

AE Safety – Rockets and Rocketry

Hazard Description: Rocketry involves small, controlled explosives that may get hot, rupture or ignite, causing serious injury and/or damage. Personnel injury or death may occur due to mishandling of the rockets.

Warning: Follow ALL manufacturer's safety instructions. In any cases where these instructions and the manufacturer's instructions differ, use the one that is more restrictive and/or provides an added layer of safety.

General Handling:

- Use only certified, commercially-made model rocket motors. Do not tamper with them for any reason. Do not use them for any purposes except those recommended by the manufacturer.
- Only use those rockets with an electrical launch system and electrical motor igniter that includes an interlock in series with the launch switch. The launch switch must return to the "off" position when released.

Prior to the activity:

- Review and be familiar with the National Association of Rocketry (NAR) safety code. www.nar.org
- Determine if there are any local rules and regulations regarding the type, size, and launching of rockets within your community.
- Appoint a Safety Observer to ensure that safety is maintained throughout the activity. The Safety Observer shall have no other duties. If the activity is to take place over an extended period of time, appoint two or more Safety Observers that can take turns and prevent fatigue.
- Safety Observers do not eliminate the need for all participating members to be vigilant. Encourage all participants to speak up if they see something that may be unsafe. Stop the activity until the issue is resolved.
- Use only prepackaged solid model rocket engines. Check the engines before installing them in the rocket to make sure that the casing and nozzle are sound and have no defects or cracks.
- Before the flight, check for loose fins, launch lugs, and shock cords as well as the condition of the recovery system.
- Ensure that only flame-resistant or fireproof recovery system wadding is used in the rocket.
- Ensure that a fire extinguisher or similar fire suppression system is at hand during the launch.
- Ensure that the unit commander is aware of the rocketry activity.

At the beginning of the activity, provide a safety briefing:

- Brief all of the manufacturer's safety precautions. Note any items where an additional layer of safety has been added by the activity director.
- Do not launch any rocket at a target, into a cloud, or near airplanes. Do not put any flammable or explosive payload into any rocket.
- Always launch outdoors, in an open area. Do not launch near trees, houses, or highways.
- Always launch in safe weather conditions. Check the weather prior to the launch. If lightning has been seen within 10 miles of the launch site, postpone the activity. Continue to monitor the weather throughout the launch period.

- Ensure that no dry grass is close to the launch pad.
- Never try to recover a rocket from power lines, tall trees or other dangerous places.
- Never try to reuse or repack a spent solid rocket engine.
- Do not attempt to modify the nozzle or the casing of a solid rocket engine.

During the activity:

- **IF THERE IS A MISFIRE:** Have a senior member remove the launcher's safety interlock or disconnect its battery. Wait at least 60 seconds after the last launch attempt before approaching the rocket.
- **AT NO TIME** is any member to place any portion of the body over the rocket, in the direction of travel. This includes, but is not limited to, the face and arms.
- Use a countdown before launch. Ensure everyone in the area is paying attention.
- At no time should any member be within fifteen (15) feet of the rocket(s) being launched. If the manufacturer recommends a greater distance, especially for the larger rockets, then the manufacturer's distance shall be used.
- When available, launch from a launch rod, tower, or rail that is pointed within 30 degrees of vertical.
- Use a blast deflector to prevent the motor's exhaust from hitting the ground.
- If the system uses a safety key, ensure that it is removed when connecting the slips to the wires of the igniters.
- Ensure that the launch pad is securely anchored so that it doesn't tilt or fall over. Between launches, check that the security of the launch pad has remained intact.

After the activity:

- Always follow local ordinances for proper disposal of the rockets and any associated batteries. Many places consider rocketry supplies and batteries to be hazardous materials.
- If your system uses lithium or lithium-ion batteries: Many places consider lithium and lithium-ion batteries to be hazardous materials. To properly dispose of li-ion batteries, it is recommended that you take them to a battery recycling location or contact your local waste management service provider for disposal instructions. Put batteries in a sealed metal container before recycling them.
- Cap the end of the launch rod when it is not in use to prevent eye injury.