km/h and an extinguishant payload of 12 870 litres.

The order is the biggest single order for ARFF vehicles in Rosenbauer's history.▲

Since its take-over of the management of South Africa's major airports in 1994, ACSA has followed a consistent fleet replacement programme with MAN and Rosenbauer.

According to Bruce Dickson, Deputy CEO: MAN Truck & Bus South Africa, "MAN is a key supplier to emergency response fleets across southern Africa and as such, has highly-skilled technicians and a comprehensive parts inventory to ensure the vehicles it supplies to these fleets are consistently at the ready. Integral to MAN's mandate from ACSA is the reduction of repair and maintenance costs of its fire tenders. This is achieved via a service level agreement (SLA) with ACSA where repairs to the ACSA MAN Panther are conducted onsite within a 24-hour turnaround period, coupled with scheduled maintenance procedures every six months at MAN workshops situated close to ACSA's respective airports."

In conclusion, Naidoo states: "The MAN Panther is an extremely reliable truck and the semi-automatic transmission and engine-clutch retarder ensure there's very little wear on the driveline and ABS brake system, which helps significantly reduce our maintenance and general operating expenses."

"They cost a cool R16 million or so, but the Panther is worth every cent. From the MAN chassis-cab plant in Germany, to the Rosenbauer body-building factory in Austria, down the Atlantic coast to Durban and into the heartland of SA, the Panther can go anywhere, making its home wherever the threat of fire lurks." ▲

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Oshkosh Striker vehicles for US Virgin Islands

The Oshkosh Striker 1500 vehicles are now on duty in the US Virgin Islands

The Virgin Islands Port Authority (VIPA) purchased three Oshkosh Striker 1500 aircraft rescue and fire fighting (ARFF) for use on the US Virgin Islands – one on the island of St Thomas and two on the island St Croix.

"We are very pleased to have three Oshkosh Striker vehicles on duty in the US Virgin Islands to enhance the emergency response capabilities of ARFF professionals who help protect air travellers," said Jeff Resch, Oshkosh Corporation Airport Products vice president and general manager. "The Virgin Islands is a high profile vacation destination, and we are honoured to work with VIPA to bring the Striker to these international airports."

"We strive to embrace new technologies, such as the driver enhanced vision system and easy-to-use electronic joystick controls, and are thankful that VIPA leadership has supported our department's drive to advance our ARFF capabilities to a higher level," said Derek Smith, ARFF fire chief for the US Virgin Islands Port Authority. "Oshkosh has supplied us with a far superior product than we could have ever expected, and has given us an elevated level of confidence in their ability to provide excellent service and support."

The Striker 1500 model offers a 4x4 all-wheel-drive axle configuration and proprietary technologies such as TAK-4 independent suspension, triple agent fire fighting capabilities and Command Zone advanced electronics for enhanced manoeuvrability, fire fighting power and reliability. The Striker 1500 accelerates from 0 to 80 km/h in 25 seconds. Other features include a 5,678 litre water capacity, 795 litre foam capacity, roof turret, bumper turret and six under truck nozzles. The US Virgin Islands vehicles also feature a driver enhanced vision system (DEVS) and infrared cameras to improve safety while responding on the airfield.

The Oshkosh Striker is on duty at some of the largest airports in the world, including Anchorage International, Las Vegas International, Dallas-Fort Worth International, Dubai World Central, Shanghai International, Incheon International, Phoenix International, and Chhatrapati Shivaji International in Mumbai.

The US Virgin Islands is located in the eastern Caribbean and consists of the main islands of Saint Croix, Saint John and Saint Thomas and many surrounding smaller islands.

The, is a designer and builder of industry-leading airport fire fighting and snow removal vehicles. Its flagship Striker Aircraft Rescue and Fire Fighting (ARFF) vehicle and Oshkosh H-Series snow removal chassis are known for their durability and superior performance and sold throughout the world.▲

The windscreen of the Oshkosh Global Striker

Fighting fires in cargo aircraft with Pyrolance

By Cas Seyffert, VP Operations - Pyrolance North America

Aviation, rescue and fire fighting (ARFF) operations are typically associated with huge apparatus capable of discharging copious amounts of water/foam solution in rapid time. Due of the nature of the beast, time is the most crucial part of any ARFF operation. Working around crash fire trucks, we are used to seeing the typical roof and bumper turrets!

Piercing nozzles are fitted to telescopic boom assemblies. Dry chemical powder (DCP)/foam integrated hose reel packs for rapid deployment and quick knockdown. Handheld piercing nozzles for those hard to reach confined space fires. Cutting tools to allow for rapid entry into the interior spaces of the aircraft fuselage. Nothing out of the ordinary with any of these tools! Right up to now! Pyrolance is a new technology that allows ARFF crews to pierce through aircraft fuselages in under five seconds to allow for rapid knockdown of those hidden fires without causing structural damage to the aircraft superstructure.

Solution identified

During a recent demonstration in Indianapolis, visiting crews from Dallas/Fort Worth (DFW) International Airport, spotted the Pyrolance punching through a flashover simulator in 10 seconds and flushed out the main fire body using high pressure atomised water fog. They were intrigued enough by this demonstration to ask for a personal on-site demonstration at DFW using the Pyrolance against an aircraft fuselage.

DFW ARFF crews identified a particular operational requirement for which they are seeking a solution which was to pierce the outer skin of the fuselage then bridge the interior space between the inner lining and the outer skin of the igloo. Then pierce the igloo skin and continue flowing high pressure fog into the contents of the igloo, presumably on fire.

Fires in aricraft cargo holds are difficult to extinguish

We were able to demonstrate that Pyrolance was able to penetrate the fuselage as required in less than five seconds and continued through the interior space and then punch through the other side of the fuselage with enough energy to spare and high pressure water fog flowing to extinguish any hidden space fire lurking in the interior.

