

# NSWRA Newsletter



New South Wales Rocketry Association Inc.

Jan - Mar 2020

A slightly different format for this issue – even the newsletter is affected by COVID-19.

I hope everyone has been able to avoid the virus and is staying safe, and is coping OK with all the restrictions.

Given the current circumstances, it is intended to issue these newsletters more frequently, to provide a bit of light reading and some technical information.

Here is a timely note from Aerotech Consumer Aerospace: “The COVID-19 situation has seriously disrupted the beginning of the 2020 Launch Season. Considering this, it is very important to remember that more than 80% of all model rocket, mid-power and high-power hobby rocket activities take place indoors. Designing, construction, assembly, gluing, finishing and painting are all necessary hobby rocket activities that do not involve launching rockets.”

Now would be a good time to tackle any projects you may have been deferring, or didn't previously have the opportunity to undertake. It should be interesting to see what members have produced once we start launching again. Maybe you're thinking about attempting HPR L1 or L2 certification? It would be worthwhile reading the article “7 Common Mistakes When Attempting Certification” in this newsletter.

## Recommended Reading

One of the conditions of membership is that members agree to comply with the club's Policies & Procedures. These are not amended very often, but in order to keep up to date with club protocols it would be a good idea for all members to re-read the document periodically. For example, last year an email was sent to members regarding the use of CTI Vmax motors. Subsequently, the RSO Checklist section of the Policies & Procedures was updated, along with some other minor changes. Members should become familiar with all aspects of this checklist, to help ensure that their rocket will be approved for launch by the RSO.

The Policies & Procedures can be found here:

[http://www.nswrocketry.org.au/Documents/NSWRA Policies and Procedures 2020 Mar.pdf](http://www.nswrocketry.org.au/Documents/NSWRA_Policies_and_Procedures_2020_Mar.pdf)

## Upcoming Events

Currently all launches are suspended until further notice

## Launch Day 25<sup>th</sup> January

Number of launches: 42

Launching for 2020 got off to a good start. Light winds meant there were plenty of good flights on motors ranging from 13mm A10, used by Andrew, Nicholas and Jason, up to F used by Geoff, Phill, Ryan and Sandeep. Sandeep's flight was a successful MPR assessment – congratulations!

Ryan's impressive “Shuttle Galactica” had a squirrely flight on an E20 motor, but the detached glider flew almost too well, fortunately it was recovered.

There were also some good launches of complex rockets – a 3-stage Comanche and 2 clustered motor flights, by Caeden in his “Battlestar” and Phill in his “Oh Deer, It's Christmas”, which managed to land in a tree.

Re water rockets - George flew his “Axion” successfully, but David H's “Astro Aqua” had a slight issue with its recovery.

## Launch Day 29<sup>th</sup> February

Number of launches: 43

Another good turnout today, nearly every rocket launched had a good flight in the light winds again.

Elena achieved her MPR assessment with her “The Kid” on an E20 motor – congratulations!

After Sandeep’s successful MPR assessment last month, he launched his “Falcon L1” for a good flight on a G77, the largest motor used today.

Unfortunately, Jason’s MPR attempt with his “Pringlenator” on a F36 motor had a mishap where the payload section separated.



## 7 Common Mistakes When Attempting Certification

*This is an extract of the article written by Tim Van Milligan of Apogee Components. The full article can be found here: <https://www.apogeerockets.com/education/downloads/Newsletter446.pdf>*

Here are the seven most common mistakes people make when attempting a Level 1 or Level 2 certification flight.

### **Mistake #1 - Lack of a Safety Mindset**

In reality, all the failed certification attempts come down to this. It is a mindset, not a process. What we see is that most people think that the purpose of the Level 1 High Power Certification is to obtain a license to buy larger rocket motors. Yes, that is somewhat true. But the reality is that the NAR and Tripoli set up the certification process as a “course in rocketry safety.” If all you think high-power certification is for is to buy motors, you’ve missed the point. We want you to get your certification so that you can fly bigger rockets. We all think you’ll have a lot more fun. But because of the legal/litigious situation we are in, we want you to do it safely. The certification process is primarily concerned with your knowledge of rocketry safety. Once you grasp that, most of the other common mistakes people make go away.

### **Mistake #2 - Lack of Experience**

How do you learn about safety? Do you read about it in a book or a newsletter article? If that is the case, you’re setting yourself up for a higher risk of failure. The person that has launched over 100 low power rockets is going to have insights that a person who just reads “how to do it”. You have actually go out and build and fly a lot of rockets to know the reason to do something. When time is short and a decision has to be made, we may make our own shortcuts. But we don’t know from past experience that the shortcut you’re making is going to cause a failure. Because of this I’m always concerned when a modeller contacts me and says he just got started in rocketry in the last few months, and now wants to know how to go about getting his L1 certification. The reason for my concern is that I know he doesn’t have a lot of experience and therefore his risk of failure is significantly higher. I really hate those conversations where I feel obligated to try to nudge them to step back and slow down the process. They don’t want to hear that it takes launching a hundred rockets to get to the point where you know where shortcuts can be made.

### **Mistake #3 - Doing Things on the Cheap**

High power rocketry is more expensive than small rockets. That goes without explanation. But there is a point where you are trying to squeeze so much money out of a rocket flight that it significantly increases the risk of failure. One of the most common things that people do to save money on a high power flight is to use a smaller rocket kit. We are asked all the time “what is the cheapest rocket that I can get that will fly an H motor?” The answer to that, of course, is the “smallest” rocket. Why? Because the price of the rocket is proportional to its size. Small rockets are less costly than a bigger one. However, using a small rocket introduces a lot of risk to the certification process. A smaller inexpensive rocket is usually less strong and less durable compared to a bigger one. We do want to see them succeed. But we’re not surprised

when they tell us that they are making a second attempt at their L1 certification because they failed on the first try. Small rockets carry a higher risk in high power rocketry unless you have a lot of experience and you know what you're doing.

