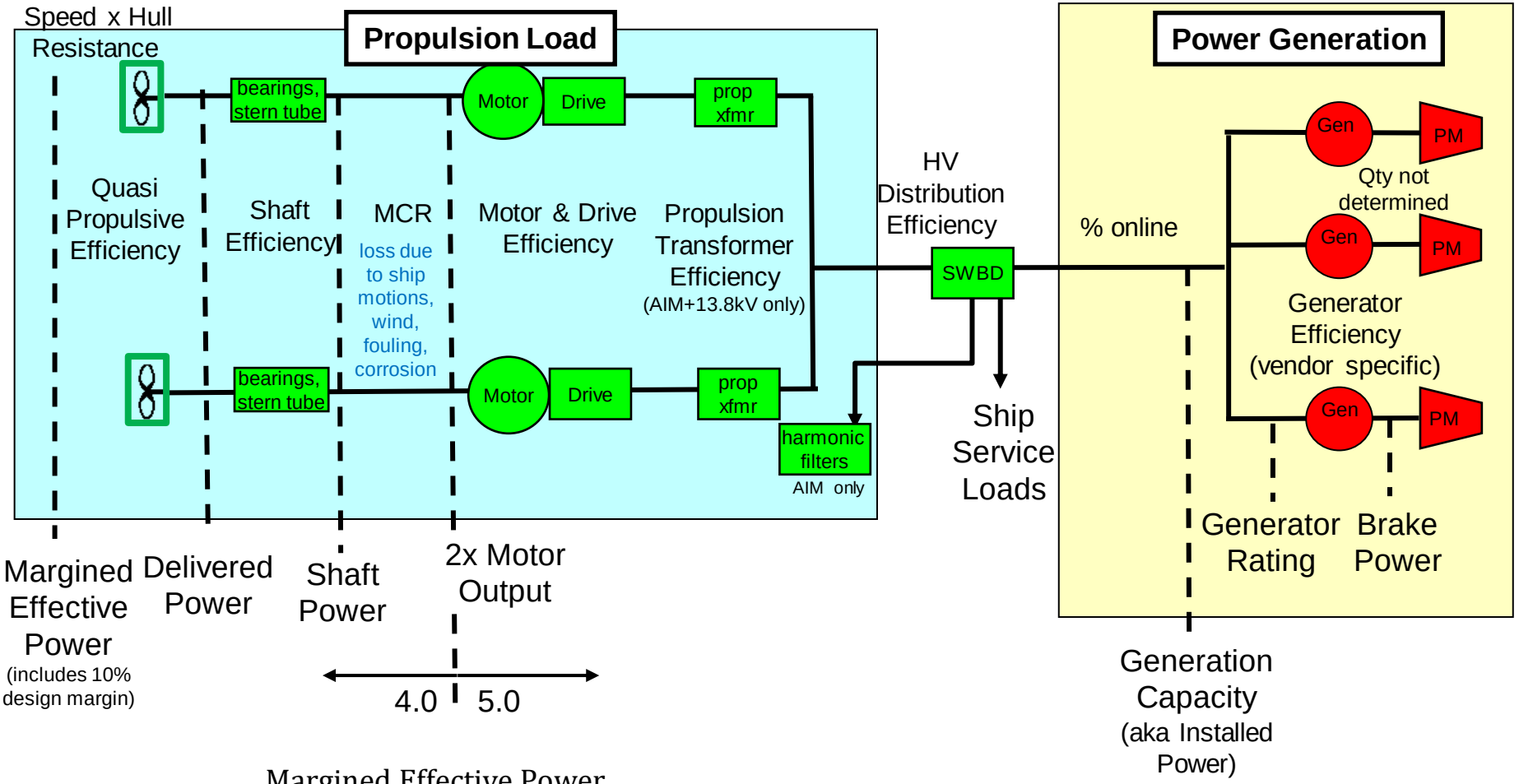
