

SMART Wind Consortium

Mechanical Systems Castings Discussion

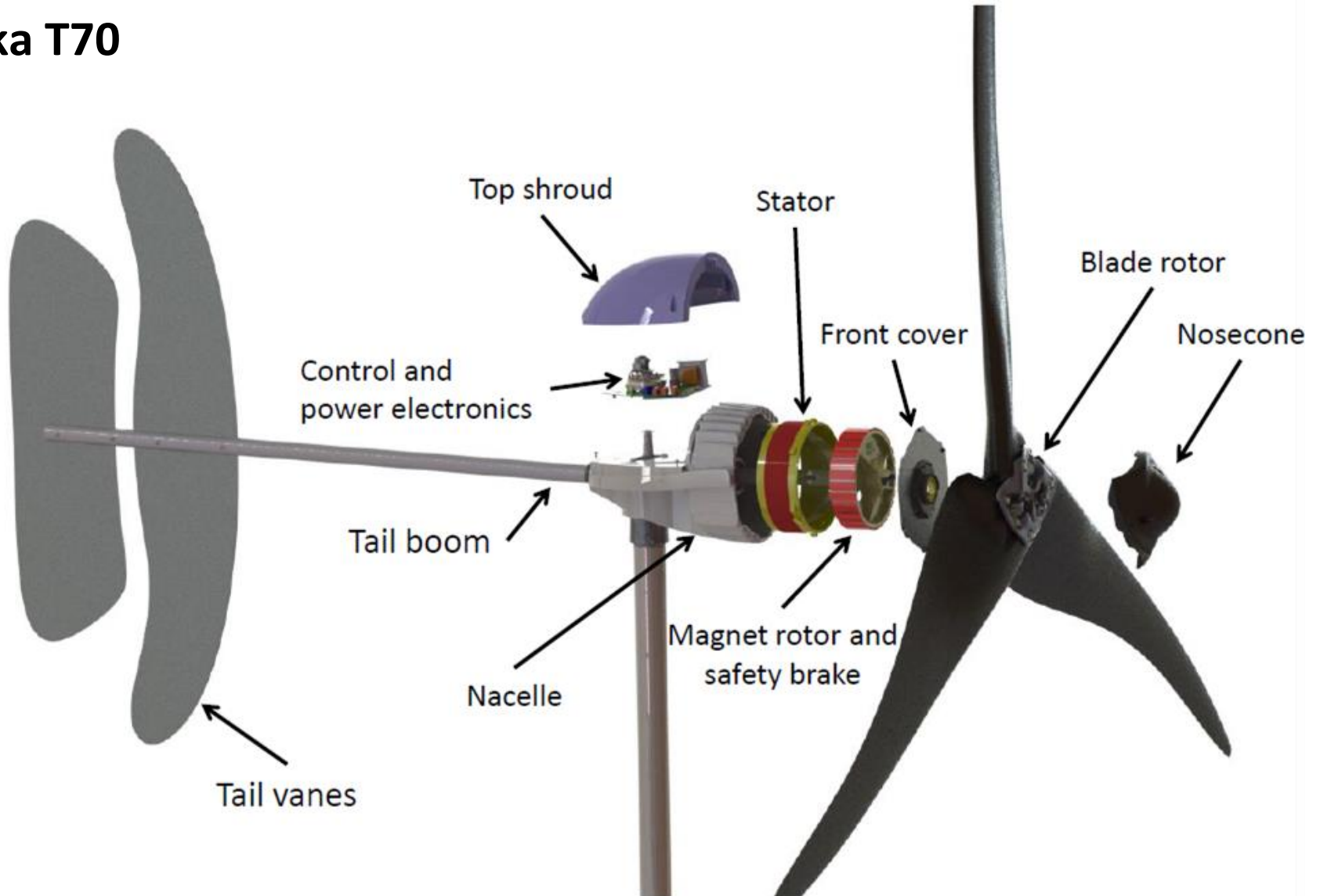
Mechanical Subgroup Meeting
November 13, 2014
NWTC
Boulder, Colorado, USA



Issues and questions from OEMs regarding castings

- What are the best practices for CNC machining of **near-net-shape castings**?
- What are the **advanced casting techniques** that could enable functionality out of fewer parts?
- How to efficiently/effectively move from raw castings to **near net shape casting** to reduce the cycle time on a sale. (Currently there is a need to machine the raw casting considerably)
- In general the turbine weight is high. aggravating the turbine loads. This increase weight is primarily attributed to big castings.

