



SY WITCH



Supplementary report on
strengthening the mast support as
well as various clarifications as of
August 19, 2014



Various additions and clarifications, as well as the need to strengthen the mast support (compare point 11.) gave reason to adapt and supplement the expert report.

Here is the addition to the status as of spring 2014.

1 General information and dimensions

Yacht:	Formerly SY «FM Witch» now SY «Witch» (Name adjustment with flag license adjustment May 2005)
Registration:	Swiss flag certificate registration number 04331
Owner :	Frank Oser and Catherine Rusch
Place, date:	Ongoing during renovation and new construction, see 3. Date of completion of hull construction August 30, 2005 (interim report) Final report March, 28, 2011 Mulhouse, France Mast support May 1, 2014 Rosas, Spain

2 Sizing

Originally before construction (according to former flag certificate)

Length of hull :	10.24 m
Beam :	3.62 m
Draft :	1.30 m
Displacement :	10 tonnes
Sail area :	54 m ²
Type :	AD16
Shell no. :	SSR 4890
Construction year:	1978
Shipyard :	Venems Yachtbouw, Lemmer, Holland



After renovation and extension:

Length of hull: 11.98 m
Length overall: 13.10 m
Beam: 3.72 m
Draft: 1.60 m
Displacement: 18.8 t (50% tanks)
Sail area : 91 m²
Shell no. : SSR 4890
Reconstruction : 2004-2005 (hull construction)
Hull shipyard : BEKA Schiffsbau GmbH, 8444 Oberhofen, Switzerland

3 Preliminary remarks

The ship was brought by land transport to Switzerland for overhaul and renovation. The first work took place at Bertschi Petrol in 8181 Höri near Zurich, where the author of this report was consulted.

To develop the basics, the hull shape (lines) was measured and recorded and modeled on the computer (Maxsurf 10.03) so that the planned extension could be simulated, the corresponding hydrodynamics could be calculated, the pressure points could be determined and the new mast position could be defined.

After transporting the hull to BEKA Schiffsbau GmbH, 8444 Oberhofen in their workshop in Saland, all parts that were no longer in perfect condition were removed before the extension, so that only the keel and the lowest bend remained (picture 1).

The renovation was designed as a back decker with a center cockpit and high headroom (throughout the entire ship), using the existing rig and, where possible, the existing equipment and engine.



4 Purpose of the study (scope of survey)

This report was created after completion of all work in Mulhouse and is intended as a final report regarding seaworthiness and as a confirmation of value.

This report is preceded by a preliminary version of the completion of the hull work on August 30, 2005, which documents the new construction and its quality, as well as the proof of seaworthiness, as required by the Swiss Maritime Shipping Office in Basel for obtaining the Swiss flag for Offshore Yachts. Likewise the value of the ship can be quantified.

5 Kasko – new construction and procedure

5.1 Steel structure

The existing front and rear part of the long keel, bow and lowest plates were placed on a new 40 mm base plate, aligned in the extension and welded to it solidly all around .

The diesel tank underneath the shaft was pressed off and resealed (welded).

Originally the ship had neither transverse nor bottom flanges and was only stiffened by a narrow longitudinal stringer structure.

A transverse frame construction with surrounding crossframe construction and light longitudinal stringers was chosen for the new structure.



The dimensioning of the new structure was carried out according to Lloyds SSC V3 and checked with GL I 3 water sport vehicles and with the latest draft (05.2004) of ISO 12215, which results in the following dimensioning.

Outer skin : 4 mm (including side deck, back deck and body roof)

Frame stringer: 60*6 mm flat steel laser cut (including deck frame) R=15

Frame distance: 800 mm

Longitudinal stringer: 30*6 mm, distance 250 mm (including deck and superstructure)

Collision sheet : Thickness 6 mm, 400 mm behind FP DWL (according to GL 0.038 * LWL)

Bottom reinforcement: As mentioned, the ship originally had no bottom reinforcements. In order to absorb the forces resulting from the extension and the new structure, massive cross beams 80*6 were pulled in at floor level and welded to the frame stringers. The carrier holds the floor construction and is supported downwards on the shell with 4 40*60 mm steel straps each

All welds were carried out in accordance with the German Lloyds welding Regulations. It was processed extremely professionally and cleanly, resulting in a very stable new long-keel hull that absolutely complies with the latest regulations and standards.

