

SAFETY INFORMATION NOTICE

No. 3 - 2015

Cheeki Rafiki MAIB Incident Report

Issued: 21 July 2015

Issues:

The publication of the Marine Accident Investigation Branch (MAIB) report of the fatal *Cheeki Rafiki* incident has highlighted numerous key safety aspects pertaining to:

- The importance of having a survey carried out by a qualified person in the event that a yacht has run aground or struck an object, occasioning damage to the keel and its attachment.
- The dependency on safety equipment and effectively raising the alarm on long ocean passages where search and rescue services are limited.
- The need for risk management and contingency planning for offshore passages.
- The associated risks of attached keel designs prevalent on modern yachts.

Notice:

Attention is drawn to the [MAIB Report](#)¹ which provides a detailed analysis into the keel detachment and capsize of the sailing yacht *Cheeki Rafiki*. In addition, a [safety flyer](#)² has been published summarising the key safety lessons to be learned.

Details:

On 16 May 2014, an alert was received from the PLB of the skipper of the yacht *Cheeki Rafiki*, which was on passage from Antigua to the UK. Despite a major search effort, during which the yacht's upturned hull was located but not recovered, *Cheeki Rafiki*'s four crew remain missing. It was determined that the yacht capsized and inverted following a detachment of its keel. The most likely cause was concluded to be a combined effect of previous groundings and subsequent repairs to its keel and bilge, which had possibly weakened the vessel's structure where the keel attached to the hull. A consequent loss of structural strength may have allowed movement of the keel, which would have been exacerbated by increased transverse loading through sailing in worsening sea conditions.

¹ <https://www.gov.uk/maib-reports/keel-detachment-and-capsize-of-sailing-yacht-cheeki-rafiki-with-loss-of-4-lives>

² <https://www.gov.uk/government/publications/safety-lessons-keel-detachment-during-ocean-passage>

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Safety Lessons:

Technical Concerns

- In the event of repeated groundings, it is possible for the keel attachment structure to weaken. In this case the subject yacht was constructed from glass-reinforced plastic with keel floors bonded to the hull.
- Identifying areas of structural damage near the keel attachment point is difficult and may require specialized non-destructive examination techniques. Hammer testing may result in false indications due to the clamping effect of the keel bolts and standing rigging. Specialist advice should be sought.
- Any grounding has the potential to cause significantly more damage than may be subjectively assessed or visually apparent. All groundings, including those perceived to be 'light', should result in an inspection for possible damage by a suitably competent person.

Safety Equipment

- Search and rescue mid-ocean is hampered by the time it takes fixed-wing aircraft to arrive and their ability to assist on scene. Consideration needs to be given as to how the alarm will be raised; which should be by the quickest means and with an accurate position. Wearing and activating a PLB provides additional assurance if it has not been possible to deploy the vessel's EPIRB.
- It is likely to take many hours or days before SAR assistance can be provided mid-ocean, during which time being able to board a liferaft will be key to survival. In small craft there will be a trade-off between positioning the liferaft so it will deploy automatically and float free in the event of an emergency, and the risk of it deploying accidentally in heavy weather.
- It is recommended that, if practicable, an EPIRB is installed in an easily accessible location, capable of floating free and activating automatically if the vessel sinks.

Sailing Practices

- Operators and crews need to be aware of the associated danger of keel detachment, and have preventative procedures in place to reduce the risk. This can be done by regular inspection of the keel attachment area, checking of keel bolts (which must be tightened at all times to a designated torque), and documenting actions to take in the event of flooding, including reducing the load on the keel and preparing the yacht for possible capsizing and inversion.
- When taking on water, the keel attachment area should always be thoroughly checked as a potential source of water ingress.
- Ocean passages require comprehensive risk assessment and contingency planning. A compromise needs to be made between planning a high latitude route and a low latitude route, avoiding particularly adverse weather at the expense of a slower passage. Suitable diversion ports should be identified along the planned track and sufficient navigational information should be available to permit entry in an emergency.
- Weather routing, vessel tracking and frequent communication from a shore-based support cell can significantly reduce the risks of offshore passages.