

MASA RSO/LCO Training

May 1, 2001



RSO/LCO Training Goals

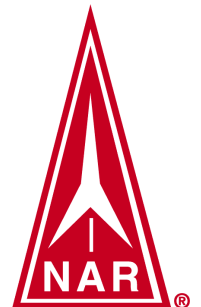
- Increase the number of Range Safety and Launch Control Officers available at MASA Launches.
- Improve MASA members' understanding of what the LCO and RSO responsibilities are during a launch.





Training Material

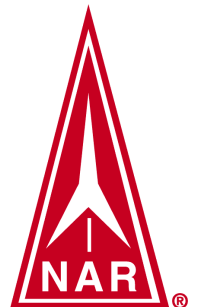
- Based primarily on the guidance provided in the NAR Safety Officer Training Program
- All requirements work back to:
 - FAA FAR Part 101
 - Model Rocket & HPR Safety Code
 - NFPA 1122 (Model) and 1127 (HPR)





RSO Function

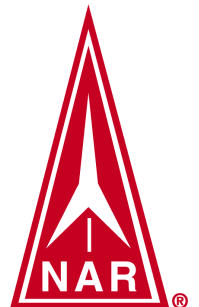
- Responsible for the safe operation of the rocketry range.
- RSO has final authority to approve or disapprove the launch of a vehicle.
 - RSO is under no obligation to allow any vehicle to fly.





MASA RSOs

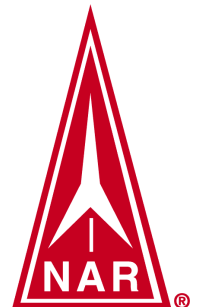
- Addition responsibility: Act as the check-in officer for clusters, staged, mid- and high-power vehicles.
 - This function is sometimes called the safety check in officer





LCO Function

- Launching the rockets when the RSO indicates it is safe to do so
- Safing/Arming the launch controller as required.
- Announcing the launch sequence.





RSO Guidelines

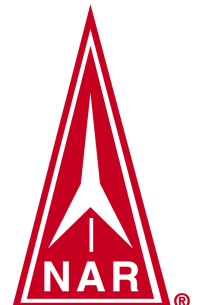
- Check the Launch Pad sign up sheet for:
 - Age of rocketeer. Must be over 18 to fly any engine “G” or larger, or reloadable engines
 - Certified for Power Level used
 - Typically F, G, or H power
 - Engine is certified
 - Engine is appropriate for rocket
 - Ejection charge is installed (reloadables only)





Vehicle Inspections

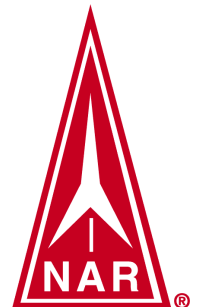
- Examine all “slip-fits”
- Examine launch lugs.
- Examine fins.
- Examine engine installation
 - Retention
 - “Fly through”





Vehicle Inspections (cont.)

- Is model stable?
- Is construction sufficient?
- Recovery system.
- Appropriate sized vent holes.
- Booster has vent hole (multi-stage only.)





Cluster Inspections

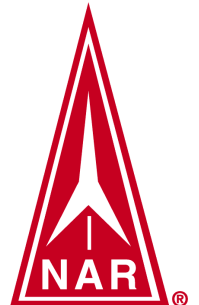
- No open holes between motor mount tubes.
- Mixed black powder & composite motors ignite composite first.
- Igniters in parallel.
- Igniters are matched.





Launch Pad

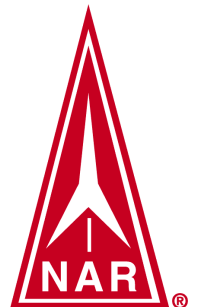
- Tower launchers will not allow model to escape.
- Blast deflectors present on all pads.
- All launch lugs on rod.
- Model slides freely on rod.
- Launch rod sized appropriately for rocket weight.





RSO Prelaunch Guidelines

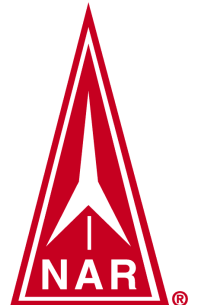
- Wind speed.
- Blast deflectors on launch pads.
- No flammable materials around pads.
- Personnel a safe distance from pads per guidelines:
 - 15 ft if total impulse <20 N-sec (“D”)
 - 30 ft if total impulse 20.01 - 160.00 N-sec (“G”)
 - 100 ft if total impulse 160.01 - 1280.00 N-sec (“J”)





RSO Prelaunch Guidelines

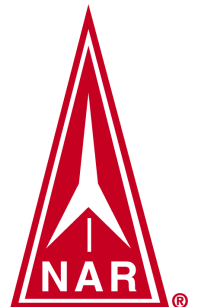
- Rocket trajectory will not cause rockets to land in spectator area.
- Fire fighting equipment.
- PA System is working.
- Smoking is controlled.
- Notification filed. Anoka tower phoned.
(Blaine only)





RSO Launch Guidelines

- Launch angle with 20 degrees of vertical.
- Rocket stable on launch pad.
- Winds < 20 mph.
- Spectators clear of launch area.
- Skies clear of aircraft.





RSO Flight Guidelines

- Models penetrating cloud cover.
- Rocket trajectories carrying over spectators.
- Track all parts of staged rockets.
- Electronics armed.
- Common threads to flight failures.





RSO Some Rockets

- Each rocket is identified on the launch pad sign up sheet.
- Determine if the rocket is qualified or disqualified to launch and reason why.
- Assume Blaine launch site:
 - 125 gram/320 N-sec propellant limit.
 - 3.3 lbs. weight limit.
- Assume the engine listed is correctly assembled (if applicable) and installed.

