

An Introduction to National Handicap for Cruisers (NHC)

Most everyone knows that the RUST series is being handicapped under NHC. But most don't know what that really means; including RUST sailors.

From the RYA website: "NHC aims to promote a single National Handicap scheme for Cruisers, giving clubs a uniform scheme that can be easily adopted for their racing. NHC hopes to promote participation in the sport and works alongside IRC.

The working concept of NHC, from the RYA website: "At the end of 2012 the RYA Technical Department started to investigate a new solution to Cruiser Racing and are rolling out NHC which is a performance handicap scheme. NHC uses known concepts used internationally in many other countries to analyse and adjust handicap numbers. NHC handicaps individual boats as the no two cruisers are the same through elements such as sail size and configuration, number of crew, weight of the boat, equipment on board, engine type, number of berths, etc etc. The handicap numbers are Time Correction Factors (TCF's expressed as 1.000 for example) which are used to calculate a boats corrected time (the time used to score a race) allowing clubs to dual score with IRC.

Whilst NHC welcomes all types of boats it is designed for cruiser racing and looks to protect and promote core cruiser racing and will actively discourage "Grand Prix" style racing yachts from dominating club cruiser racing."

The RUST series has been using NHC for 3 years now and most are favourably impressed. To give one a quick insight to how NHC works, a small dummy series was created where all the boats are deemed identical and therefore start with the same handicap, but each boat in the series is one (1) minute slower than the previous boat. This series runs for 11 races.

NHC Test

Rust Test Series

Overall

Sailed: 11, Discards: 0, To count: 11, Rating system: NHC1, Entries: 10, Scoring system: Appendix A

Rank	Fleet	Boat	Class	SailNo	Club	HelmName	NHC1	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	Total	Nett	
1st	0	one	C & C 27.3	001	byc	one	1.0	0:50:00	0:50:00	50:00	50:00	50:00	50:00	50:00	50:00	50:00	50:00	50:00	50:00	50:00	11.0	11.0
2nd	0	two	C & C 27.3	002	BYC	two	1.0	0:51:00	0:51:00	51:00	51:00	51:00	51:00	51:00	51:00	51:00	51:00	51:00	51:00	51:00	22.0	22.0
3rd	0	three	C & C 27.3	003	byc	three	1.0	0:52:00	0:52:00	52:00	52:00	52:00	52:00	52:00	52:00	52:00	52:00	52:00	52:00	52:00	33.0	33.0
4th	0	four	C & C 27.3	004	BYC	four	1.0	0:53:00	0:53:00	53:00	53:00	53:00	53:00	53:00	53:00	53:00	53:00	53:00	53:00	53:00	44.0	44.0
5th	0	five	C & C 27.3	005	byc	five	1.0	0:54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	54:00	55.0	55.0
6th	0	six	C & C 27.3	006	byc	six	1.0	0:55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	55:00	66.0	66.0
7th	0	seven	C & C 27.3	007	byc	seven	1.0	0:56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	56:00	77.0	77.0
8th	0	eight	C & C 27.3	008	byc	eight	1.0	0:57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	57:00	88.0	88.0
9th	0	nine	C & C 27.3	009	byc	nine	1.0	0:58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	58:00	99.0	99.0
10th	0	zero	C & C 27.3	000	byc	zero	1.0	0:59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	59:00	110.0	110.0

This is a test series.
All boats start with a rating of one.
Each boat is one minute slower than the last in all races.
The aggressiveness of the formula can be changed.

Sailwave Scoring Software 2.28.1
www.sailwave.com

The following images shows corrected times for the series. The first boat still wins the 10th race but by a narrower margin and the last boat still loses by a similar narrower margin. The graph shows the effect over time. Essentially, NHC changes each boat's handicap slightly over time, but the rate of adjustment reduces with each successive race. One may consider NHC is 'reconsidering' the initial identical handicaps, and applying some correction to a possibly faster or slower boat (not the skipper). But at a certain point NHC simply recognizes that the lead boat is well sailed, not just a faster yacht, and brings the rate of handicap change down to almost zero. The same for the slowest skipper, The 'boost' is initially more generous than the 'drag' on the best skipper, but also tapers off eventually. If this skipper keeps coming last, NHC is not going to keep boosting the handicap to enable this boat to win over boats consistently ahead.

NHC Test

Rust Test Series

Overall

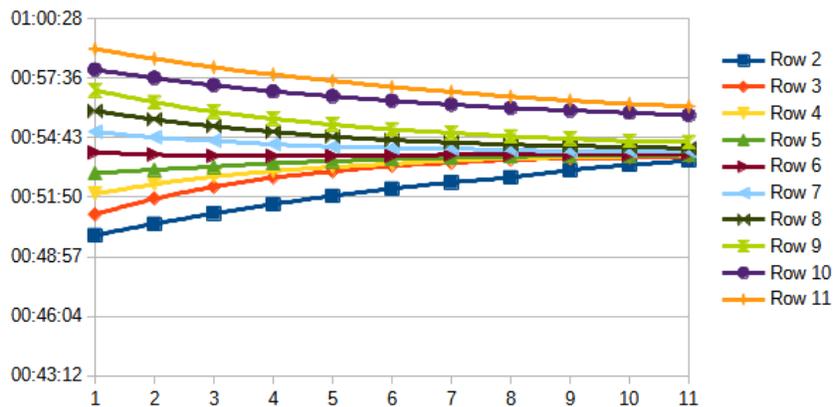
Sailed: 11, Discards: 0, To count: 11, Rating system: NHC1, Entries: 10, Scoring system: Appendix A

