Emergency Services Foundation Scholarship

Topic

Operational Fire Bikes

Report of

Leading Firefighter
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Introduction and background

After two years of negotiations with the MFB, Honda and various other parties, I started MFB Racing. MFB Racing is a community educational aid for the MFB to communicate its fire safety messages to the public. Originally it consisted of myself and a road racing motorbike donated by Honda. As well as racing the bike under the MFB umbrella I would take the bike to displays etc, and use the bike to attract a demographic the MFB normally had difficulty in reaching, that being teenagers and young adults.

As this became more popular with the community we expanded the team with the introduction of a registered version of the race bike to promote motorcycle road safety. This idea also became more and more popular, particularly as traffic congestion and the rising cost of fuel was dramatically increasing the number motorcycles and scooters on our roads. It became obvious we needed a more appropriate bike for road safety. Honda Australia saw this also and donated a Honda ST 1300 which they converted to a Fire Bike for us. The bike was painted red and fitted out with MFB badges, logos, reflective striping, coloured lights and sirens.

It was from here that I decided to investigate the use of operational Fire Bikes in other countries. I later heard of the Emergency Services Foundation Scholarships. I was already convinced a fire fighting bike would be of great benefit to the Brigade and the community through my research, so I prepared a proposal and submitted it to the Brigade for the Emergency Services Foundation to consider.

I undertook my scholarship research in Denmark, England and Hong Kong.

Firexpress

I first travelled to Denmark, home of Firexpress. There I was met by Steen, Manager and Fire Chief of Firexpress. We spent two days together discussing the use of their fire bike and the many ways it could be utilised in Melbourne. Firexpress Fire Bikes are used in many counties and a lot of their other fire fighting equipment is also.

FIREXPRESS®

THE FIREXPRESS CONCEPT

is based on two extinguishing methods

MICRO DROPS

7- 100 micron

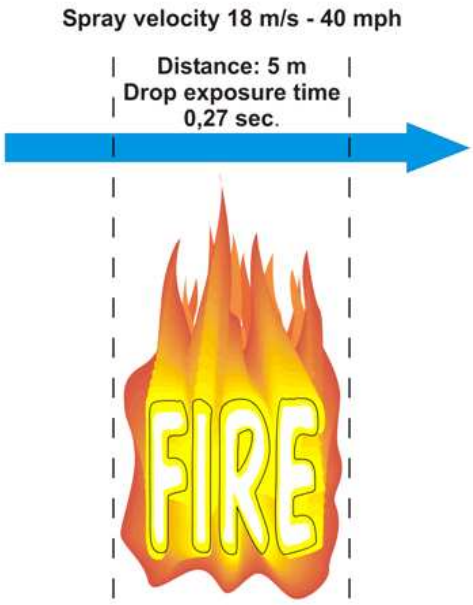
FOAM

Low expantion 1:5

MICRO-DROPS THE FIREXPRESS WAY

- **Safe pressure**
- **Minimum of entrained air in spray stream**
- **Long range of micro drops and foam,**
- **No spreading of burning debris**

Evaporation water-droplets

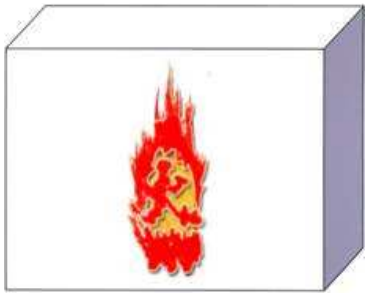


Lifetime of Droplets – vs Temperature

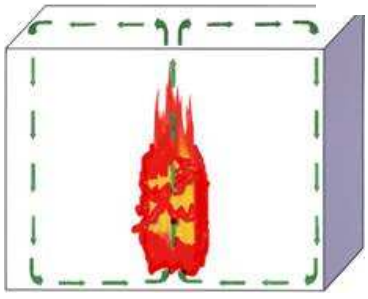
Temperature Deg. Celsius	Normal fog nozzle Microns: 1000 – 100 *Lifetime*	FIREXPRESS Micro-drop nozzle Microns: 100 – 7 *Lifetime*
200	8,0 – 0,80 sec.	0,80 – 0,080 sec.
300	5,3 – 0,53 sec.	0,53 – 0,053 sec.
400	4,0 – 0,40 sec.	0,40 – 0,004 sec.
600	2,6 – 0,26 sec.	0,26 – 0,026 sec.
800	2,0 – 0,20 sec.	0,20 – 0,020 sec.
1000	1,6 – 0,16 sec	0,16 – 0,016 sec

