

WAMASC NEWS

MARCH 2015



NEWSLETTER

This is your Newsletter and I once again reiterate; should any individual have anything that they would like to contribute, please don't be shy – feel free to contact any of the committee or contact me directly at:

michael.wayne.cuenden@gmail.com

MEMBERSHIP

We have had quite an influx of new members in the last month and we would like to extend a hearty welcome to our new WAMASC brethren. Welcome to the club folks and have fun.

As always membership forms are available on our website at:

<http://www.wamasc.org.au/membership.html>.

SAFE FLYING



Please remember that access to the TX Compound during attendance at the Field is a mandatory requirement.



OH&S AT WAMASC

There have been some subtle changes at the field over recent months to ensure the wellbeing and safety for all.

For your convenience we have taken advantage of some specifically qualified individuals who have undertaken various courses in **OH&S** and **First Aid** and asked them to perform certain duties at the club.

'**First Aid Personnel**' who have undertaken the appropriate First Aid training courses and hold either a current St John's Ambulance certificate in First Aid; it's equivalent, or better, may be distinguished and quickly identified by their **Green First Aid Cap** which they will be wearing when in attendance at the Field.

I ask you to please make yourself conversant and familiar with these personnel should you be unfortunate enough to require their services.

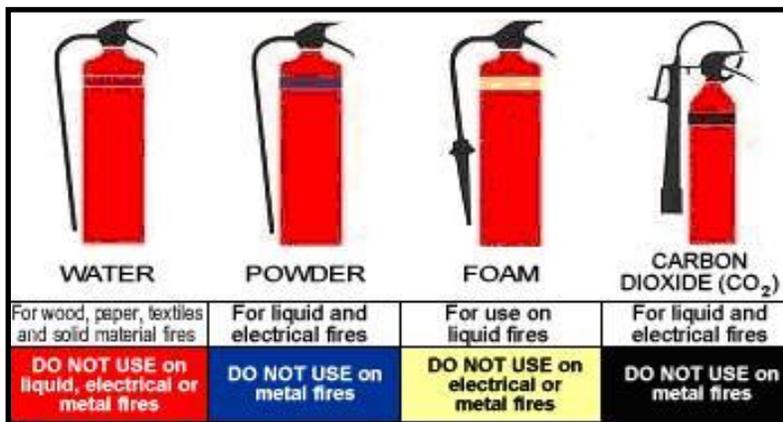


In addition please be aware that we have purchased two (2) new foam retardant fire extinguishers to replace the CO² extinguishers that were used to quell a minor spot fire some time ago.

I commend our resident Jet-Jocks in preventing the spread of that fire as it only takes a moment to grow into something major – the implications of WAMASC causing a large brush fire through Whiteman Park would not bode well for us.

Fire extinguishers are on hand for fighting fires and one should not be concerned in using one should the requirement dictate. I would rather replace an extinguisher than lose property, see a person come to harm or lose our venue.

Please be very much aware that different types of extinguishers are for use on different types of fires and using the appropriate one for your needs is paramount.