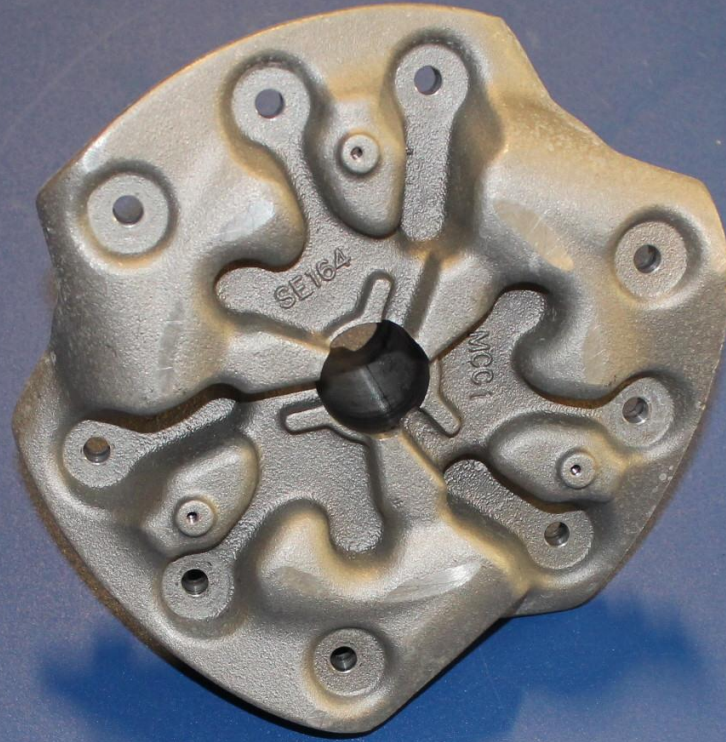
Pika T70



Yaw
(Aluminum)

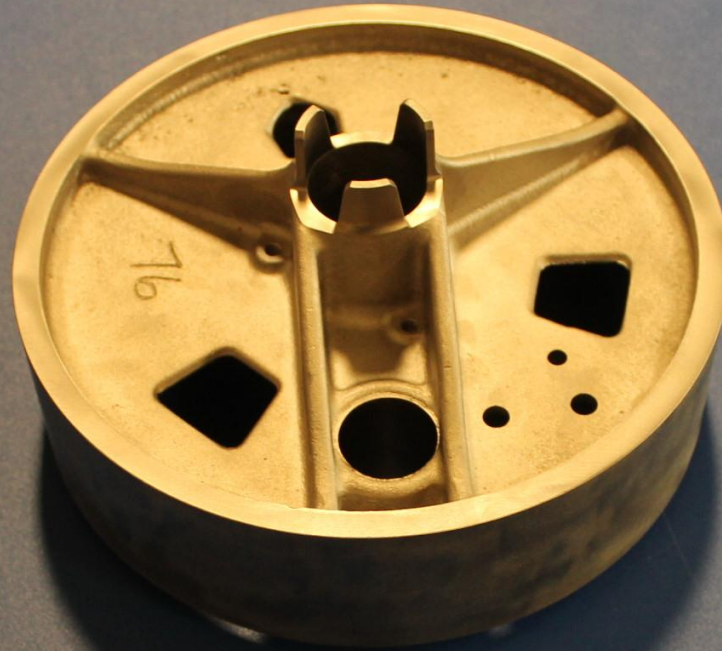


Hub
(Aluminum)

