Written by: Rex J Alexander

Launch Times & Influencing Factors

Over the past several years we as an industry have argued back and forth about the subject of launch times and what constitutes a safe and acceptable philosophy in this regard. There have been several exceptional articles, white papers and best practices written to this end. But what are the actual influencing factors that dictate what a programs safe standard of operation should be? How do the decisions an organization makes, from the type of aircraft used to where the pilot's quarters are located influence how much time it takes to get an aircraft airborne? Which elements can we safely influence or change and which ones should we leave alone?

First let me start by saying that there is no one size fits all when it comes to getting an aircraft into the air. The elements involved are as numerous and varied as the organizations performing air medical operations in the world today. Every program is different, and each one must approach this subject without any preconceived ideas or notions of how things should be so as to thoroughly and completely evaluate what will be the best and safest practices for their organization. This philosophy was best summed up by one pilot who said, *"One must always remember that launch times are task driven and not time driven."*

So as pilots, how do we best plead our case and educate or programs and customers against setting an arbitrary time for launching an aircraft? First, do your homework and be prepared to do some testing, measuring and evaluating. Tools you will need; a stop watch, a note pad, several volunteers, a measuring tape or wheel and a little time. Nothing speaks louder or carries more weight in our industry than a well constructed evaluation with good statistical data to back up your claims. Saying "It's so" just because you say so, isn't going to get the job done. You will need to prove it.

Remember the old adage, "Measure twice cut once"? Same thing applies here. Do each measurement twice and evaluate each time element 10 times using different people to come up with an average for each element. Good quality data will give your case the credence you need. It is imperative that the correct metrics are first identified and then studied or the data will be significantly skewed towards a standard that is unrealistic, unachievable and ultimately unsafe.

Distance:

- Measure the distance between where the pilots are located and where the aircraft is.
- Do the same measurement for the flight team's location to the aircraft.

Time: Determine the average for the following:

- Time to walk the distance to the aircraft. *No running allowed!!!*
- Time it takes to wait for an elevator, if one is used to get to the aircraft.
- Time it takes your communication centers to process & page out a flight request.
- Time the pilot needs to do a thorough weather check.
- Time it takes for the pilot and medical team to confirm a flight request.
- Time it takes to do a proper preflight walk around inspection.
- Time it takes for the pilots to safely perform all checklist items.
- Time required for your aircraft and it's systems to be fully operational for flight.
- And anything else that is specific to your programs operation.

INFLUENCING FACTORS

Aircraft:
A single engine aircraft will normally be faster off the ground than a twin engine aircraft due to the additional start and run-up sequence of the second engine. Newer more advanced aircraft, whether they are a single or a twin, in some cases may be quicker to get ready for flight due to the faster and more advanced systems installed. Conversely they may also be slower due additional equipment that must warm up and glass cockpits and the inability of the pilot to preload the helicopter for takeoff.

When an organizations primary aircraft goes in for heavy maintenance and a backup aircraft is utilized, liftoff times will generally increase. This is due to the unfamiliarity of both the pilot and medical team with that particular aircraft, it's on board equipment, systems, and placement of medical assets on the aircraft.

VFR vs. IFR:
VFR aircraft may, depending on installed equipment, be able to takeoff sooner than IFR equipped aircraft. This is due to the time it takes in some cases for certain onboard equipment to become fully operational for flight. Preparing for an IFR flight may take longer than preparing for a VFR flight given the additional flight planning requirements and the need to file an FAA flight plan.

Asset Location:
Where an organization locates its assets has a significant impact on its overall liftoff times. Programs that locate their pilots and medical team members nearer their aircraft will be able to get into the air much faster than those that have a greater distance to travel to get to their aircraft.

Pilots:
Pilot familiarity and experience with equipment, aircraft type, EMS operations and local area play a big roll in how fast an aircraft gets off the ground. Pilots new to an airframe will generally and should take longer to liftoff until they become more familiar with that airframe. The more advanced the airframe and the systems the longer this familiarization period may take. Pilots who are new to an area will generally do more preflight planning when accepting a flight in regards to map reconnaissance, fuel availability, weather and geographical environment.