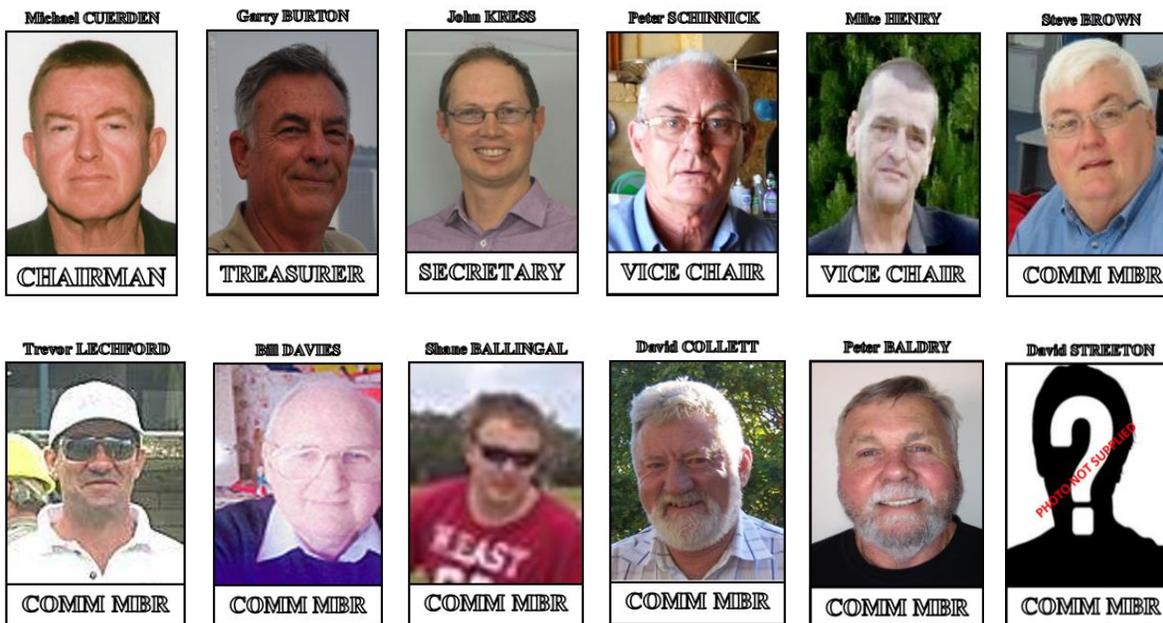
With this in mind ‘**Fire Fighting Equipment**’ such as rakes, nap-sack and shovels are readily available and accessible from within our TX (transmitter) Compound; just another reason why it should be open during attendance along with access to the First Aid Kit and Defibrillator.

I will also like to make note that we now have individuals on the committee who have a minimum standard of Certificate IV in OH&S training and will continue in their endeavour to ensure your safety.

WAMASC COMMITTEE MEMBERS

It has been brought to my attention that there are many WAMASC members not really aware of who resides on their behalf on the WAMASC Committee.

Pictures of the members of the ‘**Management Committee**’ may be accessed via our WAMASC Home Page and in an effort to enlighten everyone to who is working behind the scenes on your behalf please peruse below.



Presently our WAMASC **Management Committee** consists of twelve (12) personnel with further vacancy for two (2) more positions. Actual numbers are allowed to increase to seventeen (17) with the addition of a **Whiteman Park Representative** and two (2) **AWA Representative** Personnel.

AERONAUTICAL SURGE & STALL

In last month's Newsletter we spoke about aircraft propellers and touched on some of the forces encountered promising to speak further on a two particular phenomenon's known as **Surge (Axi-Symmetric Stall)**, more commonly known as **Compressor Surge**; or **Pressure Surge**) and **Stall** (commonly referred to as **Rotating Stall**).

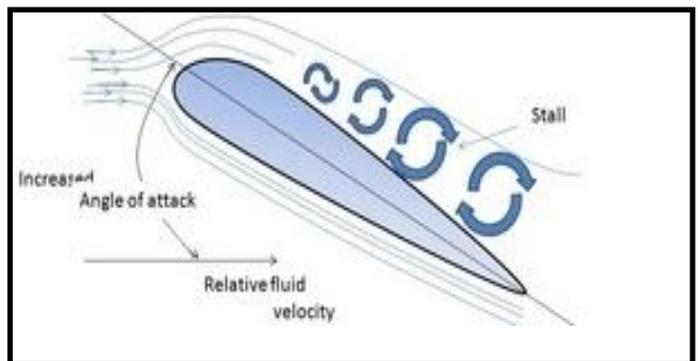
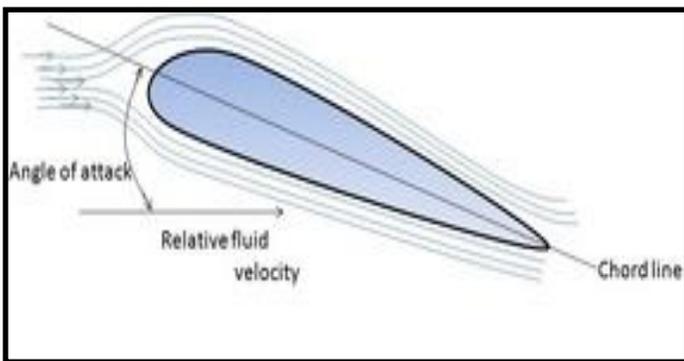
We will deal mainly with **Compressor Stall** as this phenomenon can and will occur in RC model aircraft Jet engines, on occasion, and cover **Surge** which can only occur when RAM air exceeds MACH 1 or greater (this is the reason air is not allowed to enter an engine intake above the speed of sound regardless of aircraft speed – it is the same reason and principle why a propeller will stop pushing air should any part of it exceed that speed).