Rank	Fleet	Boat	Class	SailNo	Club	HelmName	NHC1	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	Total	Nett
1st	0	one	C & C 27 3	001	byc	one	1.0	0:50:00	0:50:33	0:51:03	0:51:30	0:51:54	0:52:15	0:52:33	0:52:48	0:53:09	0:53:24	0:53:36		11.0	11.0
2nd	0	two	C & C 27 3	002	BYC	two	1.0	0:51:00	0:51:46	0:52:20	0:52:47	0:53:05	0:53:21	0:53:30	0:53:39	0:53:42	0:53:45	0:53:48		22.0	22.0
3rd	0	three	C & C 27 3	003	byc	three	1.0	0:52:00	0:52:28	0:52:50	0:53:06	0:53:18	0:53:27	0:53:37	0:53:43	0:53:46	0:53:49	0:53:52		33.0	33.0
4th	0	four	C & C 27 3	004	BYC	four	1.0	0:53:00	0:53:10	0:53:19	0:53:29	0:53:35	0:53:41	0:53:45	0:53:48	0:53:51	0:53:51	0:53:54		44.0	44.0
5th	0	five	C & C 27 3	005	byc	five	1.0	0:54:00	0:53:54	0:53:50	0:53:50	0:53:50	0:53:50	0:53:54	0:53:54	0:53:54	0:53:54	0:53:57		55.0	55.0
6th	0	six	C & C 27 3	006	byc	six	1.0	0:55:00	0:54:44	0:54:34	0:54:24	0:54:17	0:54:14	0:54:11	0:54:07	0:54:04	0:54:04	0:54:04		66.0	66.0
7th	0	seven	C & C 27 3	007	byc	seven	1.0	0:56:00	0:55:36	0:55:16	0:55:00	0:54:46	0:54:36	0:54:29	0:54:23	0:54:19	0:54:16	0:54:12		77.0	77.0
8th	0	eight	C & C 27 3	008	byc	eight	1.0	0:57:00	0:56:26	0:55:58	0:55:38	0:55:21	0:55:07	0:54:57	0:54:47	0:54:40	0:54:33	0:54:30		88.0	88.0
9th	0	nine	C & C 27 3	009	byc	nine	1.0	0:58:00	0:57:36	0:57:15	0:56:57	0:56:43	0:56:30	0:56:19	0:56:09	0:56:02	0:55:55	0:55:48		99.0	99.0
10th	0	zero	C & C 27 3	000	byc	zero	1.0	0:59:00	0:58:32	0:58:07	0:57:46	0:57:28	0:57:10	0:56:56	0:56:42	0:56:31	0:56:21	0:56:14		110.0	110.0

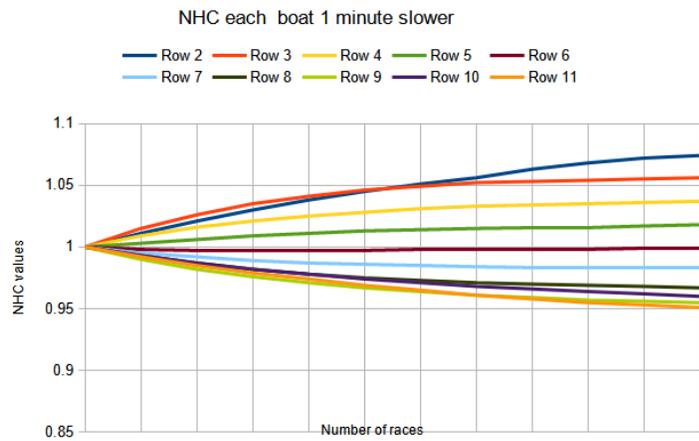
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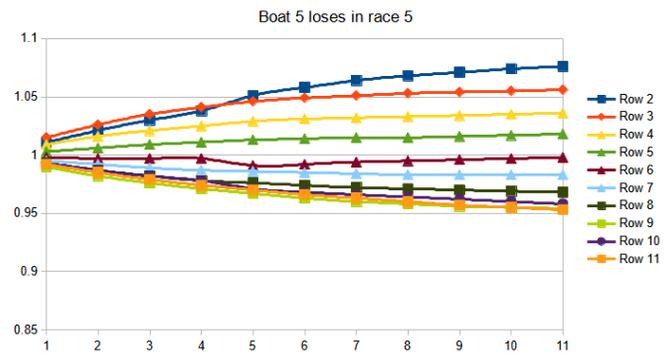
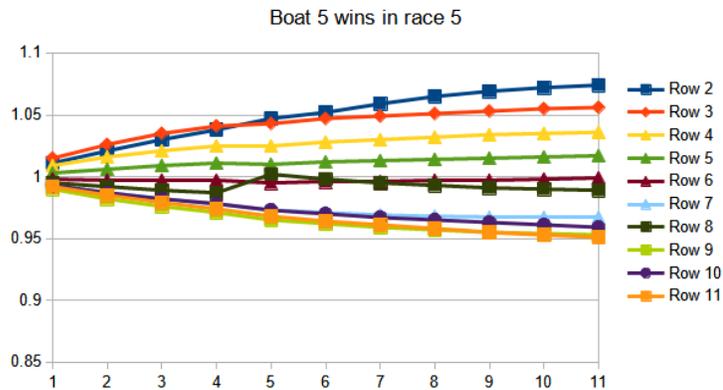
Corrected Times