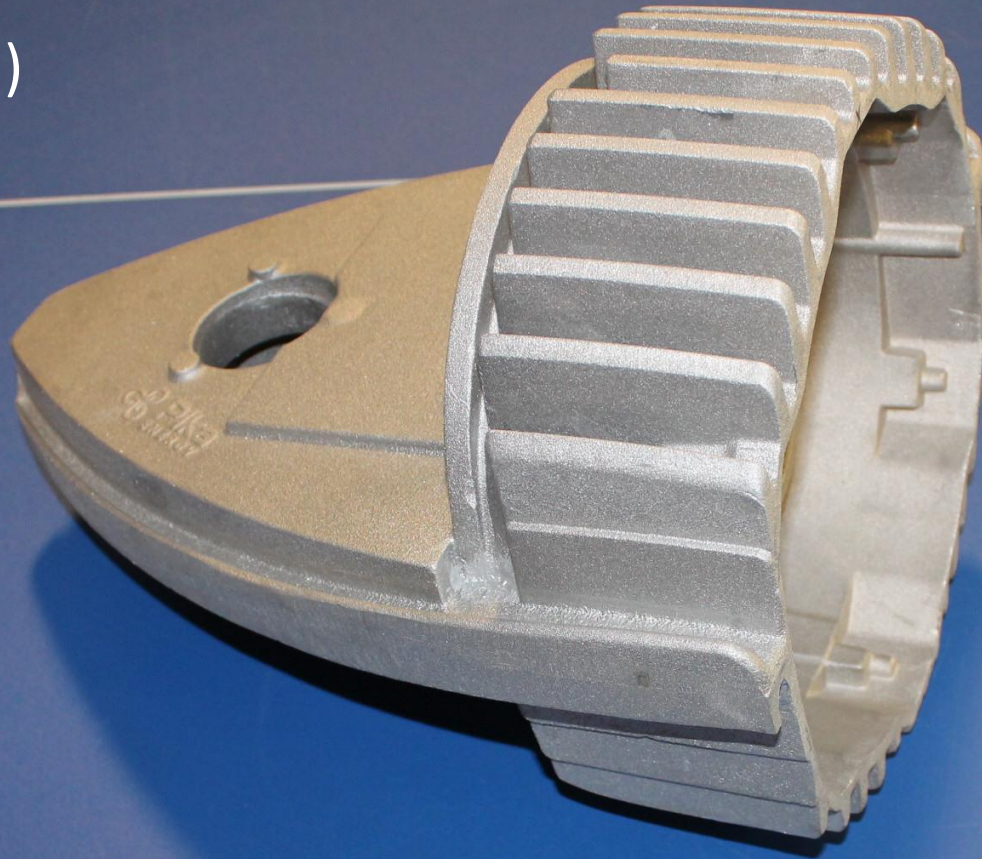


Pika
ENERGY

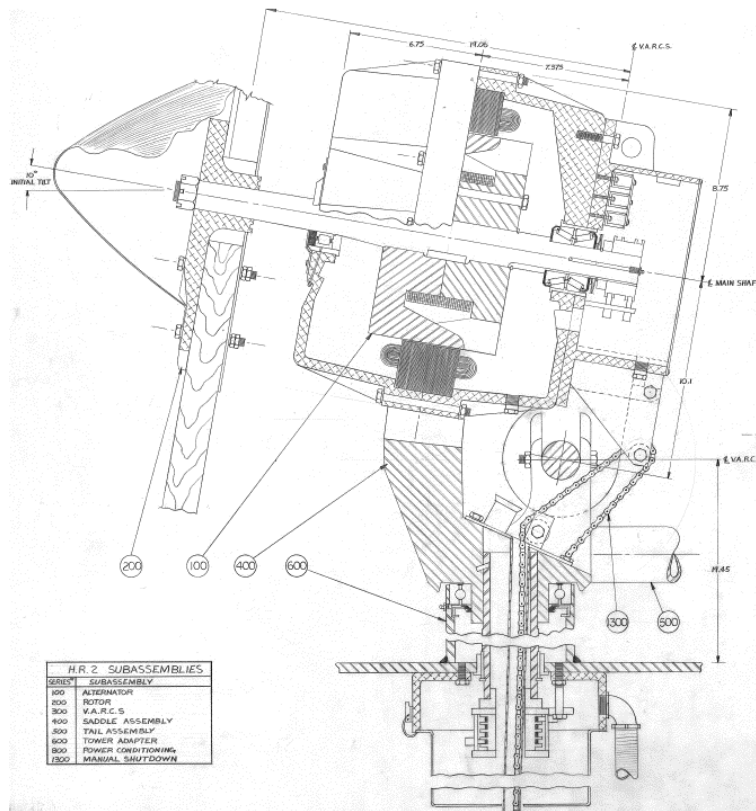
Rotor
(Aluminum)



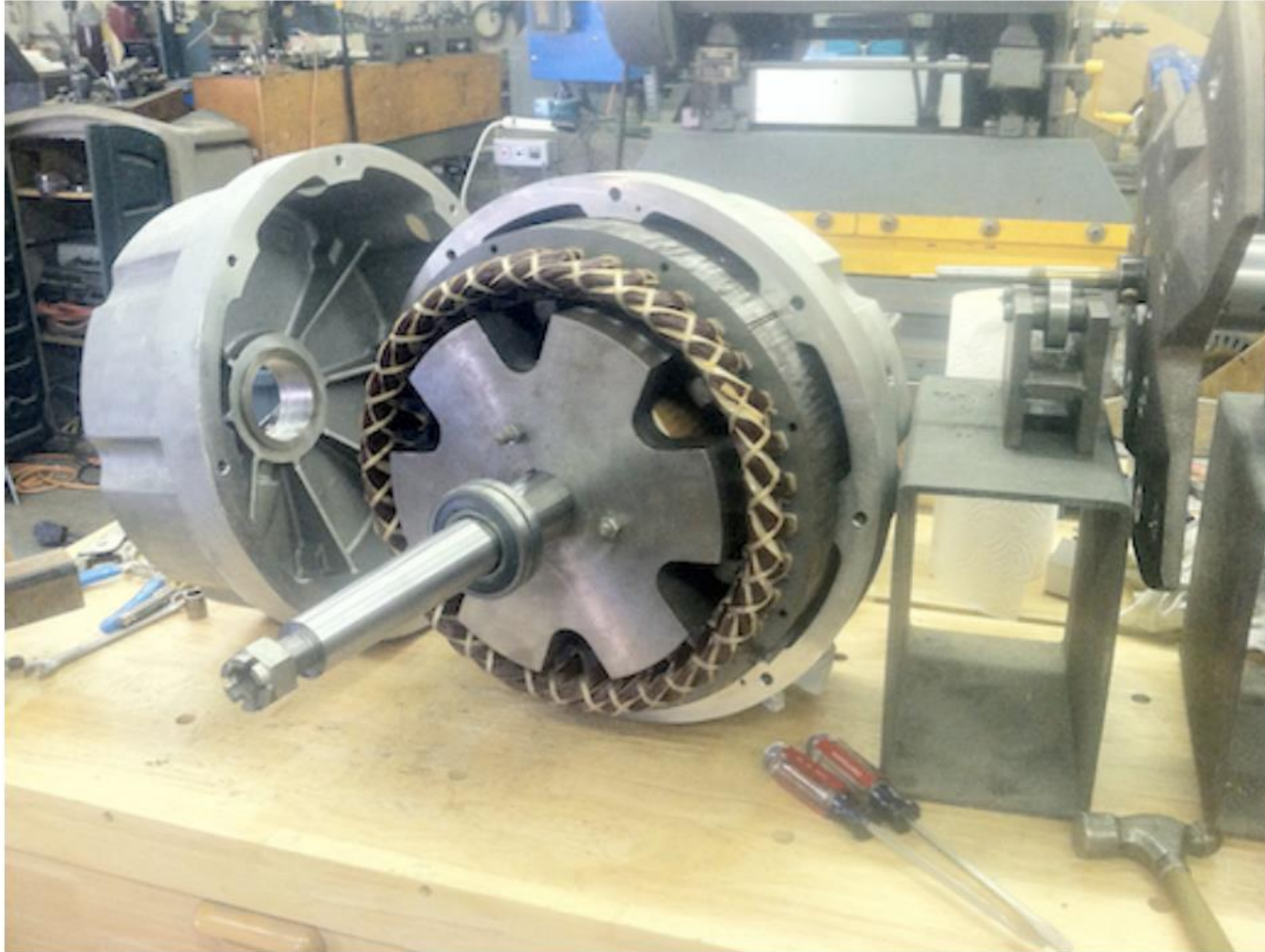
Nacelle
(Aluminum)



