US CHESS FEDERATION

P.O. BOX 775308
ST. LOUIS, MO 63177
1.800.903.8723
www.uschess.org

The US Chess Rating system

Mark E. Glickman — Harvard University
Thomas Doan — Estima

July 29, 2024

The following algorithm is the procedure to rate US Chess events. The procedure applies to six separate rating systems, three of which are for over-the-board (OTB) events, and three of which are for online (OL) events : the Blitz system, Quick Chess (QC) system, the Regular system, the online Blitz system, the online Quick system, and the online Regular system.[1] In this document, the systems will be abbreviated to OTBB/OTBQ/OTBR for the OTB systems and OLB/OLQ/OLR for the on-line systems. The formulas apply to each system separately. Note that this document describes only how ratings are *computed*, and does not set the rules that govern their use.

1 Structure of the Rating Algorithm

Before an event, a player is either unrated in a particular rating system, or has a rating based on N games. Ratings are stored as floating point values, such as 1643.759 and 1431.034. Official ratings are expressed as rounded to the nearest whole number (1644 and 1431 in the above example). A player's rating is termed *established* if it is based upon more than 25 games. Assume the player competes in m games during the event. Post-event ratings are computed in a sequence of five steps:

- The first step sets temporary initial ratings for unrated players.

[1] For a time control, write mm as the total "main time" in minutes, and ss as the delay or increment in seconds. The two *Blitz* systems apply to events with time controls where $5 \leq mm + ss \leq 10$, such as G/5d0, G/3+2 or G/7d3. The two *QC* systems apply to events with time controls where $10 < mm + ss < 30$, such as G/20+5 or G/26d3. The OTBQ ratings also apply to time controls through $mm+ss \leq 65$, which overlaps with the OTBR range ("dual rating"). The two *Regular* systems apply to time controls where $mm+ss \geq 30$.

- The second step calculates an "effective" number of games played by each player.
- The third step calculates temporary estimates of ratings for certain unrated players only to be used when rating their opponents on the subsequent step.
- The fourth step then calculates intermediate ratings for all players.
- The fifth step uses these intermediate ratings from the previous step as estimates of opponents' strengths to calculate final post-event ratings.

The calculations are carried out in the following manner:

Step 1: Set initial ratings for unrated players.

Initial rating estimates are set for all unrated players in an event. The purpose of setting initial rating estimates for unrated players is (1) to be able to incorporate information about a game result against an unrated player, and (2) to choose among equally plausible ratings during a rating calculation for an unrated player (see the details of the "special" rating formulas in Section 4.1).

The details of determining an initial rating for an unrated player are described in Section 2.

Step 2: Calculate the "effective" number of games played by each player.

This number, which is typically less than the actual number of games played, reflects the uncertainty in one's rating, and is substantially smaller especially when the player's rating is low. This value is used in the "special" and "standard" rating calculations. See Section 3 for the details of the computation.

Step 3: Calculate a first rating estimate for each unrated player for whom Step 1 gives $N = 0$. For these players, use the "special" rating formula (see Section 4.1), letting R_0 be the initialized rating. However, for only this step in the computation, set the number of effective games for these players to 1 (this is done to properly "center" the ratings when most or all of the players are previously unrated).

- If an opponent of the unrated player has a pre-event rating, use this rating in the rating formula.
- If an opponent of the unrated player is also unrated, then use the initialized rating from Step 1.

If the resulting rating from Step 3 for the unrated player is less than 100, then change the rating to 100.

Step 4: For every player, calculate an intermediate rating with the appropriate rating formula.

- If a player's rating R_0 from Step 1 is based upon 8 or fewer games ($N \leq 8$), or if a player's game outcomes in all previous events have been either all wins or all losses, then use the "special" rating formula (see Section 4.1), with "prior" rating R_0.
- If a player's rating R_0 from Step 1 is based upon more than 8 games ($N > 8$), and has not been either all wins or all losses, use the "standard" rating formula (see Section 4.2). Note that the standard formula is used even if the "effective" number of games from Step 2 is less than or equal to 8.