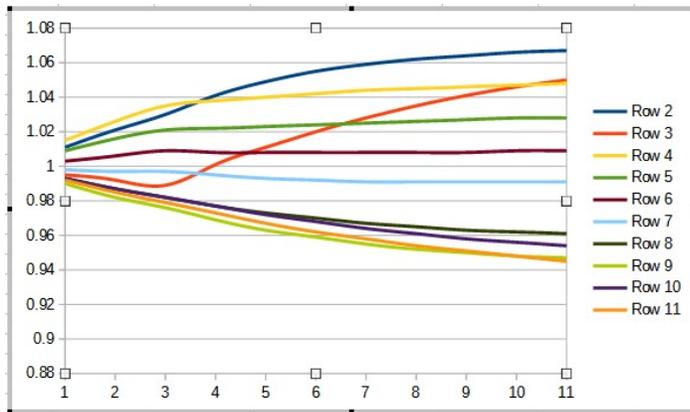
And the ratings show similar effects over time. Minor wobbles in the algorithm can exist over a short period of races at least in this somewhat artificial series.



The following graphs show the effect of the boat consistently in the middle suddenly doing better or worse. Doing better will push her ratings up more than doing worse for a few races (typically 5). In truth a boat's handicap is affected mostly by her last five (races).



Boat Five with new sails & winning.(i.e. Boat 5 is no longer ‘identical’ to the other 9 boats, and NHC sees this sudden improvement, after having established a mid-pack track record, as something to be accounted for, and adjusts accordingly. It seems reasonable to assume that a skipper does not instantly become much better over the course of a short race series, but that the boat has actually sped up.)



So what happens in real world. Pretty much what you see above with the added effects of wind and crew work over time. The boats at the front of the fleet correct to the front of the fleet and their ratings reflect that. Changes to a boat’s rating happen over time. A boat winning just one race won’t see their handicap match the fastest, unless the win is repeated fairly often. Corrected times appear to be closer under NHC than the typical PHRF handicap system.

The biggest rating changes in this year’s RUST races from 1st to 10th race were around five (5) percent; while most are in the one (1) to three (3) percent range. Last year when the Class 1 and 2 fleets were dual scored; the ratings of the class 1 boats varied less than than class 2 boats where 5% differences were seen. While it is difficult to be certain why one boat in a fleet would be 5% better than the worst boat; it is accepted these range differences likely result from better preparation of the boat, better use of sails etc.

In our small dummy series, all boats had the same handicap. In real life initial handicaps were created from our own race data (over 5 years of race dating back to 2014). The process is surprisingly simple. Choose a “base” boat, usually near the top of the fleet. For the RUST series I started with a J-24 and slowly switched to a CS-30. Now for every race in your history, divide each boat’s elapsed time by the elapsed time of the scratch boat (use sailwave’s export function to generate an excel spreadsheet(s). Do this for all races and average the resultant speed factor. Do the same for every series and average the “ratings”. This average is now the rated TOT value for each boat. For the few boats that have never raced, I gave the average of the same class boats that did race. For the even fewer boats that had no class history, I used either NHC rating tool to create a rating (adjusted between scratch boat ratings) or looked up a rating on the web where you can find the rating for just about any boat and the equations to turn it into a TOT number). Portsmouth Handicap UK or US gives reasonable numbers for both

dinghies and keelboats. (The U.S. Portsmouth numbers give more North American boats ratings than does the U.K. numbers.)

Most of the discussion in the RUST Fleet has been the use of the “initial” handicap for each year’s series. The default “Sailwave” process is to use the last rating of the previous series to seed the new series. We have tried resetting to initial values and continuing from last series. We do see ratings change with respect wind speeds: some boats/crews do better in more wind and some in less. A alternate approach would be to use a boat’s mean/average rating from the previous year(s). If RUST ever gets some upriver races in place; then this mean rating could be reasonable for these races. Some thing for discussion over the winter.

After 3 years of use and over 500 race/boat data points, NHC appears fair and consistent. Although there is clearly an element of human performance handicapping, NHC still ensures that consistently well-performing boats are not unduly penalized, and they can continue to be successful, even in a widely varied fleet. NHC treats all boats and crews equally, and does not know or care about designs that are ‘in favour’ or ‘out of favour’. NHC prevents ‘sailing politics’ from entering into racing.