# APPENDIX 19

**Business Post Naiad Report** 

### **BUSINESS POST NAIAD**

## **Background**

BPN was "grandfathered" under the Notice of Race 6.1.7, allowing yachts with a Stability Index or Limit of Positive Stability of 110° or more, to enter the race, providing it had competed in a previous SHYR. BPN had competed twice before as "Swuzzlebubble".

During the Review process, it was noted that BPN's IMS Certificate (711500) issued on 15/10/98, did not meet the required 110° for either LPS or SI.

The Chairman of the SHRRC engaged yacht designer and Australian Representative of the International Technical Committee of the ORC, Mr David Lyons, to independently review the matter. His report is attached.

### History of the yacht

BPN was designed by Bruce Farr, built in New Zealand and launched in December 1984 as "Swuzzlebubble IV". She was part of the New Zealand Admirals Cup Team in 1985.

"Swuzzlebubble" competed in the SHYR in 1985 and again in 1987, and was raced very actively out of the CYCA in the Blue Water Point Score, Short Ocean Race Point Score and long races like Sydney to Southport and Sydney to Mooloolaba.

Bought by Bruce Guy in 1994 and renamed "Naiad", she was campaigned extensively out of Launceston, competing successfully in 2 Melbourne to Hobart races, 1 Melbourne to Devenport, Melbourne to Burnie, Melbourne to Stanley, and in 4 Three Peaks Races.

Swuzzlebubble/BPN completed tens of thousand of ocean miles, including many Bass Strait crossings.

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BPN was a near "sistership" to a number of similar "FARR 40's", that were regarded as the consumate racing yacht of their era. Others were Indian Pacific, Nadia IV, Paladin,

Sagacious V, and these yachts completed extensively and successfully in ocean racing including the SHYR.

# Administration with respect to BPN

Notice of Race Item 6.1.7 "Grandfathering" specifies the stability requirements under which BPN was eligible to race. As is practice, the yacht was issued an Entry Form when a valid but not current IMS Certificate was lodged with the Application for Entry and had until 5pm, 22 December 1998 to provide a valid and current Certificate.

Mr. Bruce Guy the yacht's owner was reported as having moved the remaining lead bilge ballast blocks some 18 months ago and in accordance with IMS requirements applied for a new IMS measurement afloat (Inclination). This was completed by IMS Measurer, Mr. Richard Fisher, on 18th July 1998.

The measurement data was transmitted to the AYF for the processing of a new IMS Certificate. Prior to final release of the new certificate the Technical Manager of the AYF, Mr. Tony Mooney, contacted Mr. Fisher to advise that the yachts calculated stability was noticeably reduced. As a result the issue of the certificate was delayed while Mr. Fisher conducted some checks. It was confirmed by Mr. Fisher that the data entered on the IMS certificate was believed to be correct. The certificate was sent to Mr. Guy, who in due course sent a signed copy to Race Organisers.

In signing the certificate Mr. Guy certified that he understood his responsibilities under the IMS Rule.

It is believed the certificate was lodged with the CYCA in mid- December, and although the receipt was recorded, the fact that the certificate showed he yacht did not meet the stability requirements for the race was not detected. BPN was ineligible to compete in the 1998 SHYR.

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ATARA - RAPSCALLION - Toam FUJITSU - CUCKOO'S NEST - WICKED - VALTAIR - DICTATOR - ROBERTSON 950 - Mount Gay
30 - DANCES WITH WAVES - COROBBOREE - BOX OFFICE - CRITICAL PATH - GONDWANA - ROBBOCOP - BUCK - LYONS 750
- Too-Hot-2-Trot - SKYBIRD - ADDICTION - BREAKAWAY - JARKAN 40 - PATRICE - SEABIRD - NAUGHTY CALL NEWCASTLE AUSTRALIA/BALANCE BAR BOC50 - ALLUSIVE -EASTERN QUEEN - VANGUARD - PIANOLA V - LYONS 8000

# Sailing Yacht "Business Post Naiad"

# 1998 Telstra Sydney to Hobart Yacht Race

Disclaimer: This report was requested by the Chairman of the 1998 Telstra Sydney to Hobart Yacht Race Review Committee. It relies entirely on the veracity of the International Measurement System (IMS) Rating Certificates supplied and the information contained therein, as well as notes taken during discussions with a crew-member from the yacht, the yacht's IMS Measurer and the Technical Manager of the Australian Yachting Federation (AYF). No responsibility is accepted for the correctness of the information received. The opinions offered are based on the personal experience of the author, but are given without the assumption of any liability, and without prejudice to the author.