Extinguishing theory for micro-drops in a room-fire

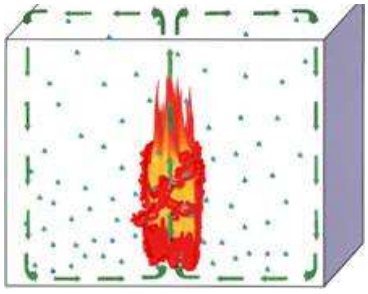
Room Fire



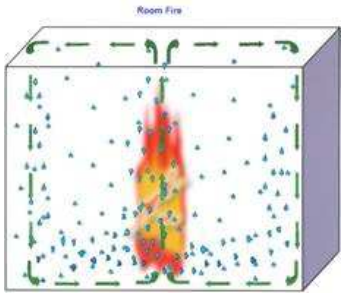
Circulating Airflow



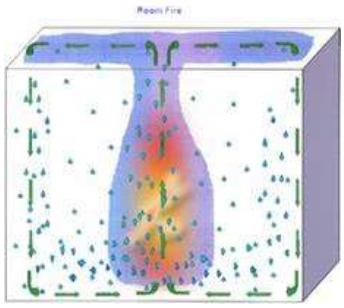
Droplets scattered into the room Long 'hang-time'



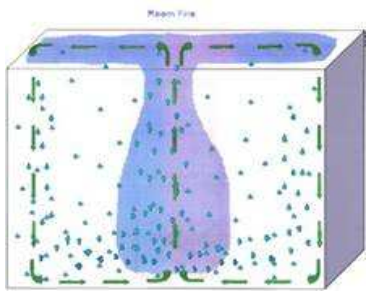
Micro-drops transported into the



Micro-drops instantly absorbs heat and generates steam



Steam pressure prevents oxygen feeding the fire – cooling hot combustion gases



Key Notes

- **Maximum fire fighting with minimum of water and foam**
- **Minimum water damage**
- **Fast knock down**
- **Low pressure ~ Low nozzle recoil ~ Easy to handle ~ one hand operation**
- **Minimum of entrained air in spray stream**
- **Long range of micro drops and foam**
- **Deep penetration**
- **High effect on flammable liquids**
- **Full control of burning gases**
- **Efficient smoke scrubbing and rid the air of toxic smoke and gases**
- **Effective in scene preservation for fire investigation**

FIRE FIGHTING MOTOR BIKES

MBW R-1200 RT

- **Compressed air driven**
- **Water tanks 2 x 25 litres**
- **30 metres of ½" hose**
- **Flow 22 Litres/min**
- **Range 11 metres**