In the calculations, use the opponents' pre-event ratings in the computation (for players with pre-event ratings). For unrated opponents who are assigned $N = 0$ in Step 1, use the results of Step 3 for their ratings. For unrated opponents who are assigned $N > 0$ in Step 1, use their assigned rating from Step 1.

If the resulting rating from Step 4 is less than 100, then change the rating to 100.

Step 5: Repeat the calculations from Step 4 for every player, again using a player's pre-event rating (or the assigned ratings from Step 1 for unrated players) to perform the calculation, but using the results of Step 4 for the opponents' ratings. If the resulting rating from Step 5 is less than 100, then change the rating to 100.

These five steps result in the new set of post-event ratings for all players.

2 Initializing Ratings

If a player has no rating under a given system, as many as seven other sources may provide rating information: the five *other* US Chess ratings, FIDE (Section 2.1) and CFC (Canadian, Section 2.2). These may vary in quality because of the number of games on which they are based, the age of the ratings and general quality of the rating system or its conversion. A weighted average of these will be used as an initial estimate of the player's rating—the weights will be expressed in terms of the number of "games" worth of information the rating provides. If none of these ratings exist, the initial rating will be the age-based rating (Section 2.3) with the tournament games having been played, N, set to 0.

Suppose $K \geq 1$ ratings from the alternative sources *do* exist for the individual. Let X_k, $k = 1, \ldots, K$ be the (converted) rating from source k. The following computations are carried out for each k:

1. Determine the *Game Factor*, G_k. For the OTBR rating, this is (at most) 10. For initializing an OLB rating, this is (at most) 10 from an OTBB rating. For initializing OLQ rating, this is (at most) 10 from an OTBQ rating. For all other US Chess ratings, G_k is (at most) 5. The Game Factor for a rating system can be no higher than the number of games actually credited under the system. For instance, if someone is credited with 7 games under OTBR, the Game Factor on OTBR is reduced to 7. The Game Factors for converted FIDE and CFC ratings are shown in the sections describing the conversions.

2. Determine the *staleness* of the rating, D_k — the number of days from when that rating was computed to the end date of the tournament now being rated.

3. Determine P_k, the age-based initial rating (Section 2.3) that would have been computed *at the time of that rating*. Now compute

$$Z_k = \min\left(6, (X_k - P_k)/350\right).$$

   A large positive value of $(X_k - P_k)/350$ means that the player was unusually strong for his/her age; a large negative number means the player was unusually weak for his/her age.

4. Determine the *Staleness Factor*, S_k, for rating source k:

$$S_k = \exp\left(.06\,(Z_k - 6) \times D_k/365.25\right).$$

   This is used to reduce the weight put on a rating due to its staleness, where the weight depreciates faster with staleness for lower rated players.

5. The *Adjusted Weight*, W_k, on the rating is the product of the *Game Factor* and the *Staleness Factor*: $W_k = G_k \times S_k$.

The initial rating for the player in the system being rated is the weighted average of the available ratings using the Adjusted Weights:

$$R_0 = \frac{\sum_{k=1}^{K} W_k X_k}{\sum_{k=1}^{K} W_k}$$

rounded to the nearest integer. The value of N for the rating is set to the sum of the Adjusted Weights, but capped at 10:

$$N = \min\left(10, \sum_{k=1}^{K} W_k\right)$$

rounded up to the nearest integer (so it will always be at least 1, but can be no more than 10).

