

## CBA APPENDIX

The CBA-procedure includes an algorithm that assesses players' performance based on the Probability P that players should return certain scores. This probability varies slightly from *handicap category* to *handicap category* and the number of players in each *handicap category* is used to determine normal conditions. Such normal conditions are defined by a specified range of players scoring in the *buffer zone* or better. The competition performance of the players is calculated from the *buffer zone* or better (BZ+) scores returned in the competition ( $N_{BZ}$ ). This value is then compared with the calculated range of players scoring according to expectation (normal conditions). If the value is within the expected range, CBA is 0 (and buffer zones remain unchanged); if the value is outside the range, an adjustment (shift) in the buffer zones is computed. When the value is outside the range, the algorithm will select the CBA that would make the new competition p-value (taking into account the shifted buffer zones) fall inside the normal range.

Given the nature of scores in golf and their variability, it is impossible to develop a "perfect" CBA-tool. The EGA's HRG have identified two main weak points for any daily adjustment feature: false positive CBA-values (CBA other than 0 when conditions were normal, also known as "Type I Errors") and a self-perpetuating cycle (once a false positive CBA-value is calculated, the likelihood for the next false positive increases). This algorithm is designed to minimize the likelihood of false positive values and consequently to avoid a self-perpetuating cycle. This way, the amended algorithm will produce a higher percentage of rounds where CBA is 0.

The CBA-calculation will be applied at the end of the competition, subject to the following provisions:

- 1 The effect of the CBA-calculation will be to shift the *buffer zones* of each *handicap category* with a specific value, from -2 to +1, according to the calculated CBA, for all *handicap categories* affected by CBA.
- 2 Where the abbreviation RO appears in conjunction with the value CBA (-2) the competition is designated "reduction only", meaning that *EGA Handicaps* will only be reduced and not increased.
- 3 Scores from players with "inactive" handicaps (if applicable) and/or handicaps in *handicap category* 4 or 5 maintained according to configuration 2 or 3 (Appendix Z) must not be included in the CBA calculation.
- 4 Where a *qualifying competition* has been cancelled for any reason, even if the score is allowed to stand for handicapping purposes, a CBA must not be calculated. In this situation, *EGA Handicaps* will be adjusted using CBA = 0 and the competition will be designated "Reduction Only" i.e. no *EGA Handicaps* will be increased as a result of a cancelled competition.
- 5 Where a qualifying competition field comprises only of players in *handicap category* 5 (or *handicap category* 4 & 5 under configuration 3, see Appendix Z) or less than 10 players from *handicap categories* 1 to 4 (*handicap category* 1 to 3 under configuration 3, see Appendix Z) no CBA must be calculated and all *EGA Handicaps* will be adjusted against Stableford points scored with the *handicap categories buffer zones* unadjusted. NB: this is not a RO-scenario.
- 6 Committees in charge of competitions are reminded that, provided a competition meets the CBA-criteria, they do not have the discretion to determine whether a *qualifying competition* is designated "Reduction Only" or not.
- 7 The CBA-procedure may not be applied to EDS or 9-hole scores.

## CBA ALGORITHM

### NORMAL CONDITIONS-LIMITS

1.- The normal conditions upper p-value for each *handicap category* is defined in the following table:

CATEGORY	1	2	3	4
	$upperP_1$	$upperP_2$	$upperP_3$	$upperP_4$
upper p-value	53,50%	45,00%	43,50%	48,00%

2.- The normal conditions lower p-value for each *handicap category* is defined in the following table:

CATEGORY	1	2	3	4
	$lowerP_1$	$lowerP_2$	$lowerP_3$	$lowerP_4$
lower p-value	31,00%	27,50%	28,00%	34,00%

### COMPETITION NORMAL CONDITIONS-LIMITS

1.- Count the number of players in *handicap categories* 1 thru 4 ( $n_i$ ) and calculate the total number of players included in the CBA-calculation (N).

CATEGORY	1	2	3	4
number of players	$n_1$	$n_2$	$n_3$	$n_4$

$$N = n_1 + n_2 + n_3 + n_4$$

NB: Do not include *handicap category* 4 if configuration 3 has been selected (see Appendix Z).

2.- Calculate the competition normal condition upper p-value using the formula:

$$nc.upP = \frac{(n_1 * upperP_1 + n_2 * upperP_2 + n_3 * upperP_3 + n_4 * upperP_4)}{N}$$

3.- Calculate the competition normal condition lower p-value using the formula:

$$nc.lwP = \frac{(n_1 * lowerP_1 + n_2 * lowerP_2 + n_3 * lowerP_3 + n_4 * lowerP_4)}{N}$$

4.- Calculate the competition normal condition-limits using the formulas:

$$upperncLIMIT = nc.upP * N + 2,821 * \sqrt{N * nc.upP * (1 - nc.upP)}$$

$$lowerncLIMIT = nc.lwP * N - 1,833 * \sqrt{N * nc.lwP * (1 - nc.lwP)}$$

5.- Count the number of players returning a score in the buffer zone or better ( $N_{BZ}$ ).

6.- Count the number of players returning a score in the *buffer zone* minus 1 or better ( $N_{BZ-1}$ ).

7.- Count the number of players returning a score in the *buffer zone* minus 2 or better ( $N_{BZ-2}$ ).

8.- To determine the *CBA*-value, apply the following rules:

-If the number of scores in *buffer zone* or better ( $N_{BZ}$ ) is inside the normal conditions-limits [ $upperncLIMIT$ ,  $lowerncLIMIT$ ], *CBA* is 0.

-If the number of scores in *buffer zone* or better ( $N_{BZ}$ ) is higher than the normal conditions upper limit  $>[upperncLIMIT]$ , *CBA* is +1.

-If the number of scores in the *buffer zone* minus 1 or better ( $N_{BZ-1}$ ) is higher than the normal conditions lower limit  $>[lowerncLIMIT]$ , *CBA* is -1.

-If the number of scores in the *buffer zone* minus 2 or better ( $N_{BZ-2}$ ) is higher than the normal conditions lower limit  $>[lowerncLIMIT]$ , *CBA* is -2. If not, *CBA* is -2&RO.