Pyrolance achieves this by flowing water at 160,5 l/m with a pressure of 30 337 kpa at a speed of 644 km/h through a specially designed Lance that enables it to add a granite abrasive into the stream allowing it to pierce or cut most materials at a phenomenal rate. The droplet size of Pyrolance is around 0,015 cm (150 microns) giving it enough muscle to attack even the most formidable fire. Pyrolance has a heat absorbsion capacity of around 9 800 BTU (British thermal units) per second (10 MW).

The lance is supplied via a 1,27 cm high pressure hose with a maximum length of up to 91,5 m from the main pump. The hose is typically stored on an electrically operated hose reel allowing rapid deployment. Fitment can be on any pumper or ladder truck working off the main transmission via a PTO. Alternatively a stand-alone diesel power pack allows for "plug and play" applications found on ships, oil rigs or industrial sites.

Synopsis

All credit must go to the DFW ARFF crews for identifying a new technology such as Pyrolance for use on fires in cargo aircraft. Fires in aircraft cargo holds are difficult to extinguish and Pyrolance enables ARFF crews to deal with these fires in a totally new and extremely effective way.

Combined with the use of a thermal imager, this tool becomes the "smart bomb of the fire service" as it allows for highly efficient precision attack of hidden confined space fires. ▲

WORKING ON FIRE

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WORKING ON FIRE

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 would 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:

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Hendrik Gert 'Bandit' Steyn

2 April 1953 to 3 August 2011

Bandit Steyn of Working on Fire, recently passed away while fighting a fire. His colleagues wanted to honour him by submitting the following tributes.

Memories of Bandit Steyn

Hey Bandit my mate goodbye. I am missing you as a friend, colleague and just being Bandit.

Please remember I am only half a "jam stealer" and will keep trying to stay operational and implement some of the things you taught me. For all important projects I always consulted you in our meeting room outside. These meeting were part of a very special bond between us passionate fire fighters and I normally had to change what I thought was a fool proof plan due to your practical input.

If someone asked about a situation the reply was often "it's OK Bandits there" and we all knew it was in good hands. You were always there, reliable Bandit working harder than most. Your sprit will live on with us all.

Many people never saw your serious side or even know that you were a loved father and husband. Karen is already at a loss "What will I do without Bandit" I know she will cope but she will need time to get over her loss. Alex is being a great help for Karen and I am sure you would be proud of him.

From the start of the aerial ignition project, you were a key player. You could interpret things from the air and know what was happening on the ground like no one else. Without you we would not have been able to achieve what we did especially the work in the Kruger and Pilanesberg.

Your knowledge of the fuels to know if, when, where and how to burn, to burn safely is irreplaceable. The only time we nearly had a mishap was during the preliminary work for the Kruger "Fire Storm" high intensity burn. Two old fire fighters nearly had one of our test fires get out of hand. Bakkie sakkie had no water and no beater. Luckily my hearing is slightly better than yours and I heard it crackling as we drove away. We had to do a traditional fire fighters dance to put it out with our boots and even you thought it might get away from us. This one was very nearly pink shirt material.

Where ever you have been locally and internationally you have always been remembered and respected for your dedication, knowledge and ability to make the work easier with your mischievous humour. Friends and colleagues from South Africa, Chile, Australia, United Kingdom and New Zealand have sent condolences and all of them echo the same respect for you that we all had.

Rest well my friend.
Bob Connolly (South Africa)

To Working on Fire it is a very big loss
The late Mr Steyn was our great leader on a fire line
He was a hero, fire boss and family to Sekororo Team
We learnt more from him
We were still hoping to learn more from the late Bandit
He was very creative and natural skill
This team lost a very important person
This team was honoured by a great hero
We will miss him on the fire line
We will miss his jokes, smile and courage, like "walala wa sala OR a si hamberi madoda!!
Working on Fire lost a soldier of fire operations
May God be with them all the time
We will always remember and miss you
May his soul rest in peace!
Sendy Seerane (Sekororo Team) ▸

Firstly I would like to send my condolences to the Steyn family.

We have lost a good man! He was like a father to us because he gave us advice in life. I remember the day of his death he said to me "I think I am getting old". He made the Sekororo team to be one of the best teams in Working on Fire across the whole Province. To Working on Fire management – please take care of this team so that he can rest in peace!

May his soul rest in peace!
Modungwa Pilose (Senior Crew Leader – Sekororo Team)

The project manager that I will never forget, Mr Steyn, we used to call him Bandit. He was like a friend to us. A person who knows his job, I will learn so much about him, a good leader. I was respecting him and I was enjoying working with him. The project manager that is irreplaceable. Mr Steyn I will always miss him and I will always salute him. I always say that the work you did, it was sign by the one the mighty God and your soul rest in peace!
Motena TT (Sekororo Team)

A teacher with the patience to explain everything even a third or fourth time, who never got tired of all your questions! A comedian, not afraid to use self-deprecating, with the ability to always make you laugh! A protector that would always take care of you and make sure you are ok. An honest and pure friend, never to be forgotten! To me, that is Bandit!
Renske Oussoren (Holland)

It was truly a pleasure and a privilege for both of us working with Bandit. He was always willing and accommodating, no change of plan or additional request to "please light a head fire or back fire here, there or anywhere" was too much for Bandit. He was always professional in the execution of his duties and was one of the best fire managers we worked with - he was very observant and had the art and science of fire management at his fingertips. He read extensively and was happy to learn about new topics, especially matters of conservation and ecology. Without Bandit's dedication the hundreds of kilometres of firebreaks that were required for the Savanna Fire Ignition Research Experiment in the Kruger National Park would not have happened, and SavFIRE would not have been the highly successful, fun project that provided new and valuable insights into fire behaviour. The twinkle in Bandit's eye and his sense of humour meant that one had to keep one's wits on high alert. This was appropriately demonstrated when (Winston) had a cardio version in hospital involving an electrical shock treatment when he remarked that he had a second hand cattle prodder available for such a task in the future at a greatly reduced cost. His people skills were admirable and it was always a pleasure to work with Bandit and the Working on Fire crews. Bandit, we salute you and miss you!
Lynne and Winston Trollope

Fire season: A two way radio alarm sounds in the dispatch centre at Nelspruit airfield.

