

# United Kingdom Rocketry Association



## Team Project Support v3.2 *Application Process*

Produced by UKRA Safety & Technical.

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# Team Project Support



## 1.0 Introduction

This policy will set out a means by which a team, from a university or other recognised body, may apply to launch a rocket safely from a UKRA supported site, with the appropriate indemnity and without the requirements normally imposed by the UKRA certification process.

## 2.0 Background

The promotion of safe and responsible model, high power and experimental rocketry is fundamental to the United Kingdom Rocketry Association (UKRA).

Central to these principles is the demonstration of proficiency and experience through the model achievement program (MAP) and high-power rocketry certification. It is UKRA's opinion that the necessary experience required to fly safely cannot be acquired quickly. The MAP scheme and certification levels allow the skills required to be proficient in constructing and flying rockets to be gained through a series of increasingly complex builds. For individual members, these measures of attainment have worked well, giving range safety officers (RSOs) clear criteria and standards with which to assess the suitability of an individual rocket project to fly, for the given experience of a particular member. Implicit in each certification, is that the member has constructed a project themselves and understands, to a given limit of impulse, how to conduct and recover a launch safely for a particular site, under the ultimate authority of the RSO. As our primary aim is the promotion and maintenance of safe rocketry for our members, the MAP scheme and certification levels are UKRA's preferred route into rocketry.

However, over the time of UKRA's existence, we have received many requests for assistance with rocketry projects from teams of individuals, frequently in full time or higher education. UKRA is keen to promote and encourage this type of project. Team projects have previously demonstrated detailed engineering insight and innovative solutions to the challenges of rocket flight and recovery. Nonetheless, such team projects can present significant problems for UKRA, that are not faced with individual member projects. Foremost in our concern, is that team members often lack prior rocketry experience. Furthermore, as these projects are usually to be completed in a limited period, such as the final year of a degree course, time is not available to gain sufficient experience and complete the certification process required. Finally, as certification requires an individual to have constructed a project unaided, these team projects do not conform to that certification process. UKRA has therefore

developed this process (called Team Project Support or TPS for short) to enable team-based projects to be conducted and flown with UKRA guidance and from UKRA supported sites. This is quite separate from high power rocketry certification but will allow access to insurance indemnity.

### 3.0 TPS Process - Introduction

TPS will be achieved through an enhanced level of scrutiny for a given impulse range of project. The steps required for this process are detailed below, but first there are a few caveats which must be recognised and adhered to by any team applying for TPS.

- The application steps are not optional and must be completed in full for UKRA to support your project.
- Failure to follow these steps or follow the guidance of your mentor will automatically lead to cancellation of your planned flight.
- The UKRA safety code must be adhered to in respect of all other parameters except those defined in this policy.
- Whilst UKRA will make every effort to process and complete your application in a timely manner, your external time constraints (i.e. university course completion) are not a concern of UKRA and we will not be held responsible for missed deadlines.

Remember that UKRA's primary aim is the promotion and maintenance of safe rocketry in the United Kingdom.

There are two routes for teams wishing to use the TPS system. These are "Mode A" and "Mode B". Both of these systems are quite similar but have some subtle differences in the level of monitoring relative to the type and power of the proposed vehicle. Please familiarise yourself with both modes before applying.

### 4.0 TPS Mode A - Requirements and Application Process.

1. TPS Mode A is intended for projects that utilise off the shelf components, use a propulsion system with a total impulse less than 640Ns, have simple avionics and standard recovery systems.
2. To be classed as a "team" under TPS, the group will consist of a minimum of 3 members.
3. The youngest member of the team, at the time of application, will be at least 16 years of age.

4. The team must contain one full UKRA member with BMFA insurance, who will be present for the intended flight. This member does not need to have undertaken any previous certification flights.
5. Application for TPS Mode A must be accompanied by a letter of support from a tutor or group leader confirming the educational goal of the intended project. The letter should state the intended reasons for the proposed rocketry project, whether a research project or part of course work contributing to the awarding of a degree by a United Kingdom recognised body.
6. The fee for TPS Mode A is £250, payable on application.
7. Application for TPS Mode A will be made by contacting the UKRA safety and technical committee (S&T). This will be at the start of the project, before building begins. A technical description of the proposed rocket and flight must be submitted and approved by S&T. The sections “TPS - Project Proposal” and “TPS -Team Details” should be used. Consideration of a project by S&T does not equal acceptance of the project for TPS.
8. Time should be allowed for S&T to consider your project and ask pertinent questions.
9. If the project complies with Mode A specifications (defined in section 4.1 above) approval will be granted by S&T, a mentor will be sought to oversee the development of the project. The minimum requirement for mentorship will be a full adult UKRA member of good standing and who is a UKRA level 2 range safety officer (RSO). Please note - if a suitable mentor cannot be found necessitating the early cancellation of the TPS application, £200 of the application fee will be returned.
10. The mentor will then be your point of contact moving forward. They must be completely familiar with the rocket prior to launch.
  - a. This may require an ‘in person’ inspection of the launch vehicle, but this is not always necessary.
  - b. The mentor must understand the mode of recovery and operation of the avionics.
  - c. The mentor must be able to see that the pyrotechnic devices or articles are capable of being disarmed from outside the airframe of the launch vehicle, without dismantling the airframe or necessitating its removal from the launch pad.
11. Prior to an intended launch completion of the section “TPS - Full Project Details” is required. These will be checked by the mentor and forwarded to S&T for approval.
12. The mentor will be required to liaise with the planned launch event co-ordinator, explaining the nature of the flight and obtaining permission to use the site. Permission to use the site should be forwarded to S&T as a courtesy.

