

# A Beginner's Guide to The Good Dam Distance Race



## Handicaps and Ratings

(This is background stuff)

When sailboats of the same design race, there is little difficulty in determining which boat has competed the best: the boat that crosses the finish line first is the winner. The next boat that crosses the finish line places second, and so on for the remainder of the competitors. However, when sailboats of different designs race, some method of determining a handicap for each design is necessary, as one boat design might be capable of better performance than another. The purpose of the race, after all, is to determine which skipper and crew performed the best, not which design is fastest. To that end, the sailing community has developed several rating (handicap) systems for determining a boat design's performance potential. The system most often used is called PHRF (Performance Handicap Racing Fleet).

PHRF assigns each boat design a handicap number. Designs with greater speed potential have a lower (smaller number) PHRF rating. Designs with less speed potential have a higher (larger number) PHRF rating. The design's rating (handicap) is expressed in seconds-per-mile raced. In a nut shell, the faster-rated boat 'owes' the slower-rated boat some amount of time. The amount of time owed is determined by the difference in ratings between the boats and the length of the race course. The time that is owed is added to the *elapsed time* of the faster-rated boat. A formula that expresses this relationship is: ***Corrected time = [elapsed time] + [PHRF difference between the boats X race course distance (in miles)]***. *Elapsed time* is defined as the amount of time that each boat required to sail the race course. The *elapsed time* is adjusted by the boat's rating (handicap) to yield her *corrected time*. A boat's *corrected time* is what is used to determine her finish place for the race.

Consider a boat that has a PHRF rating of 150 racing against a boat having a PHRF rating of 180. The 'faster' boat (rated 150) 'owes' the 'slower' boat (rated 180) 30 seconds for every mile of race course. After one mile of racing, the boat with a rating of 150 is expected to be 'ahead' (by 30 seconds) of a boat with a rating of 180. Stated another way, if these two boats raced a one-mile course and the boat rated 150 finished 30 seconds ahead of the boat rated 180, the two boats would be scored as being tied for the race. If the race course was two miles in length, the boat rated 150 could finish 60 seconds ahead of the boat rated 180 and the race would still be a tie. The scoring program, whether done by hand or by computer spreadsheet, will add 30 seconds to the elapsed time of the faster-rated boat (rated 150) for each mile of race course. Since there are usually more than two boats racing, a method is needed to account for the rating difference between all the boats. This can be done by comparing the rating difference between the slowest-rated boat (largest PHRF number) and **each** of the other boats.

Consider the following fleet:

Boat	(PHRF) rating
A	260
B	180
C	80
D	200

In a 3 mile race, Boat B would owe Boat A (the boat with the slowest rating) 240 seconds  $[(260-180) \times (3)]$ . Boat C would owe Boat A 540 seconds  $[(260-80) \times (3)]$ . Boat D would owe Boat A 180 seconds  $[(260-200) \times (3)]$ . Boat A, being the slowest-rated boat in the race, is the 'base' boat, and her elapsed time is not adjusted. Below is the example race displayed in a table.

Boat	(PHRF) rating	Rating difference	Course length	<i>Time adjustment</i>	<i>Elapsed time</i>	<i>Corrected time</i>	Place
A	260	-	3 mi	-	47 min	47 min	3
B	180	80	3 mi	240 sec (4 min)	40 min	44 min	1
C	80	180	3 mi	540 sec (9 min)	36 min	45min	2
D	200	60	3 mi	180 sec (3 min)	47 min	50 min	4

PHRF is the basis of the **pursuit start** we will use for the Good Dam Distance Race.

### Pursuit Start Races (or“...to start or not to start...”)

(more background stuff)

In almost all sailboat racing, the boats start at the same time, technically when the Class Flag is lowered at the end of the 5-minute starting sequence. If boats of different designs are racing, each boat's *elapsed time* is recorded as it crosses the finish line, and that time is adjusted by a scoring program, after the race is completed, to yield her *corrected time*. In a **pursuit start** race, a boat's *time adjustment* (based on handicap and racecourse length) is calculated **before** the race begins, and a boat will start before or after other boats based on the relative handicaps between the boats racing. Then, a boat's finish position is ranked in the order she crosses the finish line. In other words, differences in handicap are dealt with by having the slower-rated boats start before the faster-rated boats. We like this type of start for three reasons: 1-There are fewer boats on the start line at any given moment. This reduces anxiety for novice racers. 2-As boats approach the finish line, there is no doubt about you 'correcting out' with faster or slower boats. If you cross the line ahead of a boat, you beat her. If you cross the finish line behind another boat, she beat you. The finishes can be exciting if you are approaching the finish line in close proximity to another boat. 3-The entire fleet of boats is more likely to finish the race near the same time. This allows the fleet to return to the Club at about the same time for the post-race **party**.