Black Island HR3



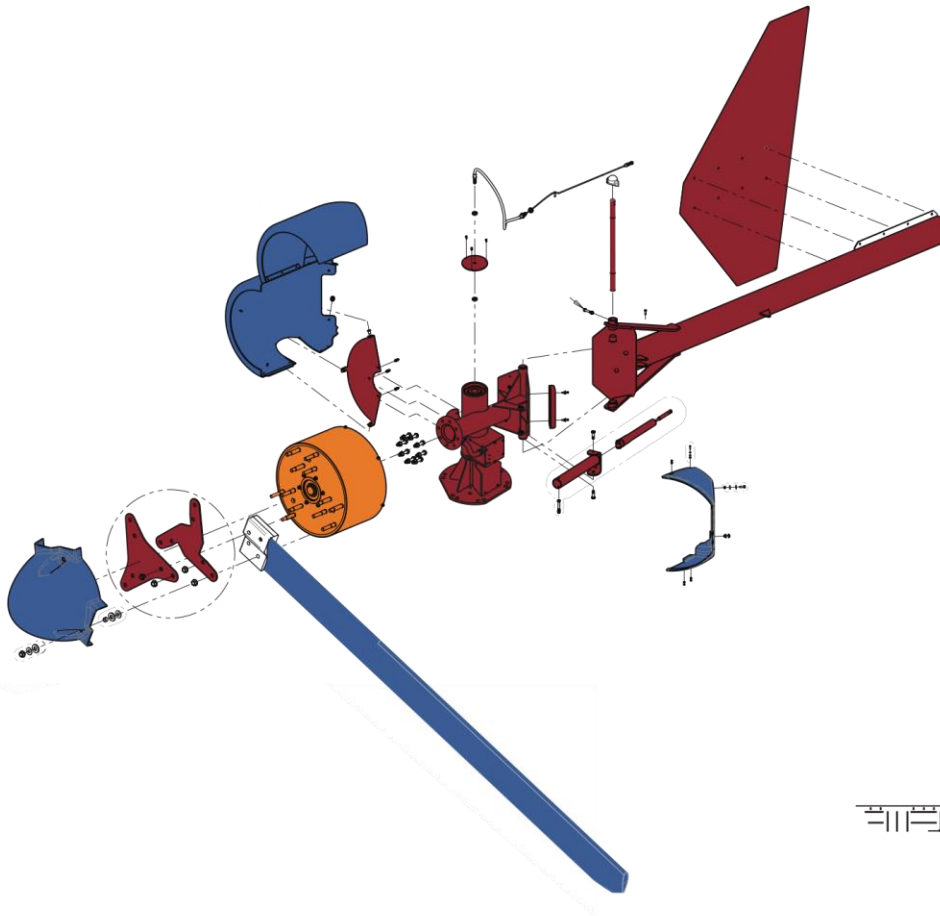
Generator housing (Aluminum)



