Some Thoughts on Engine failures

In attempts to find a good cumulative distribution function I’ve came up to such a construction:

It means that an engine’s chance to fail by time is . represents overall tech progress and usage experience. When increased, it makes early failures less likely to occur. represents how much resources are spent on the engine. Dividing it by makes the engine last times longer. Now we are going to find a function that returns failure time based on “luck”. The multiplier ensures that increasing makes the curve steeper and does not increase the cumulative function at the same time.

An important note: we use random values from [0; 1), thus we SHOULD not get any issues. Probably we should use something [0; 0.99) in order to avoid weird durations with enormous burn durations. Let us bind to in a way that makes a certain cause when .