Medical Team Members:
Just like pilots the experience level and training of on organization's medical team members plays a big role in the efficiency and speed in which a program can respond to a transport request. Senior well trained medical teams will normally equate to faster liftoff times. Medical team members who are required to work in the hospital vs. being dedicated for transport only may also negatively impact the time it takes a program to respond to a flight request.

Patient Type:
The type of patients that you will be transporting can significantly impact your liftoff times. Specialty teams and complicated patients such as neonatal, balloon pumps, ventricular assist devices, or neonatal/ecmo can add significant time to the preparation for liftoff.

Weather:
Weather is probably the most difficult thing to factor into the equation due to the fact that it is constantly changing and completely unpredictable. The distance you will need to travel is directly proportional to the weather time window that you must plan for. The greater the distance the greater the time window needed, hence the longer it will normally take to check the weather to insure that the trip can be safely accomplished. A 10-15 minute trip out and back may only require a weather window of one hour. A trip that is an hour one way will require a weather window of three to four hours depending on aircraft type, airspeed, fuel needs, fuel availability, geographical environment, transport type and patient destination. This may take longer to plan for.

Cold weather can be a big factor in liftoff times, especially in northern climates. Many aircraft that are based in colder climates may take longer to liftoff depending on cold weather equipment installed and hangar availability. This is due to the manufacture's guidelines that the engine, transmission and hydraulic fluids must reach a minimum temperature prior to liftoff.

Assets available for checking weather play a big roll in how long it takes to evaluate the weather. A faster dedicated weather system vs. a slower internet or phone based system will normally equate to less time needed for doing a weather check.

Distance:
The distance an aircraft will have to travel to pickup a patient and then go to the patient's final destination factors into the time needed to properly prepare. For longer flights a pilot must carefully consider the weather window needed and the fuel requirements for that flight. If fuel is going to be needed then the pilot will have to check on the availability of fuel along the route which is directly dependent on the time of day and the day of the week. In some cases pilots may elect to add additional fuel to the aircraft prior to takeoff so that they can complete a longer flight without the need for stopping to refuel. This in turn will increase the liftoff time.

Destination Familiarity:
Per Federal Aviation Regulations if a pilot has never been to a location or has not been there within the past 90 days he is required by law to become familiar with that location and that locations information prior to liftoff. Depending on the complexity of the mission this could take several additional minutes.

Regulations: With the new rewrite of A021 operation specifications pilots are required by law to check obstacle height for their entire route and annotate it prior to departure. This in turn has added additional time to the preflight planning portion of all flights.

RECOMMENDATIONS:

Given the above information and after your investigative work, you should have a better feel for what is required to launch your aircraft and what would be considered a standard liftoff time for your program. *I highly recommended that the best way to quantify this liftoff or response time would be to use a **windowed approach** rather than a hard and fast rule of a one size fits all*. This will help you take into account many of the variables listed above. So instead of saying our goal is to be in the air in X minutes, say instead our goal is X to X+4 minutes under normal circumstances, for a single engine aircraft, on a VFR flight, for an adult trauma patient with a seasoned pilot with several hundred hours in type. You can further subdivide flights that may require a weather check, are outside your local flying area, or utilize a specialty team for transport. All of which will add additional minutes to the equation.

It would be impossible to take into account all of the factors that influence any one flight program or for that matter any one flight. There will always be exceptions to the rule. You will invariably find things that you can do to help improve the process, **but never sacrifice safety for time**. Many in the industry strongly advise against setting a single one size fits all time standard for the launching of an air medical aircraft. No one wants to inadvertently add pressure to pilots, medical teams, first responders, hospitals, administrators or operators that would negatively impact the decision making process while trying to meet an imaginary, unrealistic standard that will in the end compromise safety. There are things we can change and improve and there are things that we must learn to live with and leave as they are. The trick is, knowing which is which. Like most things in life this usually only comes through trial and error. So if you're going to error, make sure that you always error on the side of safety.