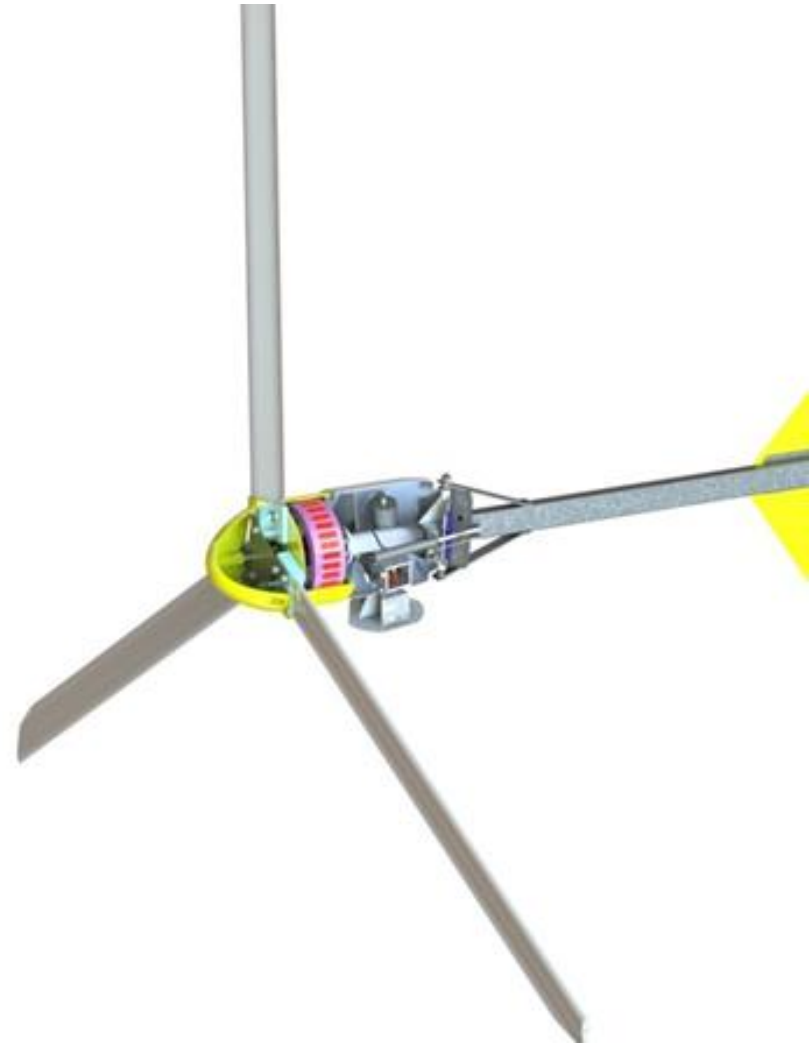
Nacelle/mainframe
Rotor Hub
Nosecone
(Aluminum)



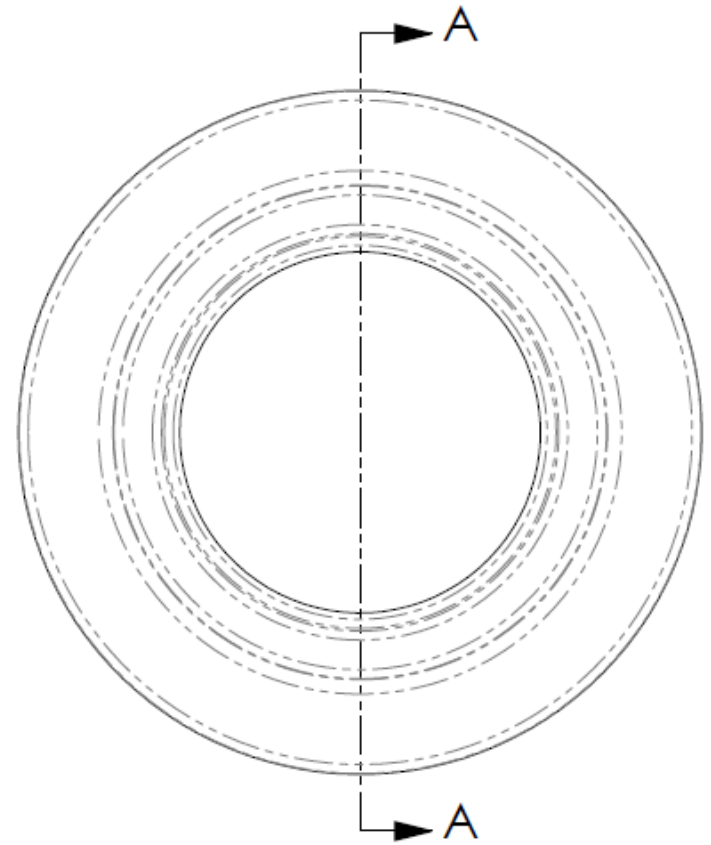
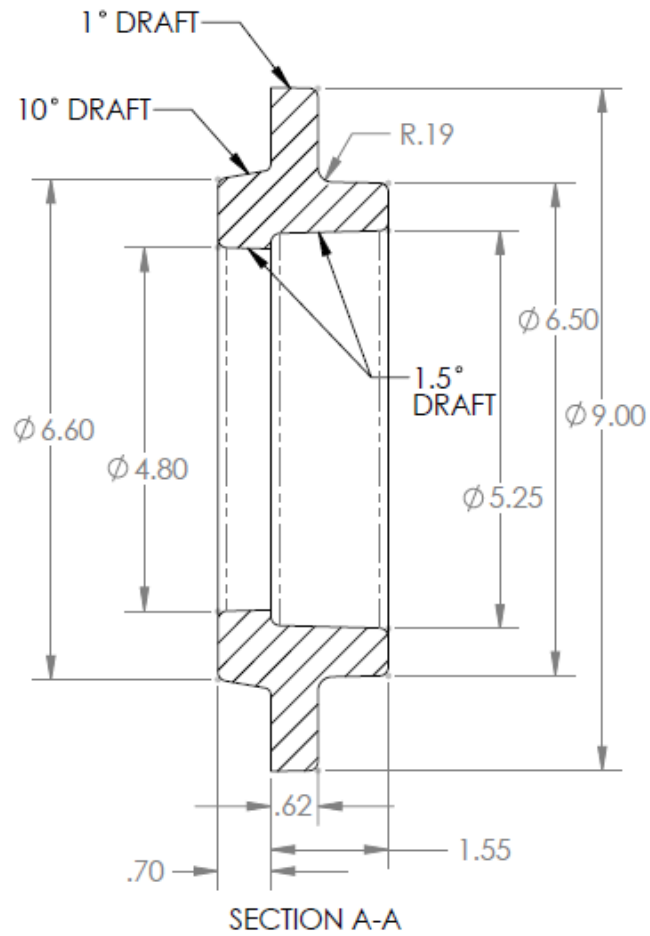
Bergey Excel 10