Example: A player born July 1, 2000 plays in an OLB tournament ending Sept 1, 2020. She has established OTBR, OTBQ and OTBB ratings. The Game Factors for these three systems are 10, 5 and 10 respectively—the last because an OLB rating is being initialized and that is the Blitz rating for OTB. The calculations (with rounding—calculations are actually done to full precision) are:

Source	X_k	Date	G_k	D_k	P_k	Z_k	S_k	W_k
$OTBR\ (k=1)$	1759	2018−03−25	10	891	886.52	2.49	0.60	5.98
$OTBQ\ (k=2)$	1643	2018−01−13	5	962	876.80	2.19	0.55	2.74
$OTBB\ (k=3)$	1658	2016−07−16	10	1508	802.05	2.45	0.41	4.15

The interpretation is that the OTBR rating is treated as if it were 5.98 games of information; the OTBQ as 2.74 and the OTBB as 4.15. The initialized rating is given by

$$R_0 = (5.98 \times 1759 + 2.74 \times 1643 + 4.15 \times 1658)/(5.98 + 2.74 + 4.15) \approx 1702,$$

and where $N = 5.98 + 2.74 + 4.15 = 12.87$ rounded down to the maximum of 10.

2.1 FIDE conversions

As of March 1, 2024, if an unrated player has a FIDE rating, use a converted rating according to the following formula:

$$\text{USrating} = \begin{cases} -1073 + 1.5667 \times \text{FIDE} & \text{if FIDE } \leq 2000 \\ 20 + 1.02 \times \text{FIDE} & \text{if FIDE } > 2000 \end{cases}$$

This will be treated as having a Game Factor of 10 if the FIDE rating is greater than 2000, and a Game Factor of 5 if the FIDE rating is less than or equal to 2000.

2.2 CFC conversions

If an unrated player is a Canadian resident and has a CFC rating [2], use a converted rating according to the following formula:

$$\text{USrating} = \begin{cases} \text{CFC} - 90 & \text{if CFC } \leq 1500 \\ 1.1 \times \text{CFC} - 240 & \text{if CFC } > 1500 \end{cases}$$

This will be treated as having a Game Factor of 5.

2.3 Age-Based ratings

To determine an age-based initial rating, use the following procedure. Define a player's age (in years) to be

$$\text{Age} = (\text{Tournament End Date} - \text{Birth Date})/365.25.$$

The formula for an initial rating based on age is given by

$$\text{USrating} = \begin{cases} 100 & \text{if Age} < 2 \\ 50 \times \text{Age} & \text{if } 2 \leq \text{Age} \leq 26 \\ 1300 & \text{if Age} > 26 \end{cases}$$

If an unrated player does not provide a birth date or if the "Age" is calculated to be less than 3 years old (which is almost certainly an error), then

- If the player is inferred to be an adult (e.g., through an appropriate US Chess membership type), they are treated as a 26 year old ($R_0 = 1300$)
- Otherwise, they are treated as a 15 year old ($R_0 = 750$).

[2] Please note that the US Chess does not maintain a historical database of CFC ratings or a cross-index between US Chess IDs and CFC IDs, so tournament directors are requested to alert the US Chess ratings department when any of their players have no US Chess rating but do have a CFC rating, as those conversions have to be performed manually.

3 Effective number of games

This section describes the computation of the "effective number of games" a player has previously played. This quantity is used in the rating calculations described in Sections 4.1 and 4.2. The effective number of games conveys the approximate reliability of a rating on the scale of a game count.

For each player, let N be the number of tournament games the player has competed, or, for unrated players, the value assigned from Step 1 of the algorithm. Let R_0 be the player's pre-event rating, or, for unrated players, the initialized rating assigned from Step 1. Let

$$N^* = \begin{cases} 50/\sqrt{0.662 + 0.00000739(2569 - R_0)^2} & \text{if } R_0 \leq 2355 \\ 50.0 & \text{if } R_0 > 2355 \end{cases} \tag{1}$$

Define the "effective" number of games, N', to be the smaller of N and N^*. As a result of the formula, N' can be no larger than 50, and it will usually be less, especially for players who have not competed in many tournament games. Note that N' is a temporary variable in the computation and is not saved after an event is rated.