### 1. Scope

The Chairman of the 1998 Telstra Sydney to Hobart Yacht Race Review Committee requested the author to comment as far as possible, as to the material significance or otherwise, of the IMS stability information contained on the IMS Rating Certificate (Number 711500, issued 15<sup>th</sup> October 1998 – Attachment 2) of the yacht "(Business Post) Naiad". Specifically, it has been recognised that the Limit of Positive Stability (LPS) and Stability Index (SI) recorded therein, being 104.7° and 102.8° respectively, were below the lower limit of acceptability for the 1998 Telstra Sydney to Hobart Yacht Race ("the Race"), which was 110° for yachts 'grandfathered' in accordance with the Notice of Race (NOR). Notwithstanding this, the yacht's entry was accepted and the yacht started the Race on 26<sup>th</sup> December 1998.

Recognising that this is so, and recalling the Disclaimer noted above, the following comments are made regarding the author's opinion on the material significance of this deficiency in stability requirement within the context of contemporary IMS practice.

#### 2. Introductory Notes

The following notes will provide background information of an explanatory nature:

- The IMS calculates certain information about a yacht's measured statical stability (useful in predicting resistance to gusts and capsize). The calculation methods embedded in the IMS software include classical naval architecture methods and endorsed stability indicators derived from ongoing research that had their main impetus from the 1979 Fastnet Race and subsequent technical meeting minutes and papers.
- 2. The calculations are subject to measurement tolerance. The IMS software is sufficiently well written to flag any gross errors in input data that could otherwise lead to major inaccuracy in calculated data. At a lower level, errors in input data must be identified by the personnel who have the responsibility for measurement in the field (accredited IMS Measurers), or the AYF which is the issuing authority in Australia.
- 3. Measurement variability and IMS certificate "quality" in Australia is representative of the standards of practice elsewhere in the world.
- 4. The LPS that is calculated on the IMS certificate is in most instances a conservatively low (safe) value, as its derivation disregards the added buoyancy of the yacht's decks and coach-roof.

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- 5. This system of stability assessment for offshore racing yachts has been in continuous operation for a decade in Australia (and for longer overseas), and in the opinion of the author, has lead to a general increase in the stability, and therefore safety, of IMS-rated yachts.
- 6. Stability assessment as required by the IMS has a beneficial effect on the resistance to knock-down and capsize of offshore racing yachts.

### 3. IMS Stability of "Business Post Naiad"

It is reported that Attachment 1 accompanied the yacht's application for entry to the Race. As it accompanied other information deemed acceptable by the Race organisers, the yacht's entry was accepted.

Approximately 18 months ago, the yacht's owner, Mr.Bruce Guy, is reported to have removed all the remaining lead bilge ballast blocks from the yacht. In accordance with IMS requirements, he applied for a new IMS measurement afloat, which was completed by the IMS Measurer, Mr.Richard Fisher on 18<sup>th</sup> July 1998.

The data was transmitted to the AYF for processing of the new IMS certificate. Prior to final release of the new certificate, the Technical Manager of the AYF, Mr. Tony Mooney, contacted Mr. Fisher to advise that the yacht's IMS calculated stability was noticeably reduced. As a result, the issue of the certificate was delayed while Mr. Fisher conducted some checks. After further discussions, which included investigation as to whether there had been a typographical error in measurement data, it was confirmed that the data as entered on the IMS certificate (Attachment 2) was believed to be correct.

The certificate was sent to Mr.Guy, who in due course sent a signed copy to the Race organisers.

Both Mr. Fisher and Mr. Steve Walker, a crewmember on the yacht in the Race, upon learning of Attachment 2's contents, brought to Mr. Guy's attention the stability deficiency. They pointed out that it fell below the limit of acceptability for the Race. Notwithstanding this, the yacht proceeded to compete in the Race under this IMS certificate.

