

Introduction:

This Safety Regulation, in various formats, has been in use in the Model Aeronautics Association of Canada (MAAC) since 1996. It was based on the former International Miniature Aircraft Association (IMAA) Safety Regulations and has proven itself over many years' experience by thousands of North American modellers and pilots of Large model aircraft.

SECTION 1.0 - SAFETY STANDARD

1.1 Adherence to Guidelines: These Safety Guidelines is to be strictly followed at all MAAC sanctioned Large Model Events.

1.2 The most current MAAC Safety Code in effect is to be observed.

1.3 The Event Director, Safety Officer and Flight Line Director shall ensure that all participants in a MAAC Large Model sanctioned event are fully cognizant of the fact that the operation of radio controlled aircraft can be dangerous and such participants should always be alert.

SECTION 2.0 – EVENT DIRECTOR/SAFETY OFFICER/FLIGHT LINE DIRECTOR

2.1 Each MAAC Large Model Sanctioned event must have an appointed Event Director, a Safety Officer and a Flight Line Director who will be responsible for general safety, including aircraft, pilot helpers and spotters, flight line control, flight traffic pattern, spectator control and frequency control if appropriate.

2.2 The Safety Officer/Flight Line Director(s), required by these Safety Guidelines, are to help and assist the pilot, and are not to determine the technical airworthiness of a model, or the competence of the pilot. Ultimately, it shall be the responsibility of the pilot (or owner), and theirs alone, for a safe model and a safe flight.

2.3 The Event Director, Safety Officer and Flight Line Director shall enforce the current MAAC Safety Code as described in Section 1.2.

SECTION 3.0 - SAFETY CHECK

3.1 The Pilot/Builder are ultimately responsible for the Safety Inspection and Flight Readiness of their model. He/she shall sign a declaration that they have inspected the aircraft according to the MAAC Large Model Safety Code standards (MAAC Safety Document <u>MSD 9</u> – Large Model Aircraft) and that it ready for safe flight.

3.2 The MAAC Large Model Safety Checklist should be used for the purpose of inspecting aircraft for any deficiencies/requirements. Copies of this MAAC Large Model Safety Checklist Form are available from:

- a. Addendum C of this document;
- b. MAAC office; and/or
- c. MAAC R/C Large Model Committee website.

3.3 After inspection, the aircraft may be flown as often as the pilot desires, provided that he/she follows the chosen frequency control standard. However, if the airplane is involved in an accident, no matter how minor, and the pilot wishes to fly again, the aircraft shall go through another safety inspection check.

3.4 Flight Testing: All aircraft are to have been flight tested and flight trimmed with a minimum of six (6) flights before the model is allowed to fly at an MAAC Sanctioned event.

3.5 Declaration of Flight Readiness: The pilot must sign a declaration that he/she has complied with the MAAC Large Model Safety Code requirements (MAAC Safety Document <u>MSD 9</u> Large Model Aircraft. This may be done on the event registration form or on a separate form as directed by the Event Director. The following declaration is provided for the Event Director's use:

DECLARATION: "I hereby certify that the Model Aircraft designated above has been constructed in accordance with large model techniques, has successfully flown a minimum of six times, and all of the equipment contained therein meets or exceeds the MAAC Large Model Safety Regulations. Further, that prior to first flight of the day, the batteries have been fully charged and the control systems have been checked for proper operation"

Signed (Owner/Builder):

SECTION 4.0 - SPOTTER / HELPER

4.1 Spotter/ Helper Definition: An assistant to aid the pilot during start-up, taxing onto the runway, and to keep pilot alert to other aircraft movements in the air and on the runway.

4.2 Each pilot is required to have a spotter / helper at all MAAC sanctioned events. Please refer to MAAC Safety Document <u>MSD 7</u> - Need For and Duties of Spotters and Helpers" for additional information.

SECTION 5.0 - EMERGENCY ENGINE SHUT OFF (Kill Switch)

5.1 Magneto spark ignition engines must have a coil-grounding switch on the aircraft to stop the engine. This will also prevent accidental starting of the engine. This switch shall be readily available to both pilot and helper. This switch is to be operated manually and without the use of the Radio System.

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5.2 Engines with battery powered ignition systems must have a switch to turn off the power from the battery pack to disable the engine from firing. This will also prevent accidental starting of the engine. This switch shall be readily available to both pilot and helper. This switch shall be operated manually and without the use of the Radio System.

5.3 There must also be a means to stop the engine from the transmitter. The most common method is to close the carburetor throat completely using throttle trim, however other methods are acceptable. This requirement applies to all glow/gas ignition engines regardless of size.

5.4 Large Model Electric Models must have an externally accessible power 'kill switch' or arming plug that will disable power to the motor(s). This device shall only be activated at the flight line starting area just prior to flight or at a designated engine test run area.