#### **Mistake #4 - Making Things Too Complicated**

This is not related to cost, but you can make a flight overly complex. The most common thing we see in this area is when a customer wants to add dual deployment to their Level 1 Certification attempt. We don't even have to ask the question about their experience level, because we already know the answer. If the customer wants to add dual deployment, we know that they've never done dual deployment before. Despite the cool advantages, dual deployment is very complex, because you have to add more components to the rocket to allow for the ejection of a second parachute. Whenever you add complexity to a rocket, you increase the risk that things can go wrong. This article is about minimizing the risk so that you maximize your chances of success. Therefore, it is our recommendation that you don't add dual deployment to either your L1 or L2 certification.

I'd also say to even avoid using reloadable motors and use the Disposable Motors System. With a reload motor, you still have to go through the assembly of the motor, and while it isn't too hard, it adds more steps to the preparation of the rocket. There will be plenty of time to do more complex things later. You don't need to do them all at once.

#### **Mistake #5 - Trying for too much versatility**

Somewhat related to both being too cheap on the flight and making it too complex is adding too much versatility to the launch. We see this all the time, when the customer comes to us and says: "I want to use the same rocket to get both my Level 1 and Level 2 certifications." I hate hearing this question because the failure rate is high for this modeller. This is definitely the novice rocketeer. From my perspective, if the rocket can do both missions, it is optimized for neither. A rocket that is optimized for success in an L1 flight is going to go way too high on an L2 attempt. So the rocketeer says to himself, "I'll add dual deployment to the rocket so that it doesn't drift too far on the J-size motor." Therefore, he makes the mistake of adding extra complexity on the L2 flight attempt. Notice as stated above, that I said not to add dual-deployment to either a L1 or L2 attempt. If you fail your L2 attempt, you will spend far more money than you would have if you had spent a little more and been successful. And more importantly, I'm doing it from a "safety" point of view. If you fail in the attempt, it means you weren't safe.

#### **Mistake #6 - Too Much Power**

An H-motor is an H-motor, right? This mistake makes itself known when a person asks "What H motors are available?" They think "I might as well make do with what is available, rather than what would be right for the rocket." This mistake is really about improper motor selection. The essence of the mistake is not enough experience in rocketry to appreciate the difference in thrust of the motors. Most often, newbies make the mistake of choosing a motor that is too powerful rather than one with too low of thrust. That is why I titled this mistake as being one of too much power rather than incorrect motor selection. The general attitude I sense from the modellers that make this mistake is: "whether I succeed or whether I fail, the flight will be spectacular!" So what is more important to them is not safety, but putting on a good show for the audience. I don't know how to change this attitude, because I fully understand where it comes from. Behind the attitude is a desire to have your flight stand out so that other people remember it. I'm embarrassed to say it, but when I fly bigger rockets I want this too. However, I will suggest that they choose a more appropriate motor based on the rocket they are flying.

#### **Mistake #7 - Rushing the Process**

The problem with being in a rush is that it creates more pressure and stress on the modeller. And when you're under stress, and this has been proven by research studies, is that you discount the negative consequences of your decisions. In other words, you ignore all the bad things that could happen and you assume that everything will go right. The result: you take greater risks. You'll say things like: "I'll glue on the fins with 5-minute epoxy when I get to the field. They'll be rock-hard by the time I make the flight." Yea... that situation actually happens. And it is a disaster just waiting to happen. Being under a time crunch is not the ideal situation for going after a high power certification, because we want to be extra cognizant of the risks involved. We need to build in extra time for those last minute problems. You have to assume problems will come up. That is why you make up step-by-step procedures for prepping the rocket. And you practice them before you get to the field. But in the grand scheme of things, you have to ask yourself: "Will the world come to an end if I don't fly the rocket this weekend?" If the answer is anything other than "No," then something is wrong with the situation. I've actually heard modellers say: "If I don't do it this weekend, I'll have to wait an entire year because the farmer that owns the field will have planted his crops." Really... what is the problem of waiting another year? You can't fly another high-power rocket on that field anyway, so what is the urgency? In the meantime, you can gain extra experience building and flying smaller rockets and learning more about how to select the proper rocket engines for high powered vehicles. There will always be self-inflicted pressure on the modeller to fly a certification flight. They want the pressure to go away, and the only way they feel to relieve the pressure is to fly the rocket. Just get it done. But that is not the best situation to be in. And that is why the certification witness is an indispensable part of the process. They have to be coach and also the voice of reason. I've seen many witnesses in action, and I have to say I'm very proud of all of them. They do a great job calming the rocketeer down and letting them know that they aren't a failure if everything doesn't go as planned. They've been in the same situation themselves, just like I'll be the first to tell you that I didn't get my L1 certification on my first attempt. The important thing is to learn from the mistakes, and make sure that they don't happen again. That is what experience is all about.

## **Conclusion**

As you read this article, I hope you didn't feel too let down that I didn't give you answers like: "Nose cone separation" as being among the seven most common mistake people make. Yes, those things happen. But the preventable mistakes happened before the flight was made. The most common mistakes are a result of decisions prior to the flight. They don't happen on the launch range. Most importantly, they are preventable with a change in attitude. So I want to conclude this article saying that if you are going for any high-power certification, then you need to pause and examine your reasons for wanting the certification. I'm not telling you that a certification isn't worth it. I think it is a worthy objective. I just want you to put things into perspective and realize that certification is not the end-all/be-all of rocketry. Remember, high power certification is really a safety course designed to perpetuate the hobby of rocketry. It isn't just for permission to buy big motors and for bragging rights, although that is cool too.