## Generating Pursuit Start “Delay Times”

(the last of the background stuff)

Now, let's look at how this information can be used to create a *pursuit start*. First, understand that a pursuit start is **not** simply having a **group** of slower-rated boats starting before a **group** of faster-rated boats. A *pursuit start* will take into account **each** boat's PHRF rating, along with the race course distance, and generate a *time adjustment* (a number of seconds or minutes) for **each** boat. We call this *time adjustment* the starting “**delay time**”. Very loosely, delay time is the amount of time that a faster-rated boat must wait before starting after a slower-rated boat has started. However, the *delay times* for the boats in a race fleet are more structured than this. Slower-rated boats will start **proportionately** sooner than faster-rated boats. If two boats have the same rating, those two boats will have the same *time adjustment* (and the same *delay time*), and will be allowed to start at the same time. The slowest-rated boat is arbitrarily chosen to be the basis for comparison, and has a *time adjustment* (and a *delay time*) of 00:00. We will call this boat the “**base boat**”. Thus, the base boat (slowest-rated boat) will be allowed to start first. In the race example above, the slowest-rated boat is Boat A (highest PHRF number). The *time adjustment* for Boat B is 240 seconds (4 minutes). Boat B is allowed to start 240 seconds, but no sooner, after boat A (the slowest-rated boat) is allowed to start. The *time adjustment* for Boat C is 540 seconds (9 minutes). Boat C is allowed to start (no sooner than) 540 seconds (9 minutes) after Boat A is allowed to start. And as you guessed, the *time adjustment* for Boat D is 180 seconds, and is allowed to start (no sooner than) 3 minutes after Boat A is allowed to start. You may have noticed that Boat C has the largest *time adjustment* and has to wait the longest before starting. This only makes sense as Boat C is the fastest-rated boat and logically should give the other boats more ‘head start’. You may also have noticed that even though “*delay time*” is stated in relation to the slowest-rated boat, the *delay time* between any two boats remains proportional to their PHRF rating. For example, the rating difference between Boat B and Boat D is 20 seconds per mile. With a 3 mile race course, you would expect the boats to be allowed to start 60 seconds apart. The difference in their *delay times* is 240-180 seconds, or as stated, 60 seconds.

At this point in the explanation of the *pursuit start*, the only detail missing is the actual moment that the base boat is allowed to start. This brings us to the “*Delay Time Clock*”. This is a timepiece used to count up (like a stopwatch). It starts at 00:00 and counts up in minutes and seconds. Race Committee will have such a timepiece, and **so should each race boat**. For a pursuit start to be functional, all the clocks (RC and competitors) must start counting up at the same instant. This results in every clock showing the same time. The procedure for starting the *delay time clock* is described in the a later section of this guide and in the Sailing Instructions.

Sometimes it is not the slowest-rated boat in the fleet that is chosen to be the base boat. RC often chooses a ‘phantom’ boat and arbitrarily assigns a PHRF rating of a number **higher** than any of the boats present for the race. This does not change the fairness of the start. This will, however, result in **no** boat being allowed to start at the moment the *delay time clock* starts. However, of the boats present for the race, the slowest-rated boat will still start first, with the remaining boats starting after her (proportionately to their rating).