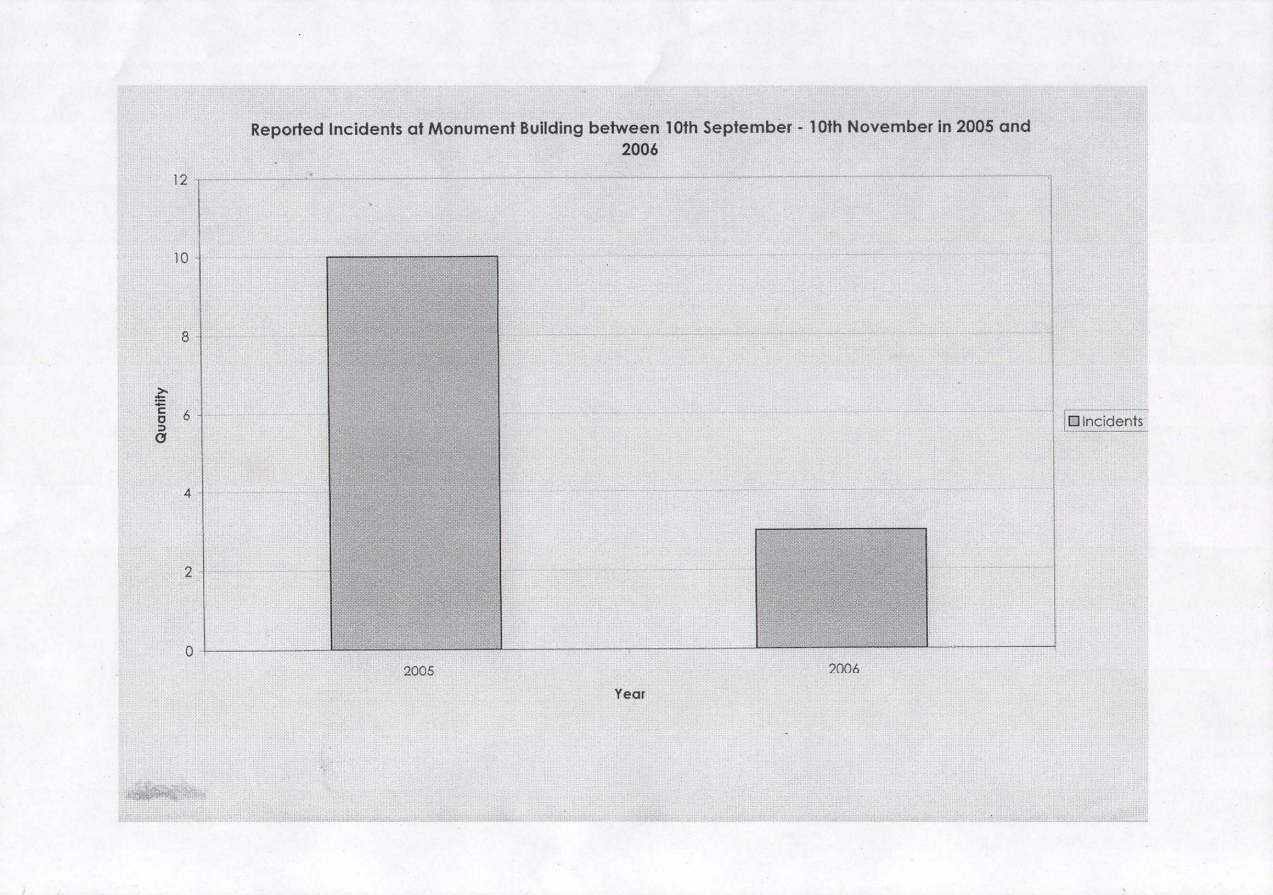
Fire Bikes Overseas

There were two types of Fire Bikes I studied. One from Liverpool, England and the other was in Hong Kong.

In Liverpool I stayed with Leading Firefighter Terry Clarry of Merseyside Fire & Rescue Service. Terry was the Firefighter behind the introduction of the Fire Bike in Merseyside. He also rides a Honda ST 1300, the same as the one I ride. Terry's bike is not used to fight fires but he turns out to all Automatic Fire Alarms (AFA's). During day light hours only, Terry is turned out by radio along with a fire truck from the nearest station. 95% of the time Terry will arrive before any truck gives on scene and investigate the alarm, often turning the truck back before it gets to the call.

In England, the Firefighters don't reset AFA's. It is up to the owner/occupier to maintain and reset their alarms. The Firefighters investigate the premises and extinguish any fire if necessary. On the odd occasion when Terry has found a fire, he has helped co-ordinate the evacuation and prepared the scene for the arrival of the fire truck. He is also usually in a position to give the SO of the truck instant and valuable information, such as type of fire and location, etc.

