

## HANDICAP REVIEW APPENDIX

For general (introductory) information on *Handicap Review* (HR in this appendix), refer to the Explanatory Note on HR in section 3.15.

Clause 3.4.8 requires *handicap committees* and *national associations* to carry out a *HR* at least once a year, typically at the end of each playing season. The procedure has now been modified not only to apply to the *HR* process itself, but also to other *handicap committee* decisions (i.e. *General Play*, allotment of first handicap).

The *HR* is an important adjunct to the handicapping process and is mandatory for all players, in *handicap categories* 1 – 5. The *HR* will only use scores from the last 12 months of the player's handicap record. However, not all scores from within this time frame are eligible for *HR*. Neither cancelled rounds nor scores with *CBA -2&RO* are suitable for *handicap review*. 9-hole scores, however, must be included.

In order to compare scores posted from different sets of tees and courses and to compare the score directly against the *EGA Handicap*, all scores must be ported to the Course of Standard Relative Difficult (COSRD, a course with SR=113). The Gross Differentials of such a course are fully comparable against the player's *EGA Handicap* at the revision date. Once all scores are comparable, the *HR* calculates their mean and standard deviation. With those two metrics, the algorithm will yield a range of expected handicap, which is the player's handicap expected handicap range. Finally, the algorithm will provide a proposed handicap; however, the proposed handicap will never be higher or lower than the current *EGA Handicap* plus/minus 3 strokes.

### ELIGIBLE SCORES

1.- All individual *qualifying scores* are eligible scores for *HR*, with the following exceptions:

- rounds where *CBA* was -2&RO
- rounds cancelled by the committee

### STANDARD GROSS DIFFERENTIAL (SGD) CALCULATION

1.- For every eligible round over 18 holes, calculate the SGD using the formula:

$$SGD = EGA\ HDCP + ND * \frac{113}{SR}$$

Where:

ND: 36 – (StablefordScore – CBA)

2.- For every eligible round over 9 holes, calculate the SGD using the formula:

$$SGD = EGA\ HDCP + 2 * ND * \frac{113}{SR}$$

Where:

ND: 36 - StablefordScore

Note: National Associations can include the SGD value in the Handicap Record Sheet.

## REVIEW PROCESS

1.- Only players with 8 eligible scores in the last 12 months can be included in the HR. If a player does not have 8 scores, take enough scores from the previous 12 months, in chronological order (latest first), to add up to a total of 8 eligible scores. If fewer than 8 eligible scores in the last 24 months are available, a Handicap Review cannot be performed.

2.- Calculate the mean of all SGD ( $\overline{SGD}$ ) calculated previously.

3.- Calculate the Standard Deviation (Bessel's corrected<sup>(1)</sup>) of all the SGD ( $\sigma_{SGD}$ ).

4.- Calculate the Degrees of Freedom (DF) adding to the total number of 18-hole rounds, the number of 9-hole rounds divided by 2 (0.5 rounded up), and subtract one:

$$DF = N_{18} + \frac{N_9}{2} - 1$$

Where:

DF: degrees of freedom

N<sub>18</sub>: number of 18-hole rounds

N<sub>9</sub>: number of 9-hole rounds

5.- Calculate the factor a using the two tails t-Student table<sup>(2)</sup> for an error of 0,01 and the Degrees of Freedom (DF) calculated in the previous point.

6.- Calculate the factor b using the two tails t-Student table<sup>(2)</sup> for an error of 0,05 and the Degrees of Freedom (DF) calculated in the previous point.

7.- Calculate the upper and lower estimated SGD using the formulas:

$$upper\ eSGD = \overline{SGD} + a * \frac{\sigma_{SGD}}{\sqrt{(DF + 1)}}$$

$$lower\ eSGD = \overline{SGD} - b * \frac{\sigma_{SGD}}{\sqrt{(DF + 1)}}$$

8.- Convert both upper and lower eSGD into upper and lower Index limits using the formula:

$$upper\ INDEX = \frac{(upper\ eSGD - 2.1)}{1.13}$$

$$lower\ INDEX = \frac{(lower\ eSGD - 2.1)}{1.13}$$

9.- If the player's *EGA Handicap* falls between the upper and lower Index limits ( $[lower\ INDEX, upper\ INDEX]$ ) no adjustment is needed.

