

NAR HPR Certification Conditions

Anyone seeking a **NAR** Level 1 HPR certification at a **BARC** launch (or serving as a certification team member) needs to have a **working knowledge of** the following requirements:

- What Rockets require HPR certification?
 - Models containing multiple motors with a total installed impulse of ≥ 320.01 NS
 - Models containing a single motor with a total installed impulse of ≥ 160.01 NS
 - Rockets that weigh >53 ounces (1500 grams)
 - Models powered by motors not classified as model rocket motors (NFPA 1122)
 - Average thrust >80.0 N
 - Contains >125 grams of propellant
 - Hybrid & Sparky (NFPS 1125) rocket motors
- Applicants must:
 - Have a copy of the **NAR High Power Certification Application** form, ID, and NAR membership card in-hand.
 - Read, and have a working knowledge of, the associated **NAR Certification Process**.
 - Be at least 18 years old (14 for Junior Level 1), and a member in good standing of the National Association of Rocketry (NAR).
 - Themselves, build the rocket to be used for their certification attempt - scratch built or a kit. The rocket must be constructed in such a manner that it will **perform safely** under the additional stress of a HPR motor.
 - Assemble, and drill the delay, of the motor, **in the presence of a certification team member**.
- Only individuals may attempt HPR certification –teams may not certify.
- The rocket must use an **active recovery system**
 - The deployment of a primary recovery device that **actively changes** the physical configuration and **dramatically reduces** the vertical descent rate of the rocket model when deployed.
 - Where dual deployment and secondary recovery devices are used, the deployment of a secondary recovery device must **actively change** the configuration of the model in order to inhibit ballistic recovery and slow the decent rate so as to allow for **safe deployment of the primary recovery device**.
- Combinations of D, E, F or G motors that meet the impulse requirements do not qualify.
- During the safety inspection [RSO] **the modeler will be expected to provide oral answers to technical questions** related to the safety and construction of his model:
 - Identification of the model's CG & CP
 - Methods used to determine model stability
 - Interpretation of the rocket motor's designation
- The flight must be witnessed by the certification team members. **Stability, recovery system deployment, and safe recovery** should be considered **when evaluating safety of the flight**. Models experiencing a catastrophic failure of the airframe, rocket motor, and/or recovery system (e.g., shock cord separation) will not be considered as having a safe flight.
- High power range safety officers will require high power certification (NFPA 1127)

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IMPORTANT NOTE

Prior to performing the certification flight attempt, the certification witness (and RSO) will assess the applicant's knowledge of rocketry principles, safety practices, and construction techniques. Failure to satisfy this assessment shall in itself be sufficient grounds to deny the applicant the right to proceed with the launch attempt.

The following is a list of typical knowledge assessment questions:

- Rocket construction methods – use of adhesives, fin attachment, shock cord type and securing method, drag separation?
- Recovery system components?
- Location of, and method of determining, the CG & CP?
- Apogee expected and how determined?
- Rocket safety – stability, distance from launch pad, igniter insertion, continuity checks, ejection charges, etc.

It is left to **the judgment of the certification team** to differentiate between flight damage and “normal” maintenance to assure reliability (e.g., shock cord replacement to prevent future flight problems). “Zippering” of the body tube is another area of flight damage left to certification team judgment for acceptability.