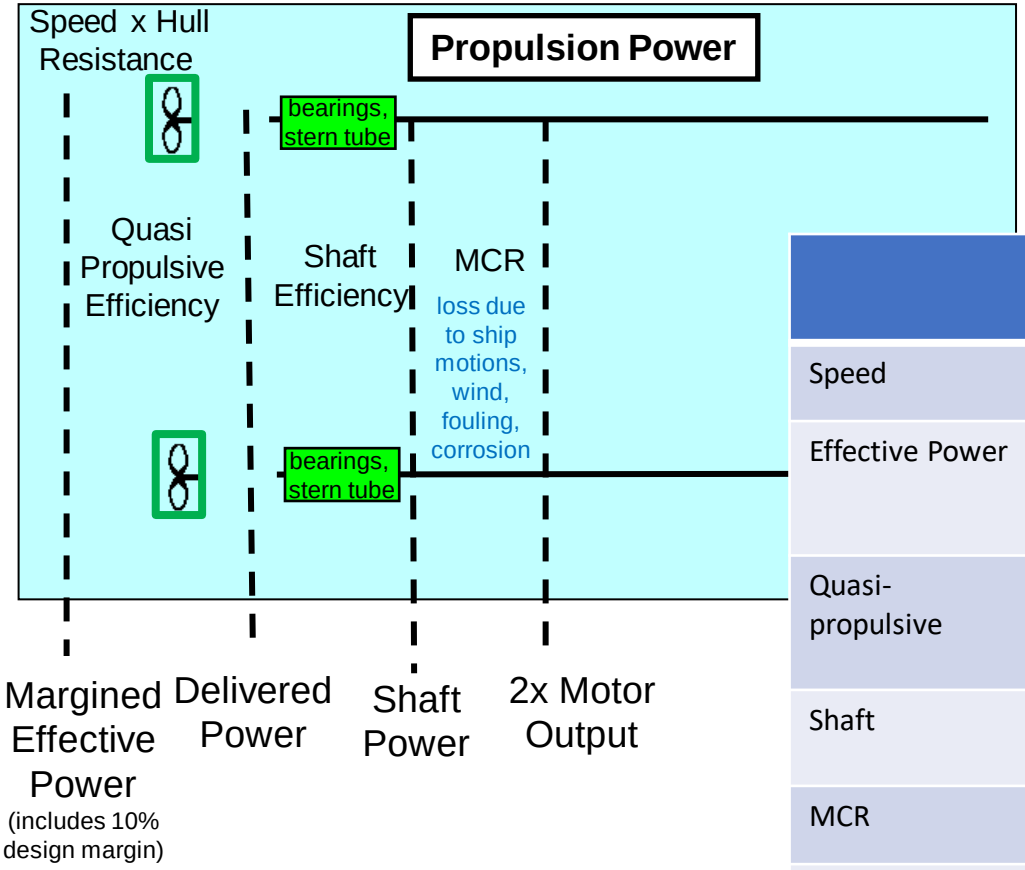
Equation to Generator Capacity