5.2. Ballast

Ballast proportion: Based on the planned interior, the detailed weight Calculations resulted in a weight without ballast of 12.7 t. The ballast share was set at 30.2% i.e. 5.5 t, which gives a total weight of 18.2 t (with empty tanks)



Ballast installation: The 5.5 t of ballast was placed in the keel in the form of lead bars with the individual layers being filled with bitumen

5.3. Rudder

The rudder was completely rebuilt and the rudder area was increased to 1.2% of the effective sail area (1.1 m²). The sizing of the rowing stick was carried out according to GL and Lloyds SSC and resulted in a \emptyset of 50 mm. The construction was done using 4 ribs welded to the stick.

The rudder is stored on the one hand in the Hennegatt tube (Exalto) and on the other hand in a bronze box on the skeg. This part of the skeg can be removed with screws so that the rudder can be extended downwards.

5.4. Self-draining cockpit

The center cockpit is integrated into the construction of the backdecker and connected to the frame stringers, which are supported laterally under the cockpit on the keel construction and thus form the engine room.

The cockpit floor lies 1.2 m above DWL. Towards the entrance there is an area 300 mm deeper with a fixed coaming of 150 mm as well as a flexible coaming of 150 mm (pluggable) ISO 118123.4 8.3. The drainage pipes are also located in this area.

The dimensions of the drain pipes correspond to ISO 11812.4.

5.5. Gas box

BB aft in the aft peak is a self-contained gas locker with a separate deck hatch and aft outboard for 2 standard gas bottles.



5.6. Windows and hatches

Windows: GEBO windows in superstructure, side and backdeck side aft, partly to be opened

Hatches: GEBO 500*500 deck hatches as escape hatches in the fore and aft cabins

Companionway: Sliding hatch made of steel, very smooth, lockable in different positions
Plug in sheet combined with flexible coaming portion (see 5.4)

5.7. Machinery

A new engine was installed. The installation was completely new on the existing foundations.

Engine: Type : Beta Marine Diesel 67.1 kw (Kubota 90 HP)
BV 3800 B-90 HE
Number: 8S1656

Transmission: ZF Transmission

Cooling: Keel cooling running from StB to BB on both sides

Service : Single lever shift cable Vetus

Shaft: New Ø 35 mm

Stuffing box: New water-cooled (Exalto)

Propeller : **EWOL rotary wing prop Elica/Prop 23" ISO 35 (2017)**

Exhaust : V2A construction (exhaust gas resistant) runs aft under the ship for cooling



6. Bow thruster

VETUS BOW 6012D (October, 2021)

7. Sea valves

All new ball valves screwed for:

- Toilet 1 3/4 inch, kitchen 1 1/4 inch – 3/4 inch for seawater foot pump
- 2 bilge pipes 1 1/4 inch
- 3/4 stuffing box shaft (engine keel cooling)

8. Steering

Hydraulic control system (Vetus) with prepared autopilot pump

9. Board systems

Most onboard systems have been newly installed

10. Check list

1. Bow-anchor with at least 90m chain	ok
2. Blatten anchor with 15m chain and rope	ok
Sufficient rope	ok
Towing hawser 5 times the ship's length	ok
2 bilge pumps including 1 hand pump	ok
Pütz	ok
Radar 3G / radar reflector	ok
2 waterproof lamps with signaling device	ok
Emergency tool	ok
Bolt cutters	ok
Emergency tiller	ok
On-board pharmacy	ok



Drinking water supply 440L	ok
Dinghy Talamex TLA 250	ok
Mercury F 3.5 MH Outboarder	ok
Sailomat Wind Vane	ok
Logbook	ok
Sea road regulations	ok
Bearing compass	ok
Illuminated steering compass	ok
Binoculars	ok
Hand solder	ok
black cone - black ball	ok
Life raft, Seago, bag, 4 places	ok
2 lifebuoys with self-igniting lamp and 30m rope	ok
Hand fire flares and emergency rockets, smoke signal	ok
Emergency lantern	ok
Signaling mirror	ok
Flags N and C	ok
SSB radio receiver	ok
VHF/VHF emergency transmitter (mobile phone)	ok
Fire extinguisher 2 x powder	ok
horn	ok

11. Reinforcement of the mast support in 2014

11.1. Preliminary remarks

The original plan for the major renovation and reconstruction was to reuse the existing rigging of the original Witch. Because the ship would have been heavily under-rigged, the owners decided to use a larger, more modern rig with a shortened foresail triangle (partial rig) from Seldén.

Length of mast 17.25 m
Length of boom 4.82 m

The original top rig included a mast-laying device in the form of a mast chair, as was used on the original Witch.

The new mast has a larger profile and stands on a mast base that is common for this type of rig. The support surface of the new mast base has a different shape



and is larger and longer and could therefore no longer be mounted centrally above the mast support.

As a result, the force distribution on the mast support running below deck on the keel became asymmetrical and unfavourable.

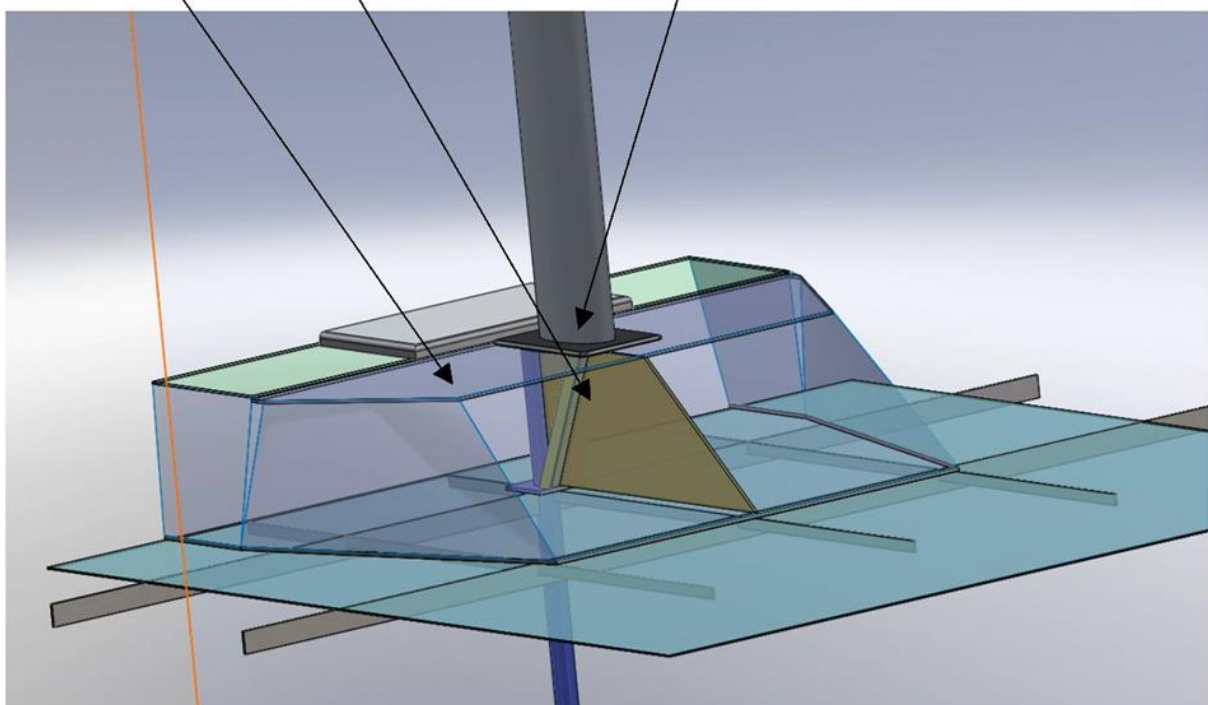
This resulted in a deformation of the upper structure and absolutely had to be corrected.

11.2 Purpose of the study (scope of survey)

The purpose of this report is to document the measures to strengthen the mast Support and to confirm the professional planning and execution for the flag and the insurance.

11.3 Execution of reinforcement from a shipbuilding perspective

Reinforcement was necessary to ensure the correct introduction of force into the existing structure. The rig was therefore removed again, the upper structure was cut open and a reinforcing middle plate (8mm) with T-reinforcement on both sides (40*40*5 mm) was installed according to the sketch below. The top plate was replaced with a stronger, thicker plate (8 mm)





The compression forces of the mast are absorbed by the middle plate and guided to the existing mast support using the T-reinforcements on both sides

The work was carried out by the owner with the support of a Swiss welder at the berth in Roses, Spain.

The planning and calculation was carried out by Panacek Yacht Design GmbH and accepted by the author on site in Roses on April 30, May 1, 2014.

11.4. Summary and conclusion of the mast reinforcement carried out

In summary, it can be stated that the introduction of a mast support was absolutely necessary. The chosen design created an extremely stable substructure and the force curve of the mast forces was corrected.

The hull is of extremely good quality, very robustly built and, although built on an existing keel, can be described as absolutely high quality. Many clever details and individual needs of the owners have already been implemented in the kasko.

The unrestricted seaworthiness of the SY «Witch» can be further confirmed.

In the last report dated March 28, 2011, the value of the ship was confirmed **CHF 350'000.--**. This value is still the same as of 2014.

The current adjustments and upgrades (rig) offset some depreciation on the components.

Thalwil, August 19, 2014

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Circular of the report :

- Owners of SY « Witch »
- Swiss Maritime Office SSA
- Murette, Insurance