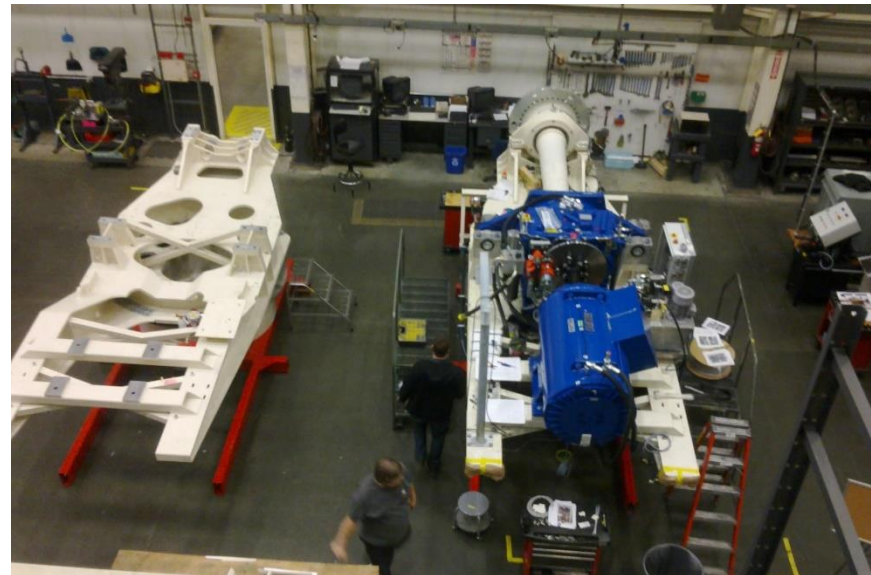
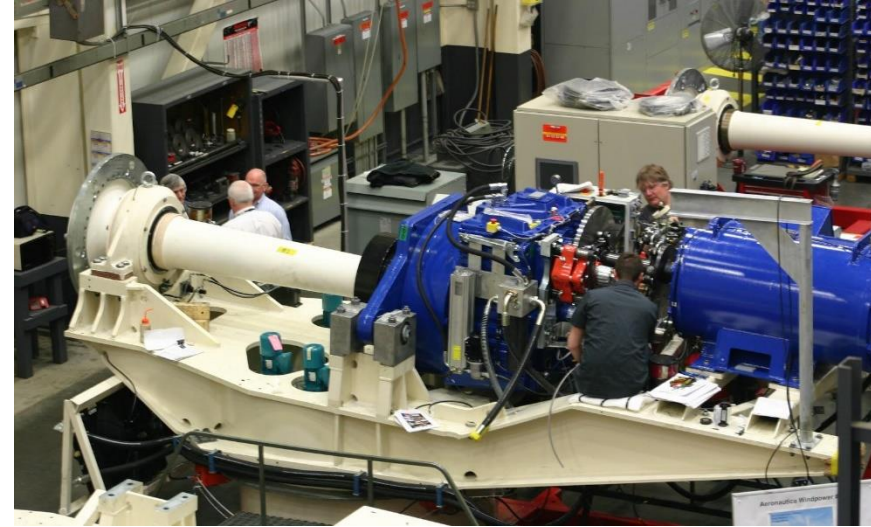
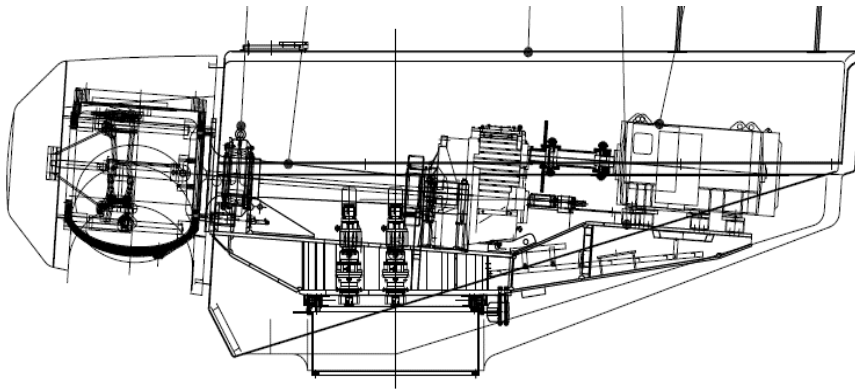
111111



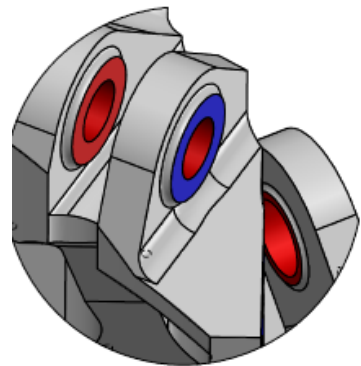
Front Bearing Holder (Ductile Iron)