13. Sufficient time must be given for S&T to approve steps 11 & 12. S&T reserve the right to suggest amendments to the planned launch vehicle, flight and location. Final approval will not be possible until S&T is satisfied any necessary amendments have been made.
14. Subject to satisfactory completion of steps 11, 12, and any amendments detailed in step 13, S&T may then grant approval for a flight whose total impulse is less than 640Ns, to be made at the location defined in the TPS – Full Project Details.
15. S&T approval is subject to the following conditions;
  - a. That the preparation of all pyrotechnic articles must be supervised by the mentor or the mentor's appointed representative on launch day.
  - b. The preparation of the motor must be supervised by the mentor or the mentor's appointed representative on launch day.
  - c. Installation of motor ignitors and arming of pyrotechnic articles must be supervised by the mentor or the mentor's appointed representative on the launch pad.
16. Cancellation of support will occur if the team;
  - a. Fails to comply with the conditions of S&T.
  - b. Fails to demonstrate a safety conscious and responsible attitude.
  - c. Does not engage with the mentor or follow their instructions.
17. Cancellation of support will lead to the application fee being forfeited.
18. Following cancellation of TPS UKRA reserves the right to circulate details of the cancellation to all UKRA affiliated clubs or rocketry event organisers as appropriate.
- 19.** There must be an understanding that such team projects will not be eligible for use within the UKRA high power rocketry certification framework.

#### 5.0 TPS Mode B - Requirements and Application Process.

1. TPS Mode B is intended for projects that do not utilise solely off the shelf components, use a propulsion system with a total impulse in excess of 640Ns, have complex avionics, non-standard recovery systems or are deemed by S&T to fall outside the scope of Mode A.
2. To be classed as a team under TPS, the group will consist of a minimum of 3 members.
3. The youngest member of the team, at the time of application, will be at least 16 years of age.
4. The team must contain one full UKRA member with BMFA insurance, who will be present for the intended flight. This member does not need to have undertaken any previous certification flights.
5. Application for TPS Mode B must be accompanied by a letter of support from a tutor or group leader confirming the educational goal of the intended project. The letter should state the

- intended reasons for the proposed rocketry project, whether a research project or part of course work contributing to the awarding of a degree by a United Kingdom recognised body.
6. The fee for TPS is £750, payable on application.
  7. Application for TPS will be made by contacting the UKRA safety and technical committee (S&T). This will be at the start of the project, before building begins. A full and detailed technical description of the proposed rocket and flight must be submitted and approved by S&T. The sections “TPS - Project Proposal” and “TPS - Team Details” should be used. Consideration of a project by S&T does not equal acceptance of the project for TPS.
  8. Time should be allowed for S&T to consider your project and ask pertinent questions.
  9. Following approval by S&T, a mentor will be sought to oversee the development of the project. The minimum requirement for mentorship will be a full adult UKRA member of good standing and is a UKRA level 2 range safety officer (RSO). For level 3 flights and greater (>5120Ns) a UKRA level 3 RSO will be required. Please note - If a suitable mentor cannot be found necessitating the early cancellation of the TPS application, £650 of the application fee will be returned.
  10. The mentor must be completely familiar with the rocket prior to launch.
    - a. This will require an ‘in person’ inspection of the launch vehicle.
    - b. The mentor must understand the mode of recovery and operation of the avionics.
    - c. For commercial avionics, the documentation for the device should be supplied to the mentor. For experimental avionics, full details of testing must be provided.
    - d. Pyrotechnic devices or articles must be capable of being disarmed from outside the airframe of the launch vehicle, without dismantling the airframe or necessitating its removal from the launch pad.
    - e. Adequate ground testing of recovery devices must have been witnessed by the mentor prior to flight. Videographic evidence is acceptable but in person demonstrations are preferred.
  11. Prior to an intended launch completion of the section “TPS - Full Project Details” is required. These will be checked by the mentor and forwarded to S&T for approval.
  12. The mentor will be required to liaise with the planned launch event co-ordinator, explaining the nature of the flight and obtaining permission to use the site. Permission to use the site must be forwarded to S&T.
  13. Sufficient time must be given for S&T to approve steps 11 & 12. S&T reserve the right to suggest amendments to the planned launch vehicle, flight and location. Final approval will not be possible until S&T is satisfied any necessary amendments have been made.

14. Subject to satisfactory completion of steps 11,12, and any amendments detailed in step 13, S&T may then grant approval for a flight whose total impulse is less than 5120Ns, to be made at the location defined in the TPS – Full Project Details.
15. Subject to satisfactory completion of steps 11,12, and any amendments detailed in step 13, S&T may then grant approval for a flight whose total impulse is greater than 5120Ns once it has been discussed with the BMFA insurance underwriters, who must confirm in writing that they are willing to insure the project.
16. S&T approval is subject to the following conditions;
  - a. That the preparation of all pyrotechnic articles must be directly supervised by the mentor on launch day.
  - b. The preparation of the motor must be directly supervised by the mentor on launch day.
  - c. Installation of motor ignitors and arming of pyrotechnic articles must be directly supervised by the mentor on the launch pad.
17. Cancellation of support will occur if the team;
  - a. Fails to comply with the conditions of S&T.
  - b. Fails to demonstrate a safety conscious and responsible attitude.
  - c. Does not engage with the mentor or follow their instructions.
18. Cancellation of support will lead to the application fee being forfeited.
19. Following cancellation of TPS UKRA reserves the right to circulate details of the cancellation to all UKRA affiliated clubs or rocketry event organisers as appropriate.
20. There must be an understanding that such team projects will not be eligible for use within the UKRA high power rocketry certification framework.



