

Informative statement on certain fields within the FireBridge spreadsheet.

As folks that are accustomed to the use of SEATS and LATS, one thing they will instantly notice is a remarkable error (as it would appear) in Aircraft Estimated Run Lengths, and Adjusted Run Lengths and corresponding aircraft max drop times etc.

This is not an error.

One has to understand some fundamental aspects of working with a spreadsheet. One of those is that the spreadsheet can only calculate what the designer assigns as its parameters. It can't think for itself.

Likewise, you first start off selecting the fire rate of spread, then the heat per unit area. Next you will select the fire line length and then the aircraft drop speed in knots, then you select the tank size.

The fire's active width is calculated based upon the rate of spread converted to feet per second and so in each second the fire is only the distance wide as it is displaying. This is a critical piece to keep in mind as it relates to aircraft drop pattern width which is nearly always 40 to 60 feet wide[131m & 196.8m respectively] (assuming) in comparison to a fire line width of 2 or 4 feet[6.5m & 13.1m]!

For example, if you have a Rate of spread of say 20 chains per hour, a heat per unit area of 300 Btu and a tank size of 800 gallons[3,028L], further with a aircraft speed of 89 knots, then the fire line length of 250 feet[820m], you would then have an area of only 92.5 square feet[8.59m²]. Your fire Btu generation in Btu per foot per second would be 27,522 Btu[296,244 kW/m/sec]. And this would require 2.94 gallons per second[11.13L/sec] to be dropped. The output of the rate of spread is only .37 feet per second[.1137m/s]. That translates to a fire active width of only 4.5 inches wide[.1143m]!

Further down you have an aircraft estimated coverage level of 24,975 square feet[2320m²]. This is based upon the Btu the fire is generating vs what the aircraft can absorb and gives an effective area of what the aircraft area could be. To the right of this is the aircraft estimated run length in feet. It shows 68,060.61 feet[20,744m]. And below this is a drop time of 272.24 seconds. We know that no SEAT can make a 68,000 foot drop or drop for 272 seconds. This is because of existing drop designs and conditions. However, these figures are telling you what the aircraft's BTU coverage, and time *would be* if you could only drop 2.94 gallons per second, in an area no wider than .37 feet! This translates to longer runs and longer drop times. (The MAFFS system is seriously a better option in my opinion for this)

The reality of this is, that, the fire with the dimensions above, moving that slow, is only using .01% of the total tank volume of the aircraft and so therefore it's showing up as a massive surplus and therefore the spreadsheet shows that it can drop longer and farther. The reality of this is actually a waste of actual water or retardant being used because the current tank systems (to my knowledge) cannot configure their drop systems to be more like that of an adjustable nozzle to confine the drop pattern to be more commensurate with the fire line width. This also is NOT intended to be 100% accurate, it is however, designed to be a WAG estimation tool for IC4's, Captains and Dozer operators and IC3's.

One should always first pay close attention to the following elements in the spreadsheet.

1. Fire Active width
2. Fire Line Length
3. Total Area in Square Feet
4. The Btu/ft²/sec/Area
5. Gallons/sec- required
6. The gallons/ft² required
7. The Btu absorption capacity of the aircraft used

As in this example, the fire is generating 27,522 Btu/ft²/sec and the aircraft is capable of absorbing 7.5 million Btu. Since we are dealing with square feet the figures are going to be based upon the absorption capacity vs what is generated and in this case since there is more capacity than generation, the surplus has to be stated somehow. [Metrics will need to be worked out.]

These elements above will allow you to think about what the numbers in the spreadsheet are actually telling you. It's actually saying that for a seat on a fire for 100 square feet, is actually a waste of time and money when 3 type 4 engines shown below would be better suited. And be more effective.

Also, on average a seat drops at a rough width of between 30 to 60 feet wide give or take. So if you think about it, that means that out of a fire line that is in this case 1/3 of a foot wide(4.5inches), means you have approximately 29 to 59 feet of wasted water on each side of it. (figuratively speaking).

As the ROS climbs and the HPA goes up, the aircraft run times and lengths are more in tune with actual in the field settings but there is still factors that need to be added that are NOT in this current generation of FireBridge Spreadsheet.

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