A **compressor stall** is a local disruption of the airflow in a gas turbine or turbocharger compressor. It is related to **compressor surge** which is the complete disruption of airflow through the compressor. **Stalls** range in severity from a momentary power drop (occurring so quickly that it barely registers on engine instrumentation) to a complete and total loss of compression (**Surge**) necessitating a reduction in the fuel flow to the engine.

Surge and Stall occurs mainly in a **jet engine compressor** when a large volume of air entering into the inlet (intake) enters at a speed that causes air de-laminar flow and/or separation on the compressor blades. This is the very same effect that can occur on any lift cross sectional aerofoil whether it be a propeller, turbine, compressor or wing.

Surging and Stalling both lead to unstable flow in compressors and to understand the concept behind **Surging and Stalling**, we should once again revisit the concept of airflow over an aerofoil. An aerofoil will stall when the airflow completely separates from its top (**Low Pressure**) side. Be aware that these **High** and **Low** pressure areas will invert should airflow exceed the speed of sound (340.29m/Second or 671.207051MPH at sea level dependant on ambient t°) – reiterating that this is the reason RAM air is not allowed to enter an engine intake above this speed.

Note: I will speak about **Movable Plugs (Mouse)**, **Convergent** and **Divergent Ducting**, **Splitter Plates** and other methods of slowing airflow into an engine in a later edition.



The pictured blade above depicts airflow commencing from the LE (Leading Edge) across the top of the blade and progressing along its width past the TE (Trailing Edge). Airflow having to travel further on the top side of the aerofoil is initially accelerated causing a reduced pressure gradient (exactly the same as a lift wing). As the flow reaches the maximum thickness of the aerofoil, it starts to slow down, causing pressure to increase, or a positive pressure gradient starts to occur. This pressure gradient is unstable as the airflow is still positive (LE towards TE). This unstable condition forces a flow separation - there is reverse flow over the aerofoil surface past the separation point. If the angle of attack of the aerofoil increases, this separation point will move forward

towards the LE, making the flow separation area bigger. It will come to a point that the whole flow over the aerofoil separates, starting from the LE. This condition is called **Stall**.

There are two (2) types of compressors - **Axial Flow** and **Centrifugal**. Stall being more prevalent in the space saving design of the Centrifugal type. A **Compressor Stall** occurs when the pressure of air entering the engine drops below the pressure in the compressor, or the air within the compressor drops momentarily as a result of stalling air (disruption in air pressure (separation)). When this happens the compressed air expands and travels toward the area of less pressure (toward the front and out the back). This is only partial compression loss due to separation. In an **Axial Flow** compressor propagation of the instability around the flow path annulus is driven by stall cell blockage causing an incidence spike on the adjacent blade. The adjacent blade stalls as a result of this incidence spike, thus causing stall cell "**rotation**" around the rotor.

This can be related to some of the air being bypassed around the engine core, and some entering the core. Air that enters the core is compressed considerably in stages (compressed more and more as air travels toward the back) before it is mixed with fuel, ignites, and expands out the rear of the engine.