During the day when Terry is not chasing false alarms (FA's), he visits premises that have AFA's during the night that the trucks have turned out to. He tries to build a repour with the owners or managers and establish a cause for the FA and make sure the owners follow up on any maintenance issues that may need attending to. This saves an enormous amount of time that would other wise be tying up truck crews. Terry also spends a lot of time building relationships with the many Universities in Merseyside. He works closely with co-ordinators and fire wardens to ensure student are aware of fire safety and the consequences of being careless or causing false or malicious calls.



Since the introduction of the Fire Bike, the number of automatic alarms at the Monument Building has dropped by 66% in 2006 compared to the same period of time the year before.

Hong Kong

Hong Kong is an incredible place. It is so crowded and busy. The Fire Brigade there have a vast range of fire fighting vehicles and equipment ranging from boats to 2 and 4 wheel motorcycles.
Quad bikes are used for all fires and special service calls. They patrol in pairs along narrow lane ways that are cluttered with stall owners and their merchandise. There is no fire protection in these lanes at all and many unsafe practises are used. These lanes are all over Hong Kong.
The two wheeled bikes supplied by Firexpress in Denmark are used for small fires and also vehicle fire. They are also used in rural areas where trucks find it impossible to gain access.

Difficulties Responding in the CBD

The MFB find it increasingly difficult to turnout in the city due to traffic congestion. Although there are many tram track available to help, delays still occur. Several streets have to be avoided because of centre road parking which leaves no room to pass. Response times are blown out particularly during peak hour times, which these days are from 07:00hrs to 10:00hrs and 14:30hrs to 18:00hrs, which is most of the day. There is no real quiet time to speak of really. Also, when trucks park at a call, they add to the congestion because the street is often the only place to stop.

Having a Fire Bike responding at the same time as a pumper to a call will reduce response times greatly and will provide a quicker word back to VKN8. This could in turn result in the pumper turning back to the station, leaving them available to respond to another call. Also, the less time trucks are responding under emergency conditions, the safer the Firefighters and the public.

Environment

Heads of Government world wide are not only supporting but are actively engaged in reducing greenhouse gases as best they can. We should be doing all we can in Australia to reduce greenhouse gases and water consumption to improve our environment.

On average, a diesel truck emits 3 kg of greenhouse gases for every litre of fuel. Based on one truck (Pumper) using one tank of fuel per week, it would produce 1 tonne of greenhouse gases per week, that's 52 tonnes per year.

On average a motorcycle will emit 2.5 kg of greenhouse gases per litre of petrol. Based on one motorcycle using one tank of fuel per week, it would produce 65 kg of greenhouse gases per week, that's 3.4 tonnes of greenhouse gases per year. That's 6.3% of what a truck will emit or 16 times less than a truck.

How much damage does "X" amount of greenhouse gases do?? The science behind this question is a bit sketchy; however, to put these figures into some sort of context, you could look at it like this.
You all know the black balloon commercials on TV, right. Well, each black balloon contains 50 grams of greenhouse gases. An averages household produces 12 tonnes per year, (240,000 balloons). Road transport in Australia contributes about 70 million tonnes per year. Australia's emissions for 2005 was 522 million tonnes. Road transport is the fastest growing source of emissions.
(These figures are from the EPA's "Factors and Figures Work Book 2006")

Another environmental concern is the consumption of water. A MK 5 pumper could use over 200 litres of water in one minute from its hose reel. A fire Bike produces 22 litres in the same amount of time and would extinguish a small fire quicker and more effectively.

Fire Bike's many possible roles

Fire Bikes are utilised in many different ways in many different countries. All of the following and more are used in some part of the world.

- Automatic Fire Alarms (AFA's) as previously mentioned.
- Rubbish bin fires
- Car fires
- Fence and hedge fires
- Small grass and brush fires
- Miscellaneous small fires
- First level structure fires in Hong Kong.
- Road traffic crashes
- Emergency medical response
- Tunnel incidents
- General patrolling
- Community fire and road safety awareness and education

Safety record

Hong Kong – Fire Bikes introduced in 2001. To date there has been no accidents involving the motorcycles.