10.- If the player's *EGA Handicap* is below the lower Index limit  $< lower\ INDEX$ , such limit will be the Reviewed Handicap. Calculate the adjustment by subtracting the *EGA Handicap* from the Reviewed Handicap, rounding the positive difference up to the next integer (away from zero).

11.- If the player's *EGA Handicap* is above the upper limit  $>_{upper}INDEX$ , such limit will be the Reviewed Handicap. Calculate the adjustment by subtracting the *EGA Handicap* from the Reviewed Handicap, rounding the negative difference up to the next integer (towards zero).

12.- For each *handicap category* the following maximum adjustments must be applied:

CATEGORY	1	2	3	4	5
MAXIMUM	±1	±2	±3	±3	±3

13.- Calculate the Proposed Handicap adding to the *EGA Handicap* the adjustment calculated taking into account the maximum adjustments provided in table 12.

14.- Any player whose initial *EGA Handicap* is higher than the final *EGA handicap* should not be adjusted up<sup>3</sup> as a result of *HR*.

<sup>3</sup>If a player, with an initial *EGA Handicap* higher than the final, requests for a *handicap review*, *handicap committees* must study carefully his scoring evolution before adjusting up the player's handicap. This scenario may happen more often under system configuration 2 and 3, where above a given *EGA Handicap*, upward adjustments are not applied on a round-by-round basis.

## REVIEW RESULT

The review process will yield the following information:

1.-Expected Handicap Range: the range where the player's handicap is expected to be according to the results. It is represented by the range  $[_{lower}INDEX, _{upper}INDEX]$

2.-The Reviewed Handicap: when the player's handicap falls out of the Expected Handicap Range an adjustment is needed. The Reviewed Handicap will be:

-if player's handicap  $< _{lower}INDEX$ , the Reviewed Handicap will be the  $_{lower}INDEX$

-if player's handicap  $> _{upper}INDEX$ , the Reviewed Handicap will be the  $_{upper}INDEX$

The Reviewed Handicap should be the handicap the player should have according to the scores.

3.-The Proposed Handicap: the handicap proposed by the *HR* algorithm. The difference between the Reviewed Handicap and the Proposed Handicap will be the rounding and the maximum adjustment (category dependent).

## HOW TO READ THE RESULTS

Most times the review process will not change the player's handicap because the handicap will be inside the Expected Handicap Range. Some players will have handicaps falling outside the range; these players need a different handicap, the Reviewed Handicap. In exceptional cases the player's handicap will be very far from the Expected Handicap Range and the Proposed Handicap (the final result of the handicap review) will not be the same handicap as the Reviewed Handicap, because of the maximum adjustment constraint of HR. In such cases, the *handicap committee* should consider the player for further investigation, taking into account the player development, namely in non-qualifying competitions such as Match Play events, ProAms, team competitions, etc. When studying this kind of players, the Expected Handicap Range can provide the handicap committee with valuable information about the golfing level, in handicapping terms, of the player. Such information may be considered to support a *General Play* adjustment to amend the player's handicap.

*HR* results may also be used for the purpose of studying players with a newly allotted handicap (see Guidance Note in section 3.11). When the player has submitted at least 8 eligible scores, a *HR* is strongly recommended. *Handicap committees* can use the Expected Handicap Range and the Reviewed Handicap to support a decision to adjust a player's handicap on the basis of *General Play* in such circumstances.

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## (1) STANDARD DEVIATION BESSEL'S CORRECTION FORMULA

$$Sd. Dv = \sqrt{\frac{\sum_{i=1}^{i=n} (x_i - \bar{x})^2}{n - 1}}$$

Where

$X_i$ = values

$\bar{X}$  =mean value

n: number of values

In the Handicap Review formula would be:

$$Sd. Dv = \sqrt{\frac{\sum_{i=1}^{i=n} (SGD_i - \overline{SGD})^2}{n - 1}}$$

Where

$SGD_i$ = each of the SGD results

$\overline{SGD}$  =SGD mean value

n: number of scores ( $N_{18} + N_9$ )

