Seeding Procedure – Updated 2023-01-25

1. Definitions:
   Stage speed factor: this is a number calculated for each competitor for each stage that they complete.
   Raw event speed factor: this is a number calculated for each competitor for each rally that they start.
   Scaled event speed factor: this is a number calculated from the raw event speed factor for regional and super-regional rallies. For national rallies, the scaled event speed factor matches the raw event speed factor.
   Official speed factor: this is a number calculated from each driver's recent event speed factors from national events only and is the primary value used for seeding.
   Alternative speed factor: this is a number calculated from each driver's recent scaled event speed factors for all rallies. It is used for seeding only if the driver does not have a non-zero official speed factor. This calculation now includes results from NASA RallySport and CARS rallies.
2. Speed factor calculation:
   a. Stage speed factor
      i. For any stage where any competitor finishes in less than 2 minutes, all competitors will receive a stage speed factor of 0.
      ii. For any stage where 25% or more of the competitors are awarded the same finish time due to a stage stoppage, all competitors will receive a stage speed factor of 0.
      iii. For all other stages, the mean and standard deviation of all competitor finish times are calculated. Any competitors with a time slower than the median time plus twice the standard deviation time will receive a stage speed factor of 0. Their stage time is removed from data calculation, the mean and standard deviation are recalculated, and the process repeats until no drivers remain slower than the cutoff. The remaining drivers receive a stage speed factor equal to:

$$stage\ speed\ factor = \frac{mean - stage\ time}{standard\ deviation} * 25 + 50$$

   b. Raw event speed factor
      i. Competitors who receive fewer than 4 non-zero stage speed factors at a rally will receive a raw event speed factor of 0.
      ii. All other competitors will receive a raw event speed factor equal to the average of the best 75% (rounded down) of their completed stages.
   c. Scaled event speed factor
      i. For national rallies, every competitor's scaled event speed factor is equal to their raw event speed factor.
      ii. For all other rallies, a linear scaling calculation is done based on the set of competitors who earned a non-zero raw event speed factor and already had a driver speed factor higher than 50 before starting the event. The linear scaling coefficient is calculated as:

$$a = \frac{\sum_{i=0}^{n} driver\ speed\ factor/raw\ event\ speed\ factor}{n}$$

iii. For rallies not sanctioned by ARA, the linear scaling coefficient above is limited to a maximum value of 1.0.

d. Official speed factor
   i. Each driver's official speed factor is recalculated immediately after every ARA event (even if they did not compete in that event) and on January 1st of each year.
   ii. Each driver's official speed factor is calculated from their best non-zero national event speed factors from the current season and the previous 2 calendar years.
   iii. If a driver has earned at least 3 non-zero national event speed factors during this time, their official speed factor is the average of their highest 3 national event speed factors.
   iv. If a driver has earned less than 3 non-zero national event speed factors during this time, their official speed factor is the average of all their non-zero event speed factors.

e. Alternative speed factor
   i. Each driver's alternative speed factor is recalculated immediately after every event (even if they did not compete in that event) and on January 1st of each year.
   ii. Each driver's alternative speed factor is calculated from their best non-zero scaled event speed factors from the current season and the previous 2 calendar years.
   iii. If a driver has earned at least 3 non-zero scaled event speed factors during this time, their alternative speed factor is the average of their highest 3 scaled event speed factors.
   iv. If a driver has earned less than 3 non-zero scaled event speed factors during this time, their alternative speed factor is the average of all their non-zero event speed factors.

f. Seeding
   i. For seeding purposes, official speed factors are rounded to the nearest tenth and alternative speed factors are rounded to the nearest integer.
   ii. Drivers with a non-zero official speed factor are seeded in descending order.
   iii. Drivers with a zero official speed factor but a non-zero alternative speed factor are inserted in the order based on their alternative speed factor.
   iv. Drivers that do not have either an official speed factor or alternative speed are seeded at the discretion of ARA, primarily based on previous race results provided by the driver.