"Nelspruit Fire Control, come in for Bandit.
Fire control: Go ahead.

I have a fire at X, Lizette can you help me with a spotter and four bombers?

Fire control to Bandit: I confirm, one spotter and four bombers inbound to yours – be safe."

I knew his voice well, before I met the face.

We worked together during numerous fire scenarios, when voices carried the urgency between us and drinks celebrated victory.

Through the years we came to know about our families, about our philosophies, about humour, about respect and about the things that is in the make-up of a friendship.

I will always cherish that.

"Nelspruit Fire Control; I know you are safe.

Lizette; over and out…."
Lizette Heine (South Africa)

The first time that I met Bandit was in 2006 when we started the SavFIRE project in the Kruger National Park. Since then and until the end of the fire application on the project in June 2011, Bandit has been and played a very important role in the success of this project. To me what is even more important is that we would have not been able to accomplish many of the fire treatments or successfully run a fire project of this scale in the park without Bandit's experience and skill with fire and in particular his love for working in the Kruger National Park. I think that the SavFIRE project was able to combine two of Bandit's love in life – fire and the Kruger National Park.

In terms of me learning about fire, how to set fire and read fire behavior in the veld, Bandit taught me a tremendous amount. Since 2006 – the very first time I met Bandit and at every fire we attended, I was able to learn from him. He was always a willing teacher and very practical which gave me the opportunity to gain invaluable experience from someone who was so passionate about his job. I am forever truly grateful for my time spent with Bandit who has left a lasting impression on my career in fire ecology and in my life.
Navashni Govender Riddell (South Africa)

Bandit, the one project manager always looking for the ultimate burning challenge and always hoping for an opportunity or loophole to present one of those well conjured up pranks to present to some innocent unsuspecting individual!

When the season was completed and there were times when boredom was setting in waiting for burning projects, Bandit would be up to some tricks around the admin offices. The project manager training sessions in November presented the best situations for pranks to be sprung, even the odd display of 'rose petal' chewing tactics late one night in Colleen's office.

One of Bandit's best chirps was when operations were in full flight during the fire season and I would request admin work to be completed etc. - he would always say that the admin is for "jam stealers" and he just wants to do the actual ground work - admin was Bandit's worst nightmare.

You will be sorely missed my friend - go well.
Ginge Hudson (South Africa)

Every once in a while a person enters your life and enriches it for no other reason than they are who they are. Bandit being charisma, dedication, compassion and a huge dose of fun all rolled into one. The fun side was shown often when coming into the procurement hangar. For one that startles easily, the hangar door is a nightmare! Sitting behind your desk concentrating an almighty bang would resound through the hangar. That was enough to cause you to spill your coffee should you be drinking coffee or it made you jump out of your socks. Following the resounding bang, Bandit enters with that twinkle in his eye and the sheer delight at catching you out, once again, even though you knew to expect it. It is Monday after all. Then as though you had imagined the whole thing, he would politely greet you and say: "Sorry to worry you, but could you give me an order to have the gas bottles filled"

We would ask Bandit to test out certain samples that we had been given by suppliers as he would always give a report back and we trusted his judgement. Of course most of the samples took the form of gloves. Bandit would look at me and remind me; yes there it was again, the twinkle in the eye that technically he could only test out one glove and not the pair. That was the nature of Bandit.

Donna Joubert (South Africa)

Bandit was a person who I could rely on to provide inspiration on both a professional and personal basis. He was a true Springbok; tough, tenacious and fair. Good on ya mate! The first controlled burning smoke you see coming from Chile will be for you.

Mike Cantelo (Australia)

What an awesome person – caring husband, loving father and of course friend for life! Working with Bandit was a unique experience, his knowledge of fire behaviour and fuel loads could encourage anyone to start loving fire – that twinkle in his eye when you mentioned anything about fire was a sure sign that he loved his work!

His humorous nature could be a problem if you had a nervous disposition – everyone looked forward to Mondays when he came to replenish stocks and replenish his dose of humour on you! Whenever he made coffee for us he always left it a mess – how I wish that mess is there now – new policy in the office "always make sure you leave a few sugar grains on our counter" just like Bandit did! Yellow roses will always remind me of you Bandido never knew they were edible!

Gone but not forgotten – may you rest in peace!

Colleen Sparg (South Africa)

People talk about legends, well I once knew a legend; his name was Bandit Steyn and he was a man amongst men. He was tough as nails yet gentle when needed. He led from the front would never ask anyone to do something he could not do better than they could. When on operations, Bandit was with his people and would stand up for them no matter what it took. Nothing was to difficult for Bandit, he lost an arm but all that did was spur him on to prove that he could over come and he always did. Whether it was changing a tyre on his vehicle or driving his car while talking on his cell and lighting a smoke all at once with only one arm. We always made sure that we sent any overseas guests for a drive with Bandit to see their reaction - you can only imagine what they had to talk about when they got back to their organized world. Bandit we will miss your humor and your practical jokes it will never be the same without you. Go well brother, Hamba Kahle. Harira Rangoma Bandit!

Chris de Bruno Austin (South Africa)

My memory of Bandit is that he was a down to earth practical person. He enjoyed what he was doing tremendously – practical fire management, burning firebreaks, controlled block burns, fighting fires to minimise losses and to work in the open environment, especially the SavFIRE Project in Kruger National Park and NOT to be office bound and bogged down with paperwork. He was a hard worker, dedicated and was willing to go the extra mile. When a project came up, no matter how far from home and how long he had to stay away from home he was already planning and packing, ready to go. He past all his experience to fellow workers and improved their skills to apply fire as a practical management tool. He was willing to learn and also willing to share his knowledge to fire fighters, colleagues and researchers. We have lost a friend, colleague and fellow fire fighter that will be dearly missed. Rest in peace and thanks for the good memories you left behind.