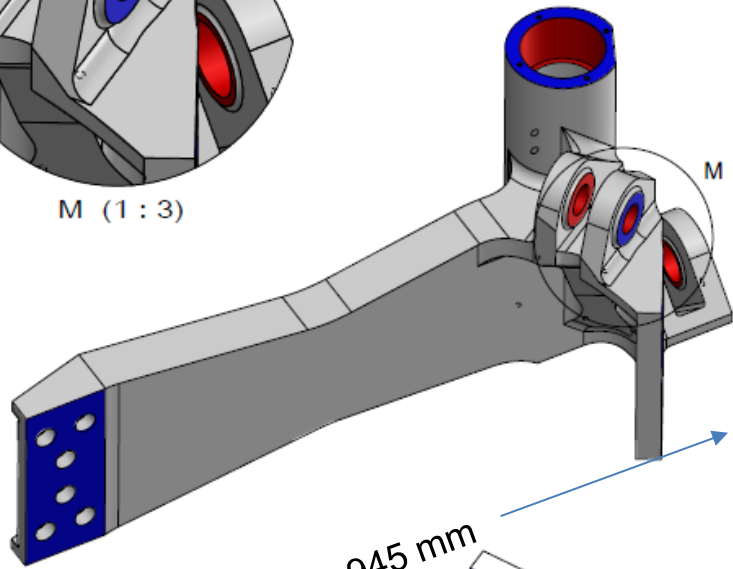
Aeronautica 54-750 kW



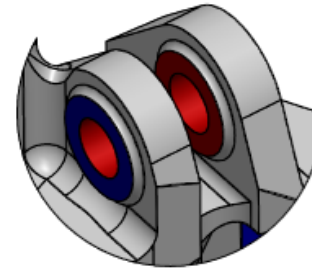
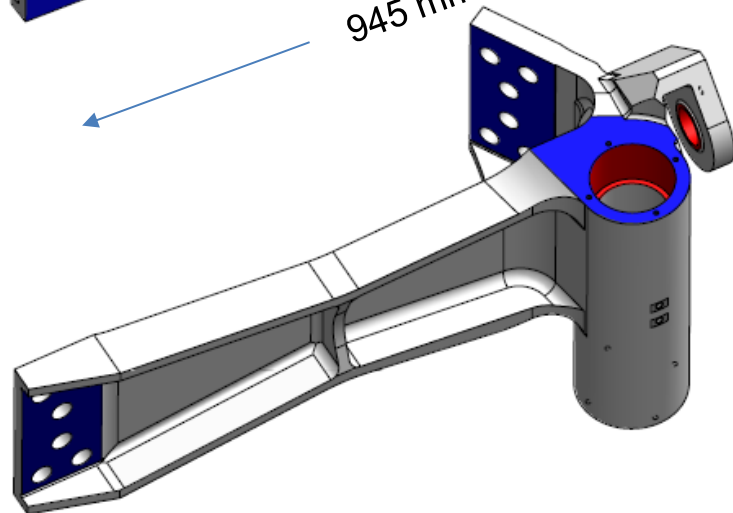
Pitch Triangle (Ductile Iron)



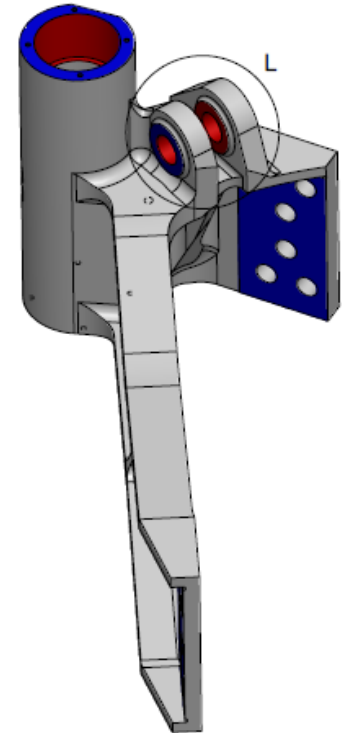
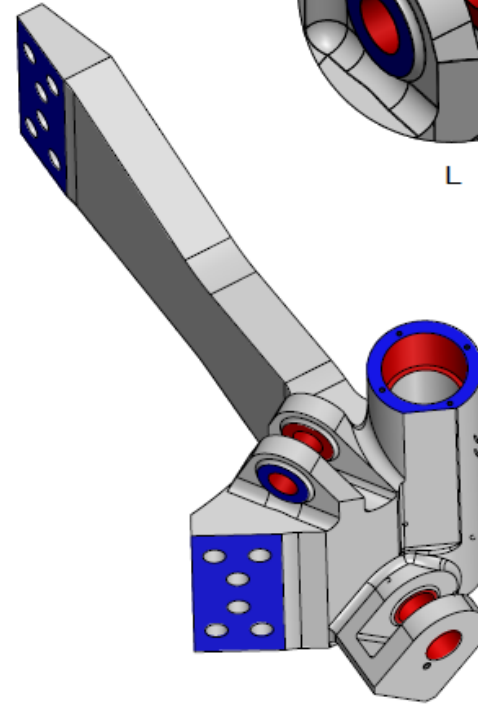
M (1 : 3)