Example: Suppose a player's pre-event rating is $R_0 = 1700$ based on $N = 30$ games. Then according to the formula above,

$$N^* = 50/\sqrt{0.662 + 0.00000739(2569 - 1700)^2} = 50/\sqrt{6.24} = 20.0$$

Consequently, the value of N' is the smaller of $N = 30$ and $N^* = 20.0$, which is therefore $N' = 20.0$. So the effective number of games for the player in this example is $N' = 20.0$.

4 Main rating algorithm

The specific rating algorithm used for a player mainly depends on the number of rated games previously played. For eight or fewer games, the "special" rating algorithm applies (this used to be called the "provisional" rating algorithm). For more than eight games, the "standard" rating algorithm (previously the "established" rating algorithm) applies. We describe in detail each of these algorithms.

4.1 Special rating formula

This procedure is to be used for players with $N \leq 8$. It also applies to players who have had either all wins or all losses in all previous rated games, regardless of the value of N.

The algorithm described here extends the old provisional rating formula by ensuring that a rating does not decrease from wins or increase from losses. In effect, the algorithm finds the rating at which the attained score for the player equals the sum of expected scores, with expected scores following the "provisional winning expectancy" formula below. For most situations, the resulting rating will be identical to the old provisional rating formula. Instances that will result in different ratings are when certain opponents have ratings that are far from the player's initial rating. The computation to determine the "special" rating is iterative, and is implemented via a linear programming algorithm.

Define the "provisional winning expectancy," PWe, between a player rated R and his/her i-th opponent rated R_i to be

$$\mathrm{PWe}(R, R_i) = \begin{cases} 0 & \text{if } R \leq R_i - 400 \\ 0.5 + (R - R_i)/800 & \text{if } R_i - 400 < R < R_i + 400 \\ 1 & \text{if } R \geq R_i + 400 \end{cases}$$

Let R_0 be the "prior" rating of a player (either the pre-event rating for rated players, or the Step 1 initialized rating for unrated players), and N' be the effective number of games. Also let m be the number of games in the current event, and let S be the total score out of the m games (counting each win as 1, each loss as 0, and each draw as 0.5).

The variables R'_0 and S', which are the adjusted initial rating and the adjusted score, respectively, are used in the special rating procedure. If a player has competed previously, and all the player's games were wins, then let

$$\begin{aligned} R'_0 &= R_0 - 400 \\ S' &= S + N' \end{aligned}$$

If a player has competed previously, and all the player's games were losses, then let

$$\begin{aligned} R'_0 &= R_0 + 400 \\ S' &= S \end{aligned}$$

Otherwise, let

$$R'_0 = R_0$$

$$S' = S + \frac{N'}{2}$$

The objective function

$$f(R) = N' \times \text{PWe}(R, R_0') + \left(\sum_{i=1}^{m} \text{PWe}(R, R_i)\right) - S'$$

which is the difference between the sum of provisional winning expectancies and the actual attained score when a player is rated R, is equal to 0 at the appropriate rating. The goal, then, is to determine the value of R such that $f(R) = 0$ within reasonable tolerance. The procedure to find R is iterative, and is described as follows.

Let $\varepsilon = 10^{-7}$ be a tolerance to detect values different from zero. Also, let $x_0 = R_0' - 400$, $y_0 = R_0' + 400$, and, for $i = 1, \ldots, m$, $x_i = R_i - 400$, $y_i = R_i + 400$. Denote the unique x_i and y_i, $i = 0, \ldots, m$, as the collection

$$S_z = \{z_1, z_2, \ldots, z_Q\}$$

If there are no duplicates, then $Q = 2m + 2$. These Q values are the "knots" of the function f (essentially the value where the function "bends" abruptly).