Piet van der Merwe (South Africa)

I was deeply saddened to hear of the sudden passing away of Bandit Steyn. Although I did not know him very well, he always impressed me as a fire fighter's fire fighter – professional, committed, tough and caring; a person who did the route-marches with the trainees, and roughed it on the fire-line. His was a face that I knew from the beginnings of Working on Fire, as a trusted member of the team that Johan and Chris built into one of the very finest programmes that Government has initiated since democracy. His disability was not a handicap; if anything, he inspired so many in the way he got on with life despite it, and did not let it hinder him in all he did to secure the lives and livelihoods of all our people. He was a true legend of the programme, and will be sorely missed. My thoughts are with you all, and I would like to convey our condolences on behalf of the Natural Resources Management Programmes to his family, loved ones, friends and fellow fire fighters.
Guy Preston (South Africa)

I had the privilege to work with Bandit during the SavFIRE burn project in the Kruger and one word that comes to mind when I recall my time (although short) with Bandit, that word is 'respect'.

To operate in an environment where one is respected by workers and colleagues are unique, to have it in abundances as Bandit did, speaks volumes for the person he was.

My lasting memory of Bandit was seeing him drive off into the sunset on his much beloved motorbike at speeds slightly quicker than the speed limited dictated, "Drive hard forever Bandit"

E hoa Bandit – Haere ki te po, haere haere, haere atu ra

Evan Rarere (New Zealand) ▲

Are you a competent fire fighter?

By Lenny Naidoo, Chief Fire Officer: Rural Metro Emergency Management Services

There are many qualities that determine if you fit the profile of a competent fire fighter. Let's look at some of the key qualities of a competent fire fighter.

A competent fire fighter is a practitioner that is:

- Disciplined
- Courageous
- Observant
- Innovative
- Team player
- Physically fit
- Keen
- Committed
- Competent

Self discipline can achieve many of the qualities of a fire fighter. I am going to touch on the aspect of competency for fire fighters. There are many sayings and phrases that fire fighters will encounter as they progress through the ranks and interact with experienced fire fighters. I will just pick on four phrases.

How often have you heard the phrases:

- "As a fire fighter you learn every day"
- "There is no fire fighter that knows everything"
- "No two incidents are the same"
- "There is a half-life to knowledge"

All of the above is so true in every respect.

1. " As a fire fighter you learn every day"

Learning is a continuous process especially in the field of fire and rescue work where technology advances each day and new equipment and techniques evolve continuously. A competent fire fighter has to stay in touch with all the advances in fire and rescue work. An example here is "new car technology" where composite materials are being used and reinforcement of structural members warrants new equipment and new approaches.

2. "There is no fire fighter that knows everything"

Consider firstly the job description of a professional fire fighter and secondly the curriculum to safely perform the tasks associated with the said job description. What becomes evident is the wide range of skills that are necessary. A fire fighter is expected to turn out to and deal with incidents that involve fires, rescues and hazardous materials. In addition fire fighters need to have advanced medical training in order to treat and stabilise victims. These four areas of competence require an extensive syllabus in order to ensure fire fighters are suitable to turn out and perform at such incidents. The extensive syllabus leads to another saying "As a fire fighter you are a jack of all trades and master of none". Obviously as you gain experience and achieve promotion and aligned rank, you can then specialise in any of the four areas mentioned. However as an 'operational' fire fighter you are expected to have vast knowledge and expertise in theareas alluded to.

There are many qualities that determine if you fit the profile of a competent fire fighter

3. "No two incidents are the same"

It would be freaky if you turned out to identical incidents where all things were the same. This is improbable as there are so many variables when one considers the weather, the time of day, number of victims, approach, response team members, actual incident, actions taken etc. This is where fire fighters need to be innovative and use their training, experience and knowledge to the fullest. Training and development will probably never have prepared fire fighters for every perceivable type of incident and this is where the ability to remain calm and focussed is vital. The approach will change from time to time and in some instances even what you learned may not be the best approach. There will always be 'THE JUDGEMENT CALL'. Here it is important to ask three important questions - ***What is happening, what is going to happen*** and ***what am I going to do***. The judgement call is vital when lives are threatened and if the answer to your question: ***what is going to happen***, is, that victim/s are ▸

going to die, then you need to make a quick decision. Should I approach the conventional way or should I risk it because lives will be lost. That is a dilemma that many a fire fighter may have to face in his/her career.

4. "There is a half-life to knowledge"

We are human and are prone to forget , it is said that six months after learning , half of what you learned is lost if you do not reinforce the learning. Achieving competence and being awarded a certificate is step one and by far not the end in the training and development field of fire fighting. Reinforcement training and drills are equally as important as achieving competence and both aspects go hand in hand in ensuring fire fighters can perform at maximum safety and efficiency. The four areas described earlier in the job description of a professional fire fighter require the operation of many complex items of equipment. Proficiency in maintaining and bringing into operation the equipment is crucial to saving lives. Imagine a situation where you have not practiced complex high angle techniques for over a year and all of a sudden are expected to rig up a rescue system in the dead of night with no lighting. It will be an uphill battle to get going and this leads to an important aspect of 'confidence'. Reinforcement brings about confidence and confidence will ensure your ability to perform at maximum efficiency. I always use the example of tying your shoe laces; you can tie your lace without looking at your shoes or tie your lace whilst talking. This is due to reinforcement or repetition. Therefore practical training and drills are necessary to sharpen your skills.

I hear - I forget, I see - I remember, I do - I understand

The words of Confucius which are so relevant to the fire and emergency services.

Stay sharp and stay focussed, every fire fighter is special and we need to ensure we serve and protect as best as we can.

Remember work as a team or die as a group. ▲

Forest fire management

at the Kikonda Central Forest Reserve, Uganda

By Blessing Mutambukye; senior forest manager; global-woods AG

The afforestation project at the Kikonda Central Forest Reserve (KFR) is a commercial plantation to produce high value timber. It is located in a rural area in Uganda and about 180 km north-west of the capital Kampala.