# 4. IMS Certificate Inconsistency

Mr. Walker located the lead believed to have been removed from the yacht, and forwarded the author a facsimile (Attachment 5) on 20<sup>th</sup> January 1999 with information about the weight of the ballast. Due to an oversight, the weight of the ballast had been omitted from the Measurement Inventory dated 18<sup>th</sup> November 1995 (Attachment 3) which was completed before the ballast was removed. This information is normally recorded in accordance with IMS requirements.

As can be seen from the facsimile, the weight was believed to be approximately 300kg. However, the IMS certificate (Attachment 1) records a measured displacement (DSPM) of 6020kg and the latest certificate (Attachment 2) a DSPM of 6287kg. This *increase* in the physical weight as calculated by the IMS lines processing software (LPP) is unexpected, and notwithstanding measurement tolerances, is believed to be incorrect, considering approximately 300kg was actually said to be *removed*. The only documentary evidence as to the outfit of the yacht including heavy items at the time of

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measurement is the Measurement Inventory dated 18<sup>th</sup> July 1998 (Attachment 4). This document does not provide any explanation for the weight increase. Mr. Walker reported that several items of accommodation were added without being recorded, but it is the opinion of the author that this is unlikely to account for the entire difference.

To summarise:

Calculated increase in DSPM = 6287kg-6020kg = 267kg

whereas

Ballast removed (reduction in DSPM) = 300kg

IMS measurement requires bilges and tanks to be dry at the time of measurement afloat. Even if this requirement were not complied with, the inconsistency cannot be explained, unless the earlier certificate (Attachment 1) was wrong.

On balance, it is the opinion of the author that there could have been an error in the freeboards (FFM and FAM) on the IMS certificate (Attachment 2). Mr. Fisher believed them to be correct in a conversation the author had with him in the course of enquiries, but it is believed doubt remains.

The IMS certificate also records measured righting moment data (RM, RMC), which appear consistent with both IMS certificates considering the ballast removal.

In closing it is possible that if the freeboards were incorrect on the latter certificate (Attachment 2), but the RM and RMC data were correct, that the IMS calculated limit of positive stability and stability index (LPS and SI) would have been greater, perhaps in the order of 5-8°. It is stressed that this cannot be checked retrospectively.

Inspection of the yacht's IMS offset file (NAIAD.OFF) using Offshore Racing Council (ORC) software indicates that it could be considered to be a "poor" file, lacking in a more desirable level of surface definition of the hull and appendages (keel and rudder). There is a lack of the usual definition (by way of sufficient vertical stations measured port and starboard) in way of the keel, which makes keel volume measurement and yacht "roll" more approximate. In a case where calculated stability is critical, such departures can only add to the uncertainty in results, which may lean either in favour, or against, the yacht. Yacht "roll" and station definition is also not as refined as the author would consider satisfactory.

The size of the offset file is relatively small (11.94kB), which when compared to most contemporary files of 22-30kB indicates a further lack of measurement definition and certainty.

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#### 5. Conclusions

- 1. It has been determined that there are irregularities with the yacht's IMS measurement that cannot now be physically checked.
- 2. It is possible bearing in mind the DSPM discrepancy, that the yacht's physical stability as determined by IMS methods was greater than indicated by its final IMS certificate. This could amount to approximately 5-8°. This cannot be confirmed, nor whether the consequent increase would have resulted in a value above the threshold of eligibility to the Race. Furthermore, if the explanation for the discrepancy lies in the former certificate (Attachment 1) being seriously flawed, with the latter (Attachment 2) being acceptably accurate, then the material significance of insufficient stability would be proven.
- 3. Comparing the two IMS certificates (Attachments 1 and 2), there is a deleterious reduction in resistance to capsize wave energy as determined by comparing the "Ratio of stability curve areas, positive/negative" of approximately 36%. The degree to which this percentage may be deleteriously overstated by measurement error cannot be determined. In a situation where the yacht was dismasted, depriving it of "roll inertia" (resistance to rolling upside down), any decrease in resistance to knock-down or capsize energy must be viewed as seriously prejudicial against safety in open ocean conditions. Attachment 6 shows the effect between 2° and 90° of heel where the area under the curve is an indication of the major part of the resistance to capsize energy.
- 4. The foregoing cannot rule out the possibility that even if the 300kg bilge ballast were still installed, the yacht may have been rolled given the reported conditions. Other yachts of similar size in the vicinity were rolled, in spite of the fact they met the stability criteria for the Race.
- 5. It is clear that Messrs Walker, Fisher and Mooney appeared to act very responsibly in pointing out to Mr.Guy, what appeared to be a case of an IMS stability deficiency based on the contents of Attachment 2. Mr. Walker said he was told that the yacht's entry to the Race was still accepted.
- 6. After considering points 1. to 4. above, and the foregoing discussion, it is felt that there is a reasonable likelihood of material significance associated with the stability decrease.