SECTION 6.0 - RADIO REQUIREMENTS

6.1 Radios must be either 72 MHz or 2.4 GHz. 72 MHz radios must be impounded before any flying takes place.

6.2 Where prescribed by the manufacturers operating instructions, all members shall perform a range check before the first use of the day and after any mishap that requires repairs (MAAC Safety Document <u>MSD 17</u> - Radio Spectrum).

SECTION 7.0 - MAXIMUM AIRCRAFT ALLOWANCES

7.1 MAAC aircraft weight is not to exceed 35 kilograms (77 pounds), including a full load of all liquids (engine fuel, smoke fluid, etc.) Note: This weight is a Canadian Standard. If you are flying in the USA you are subject to the AMA limits of 55 pounds unless you make prior arrangements to have an "Experimental Aircraft" category inspection and permit which goes up to 100 pounds. Copies of the Experimental Class Rules are available through the AMA. It is the pilot/modeller's responsibility to obtain such permits etc prior to participating in USA events with a/c over 55 pounds. Also see "Addendum A" at the end of this document.

SECTION 8.0 - FLYING SITE LAYOUT

8.1 The flying site shall be set up to provide, at minimum, a separation of 19.5 Meters (65 ft) from the near edge of the runway to the beginning of the spectator area, and where possible, a distance of 30 Meters (100 ft) or more is recommended. The Event Director may at his/her discretion enforce a greater separation if they feel the size or nature of the aircraft so warrants; <u>MPPD 6</u> - Recommended R/C Flying Site Specifications refers.

8.2 A specific area shall be set aside for engine test runs. This area should be remote from the spectator area, pits, and flight stations to reduce danger and annoyance to persons in this area. No engine may be started in any area other than the engine test area and runway entrance(s).

8.3 Access to a chemical fire extinguisher at starting areas is suggested. However for turbine aircraft a fire extinguisher is a requirement.

SECTION 9.0 – RECOMMENDATIONS

9.1 The following recommendations are included in the **Safety Guidelines**; not to police such items, but rather to offer basic suggestions for enhanced safety.

- a. <u>Servos</u> need to be of a rating capable to handle the loads that the control surfaces impose upon the servos. Standard servos are not recommended for control surfaces. Servos should be rated heavy-duty ounces of torque. For flight-critical control functions a minimum of 45 inch/ounces of torque should be considered. This should be considered a minimum for smaller aircraft and higher torque servos are strongly encouraged for larger aircraft. The use of one servo for each aileron and one for each stabilizer half is strongly recommended. Use of digital and multi servos is also recommended on larger aircraft especially larger aerobatic aircraft;
- b. **<u>On-board batteries</u>** should be, at a minimum:
 - 1) 1000 mAh up to 20 lbs.,
 - 2) 1200 mAh to 30lbs.,
 - 3) 1800 mAh to 40 lbs.,
 - 4) 2000 mAh over 40 lbs. flying weight; and
 - 5) The number and size of servos, size and loads on control surfaces, and added features should be considered as an increase to these minimums. Batteries should be able to sustain power to the onboard radio components for a minimum of one hour total flying time before recharging. Dependable redundant and fail-safe battery systems are recommended;
- c. The use of <u>anti-glitch devices</u> for long leads is recommended for 72 MHz radio systems;
- d. There is no <u>maximum engine displacement limit</u>, as it is the position of this body that an under powered aircraft presents a greater danger than an over powered aircraft. However, the selections of engine size relative to airframe strength and power loading mandates good discretionary judgment by the designer and builder. Current maximums for engine displacement are 6.0 cu. in. for two-stroke and 9.6 cu. in. for four-stroke engines;
- e. <u>Generally</u>, it is recommended that no attempt should be made to fly a radio controlled model aircraft with a gasoline engine in which the model aircraft weight would exceed 12 pounds per cubic inch of engine displacement (under powered), or be less than 5 pounds per cubic inch of engine displacement (overpowered). Example: Using a 3 cu. inch engine, a model would likely be under powered at an aircraft weight greater than 36 pounds. With the same engine, an aircraft weighing less than 15 pounds would likely be over-powered;
- f. <u>Servo arms and control horns</u> should be rated heavy duty. Glass filled or metal servo arms and control horns are highly recommended;