945 mm



L (1 : 3)



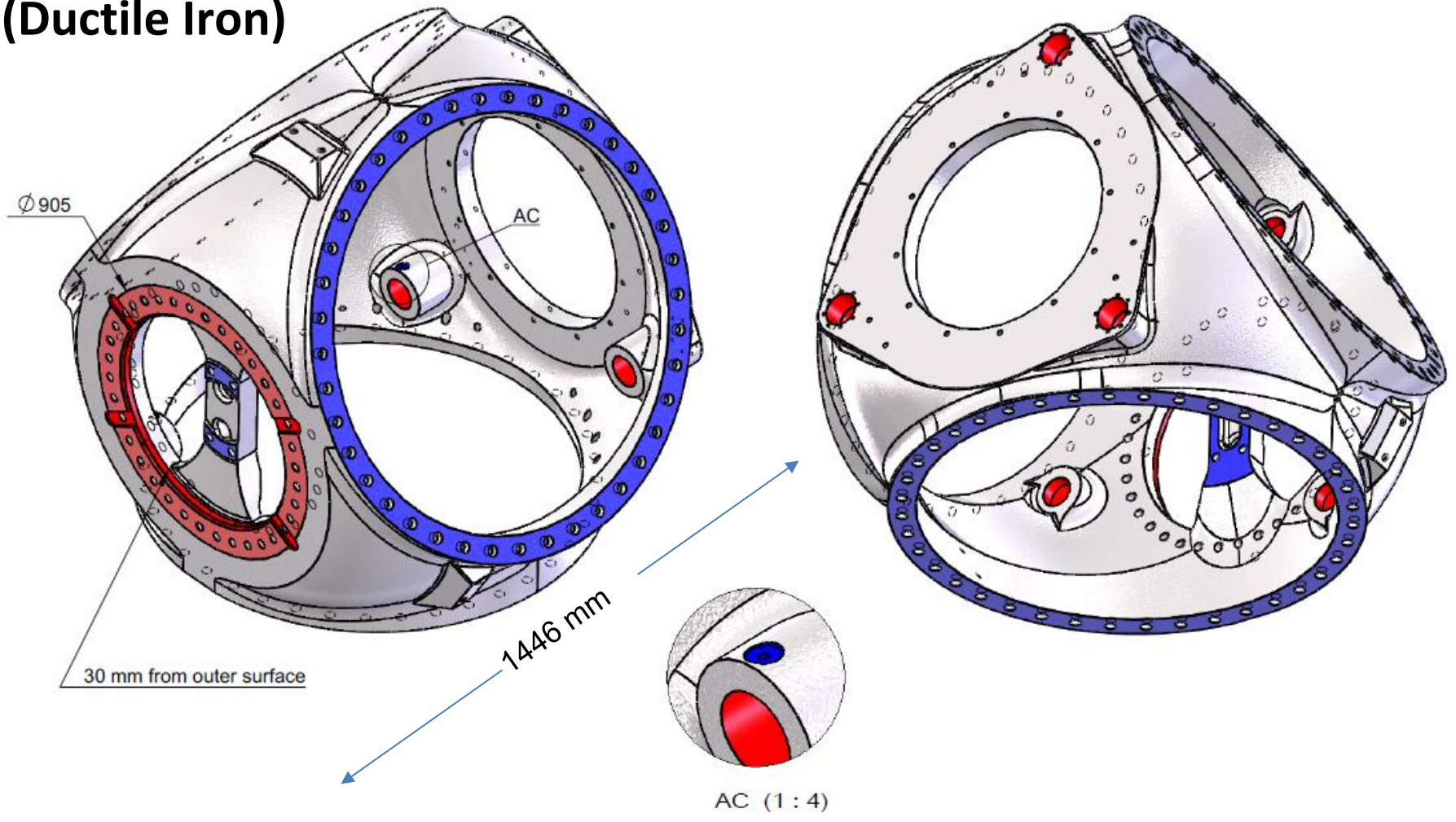
Note:
Raw surfaces (colour code RED) must be protected during abrasive blasting, prior to an during surface treatment.

Generally	Surface treatment according to S-NWX-Surface-Protection-System
	All surfaces to be metalized and painted except otherwise indicated by the colour
RED	Surface must remain raw and protected by rust preventive wax acc. NWX-111-2-
BLUE	Metalizing Only

norwin a/s	
wind turbine technologies Kildevej 7 DK-4521 Gadstrup Phone: +450483805529 Fax: +45 4838 3144 www.norwin.dk	
	WEIGHT: 86.59 kg
HK	22-03-2012 NPK 1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS.	ITEM: Pitch Slider Triangle Pitch System in Hub Pitch System
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Hub (Ductile Iron)



Note:
Raw surfaces (colour code **RED**) must be protected during abrasive blasting, prior to and during surface treatment

Generally | Surface treatment according to S-NWX-Surface-Protection-System

<p>norwin a/s wind turbine technologies Kildeager 7 DK-4621 Gadsbøup Phone: +45 4636 0829 Fax: +45 4636 3144 www.norwin.dk</p>	<p>UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS.</p>	<p>ITEM: Hub Machinery NW 750</p>
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