## (2) TWO TAILS t-STUDENT TABLE

DF	P	0.20	0.10	0.05	0.02	0.01	0.005	0.002	0.001
2		1.886	2.920	4.303	6.965	9.925	14.089	22.327	31.599
3		1.638	2.353	3.182	4.541	5.841	7.453	10.215	12.924
4		1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.610
5		1.476	2.015	2.571	3.365	4.032	4.773	5.893	6.869
6		1.440	1.943	2.447	3.143	3.707	4.317	5.208	5.959
7		1.415	1.895	2.365	2.998	3.499	4.029	4.785	5.408
8		1.397	1.860	2.306	2.897	3.355	3.833	4.501	5.041
9		1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.781
10		1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587
11		1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437
12		1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318
13		1.350	1.771	2.160	2.650	3.012	3.372	3.852	4.221
14		1.345	1.761	2.145	2.625	2.977	3.326	3.787	4.140
15		1.341	1.753	2.131	2.602	2.947	3.286	3.733	4.073
16		1.337	1.746	2.120	2.584	2.921	3.252	3.686	4.015
17		1.333	1.740	2.110	2.567	2.898	3.222	3.646	3.965
18		1.330	1.734	2.101	2.552	2.878	3.197	3.610	3.922
19		1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883
20		1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.850
21		1.323	1.721	2.080	2.518	2.831	3.135	3.527	3.819
22		1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792
23		1.319	1.714	2.069	2.500	2.807	3.104	3.485	3.768
24		1.318	1.711	2.064	2.492	2.797	3.090	3.467	3.745
25		1.316	1.708	2.060	2.485	2.787	3.078	3.450	3.725
26		1.315	1.706	2.056	2.479	2.779	3.067	3.435	3.707
27		1.314	1.703	2.052	2.473	2.771	3.057	3.421	3.690
28		1.313	1.701	2.048	2.467	2.763	3.047	3.408	3.674
29		1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659
30		1.310	1.697	2.042	2.457	2.750	3.030	3.385	3.646
31		1.309	1.695	2.040	2.453	2.744	3.022	3.375	3.633
32		1.309	1.694	2.037	2.449	2.738	3.015	3.365	3.622
33		1.308	1.692	2.035	2.445	2.733	3.008	3.356	3.611
34		1.307	1.691	2.032	2.441	2.728	3.002	3.348	3.601
35		1.306	1.690	2.030	2.438	2.724	2.996	3.340	3.591
36		1.306	1.688	2.028	2.434	2.719	2.991	3.333	3.582
37		1.305	1.687	2.026	2.431	2.715	2.985	3.326	3.574
38		1.304	1.686	2.024	2.429	2.712	2.980	3.319	3.566
39		1.304	1.685	2.023	2.426	2.708	2.976	3.313	3.558
40		1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551
42		1.302	1.682	2.018	2.418	2.698	2.963	3.296	3.538
44		1.301	1.680	2.015	2.414	2.692	2.956	3.286	3.526
46		1.300	1.679	2.013	2.410	2.687	2.949	3.277	3.515
48		1.299	1.677	2.011	2.407	2.682	2.943	3.269	3.505
50		1.299	1.676	2.009	2.403	2.678	2.937	3.261	3.496
60		1.296	1.671	2.000	2.390	2.660	2.915	3.232	3.460
70		1.294	1.667	1.994	2.381	2.648	2.899	3.211	3.435
80		1.292	1.664	1.990	2.374	2.639	2.887	3.195	3.416
90		1.291	1.662	1.987	2.369	2.632	2.878	3.183	3.402
100		1.290	1.660	1.984	2.364	2.626	2.871	3.174	3.391
120		1.289	1.658	1.980	2.358	2.617	2.860	3.160	3.373
150		1.287	1.655	1.976	2.351	2.609	2.849	3.145	3.357
200		1.286	1.652	1.972	2.345	2.601	2.839	3.131	3.340
∞		1.282	1.645	1.960	2.326	2.576	2.807	3.090	3.291

**Note:** t-Student tables can be easily found on internet. This one was downloaded from <https://www.medcalc.org/manual/t-distribution.php>