In 2002, the afforestation has been initiated, implemented and managed by the German-based company, global-woods AG. The main activities of the project are clearing degraded bush land to make it suitable for tree planting and establishing a new forest. Until today, about 2 500 ha of new forest have been planted so far, out of the total area of 12 186 ha of the Central Forest Reserve. Besides the local tree species Musizi, mainly pine and eucalyptus species are planted. Within its boundary, the reserve is nerved by stretches of scarcely forested grassland and seasonal flooded wetlands which are illegally used for cattle grazing by nomadic tribes. To maintain open grazing grounds and benefit the grassy regrowth, these areas are frequently set on fire by the cattle keepers without any control measures in place.

Blessing Mutambukye; senior forest manager; global-woods AG

The plantation fire management

The Kikonda Forest Reserve experiences two dry seasons annually, from June util August and from December until March. As a protective measure for the planted stands during these highly hazardous times, a standby fire fighting team of 20 personnel is hired and based at the forest station within the reserve. Most fires are spotted from the 16 m high fire-lookout-platform built in a pine tree within the compound. The teams are equipped with basic fire fighting tools like the standard PPE (personal protective equipment) knapsacks, rake-hoes and fire-beaters, supported by a 700 litre bakkies-sakkie fitted with 30-metre live-hose mounted on the crew transportation truck. During the very high hazardous days, additional trucks are hired to enhance mobility for faster responses. Additionally, bicycle and foot patrols within and around the planted-area-boundaries are made and these ground personnel are kept in constant contact with the standby team at the station through a two-way radio communication network.

With a constantly increasing planted area, the parameter to be protected against encroaching fire, also increases. The most severe drought experienced since the project started in 2002 combined with an increasing pressure on remaining grazing grounds, lead to the "hottest" fire season registered.

Most of the incidences ever reported in one single season happened in the past fire season (2010/2011). Driven by the changing climate, this trend may continue and therefore appropriate strategies are put in place. Fire prevention measures are already part of the plantation grid layout, so every 25 hectare block (500 m x 500 m) is surrounded by a ▶

Suppressing a grass fire approaching the KFR

Fire damage in a pine stand caused by arsonists

Lookout-platform in the pine tree with a ladder

nine metre firebreak and every one hectare block is additionally divided by six metre fire-lines. These firebreaks are frequently maintained and are kept fuel-free by slashing and, more recently, also by the means of prescribed burning. According to the increasing planted area, the number of crew members, fire equipment and fire-lookouts will be raised.

The fire fighting approaches are generally basic, with much of the fire preparedness plans more centred on fire prevention - by looking at the potential for prescribed burning to reduce the fuels. The main focus of the fire management at the KFR however, is investing in public awareness rising within the neighbouring communities. Through educational campaigns held in villages, schools, parishes etc, we try to sensitise people on the topic of wild fires. Global-woods offers the support and means to do burn in a responsible way together with the landowner, should the villagers want to burn.

Challenges

The high value of plantations necessitates good fire risk management by the owners. The risk of fire is a perennial concern for all forestry operations due to the high combustibility of the forest resource during dry periods. Firstly, the land utilisation and management executed by the local population around the area poses an ever increasing threat to the plantation. Fire is used in an irresponsible way as an easy to apply and cheap land-management tool. Cattle keepers use fire to create pastures for their cattle while hunters use fire to flush animals out of the bush land and/or honey harvesting.

Secondly, plantation forestry is by enlarge an emerging but growing sector in Uganda and consequently getting appropriate fire fighting tools and equipment are still a hassle. Also, the fire fighting personnel's expertise is still low, although all endeavours are taken to improve experience and knowledge through personnel exchange programs with experienced companies and training programs.

For example, I was sent to participate on an exchange program with "Working on Fire International, South Africa in June 2011. While there, I went through a series of fire managing activities including proper handling and use of fire tools and equipment, the basics of conducting prescribed burns and the overall incident fire team commanding.

I have not forgotten (nor ever will forget) the time I spent in the Kruger National Park as part of the exchange program. It was the best one week of my life! I think back with fond memories of the fantastic and disciplined team of fire fighters I interacted with and also of the intense prescribed burn - learning experiences. I look forward to implement what I learned to have an experienced team for carrying out many successful prescribed burns at Kikonda Central Forest Reserve. ▲

Prescribed burning
in Calluna heathlands in Germany

Ignition of the Calluna heathlands

Authors: *René Mause[1], Daniel Kraus[2], Alex Held[2]*
(1) Biological Station Düren. Düren, Germany (2) Working on Fire (WoF) Int. - Europe

Our case study this month features the use of prescribed fire for maintaining open Calluna heathlands in North Rhine-Westphalia, Germany

The landscape

The *Drover Heide* nature reserve is located only a few kilometres south of the town of Düren (Nordrhein-Westfalen, Germany) in the transition zone from the Eifel mountain range to the Lower Rhine Plain. The reserve, comprising 680 hectares of which 150 hectares are open heathland and 150 hectares poor grassland, contains valuable habitats for several highly endangered plants and animals that depend on open landscapes. Because of the importance of its habitats, the reserve is embedded into the European network Natura 2000 and is further classified as a bird sanctuary. The area is famous for rare species such as the Nightjar (*Caprimulgus europaeus*) with 35 breeding areas and the Woodlark (*Lullula arborea*) with six breeding areas - both of which are highly restricted to open habitats.

The reserve has been extensively used as a military training area for more than a hundred years. As a result of the military activities, the reserve's vegetative structure has been kept open for a long time. However, the military activities gradually declined in the 1980s to cease completely in 2005. It was during this period of decreased military activity that the vast heathlands developed.