## (finally...)The Race

(you really need to know this stuff)

The WCSC Good Dam Distance race for 2015 will employ a *pursuit start*. Again, we feel this will reduce the novice racer's anxiety of a crowded start line, and will boost the excitement of passing boats (that means you are beating them) on the race course, especially near the finish. To calculate *delay times* for the race boats, we will need to know each boat's PHRF rating. At present we plan to use the Club's **base** rating for each member's boat. A table of the *delay times* for each of the race courses and each of the participating boats (*Delay Time Table*) will be provided. We also need to know the length of the race course. To that end, we have configured a list of 5 possible race courses. All these courses start at S 15, near the north end of Andersonville Island. Each course, specified as "B", "C", "D", "E", or "F", requires sailing to a specified buoy, rounding , and returning to S 15 to finish. Course "B" is the shortest, and Course "F" is the longest, requiring sailing to the dam and back to S 15. Each of the courses requires leaving certain navigation buoys on a particular side of the boat. Along with a map of the lake, a list of the race courses we might use will be provided. Each race course is described by the buoys that that comprise the course, the order in which they must be passed, and the side of the boat on which they must be left.

### How do I know what my *delay time* is?

Boats with different ratings have different *delay times*. And for any boat, each race course will result in a different *delay time*. To determine your *delay time*, look on the Race Committee boat to see which course is posted. This will be either "B", "C", "D", "E", or "F". On your *Delay Time Table*, go down the boat column to your boat, then across that line to the intersection with the column for the displayed course. That box shows your *delay time*.


Look at the *Delay Time Table* (Example).

# The Good Dam Distance Race

Skipper	Boat Name	Sail #	Design	PHRF WCSC base rating <b>US Sailing mean rating</b>	PHRF difference	All courses start and finish at S 15				
						Course B	Course C	Course D	Course E	Course F
						Most Distant Buoy <b>S6</b>	Most Distant Buoy <b>26ATS</b>	Most Distant Buoy <b>17</b>	Most Distant Buoy <b>8</b>	Most Distant Buoy <b>1</b>
						4.4 miles	6.2 miles	10.2 miles	14.4 miles	18.8 miles
				300		delay	delay	delay	delay	delay
Bailey, Marc	Screaming Mimi	773	Melges 24	94	206	0:15:06	0:21:17	0:35:01	0:49:26	1:04:33
Baker, Dennis	Liquid Therapy	54	Islander 32	173	127	0:09:19	0:13:07	0:21:35	0:30:29	0:39:48
Ballew, Chuck	Happy Hours	58	Ultimate 20	146	154	0:11:18	0:15:55	0:26:11	0:36:58	0:48:15
Benson, Brent	-	-	Tanzer 22K	265	35	0:02:34	0:03:37	0:05:57	0:08:24	0:10:58
Cheser, Wayne	Roadkill	538	J 80	117	183	0:13:25	0:18:55	0:31:07	0:43:55	0:57:20
Craft, Tommy	Puff	14	Redwing 30	202	98	0:07:11	0:10:08	0:16:40	0:23:31	0:30:42
Curry, Richard	Great Escape	-	O Day 27	212	88	0:06:27	0:09:06	0:14:58	0:21:07	0:27:34
Curtiss, Johanna	Slipstream	175	Colgate 26	164	136	0:09:58	0:14:03	0:23:07	0:32:38	0:42:37

If course “E” were to be signaled on the RC boat, Dennis Baker’s Islander 32 would have to wait 30 minutes and 29 seconds **after** the *delay time clock* commenced before crossing the start line. Wayne Chesser’s J 80 would have to wait 43 minutes and 55 seconds after the *delay time clock* commenced before starting. Again, it is logical that the J 80 would wait longer than the Islander 32 to start, as the J 80 is rated as a much faster design.

## Sailing the Good Dam Distance Race

The approximate time of the start of the *delay time clock* will be announced at the skippers’ meeting. All boats should be in the vicinity of the start area before the stated time, as each boat will need to start their *delay time clock* in unison with RC. RC will sound several short blasts of the horn approximately 5-10 seconds before the numeral 1 pennant is raised. The numeral 1 pennant  will then be raised with one long blast of the horn. This marks one minute **before** the starting of the *delay time clock*.

The **start** of the delay time clock will be signaled by **lowering** the numeral “1” pennant and sounding one blast of the horn. At that instant, **each** boat should start their **clock**. The clock will start at 00:00, and will count up. **When your clock counts up to your boat’s delay time (but not before) you are allowed to cross the starting line.** If your boat is on or past the starting line (on the course side of the line) before your delay time comes up, you have started too early. RC will announce by radio (VHF ch 71) if you have started too early. To correct the mistake of starting too early, you are required to sail back such that your boat is completely on the start side of the line. Then you may restart.