1. Calculate
$$M = \frac{N'R_0' + \sum_{i=1}^{m} R_i + 400(2S - m)}{N' + m}$$
This is the first estimate of the special rating (in the actual implemented rating program, M is set to R_0', but the final result will be the same – the current description results in a slightly more efficient algorithm).

2. If $f(M) > \varepsilon$, then

   (a) Let z_a be the largest value in S_z for which $M > z_a$.

   (b) If $|f(M) - f(z_a)| < \epsilon$, then set $M \leftarrow z_a$ and go back to 2. Otherwise, calculate
   $$M^* = M - f(M)\left(\frac{M - z_a}{f(M) - f(z_a)}\right)$$

   - If $M^* < z_a$, then set $M \leftarrow z_a$, and go back to 2.
   - If $z_a \leq M^* < M$, then set $M \leftarrow M^*$, and go back to 2.

3. If $f(M) < -\varepsilon$, then
   (a) Let z_b be the smallest value in S_z for which $M < z_b$.
   (b) If $|f(z_b) - f(M)| < \epsilon$, then set $M \leftarrow z_b$ and go back to 3. Otherwise, calculate

$$M^* = M - f(M)\left(\frac{z_b - M}{f(z_b) - f(M)}\right)$$

   - If $M^* > z_b$, then set $M \leftarrow z_b$, and go back to 3.
   - If $M < M^* \leq z_b$, then set $M \leftarrow M^*$, and go back to 3.

4. If $|f(M)| \leq \varepsilon$, then let p be the number of i, $i = 1, \ldots, m$ for which

$$|M - R_i| \leq 400.$$

   Additionally, if $|M - R'_0| \leq 400$, set $p \leftarrow p + 1$.
   (a) If $p > 0$, then exit.
   (b) If $p = 0$, then let z_a be the largest value in S_z and z_b be the smallest value in S_z for which $z_a < M < z_b$. If
   - $z_a \leq R_0 \leq z_b$, then set $M \leftarrow R_0$.
   - $R_0 < z_a$, then set $M \leftarrow z_a$.
   - $R_0 > z_b$, then set $M \leftarrow z_b$.

If the final value of M is greater than 2700, the value is changed to 2700. The resulting value of M is the rating produced by the "special" rating algorithm.

4.2 Standard rating formula

This algorithm is to be used for players with $N > 8$ who have not had either all wins or all losses in every previous rated game.

Define the "Standard winning expectancy," We, between a player rated R and his/her i-th opponent rated R_i to be

$$\text{We}(R, R_i) = \frac{1}{1 + 10^{-(R-R_i)/400}}$$

K-factor:

The value of K, which used to take on the values 32, 24 or 16, depending only on a player's pre-event rating, is now defined as (with the exception noted below)

$$K = \frac{800}{N' + m},$$

where N' is the effective number of games, and m is the number of games the player completed in the event. The following are example values of K for particular values of N' and m.

N'	m	Value of K
6	4	80
6	6	66.67
6	10	50
20	4	33.33
20	6	30.77
20	10	26.67
50	4	14.81
50	6	14.29
50	10	13.33

In updating the OTBR rating, if the player's rating R is greater than 2200 and the time control of an event is between $mm + ss \geq 30$ and $mm + ss \leq 65$ (i.e., dual-rated - see footnote 1), the following formula applies for K:

$$K = \begin{cases} 800(6.5 - 0.0025R)/(N' + m) & \text{if } 2200 < R < 2500 \\ 200/(N' + m) & \text{if } R \geq 2500 \end{cases}$$

where N' is the effective number of games, and m is the number of games the player has completed in the event.

Rating updates:

If $m < 3$, or if the player competes against any opponent more than twice, or if $m = 3$ and the player competes against any opponent more than once, the "standard" rating formula that results in R_s is given by

$$R_s = R_0 + K(S - E)$$

where the player scores a total of S points (1 for each win, 0 for each loss, and 0.5 for each draw), and where the total winning expectancy $E = \sum_{i=1}^{m} \mathrm{We}(R_0, R_i)$.