The area has a predominantly Atlantic climate with a mean annual temperature of 9.5°C and characterised by mild winters with low snowfall and warm summers but with no extreme heat events. The average precipitation is 605 mm and mainly falls between May and August. Soils originate from the 2,5 to 3-metre thick Holocene loess that covers the tertiary depositions of sands, grit and clay. In contrast to the sandy soils of most other heathlands, such as the famous Lüneburg Heath, Drover Heide is growing on a highly productive clay-loam where the heather (*Calluna vulgaris*) can reach a height of up to 1,5 m on these nutrient-rich soils with a mean fuel load of 18,61 t/ha. In order to maintain the characteristics of this open landscape, management activities have been intensified significantly over the past 20 years. As in other similar heathlands in central Europe, over-aged heather and the invasion of woody species are identified as the main problems.

Management activities in open habitats

During the course of intensive military activities, especially tank manoeuvres, the area was kept open without any active management; however, it was often necessary to plant woody species to protect the soil and avoid dust clouds during the summer. Today, almost the entire area is densely vegetated and the patches of denuded soil that were special habitats have vanished. A local herd of around 300 sheep graze seasonally on most of the poor grassland The main management activities to maintain open heathlands are mulching, cutting, grazing and fire.

Several methods to maintain the heathland are used in the reserve:

- Mowing: the possibility to mow and dispose of the swath is limited as the terrain must be relatively flat and free of woody vegetation to allow access of heavy machinery.
- Grazing: since 2005, a fenced area of almost 150 hectares is regularly grazed by herds of Scottish Highland Cattle and goats, which ▶

resulted in a significant reduction of woody vegetation.

- Mulching: in the case of strongly over-aged heather (more than 15 years) and a high proportion of woody vegetation, the only possible management method up to 2007 was mulching, which can be carried out at relatively low costs as all plant material is shredded and remains on the site. However, if the layer of the mulched material is too thick, natural regeneration of the heather is hampered.
- Prescribed Burning: since early 2007, prescribed burning has been one of the reserve's management activities. Between January and March, approximately 10-20 hectares of over-aged and bush encroached heathland are burnt annually by a contractor (WoF Europe).

The general public perceives fire as a destructive element and a hazard to humans and nature, as can be observed every summer when the media report on large fires and environmental destruction in southern Europe. The role of fire in ecosystems and its positive effects are often not recognised, and although wildfire problems such as in the Mediterranean are non-existent in NRW, public opinion on fire is biased. Another factor limiting the use of fire is its impact on recreation as burnt areas are generally perceived as unattractive.

It was, however, noted that visitors regularly suggested that fire be used on heathlands since this was the traditional way of improving pasture land as it was something they could relate to.

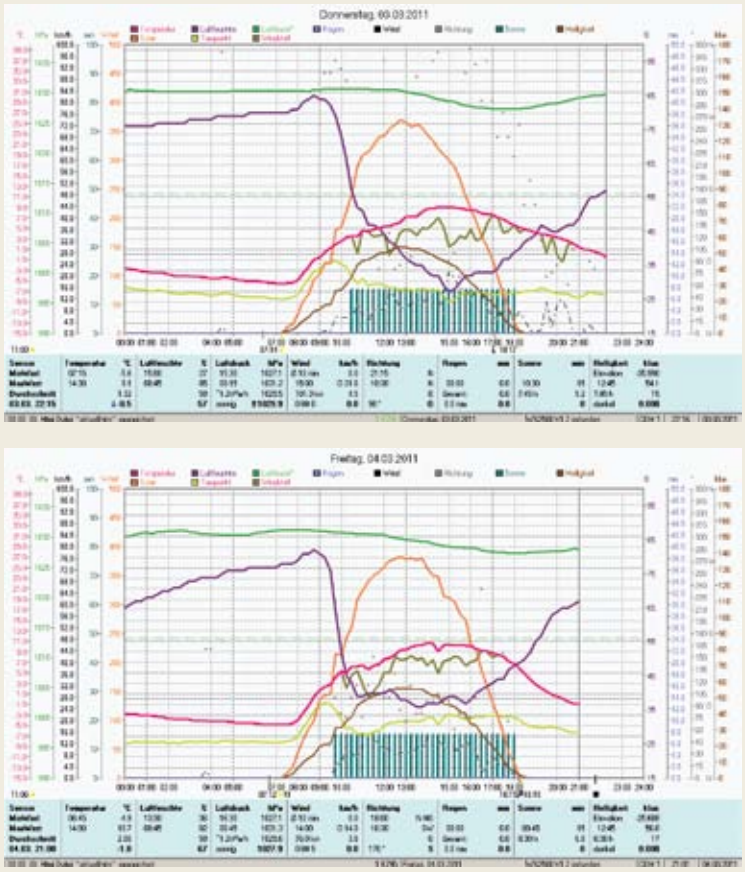
Steps towards the use of fire in the Drover Heide nature reserve

Although the first discussions on the possible use of controlled fire to maintain the *Calluna* heathlands in the reserve were initiated already in 2002 by the Biological Station Düren, it took almost five years for the first burn to be implemented. The first step was to reach a consensus among the experts of the Landscape Board of Düren and the land owners who were represented by the Federal Forest Office Wahner Heide,

Cleanburn at the end

Fire head and flank

Operations in the Drover Heide nature reserve



Two day hourly weather forecast

Insident Command's bloodhound

which is also responsible for the management of several other major properties in Germany, including some actively used military training areas. Occasionally, accidental fires break out in these areas as a result of military manoeuvres and some are intentionally set for training purposes. The main purpose for fire use in these areas is to keep the terrain open and reduce combustible material for safety reasons and not for nature conservation. This was the main reason why the land owner showed only little concern towards the use of controlled fire. However, the legal administration of all nature reserves, including Drover Heide, is under the responsibility of the County Landscape Board. According to the Landscape Law and the General Rules for Conservation Areas, it is generally forbidden to light fires in nature reserves and it is mandatory, in all cases, to apply for special permission from the local authorities.