David Lyons, BE(Hons), AMSNAME, MNASNZ

23<sup>rd</sup> January 1999

#### Attachments

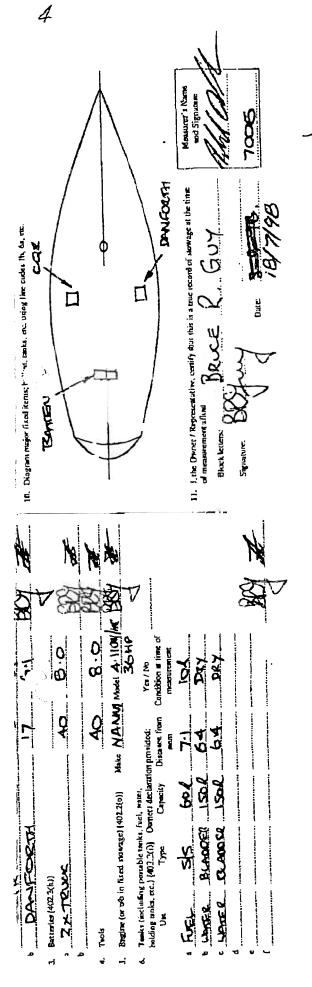
- 1. IMS certificate 711500 issued 28th July 1997
- 2. IMS certificate 711500 issued 15th October 1998
- 3. Measurement Inventory completed 18th November 1995
- 4. Measurement Inventory completed 18th July 1998
- 5. Facsimile Steve Walker Sails dated 20th January 1999
- 6. Naiad IMS Righting Moment 2-90 degrees of Heel

Footnote 1.:

[(Attachment 1 Ratio Stability Curve Areas, Pos/Neg) – (Attachment 2 Ratio Stability Curve Areas, Pos/Neg)] / [Attachment 1 Ratio Stability Curve Areas, Pos/Neg] x 100%

 $= [2.013 - 1.296] / 2.013 \times 100\% - 36\%$ 

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| 4 | INS AMENDED TO JANUARY 1998 VPP: 15/OCT/48 15:48:40 Cert No 7115:00 7115.0AT 15/OCT/98 15:48:20 OFF Neas'4: 10/JAN/90 NAIAD.OFF 24/OCT/95 17:08:08 | 0.000                                  | 0.520 PEN 0.131 PHD 0                                 |  | ICLINING TESTS  1 44,000 PLN 1625,000 PL 161  1 68,000 654 0.178 RSA  1 68,000 654 0.178 RSA  1 68,000 684 0.178 RSA            | V3 50.300 PD5 176,000 RH 150.7 RMC 130.7<br>V4 67.100 PD5 176,000 RH40 101.9 RH60 63.5<br>RH2 137.6 RH20 124.0 RH40 101.9 RH60 63.5<br>RH90 14.9 | CALCULATED LIMIT OF POSITIVE STABLLITTI LOSTING STABLLITTI LOSTING SATIO STABLLITY CURVE AREAS, POSITIVE/MEGAZIN MANUAL PEASSUREMENT SAILLY CORVEY. | KEEL DRAFT  ZND MOMENT LENGTH  (LSM) 9.660 (LSM)  1SPLACEHENT (FZGHT) (DSPN) 6287 (DSF9)  USTED SURFACE  (938) 26.19 (MSS)   | - 1                    |
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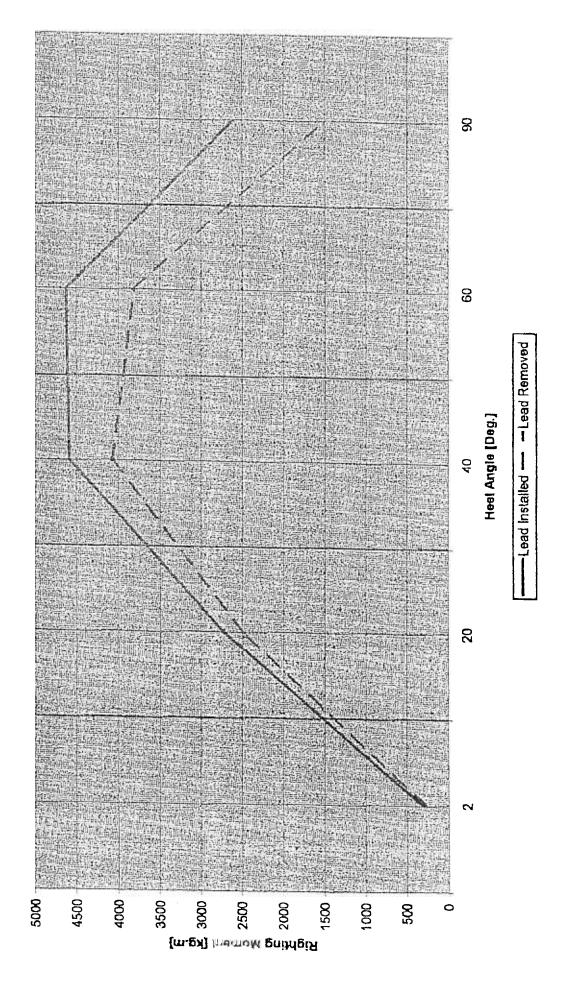
Email: stwalker@tassle.net.au