If $m > 3$ and the player competes against no player more than twice, or if $m = 3$ and the player competes against no player more than once, then the "standard" rating formula that results in R_s is given by

$$R_s = R_0 + K(S - E) + \max(0,\ K(S - E) - B\sqrt{m'})$$

where $m' = \max(m, 4)$ (3-round events are treated as 4-round events when computing this extra term), and B is the bonus multiplier ($B = 12$ effective Feburary 1, 2023). The quantity

$$\max(0,\ K(S - E) - B\sqrt{m'})$$

is, in effect, a bonus amount for a player who performs unusually better than expected.

The resulting value of R_s is the rating produced by the "standard" rating algorithm.

5 Rating floors

The absolute rating floor for all ratings is 100. No rating can be lower than the absolute rating floor.

For OTB ratings, an individual's personal absolute rating floor is calculated as

$$\mathrm{AF} = \min(100 + 4N_W + 2N_D + N_R,\ 150)$$

where AF is the player's absolute floor, N_W is the number of rated games won, N_D is the number of rated games drawn, and N_R is the number of events in which the player completed three rated games. The formula above specifies that a player's absolute floor can never be higher than 150. As an example, if a player has earned 3 wins, 1 draw, and has competed in a total of 10 events of at least three ratable games, then the player's absolute floor is $\mathrm{AF} = 100 + 4(3) + 2(1) + 10 = 124$.

A player with an established rating has a rating floor possibly higher than the absolute floor. Higher rating floors exist at 1200, 1300, 1400, ..., 2100. A player's rating floor is calculated by subtracting 200 points from the highest attained established rating after rounding to the nearest integer, and then using the floor at or just below. For example, if an established player's highest rating was 1941, then subtracting 200 yields 1741, and the floor just below is 1700. Thus the player's rating cannot go below 1700. If a player's highest established rating were 1999.51, then subtracting 200 from the integer-rounded rating of 2000 yields 1800 which is the player's floor. If an established player's highest rating was 1388, then subtracting 200 yields 1188, and the next lowest floor is the player's absolute floor, which is this player's current floor.

For OTBR ratings only, a player who earns the original Life Master (OLM) title, which occurs when a player keeps an established rating above 2200 for 300 (not necessarily consecutive) rated games, will obtain a rating floor of 2200. Achievement of other US Chess titles do not result in rating floors.

A player's rating floor can also change if he or she wins a large cash prize. If a player wins $4,000 or more in an under-2000 context, the rating floor is set at the first 100-point level (up to 2000) which would make the player no longer eligible for that section or prize. For example, if a player wins $4,000 in an under-1800 section of a tournament, then the player's rating floor would be 1800. Floors based on cash prizes can be at any 100-point level, not just the ones above based on peak rating.

6 Updating US Chess ratings from foreign FIDE events

The US Chess regularly updates ratings based on performances in FIDE-rated non-US Chess events to obtain more accurate ratings for its players. The following describes the procedure used to update US Chess ratings based on performance in FIDE events. Only players with an <u>established</u> US Chess regular rating are eligible for adjustments based on foreign FIDE events.

- Only current US Chess members are eligible for FIDE adjustments. Each time a FIDE rating list is produced, the US Chess office identifies all players who appear with a "USA flag" (usually US residents) and who have played at least one FIDE-rated game in the set of events/tournaments that are included in producing the rating list. The office may also include US residents who are not players with a "USA flag." Members with a FIDE rating of at least 2200 with a "USA flag" will automatically have their US Chess rating updated for their play in foreign FIDE rated events. US Chess members who are rated under 2200 FIDE or who have no FIDE rating must opt-in to this process in advance of the event by contacting the US Chess office. Once a player has opted-in, that player cannot opt-out without the approval of the US Chess Executive Director.