Prior to the first application of fire, the Biological Station Düren and the County Landscape Board decided to extend their knowledge on the effects and the ecology of fire by visiting an actively used military training site in Belgium (Elsenborn) to inspect several areas that were regularly burned to keep the site open. As the site is still used as a shooting range, there is a great likelihood of accidental fires that are contained by control lines. Because of the high load of ammunition in the impact area, there are no activities for fire suppression; rather, to keep uncontrolled fires from getting too intense and to keep the range open, vast areas are burnt in a controlled way annually by the responsible forest office and the military. A positive consequence is the maintenance of huge areas of *Nardus* grasslands, *Meum* pastures and *Calluna* heathlands that are unique in their vast extent. Experiencing such breathtaking landscapes certainly helped the endeavour of introducing prescribed fire to the nature reserve.

Selection of burn sites

The experts agreed that it is reasonable to apply controlled fire to maintain open *Calluna* heathlands and to restore over-aged and bush-encroached heathlands and that it leads to the desired results. Prescribed fire thus became the third alternative to manage heathlands after mowing and mulching.

Landscape with bush encroachment

The selection of burning sites was conducted by the following criteria based on an agreement between the land owner and the County

Heather regeneration

▸ Landscape Board:

- Over-aged heathland with a strong encroachment of woody vegetation (restoration measure urgently required); terrain (partially) is not appropriate for heavy machinery due to its relief or age of the vegetation; the heather is growing on loamy-clay with strong woody stems, which limits the use of a rotary mower or cutter bar - the only viable options thus being mulching and prescribed fire.
- Burning plots should not be close to public hiking trails for both safety and aesthetic reasons. During the first year of the trial, it was decided not to expose the black areas to the general public.
- Plots should be situated along old tank tracks which can serve as control lines

In addition to these basic criteria, more specific burning objectives require additional conditions. It is important to note here that it was decided to use a prescribed fire regime for a maintenance burn rather than for a restoration burn even though the treatments were rated as restoration measures. Both prescriptions for central Europe differ significantly from each other; however, since the burning permits were issued only until March 15, the prescriptions for maintenance burning were more appropriate. The burning objectives were to promote the regeneration of C. *vulgaris*; kill off small diameter trees and bush; and to create a patch mosaic. The main limitations to reach these objectives were a tight burning window due to the weather and the short days in early winter (insufficient solar pre-heating of fuels). Burning conditions need at least three to four consecutive days with relative humidities below 60% in February/ March, or a Fine Fuel Moisture Code (FFMC) of over 80, but a Duff Moisture Code (DMC) below 20 from March 21.

It was also necessary to obtain another permit from the neighbouring community of Vettweiß according to §7 of the Federal Immission Protection Law. In addition, the police authorities and local fire brigades had to be involved in the planning process. Since the nature reserve is a former actively used military training site and in addition contains heavy loads of ammunition and explosives from WWII, it was also necessary to include an explosive ordnance disposal unit.

The general public was informed of the first trial via the media and an information leaflet on the positive effects of controlled fire.

Further, a cost estimate was required. As a practical approach was desired, it was preferred to have payments for a contractor based on a daily rate. There is an annual budget available for maintenance measures in open landscapes, which allowed easy access to funds for the trial.

The local fire brigade was informed and a fire engine was present during the first burn as required by the authorities. The firefighters found it a very interesting experience and a good exercise since they would have to respond in case of an accidental fire. Further, the police were informed but were not present as no adverse effects on traffic were expected. It was also necessary to inform Nörvenich - a nearby military air base - about the burning operations as the open heathland is a training area for Tornado flight manoeuvres and serves as a bail out area in emergency situations. ▸

Map fire 2007-2011

Results

Since 2007, some 10 – 15 hectares of heathland have been burnt annually accompanied by the ecological assessments of permanent plots for floristic studies, different animal groups, such as *Arachnidae* and *Carabidae*, as well as birds. The desired effects on the vegetation structure were reached by a mix of flanking and fast spreading head fires to remove over-aged *Calluna* plants. It was not desired to have any thermal effects on the soil to allow small fauna to survive the fire. This can be achieved when the days are sufficiently long (from early February) and after frosty nights (below 0°C) but sunny days with a typically high FFMC and medium DMC. These conditions assure fast spread rates and ease of ignition but only superficial consumption of fine fuels - intensities can be high but with a short residence time and can be typically met during wintery highs between February and mid April.

Vegetation

The results of the floristic assessment far exceeded all expectations. Vegetative as well as the generative (seed) regeneration of *Calluna* was abundant all over the area by the summer following the burning operations. Of major importance is the fact that the burn plots showed a significant increase in biodiversity as Atlantic heathlands, in general, are rather poor in species composition. Prior to the burn, the heathland comprised over-aged monocultural stands of *Calluna vulgaris*; however, after the fire various species of the initial phase of a heathland and species of mat grass swards such as *Nardus stricta*, *Molinia caerulea*, *Danthonia decumbens*, *Polygala vulgaris*, *Carex pilulifera*, and *Agrostis vinealis*, were germinating on the burn plots. The burn plots are located within the fenced paddock, which leads to a revival of the traditional management method of fire and animal grazing.

The results for the reduction and repression of woody vegetation was another important aspect. The mortality among young *Betula* trees was almost 100% after the burns, especially after the optimal burn conditions in March 2007 where the temperature remained relatively warm (6°C) for several days and the relative humidity, which allowed for the excellent drying of the fuels. Consequently, the resulting temperatures of the backing and flanking fires exceeded the lethal point for almost all young trees and bushes. While some trees were resprouting relatively quickly after the fire, they did not survive the summer period and the browsing pressure of cattle and goats. Rabbits who feed on young shoots also have a certain influence on the post-fire mortality although this is difficult to quantify.

Arachnids and Carabid beetles

Both groups have been monitored in five ground traps (inspected every two weeks) since June 2006, which fortunately includes one vegetation period prior to the first burn. There is already the tendency that several species, especially the rare thermophilous, are benefiting from the prescribed burning. For example, several thermophilous Arachnid species typical to heathlands were counted on site after the burn and included: *Agroeca proxima*, *Callilepis nocturna*, *Xerolycosa nemoralis* and *Micaria silesiaca*. The burnt area can thus be considered a substitute habitat for the patches of denuded soil created by intensive tank driving. ▶

Birds

It is particularly remarkable that both nightjar and woodlark established breeding territories immediately after the burning operations as this helped to confirm the preferences of these ground breeding species as described in the literature. Both species deserve particular attention in the reserve as they are very rare breeding birds in NRW and need a special management concept.