- g. Control surface linkages are listed in order of preference:
 - 1) Cable system (pull-pull). A tiller bar is highly recommended along with necessary Bracing,
 - Arrow-shaft, fibreglass or aluminum, 1/4" or 5/16" OD. Bracing every six (6) to ten (10) inches is highly recommended,
 - 3) Tube-in-tube (nyrod). Bracing every few inches is highly recommended. Inner tube should be totally enclosed in outer tube,
 - 4) Hardwood dowel, 3/8" OD. Bracing every six (6) to ten (10) inches is highly recommended,
 - 5) <u>Hinges</u> should be rated heavy duty and manufactured primarily for use in giant sized Aircraft. Homemade and original design hinges are acceptable if determined to be adequate for the intended use,
 - 6) <u>Clevis</u> (steel, excluding heavy-duty ball links) and attachment hardware should be heavy-duty; 4/40 thread and rod type. 2/56 thread size rod is acceptable only for some non-flight surface applications (e.g. throttle). Clevises must have lock nuts and sleeve (fuel tubing) or spring keepers,
 - 7) **<u>Propeller tips</u>** should be painted or coloured in a visible and contrasting manner to increase the visibility of the propeller tip arc,
 - 8) <u>Fail Safe Operation</u>: All modern transmitters feature a "Fail Safe" option. It is strongly recommended that all Large Model Aircraft utilize this feature. When the Transmitter is turned off, the throttle should close and flight control surfaces should come to a pre-determined position.

SECTION 10 - ADDENDUMS:

- a. Addendum A, Models exceeding 35 Kg/77 lbs
- b. Addendum B, Warm-Up Events and Gaining The Six Flight Requirement
- c. Addendum C, MAAC Large Model Safety Check List, (The "Walk-Around Check")

Addendum A

Models Exceeding 35 Kg/77 lbs

From time to time the question of what to do with those rare models that show up that exceed the 35 kg or 77 lb weight restriction. Such cases are rare but the Event Director needs some guidance in dealing with the situation. The following applies these situations:

- 1. The modeller/pilot must provide proof of insurance coverage. This must be for the same amount of coverage as the current MAAC policy and must indicate that the host club, the field owner and MAAC are covered.
- 2. A Canadian modeller/pilot must also possess a Transport Canada Special Flight Operating Certificate (SFOC) for a model exceeding 35 kg. (These are obtained through application to the General Aviation branch of Transport Canada).
- 3. Visiting AMA modellers/pilots must in addition adhere to AMA Giant Scale/ Large Model Regulations and provide proof of insurance.
- 4. The Event Director's permission is paramount. It must be stressed that the Event Director, at that time and place, is the best judge of local conditions, field, spectator safety, etc as to whether such models should be permitted a flight even with the provisions given above.

Addendum B

Warm-Up Events and Gaining The Six Flight Requirement

 Flights conducted to gain the necessary 6 flights must be done with only MAAC members in attendance. All other MAAC Safety Code rules must be followed. Similarly, a MAAC sanctioned "warm-up" type of event can be held providing only MAAC members attend and it is advertised as such.

Addendum C



GIANT SCALE SAFETY CHECK LIST (The "Walk-Around Check")

<u>AIRWORTHINESS REVIEW</u>: The ultimate responsibility for the safety and airworthiness of the aircraft rests solely with the owner and/or pilot. This checklist is to be used as a guide by the pilot prior to flying at any MAAC event to ensure that the aircraft is ready for flight. It is recommended that this be copied and kept with your field box or Transmitter case.

- **GENERAL APPEARANCE** Check for damage, warps, loose or torn covering, etc.
- **PROPELLER** secure (check for cracks, damage)
- COWLING secure
- ENGINE securely attached
- **KILL SWITCH** in **OFF** position.(Electric models have arming plug removed or kill switch off when batteries installed), (Can I kill engine in flight with radio)
- CANOPY OR WIND SCREEN secure, no cracks
- HATCHES OR COVERS secure
- **RIGHT WING** attachment secure, (struts secure if applicable)
- RIGHT WING aileron hinges secure
- RIGHT WING control links and horns secure
- LANDING GEAR check struts for cracks, bends. Wheels and wheel collars secure
- TAIL SURFACES brace wires if applicable, taut and secure
- ELEVATOR hinges secure
- ELEVATOR control pushrods, links and horns secure stiffness
- RUDDER hinges secure
- **RUDDER** control pushrods or cables, links and horns secure.
- **LEFT WING** attachment secure (struts secure if applicable)
- LEFT WING aileron hinges secure
- LEFT WING control links and horns secure
- CONTROL CHECK Radio On: control surfaces/throttle moving correctly
 - Fail Safe Check (TX Off throttle closes)
 - Range check for all 72 MHz and 2.4 GHz radios
- **BATTERIES** Fully Charged?
- STARTING GLOVE, Stick or Starter?

<u>NOTE</u>

RESTRAINTS - All members shall use an appropriate method of restraining their model during starting and ground running of the model or during range checks when conducted with the motor running or where there is any danger of the motor starting as in the case of electric powered models.

Pilot Name: _____ Signature: _____

Date: