

**M.V. STABLE INCLUDING DAMAGE** (Ranger Hope © 2006)

**ANSWERS TO ASSIGNMENT TWO- FIND THE KG & LCG FOR THE NEW CONDITIONS OF LOADING 1 TO 4.**

**CONDITION 1 FULL DB TANKS DISPLACEMENT TABLE**

Item MV SABLE	Tonnes	V.C.G.	Vert. Moment	L.C.G. +/-	Long. Moment	F.S.N.
FWD DB f.water. P&S	600	3.1	1860	+22	+13200	
FWD DB fuel P&S	1100	3.1	3410	+11	+12100	
MID DB. f.w. P&S	600	3.1	1860	0	0	
ER DB fuel P&S	1100	3.1	3410	-11	-12100	
AFT DB ballast P&S	600	3.1	1860	-22	-13200	
<b>Deadweight</b>	4000		12400		0	
<b>Lightship</b>	4200T	6.5	27300	0M	0	
<b>Displacement</b>	8200		39700		0	

<b>New K.G.</b> 4.84M	<b>New LCG</b> 0 M Amidships	$\frac{39700}{8200} = 4.84M$
<b>F.S.N.</b>		
<b>Kgf</b>		

**CONDITION 2 FULL DB TANKS P&S /FULL HOLD DISPLACEMENT TABLE**

Item	MV SABLE	Tonnes	V.C.G.	Vert. Moment	L.C.G. +/-	Long. Moment	F.S.N.
FWD DB P&S	f.water.	600	3.1	1860	+22	+13200	
FWD DB P&S	fuel	1100	3.1	3410	+11	+12100	
MID DB. P&S	f.w.	600	3.1	1860	0	0	
ER DB P&S	fuel	1100	3.1	3410	-11	-12100	
AFT DB P&S	ballast	600	3.1	1860	-22	-13200	
Hold		1400	8.8	12320	+11	+15400	
<b>Deadweight</b>		5400		24720		+15400	
<b>Lightship</b>		4200T	6.5 M	27300 M/T	0 M	0 M/T	
<b>Displacement</b>		9600		52020		+15400	

<b>New K.G. 5.42 M</b>	<b>New LCG</b>	$\frac{52020}{9600} = 5.42 \text{ M}$	$\frac{+15400}{9600} = +1.6 \text{ M}$
<b>F.S.N.</b>			
<b>Kgf</b>			

**CONDITION 3 FLOODED FWD BALLAST P & S DISPLACEMENT TABLE**

Item	MV SABLE	Tonnes	V.C.G.	Vert. Moment	L.C.G. +/-	Long. Moment	F.S.N.
FWD P&S	ballast	800	7.8	6240	+29	+23200	
<b>Deadweight</b>		800				+23200	
<b>Lightship</b>		4200T	6.5	27300 M/T	0 M	0 M/T	
<b>Displacement</b>		5000		33540		+23200	

<b>New K.G. 6.7 M</b>	<b>New LCG</b>	$\frac{33540}{5000} = 6.7 \text{ M}$	$\frac{+23200}{5000} = +4.64 \text{ M}$
<b>F.S.N.</b>	<b>+4.64 M</b>		
<b>Kgf</b>			

**CONDITION 4      50 % FLOODED ER      DISPLACEMENT TABLE**

Item MV SABLE	Tonnes	V.C.G.	Vert. Moment	L.C.G. +/-	Long. Moment	F.S.N.
Use FSN of 1846 when E.R. 50% Flooded  <b>Engine room 50% flooded</b>  <b>DB Tank top = 3.1 +3.1 =6.2M</b>  <b>ER floods from Tank top To half of ER space= 8.8 -6.2 = 2.6 M</b>  <b>VCG flood water = <math>6.2 + \frac{2.6}{2} = 7.5 \text{ M}</math></b>	700	7.5	5250	-11	-7700	1846
<b>Deadweight</b>	700		5250		-7700	
<b>Lightship</b>	4200T	6.5	27300 M/T	0 M	0 M/T	
<b>Displacement</b>	4900		32550		-7700	1846

<b>New K.G. 6.643 M</b>	<b>New LCG</b>	$\frac{32550}{4900} = 6.643 \text{ M}$	$\frac{-7700}{4900} = -1.57 \text{ M}$
<b>F.S.N. 0.377</b>			
<b>Kgf 7.02 M</b>		$\frac{1846}{4900} = 0.377$	