Lessons learned from the use of prescribed fire in the nature reserve

The success of a prescribed burning operation is totally dependent on the local weather conditions, with wind direction being the most critical variable. As the terrain in the reserve resembles a long stretched hill, it means that with varying wind directions the leeside effects of the burn plots are more pronounced. The situation is further complicated by a forest belt that surrounds the open core area which contains patches of woody vegetation. This is where the leeside effects play the most crucial role in determining if a plot can be burnt or not, as the drying mechanisms for the heather fuels are unfavourable during the winter burn season. It takes much more time to overcome the effects of rime, especially after frosty nights, due to shading effects in these highly productive heather stands that can reach 1.5 m in height. Consequently, it is advisable to prepare more burn plots than can actually be burnt on the day to be able to react to the prevailing wind situation. This means it is of major importance to prepare burn plots on both western and eastern windward sides.

Generally, the window during the winter burn period is very narrow - operations do not usually start before midday after the relative humidity has dropped below 50%, and after 16.00 it becomes very difficult to light a new fire because the humidity is too high. This means that as there are only four hours per day available for the actual burning, it makes sense to prepare as much as possible in advance so as not to shorten the burning window even more. Experience also showed that it is very efficient to create control lines of four to six metres wide around the burn plots with a mulcher, or use existing roads and game trails as control lines.

The main success, however, was the reduction of upcoming woody vegetation. Almost 100% of young *Betula* trees did not survive the burning because the high flame temperatures exceeded the lethal point of the trees by damaging the xylem in a way that caused the total desiccation of the plants. At a later stage, fungi and other infections became established in the fire scars and caused further damage to surviving trees, leading to the final kill-off. This, in addition to the natural regeneration of *Calluna*, is seen as pivotal for the permanent preservation of open landscapes since mechanical treatment does not have such resounding success. Young *Betula* and *Populus* trees, for example, react with strong resprouting after being cut back with chain saws and thus make second treatment necessary within a short time. Further, the remaining stumps of thin trees can destroy tractor tires - a problem during subsequent heathland maintenance. It must be considered, however, that dense patches of young trees do not allow the development of a substorey or layer of herbal vegetation and thus carry only very low fuel loads; it is critical, therefore, that the treatments are started timely. Also from a bird protection point of view, total removal of the woody vegetation is not desired.

During the winter burn season (October-March), only a few days are suitable for efficient burning operations. Since the heather reaches a maximum height of 1.5 m, it takes some time until the fuels are dry enough after precipitation. This requires a relatively low organisational preparation phase prior to the burning operations – experience shows that one day is usually enough to have everything in place.

Transferability of results from the prescribed burning in the nature reserve

The main overall success of the prescribed burning treatments in the Drover Heide nature reserve generated a certain interest in the technique from neighbouring nature reserves as well as military training sites. Since the problems that occur in the nature reserve are common to other heathlands that have abandoned active management, the Drover Heide model with the combined grazing and burning approach will certainly play a key role in the development of management plans for similar areas. With an area of around 700,000 hectares, active and former military training areas contain many habitats with some of the highest biodiversity in Germany; and since they are littered with Unexploded Ordnances (UXOs), mechanical treatment is severely limited. For this reason, prescribed fire is both a plausible and effective technique which can be used to preserve these unique landscapes.

The reaction of the local inhabitants to the use of prescribed fire was astonishingly indifferent. Although smoke development was significant during the burning operations, nobody called the fire service or police - which was most likely due to the comprehensive information campaigns prior to the burns.

During the second burn, a group of 30 hikers watched the operation from safe distance; unfortunately, however, it was not possible interview them to get their views on the treatment. On subsequent guided excursions to the reserve, the burn plots were generally perceived as 'unusual' by the visitors. Once the ecological processes and context were explained, most people showed understanding; however, some advocates of 'free development' disagreed with both this and any approach in which humans interfere with nature, i.e. all forms of management. From a nature conservation point of view, however, the management concept in the reserve is undisputed with clear rules from the FFH directive. Further, as the political representatives of the county and its communities consider the heathland and the open landscape of the reserve an important recreation area, free development is not an option. ▲

Our poem this month is dedicated to the 13 people that lost their lives in the fatal Albatross plane crash just outside Tzaneen, South Africa.

Those on board the aircraft with registration ZU MMI were pilot Brian Gruar and passengers Marrion Anderson, Maddison and Alexandra Doak, Tess Spence, Louise Warden and Kevin Woolacott.

On board the other plane, registration ZS NJX, were pilot Pieter Geldenhuys, and passengers Stuart and Peter van Oldenburg, Frans Dely, Marietjie de Witt, and Linda Pierce. Dely was a well-known Johannesburg aviation photographer.

David Clyde Gross shared this poem on Facebook and we hope he doesn't mind us sharing it

When this life I'm in is done,
And at the gates I stand,
My hope is that I answer all
His questions on command.
I doubt He'll ask me of my fame,
Or all the things I knew,
Instead, He'll ask of rainbows sent
On rainy days I flew.
The hours logged,
the status reached,
The ratings will not matter.
He'll ask me if I saw the rays
And how He made them scatter.
The way your heart jumped in your chest,
That special solo day-
Did you take time to thank the ones
Who fell along the way?
And did you see the patchwork fields
And mountains I did mould;
The mirrored lakes and velvet hills,
Of these did I behold?
The wind he flung along my wings,
On final almost stalled.
And did I know it was His name,
That I so fearfully called?
And when the goals are reached at last,
When all the flying's done,
I'll answer Him with no regret-
Indeed, I had some fun.
So when these things are asked of me,
And I can reach no higher,
My prayer this day -
His hand extends to welcome home a Flyer.

-David Clyde Gross-

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