2019 CRF MkII Formulae

2/13/19

R1 = Base Rating — **R1= 0.06 * (L * S) / (.75*DSPS/64)^.33 + 0.3*L + 0.20*S + DC + LBRC + StabC**

Rated Length

If Age < 1990, L = L1

If Age => 1990, L = L1 + DelL

If LWL>=0.65*LOA, L1 = 1.02*(LOA + 4* LWL) / 5

If LWL<0.65*LOA, L 1= 1.02*(LOA + 4*0.65*LOA) / 5

If Age < 1990, DelL = 0

If Age => 1990 & Bm10 / Bmax <= 0.75: DelL = 0

If Age => 1990 & Bm10 / Bmax > 0.75: DelL = L * (15*((Bm10 / Bmax) - 0.75) ^ 2.1

Rated S — S = (Rig Factor*(RSAup + RSAdn) / 2) ^0.5

RSAup; Rated SA, Upwind; RSAup = Jib + Main + Mizzen + Foresail

RSAup=RSAF + RSAM + RSAY + RSAG

Rated Foretriangel Area, if LP% >=1; If J * LP% => J: RSAF = 0.55 * IG * J * {1 + 1.5 * ((LP% * J) - J)/(LP% * J)}

Rated Foretriangel Area, if LP% <1; If J * LP% < J: RSAF=0.55 * 0.96 * (IG ^ 2 + J ^ 2) ^ 0.5 * LP% * J

Rated Mainsail Area, for Jib Headed Main; If P> 0: RSAM=.45*P*E

Rated Mainsail Area for Gaff Headed Main; If PG> 0: RSAM=0.55*PG*E

Rated Mizzen Area; If PY> 0: RSAY=0.5*PY*EY

Rated Foresail Area, Schooner's; If B1> 0: RSAG=0.4*(P1+P3)/2*B1

RSAdn; Rated SA, downwind; RSAdn = Spin + Main + Mizzen + Foresail

RSAdn=SPIN + RSAM + RSAY + RSAG

If S-SPIN > A-SPIN: SPIN=S-SPIN

If S-SPIN =< A-SPIN: SPIN=A-SPIN

S-SPIN=0.95*(ISP^2+J^2)^0.5*1.8*SPL*0.8*1.0

A-SPIN=0.95*(ISP^2+TSPJ^2)^0.5*1.75*TSP*0.75*0.95

(For non-spinnaker, RSAdn=RSAup)

Displacement — DSPS — Boat weight as raced, without crew, in pounds

Draft Correction

If RD>BD: DC=0.2*L*((RD/BD)^1.75-1)

If RD<=BD: DC=0.2*L*((RD/BD)^2.5-1)

Base Draft: BD=0.15*L+1.5

Rated Draft: If fixed draft: (No centerboard): RD=DM

If Brd down draft (DMcb) > fixed draft: RD=DM+0.60*(DMcb-DM)

Length/Beam Correction — LBRC = 0.25 * L *{[(L / Bmax) / (Base LBRC)]^0.30 - 1.0}

Base LBRC: 0.037*L+1.66

Stability Correction (new for 2019)

If RmTot > RMBase; StabC=0.10*L1*((RmTot/RmBase)^1.60-1)

If RmTot =< RMBase; StabC=0.10*L1*((RmTot/RmBase)^0.20-1)

RmBase = 13.6 * (Bmax * L^0.25)^2 - 137 * (Bmax * L^0.25) + 352

RmTot=RmHull + RmCrew

RmHull=0.0090*Disp*(Bmax-Dh)*Spar Factor^3*Rig Factor^1.5

RmCrew=(((Disp/2240)/((0.01*l)^3))/254)^0.375*RmHull/(Disp*Bmax)/0.006)^0.4*LWL^1.5*7.6

Dh=(Disp/64 - Bal/690)/(LWL*Bmax*.9*PrisC*WPC)

Bal; Ballast weight, for 2019, assumed to be = 0.4 * Disp

PrisC; Canoe body Prismatic Coeff, assumed to be 0.55

WPC; Water Plane Coeff, assumed to be 0.65

2019 Rating — **Rating = R6 = R1 * Prop * DLF * SaDF * Keel * Spar * MAF**

Prop Factor — Prop = assigned prop factor

Disp/Length Factor

If Base DLF > 1.015; DLF = Base DLF + (1 + Base DLF -1.015)^0.25 1-1

If Base DLF=< 1.015; DLF = Base DLF

Base DLF: Base DLF = {(350 - 2.9 * L) / ((Disp/2230) / (0.01 * L) ^ 3)} ^ 0.20

Sail Area/Disp Factor

If Base SaDF > 1.015; SaDF = Base SaDF + (1 + Base SaDF -1.015)^3.0 - 1

If Base SaDF =< 1.015; SaDF = Base SaDF

Base SA/Disp ratio: Base SaDF = (S ^ 2 / (Disp/64) ^ 0.67 / (0.25 * L + 17.0)) ^ 0.040

Keel Factor — Keel =Assigned Keel Factor

Spar Factor — Spar=Assigned Spar Factor

Trim Tab — MAF = Moveable Appendage Factor (Trim Tab)