### Sailing the course

The race to the dam this year is a little different than previous (at least recent) editions. In addition to employing a pursuit start, we also are requiring boats to sail to specific buoys and leave those buoys on a specific side of the boat. After all, as the name of the event implies, this is a race. The course being raced will be displayed on the RC boat. To know which buoys you must sail, consult the Course and Buoy List (rev Jan 2015). This list shows which buoys must be passed, the Lat/long coordinates of and nominal depth at each buoy, the side (of the boat) on which the buoy is left, and the order in which the buoys are passed. You may notice some trends. A buoy that was left to port while sailing down towards the dam will be left to starboard when sailing back towards the finish. You may notice that the buoys are always passed on their shoreward side; boats sail on the east side of the red buoys (with the exception of 26A T-S) and sail on the west side of the green buoys. This is to allow a manageable way to shorten the race when (ugh, I mean if) the wind fails. More information follows about shortening the race.

Let’s look at the Course and Buoy List (rev Jan 2015). We will use course “D” for the example. A boat starts (but not before her delay time) the race by sailing between the RC boat and buoy S 15. From there she will sail to buoy S 6 and pass that buoy by leaving it on the boat’s starboard side. (in racing, this is known as leaving the mark to starboard) Next, the boat will sail to buoy 26A T-S, and pass that buoy by leaving it on the boat’s port side. The next mark to sail to is buoy 17, and it is rounded by leaving the buoy on the boat’s port side. We used the term

“rounded” because buoy 17 is the most distant mark on this race course (D). A boat now continues the race by sailing back to the finish. The race Course List shows the next mark to be buoy 26A T-S. The boat passes this buoy by leaving it to starboard (buoy on the boat’s starboard side). The next mark to pass is buoy S 6, which the boat leaves to port (buoy on the boat’s port side). From there, the race is completed by sailing across the finish line, between the RC boat and buoy S 25. At this point, you have beaten any boats that have not yet finished!

### **Oh, snap! the wind is dying...**


Race Committee will select the course to be sailed based on the observed and expected wind; less wind, shorter course; more wind, longer course. If, during the race, RC believes the boats will not be able to finish the race at a reasonable time (there is a post-race party to attend), RC will shorten the race. This is done by anchoring the RC boat near a **mark of the course** that the boats are required to pass, but haven’t gotten to yet. RC will display the “S” (shorten) flag  and sound two horns as the boats approach. This becomes the ‘new’ finish line. The boats finish the race by sailing between the RC boat and the adjacent mark of the race course. RC will make an attempt to inform the fleet by VHF radio if the course is shortened.

Shortening the course will allow the boats to use their engines (**after** finishing) to more quickly return to the Club (did I mention the post-race party?) Shortening the course will also require recalculating the corrected finish times of the boats. This means that boats might not be ranked in order of their finish.

## **Glossary**

**Corrected time** A boat’s elapsed time after being adjusted for rating by a scoring program

**Delay time** Delay time is the amount of time (in seconds or minutes) that a boat must wait after the start of the delay time clock before she can cross the starting line to begin a pursuit start race.

**Delay time clock** This is a time piece that counts up from 00:00, starting when the numeral pennant 1  is lowered at the beginning of a pursuit start race.

**Delay Time table** A table (only used in a pursuit start) that provides each sailboat a delay time for each of a number of race courses

**Elapsed Time** The amount of time that transpires between the start of a race and when a boat crosses the finish line.

**Mark of the course** The RC boat when it is part of the starting/finish line and any of the government buoys that are part of the course being raced. Government buoys that are not part of the race course have no significance in the race.

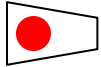
**Pursuit start** A method of starting a sailboat race in which slower boats start proportionately sooner than faster boats so that boats are scored in the order of their finish.

***Time Adjustment*** The amount of time added to or subtracted from a boat's elapsed time for the purpose obtaining a corrected time to compensate for boats having unequal ratings

## Flags you need to be aware of



**Starting Line flag** The staff of this flag is the right end of the starting line. It is also one end of the finishing line if the race has not been shortened.



**Numeral 1 pennant** When this flag is raised, you have 1 minute until the delay time clock starts. When it is lowered, each boat's delay time clock should be started.



**Shorten flag** If, after starting, the race is shortened, this flag will both signal that the race has been shortened and serve as one end of the finish line.