Liverpool – Fire Bikes introduced in 2005. To date there has been no accidents involving the motorcycles.

Benefits of Fire Bike

- Intelligent use of resources
- Extremely mobile and flexible
- Improved response times
- Quick word backs
- Will free up trucks for more important calls
- Less risk to public and firefighters.
- Better for the environment
- Cost effective to both Community and Brigade
- Minimize both fire and water damage – (Environment and fire investigation)
- Further opportunity for firefighters to gain recognized qualifications and skills
- Improve interest and boost morale in firefighters
- Gain interest and support from the community
- Work with other agencies to improve road safety

RISK ASSESSMENT

AREAS OF ASSESSMENT/ WORKPLACE	ITEM	HAZARD	PERSONS AT RISK	EXISTING CONTROL MEASUREMENTS
SELECTION AND COMMISSIONING OF MOTORCYCLE	1	Unsuitable machine for task	1-Staff	Motorcycle selected according to task they are to perform
		Unsafe distribution of customized fittings		Customized items to be fitted securely and with regard to trim of machine
		Unsafe carriage of personal equipment		Any personal equipment likely to cause injury incase of accident to be securely attached to motorcycle or stowed away
		Lack of uniformity of controls		Where machines are shared seek as practical to standardize controls
		Lack of Conspicuity		Machines to be clearly identifiable with reflective livery, illuminated signs, red and blue lights
SELECTION AND TRAINING OF RIDERS	2	Unsuitable riders	1 -Staff	Suitable selection procedures and ongoing monitoring by programmed re-assessments
PREPARATION & MAINTENANCE OF MACHINES	3	Defective Machines	1-Staff	Before each shift carry out pre ride checks as per manufacturer's recommendations. Use correct procedure to report any defects.

AREAS OF ASSESSMENT/ WORKPLACE	ITEM	HAZARD	PERSONS AT RISK	EXISTING CONTROL MEASUREMENTS
RADIO COMMUNICATIONS	**4**	Lack of effective communication	1 -Staff	Check radio and mobile phone communication transmissions at start of shift.
LOADING OF VEHICLE	**5**	Instability	1 -Staff	Loading to conform to safe load for machine, Equipment to be evenly distributed
GENERAL HEALTH HAZARDS	**6**	Accident	1 -Staff	Completion of high standard Motorcycle road safety course e.g.: Police Solo motorcycle course.
		Impact		High standard of protective equipment consisting of helmet, boots, gloves, back protector and high visibility protective clothing all compiling to motorcycle safety and fire safety standards
		Excessive Noise		To provide appropriate hearing protection. Hearing of all riders to be measured on appointment at regular intervals to monitor any hearing loss.

AREAS OF ASSESSMENT/ WORKPLACE	ITEM	HAZARD	PERSONS AT RISK	EXISTING CONTROL MEASUREMENTS
WEATHER CONDITIONS	**7**	Inclement weather causing visibility problems.	1 -Staff	Provide high visibility clothing for motorcyclists. Supervision to ensure it is worn at all times. Maintenance of PPE.
	8	Cold weather causing numbness of hands and feet resulting in reduced control of motorcycle and increased risk of collision/ falling off.	1 -Staff	Provide warm water/wind proof clothing. Provide heated hand grips on motorcycle.
	9	Hot weather causing excessive perspiration and consequential fluid loss resulting in dehydration and associated sickness.	1 -Staff	Provide lightweight ventilated clothing to reduce overheating. To provide and partake frequently of drinks for dehydration.
	10	Hazards of slippery roads and high winds, etc.	1 -Staff	Supervision to monitor weather conditions. Riders to have authority to self ground if not confident in weather.
	11	Wet weather causing saturation of clothing with consequential loss of concentration due to discomfort	1 -Staff	Provide adequate drying facilities at stations. Ensure riders are issued with waterproof clothing. Riders issued spare set of clothing.