Essential information for shaft alignment calculations

Reliability of shaft alignment calculations depends on the completeness and accuracy of propulsion shafting modeling. The shaft alignment designer should have the complete information to model the propulsion shafting properly. There are two categories of essential information for shaft alignment calculation:

Category I – obligatory data, without this data it is not possible to make a calculation.

Category II – very important additional data, without this data, there will be a larger margin for error, with this data the calculation will be more reliable.

Pos	Description	Category	
		I	II
I. GENERAL			
1	Ship type and main particulars		*
2	Is the ship a new build or repaired		*
3	Set out the cause of the propulsion train repair including description of the failure nature and conditions, if the ship is under repair		*
4	Available shaft alignment equipment (laser system, strain gauges)		*
5	What is the purpose of the calculation		*

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II. SHAFTING			
1	General arrangement of propulsion train	*	
2	Production drawings of the shafts specifying their lengths and diameters	*	
3	Masses and center of gravity for heavy equipment associated with the shafting	*	
4	Information about filling of the shaft bore (oil, rods etc.)		*
5	Information regarding propeller shaft liner (material, thickness, length and position)		*
III. BEARINGS			
1	Stern tube drawing		*
2	Material and dimensions of the stern tube bearing bushes	*	
3	Stern tube bearing lubricator (water, oil)	*	
4	Diametric clearance	*	
5	Inclination of the stern tube bearings (if slope bored)		*
6	Permissible loads (nominal pressure) for intermediate bearings specified by manufacturer	*	
7	If permissible loads for intermediate bearings are unknown material and dimensions of bearing bushes	*	
8	Thermal growth at the bearings place		*
IV. PROPELLER			
1	Weight in the air / water	*	
2	Material	*	
3	In the case of CPP weight of the blades and hub volume (hub dimensions) or propeller weight in the water		*
4	Vertical and horizontal hydrodynamic forces and moments in operation		*
V. ENGINE			
1	Static thrust load Diagram (for low speed engines)	*	
2	Deflectional and angular compliances at the thrust-shaft flange (for low speed engines)	*	
3	Crankshaft dimensions, allowable loads for engine bearings and allowable stress in crankshaft if data of item 1, 2 for low speed engines are not available		*
4	Weight of flywheel	*	
5	Thermal growth	*	

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VI. GEAR BOX			
1	Output shaft drawing specifying shaft lengths, diameters and bearing positions	*	
2	Weight of the wheel	*	
3	Permissible loads for gear box bearings specified by manufacturer in static and dynamic conditions	*	
4	Allowable difference of loads on output shaft bearings in the case of plain bearings		*
5	Thermal growth	*	
6	Toothing forces		*
VII. COUPLINGS AND SLEEVES			
1	Overview drawing with dimensions	*	
2	Weight and center of gravity	*	
3	Allowable misalignment for flexible couplings		*
4	Angular and radial stiffness of flexible couplings	*	

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