Stall in an engine is acceptable to a point. When a compressor stalls momentarily it may often go unnoticed. It may be heard as a loud bang requiring no further action. The worst case scenario would be the requirement for an engine re-start. A compressor stall often will correct itself as soon as the flow of air in the engine is restored. Quite often the simplest corrective action by the pilot is to reduce engine power until the engine stabilizes.

Compressor **Stalls** and **Surges** where most prominent in older jet engines; however, with the advent of CAD (Computer Aided Design) technology, improved engine design and understanding, this problem has virtually vanished in the modern jet engine.

Surge in an engine; however, is something else - it occurs when the compressor has a complete and total loss of compression with the resultant effect sometimes catastrophic (complete mechanical failure).

Surging is the complete breakdown of steady through flow, affecting the whole machine, in other words, when stalling takes place on all the blades simultaneously. This leads to choking of the flow. Sometimes even reversal of the flow may take place. Heavy vibrations also occur which are not conducive to an engine remaining intact.

Note: In a high pressure ratio multistage compressor, the axial velocity is already relatively small in the higher pressure stages on account of high densities. In such stages a small deviation from the design point causes the incidence to exceed its stalling value and stall cells first appear near the hub and tip regions. At very low flow rates they grow larger and affect the entire blade height. It results in significant reduction in delivery pressure.

The following, if severe enough, can cause **Stalling** or **Surging**. FOD (Foreign Object Damage) caused through the ingestion of sand, dirt etc. which causes erosion thus lowering the **Surge** line. Dirt build-up in the compressor and wear that increases compressor tip clearances or seal leakages all tend to raise the operating line, imbalance or missing blades.

E-MAIL CESSATION OF FIELD CLOSURE DUE TO FIRE THREAT

On the 24th of February 2015 I sent out an E-Mail to all members as follow up to the recent '**GFDI and what it means to you**' article in last month's February 2015 edition of the WAMASC Newsletter giving notification that said E-Mails would cease as of the beginning of March 2015.

Please be very aware that this previous courtesy service provided by your committee has ceased.

As mentioned in my E-Mail the onus is on the individual to check whether the Field is a go for flying on the day in question prior to travel. Our new **WAMASC Website** has a **'Weather Link'** that provides navigation and access to all the required and appropriate sites (organisations) to ascertain the Field Status.



FOR SALE SECTION

Please contact **Shaun MITCHELL** on **0400543225** re any of the following items:

12 Model Aircraft Plans

Radio control and control line

Average cost to purchase \$56 each, selling for \$400 ONO for the lot

Model Aircraft Accessories

2 x Electric Conversion Kits

Full Tanks

Landing Gear

1x set of retracts

Servo extension leads switches etc.

\$300 ONO for the lot

Model Aircraft O.S engines/glow (2 stroke)

1 x 62cc 2 stroke Zenoah - \$400

2 x @ 1.20 cui AX - \$300 each

1 x 95 cui AX - \$300

1 x 65 cui AX (still in box) - \$225

2 x 46 cui AX (1x still in box) - \$150

1 x 0.49 cox engine (still in box) - \$300

Price as marked or \$1550 ONO for the lot

Assorted Props, Engine Mounts, Spinners etc. (photos with assorted gear)

13x Futaba Servos

6x Hi Tec Servos/2 Deluxe

\$400 one for the lot

Model Aircraft

All planes come complete except for transmitter and receiver



2m Decathlon - \$700 one
 1.8m Decathlon - \$600 one
 Condor - \$500 one
 Gliders - \$200 one each
 P 51D Mustang - \$600 one
 PC9 Seagull - \$550 one
 Soarwing (unmade) - \$100 ONO
 Price as marked or \$3000 for the lot



LAST TO LEAVE

Please be considerate and remember to lock up correctly on departure from the field. If you are the last to go please be aware that our facility is a shared one and ensure that those behind you can gain access. Recently the main gate was locked without the three locks being left in series – this is a necessity for both Emergency Service(s) and the Buggy Club to obtain access.

Furthermore the toilet key was once again not returned to the TX Compound after opening and locked inside the ACROD toilet.