**Propeller Calculation**

Total resistance, R=112.6 kN

Effective power, PE = 112.6X10X.5144=579.24 kW

Ship Length, LBP=70.8 m= 232.28 ft

Breadth, B=11.42 m = 37.46 ft

Draft, T=4.4m = 14.44 ft

Speed, V=10 knots

Volume displacement, =2660m3=99652.04 ft3

Propeller diameter, D=.6T=2.6ft

Co-efficient ,DW= =0.429

LCB=0.34M=1.12ft

Taylor wake fraction,

ω t= 0.22

Dt = = 0.149

Thrust Deduction factot, t = 0.204

We know,

T(1-t) = R

T = 141.45 kN

ηH = = 1.02

ηR = 1.04

VA = V(1-ωt )=7.8 knot=4.01 ms-1

Shaft immersion, h= D/2+0.2 = 1.5 m

H= T(Draft)- h

= 2.9m

Thrust ,T =141.45 kN

P0 =Patm+ρgH

=129745 N/m2

PV = 1646N/m2

K=0.2(for single screw)

Z=3

D= 3.08m

Here,

= 0.5

We know, KT/j2=

= 1.3

From chart,

nm = .5

j=.4

and

here, j=

so, n = 3.85 rps = 231.34 rpm

assume, ηD = .7

PD= = 579.24/.7 = 827.48 kw

Va = 7.7 knots

Bp = 1.158()

= 45.35

δ = 3.28

= 252.93

And, P/D = .79

So , From Bp -δ chart we get,

ηo = .52

P/D=.67

**Cavitation Check:**

=83.85 kPa

=

=

=250.33 kPa

= =0.33

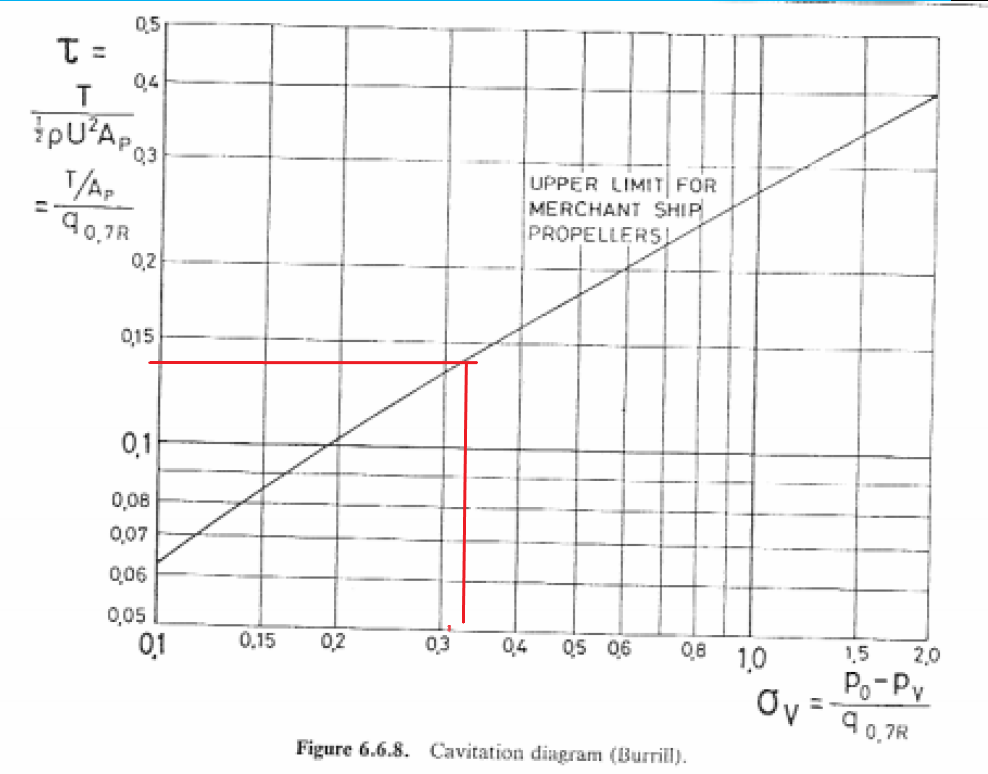
=

Therefore, =0.818

Assuming,

=0.14

From Burrill Cavitation Diagram (), the value obtained is just below the upper limit for merchant ship propeller.



Here,

ηD Calculated = ηH x ηR x ηo

= 0.55

€ = ηDCalculated – ηD assumed

= 0.55 – 0.7 < 0.005

So, ηD = 0.55