$$\frac{\text{Margined Effective Power}}{\text{QP x shaft x MCR x motor\&drive x xfmr (if applicable) x distribution}} + \text{ship service} = \%\ \text{online x Generation Capacity} + \text{harmonic filters (if applicable)}$$

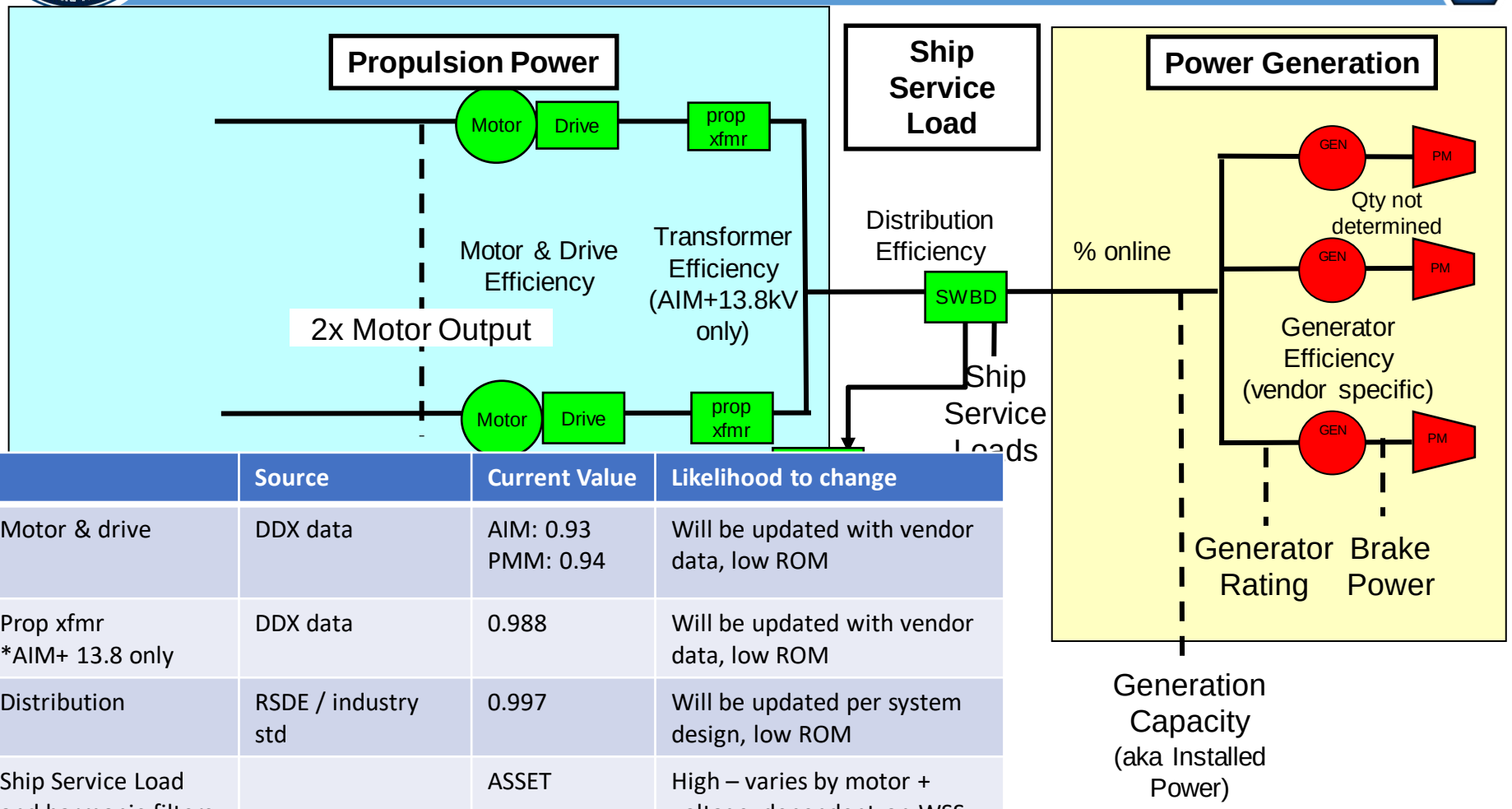
4.0 Numbers Rev 16 Nov 2020



	Source	Current Value	Likelihood to change
Speed	REQ-0010	28 kt	low
Effective Power	hull resistance curves x speed		Largely dependent on length; minor changes due to fairing
Quasi-propulsive	DDG1000 model test data	0.69	Will be updated on the order of 0-+2% to suit LSC prop
Shaft	Industry standard	0.99	low
MCR	Navy standard	0.80	low
2x Motor Output			

$$\frac{\text{Effective Power}}{0.69 \text{ x } 0.99 \text{ x } 0.8} = \text{2x Motor Output}$$

5.0 Numbers Rev 16 Nov 2020



	Source	Current Value	Likelihood to change
Motor & drive	DDX data	AIM: 0.93 PMM: 0.94	Will be updated with vendor data, low ROM
Prop xfmr *AIM+ 13.8 only	DDX data	0.988	Will be updated with vendor data, low ROM
Distribution	RSDE / industry std	0.997	Will be updated per system design, low ROM
Ship Service Load and harmonic filters		ASSET	High – varies by motor + voltage, dependent on WSS, condition under discussion
% online	THW	1.0	Low, pending TWH signature

Notes

1. Generator capacity must also satisfy (N-1) requirements.
2. Ship service load is a condition from the EPLA which includes margin and SLA.
3. The generator rating accounts for the overload capacity.
4. PMM drive has integrated transformer and DBR.