- For each identified US player, all the player's opponents are identified along with their FIDE ratings. Opponents who do not have a FIDE rating are ignored.

- The opponents' FIDE ratings are converted to the US Chess scale using the conversion described in Section 2.1. If an event is known to be a youth event, such as the World Youth Championships, then the following conversion is used for all opponents (effective as of March 1, 2024):

$$\text{USrating} = \begin{cases} -453 + 1.2667 \times \text{FIDE} & \text{if FIDE} \leq 2000 \\ 80 + 1.0 \times \text{FIDE} & \text{if FIDE} > 2000 \end{cases}$$

- The standard rating formula (with bonus) is then applied to update the player's US Chess rating based on the opponents' converted ratings. The standard formula is applied only once, as opposed to twice in the usual algorithm.

7 Miscellaneous details

The following is a list of miscellaneous details of the rating system.

- All games played in US Chess-rated events are rated, including games decided by time-forfeit, games decided when a player fails to appear for resumption after an adjournment, and games played by contestants who subsequently withdraw or are not allowed to continue. Games in which one player makes no move are not rated.
- The rating calculations apply separately to the Regular, QC, Blitz, online Regular, online QC and online Blitz chess rating systems. Other than the use of imputing initial ratings for unrated players, there is no formal connection among these systems.
- After an event, each players' value of N is incremented by m, the number of games the player competed in the event.
- Individual matches are rated with the following restrictions:
    1. Both players involved must have an established published rating, with the difference in ratings not to exceed 400 points.
    2. The maximum rating change in a match is 50 points; the maximum net rating change in 180 days due to match play is 100 points; and the maximum net rating change in 3 years due to match play is 200 points.
    3. The bonus formula does not apply to matches.

4. Rating floors are not automatically in effect in matches. Instead, if a player has a match result that would lower the rating to below that player's floor, this will be treated as a request to have that floor lowered by 100 points. If the US Chess office grants this request, the rating will drop below the old floor and the new floor will be 100 points below the old floor.

- Ratings are stored as floating point values, and not as integers. All the rating computations assume the input ratings are floating point. However, official ratings are expressed rounded to the nearest integer using conventional rounding rules. Also, ratings on tournament wallcharts, on crosstables on the US Chess web site, and in other official forums, are also displayed rounded to the nearest integer.
- The US Chess Executive Director may review the rating of any US Chess member and make the appropriate adjustments, including but not limited to imposition of a rating "ceiling" (a level above which a player's rating may not rise), or to the creation of "money floors" (rating floors that are a result of winning large cash prizes).

8 Historical Changes

This lists, by effective date, changes made since Jan 1, 2001. Except where noted, these apply to all sections with start date at or after the date specified and *not* to sections with start date earlier than that.

- 2002-??-?? Add "dual" OTB quick/OTB regular rating of OTB Regular sections with time controls $\leq 60mm + ss$.
- 20??-??-?? Extend dual rating to time controls $\leq 65mm + ss$.
- 2004-??-?? Extend quick rating to time controls $\geq 5mm + ss$.
- 2006-??-?? Change age-based initialization formula.
- 2008-06-06 Bonus point threshold reduced to 6 (from 10).
- 2008-08-07 Floating floors for very low rated players added.
- 2010-04-01 Floors at 1200 and 1300 added. (Bottom earned floor had been 1400).
- 2012-08-03 Bonus point threshold increased to 8.

- 2013-05-08 Effective games formula changed to give lower values (thus more variable ratings), particularly for players rated 1800-2200.
- 2014-03-20 Bonus point threshold increased to 10.
- 2014-09-01 Floating point precision for storing ratings
- 2015-06-01 Bonus point threshold increased to 12.
- 2017-06-01 Bonus point threshold increased to 14.
- 2020-06-01 Initialization of ratings blended through other systems.
- 2023-02-01 Bonus point threshold reduced to 12.
- 2024-03-01 Update FIDE-to-USChess conversion formulas.