# Steve Walker Sails PTY, LTD. AC.N. 039 518 493

5a Moore Street (P.O. Box 397)

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- 6.1.2 The Sydney-Hobart Yacht Race will be conducted under two separate Handicap Systems IMS and PHS, subject to sufficient entries being received to constitute a Division. Where less than 10 entries are received for a Handicap Category the Race Committee reserves the right to reallocate those yachts into another Category.
- 6.1.3 Special Class Divisions may be established at the absolute discretion of the Race Committee, provided that:
  - (i) There are five (5) or more entries of the same Class or type.
  - (ii) It can be demonstrated that the Class or type meets or exceeds the Stability and Safety requirements for IMS and PHS Categories.

    Special Class / Divisions are not eligible for traditional trophies or race records and shall sail a longer course as per the Sailing Instructions.

### 6.1.4 For IMS Category, yachts shall:

- a) Hold a current valid IMS Rating and Accommodation Certificate and unless specifically amended or excluded in this Notice of Race or the Sailing Instructions comply with all of Part 2 Limits and Exclusions of the 1998 IMS Regulations.
- b) Have an ILC Weighted Average value not less than the ILC Limit Value specified in the ILC Maxi Class Rule.
- c) Comply with the Minimum Stability Index for ORC Race Category 1 events (IMS Reg 201 refers).
- d) Have an overall length (LOA) not less than 9.0 metres and a Waterline Length (LWL) not less than 7.3 metres.

## 6.1.5 For PHS Category, yachts shall:

- a) Have a minimum LOA of 9.0 metres and LWL of 7.3 metres.
- b) Have an ILC Weighted Average value not less than the ILC Limit value specified in the ILC Maxi Class Rule.
- c) Comply with the Minimum Stability Index for ORC Race Category 1 events (IMS Reg 201 refers).
- 6.1.6 An owner who does not have a valid IMS certificate to verify the yacht's conformance with 6.1.5(c) may seek relief from this provision by providing the Race Committee, no later that the time limits set out in 4.3 with:
  - a) Information from a qualified naval architect which clearly shows that the righting arm of the yacht, when allowed to free trim, should exceed 150mm at 90 degrees of heel.

- b) Documentation from a marine authority such as a State Harbour Board that the yacht has been approved and licensed for charter work. (NSW Survey 2C).
- c) Other information which clearly demonstrates that the yacht meets the requirement of the rule. The Race Committee will be the sole judge as to the acceptability of such information.

### **GRANDFATHERING**

1

Yachts which have been accepted for entry into a previous Sydney-Hobart Race, which do not comply with the stability requirements of 6.1.4 (c) for IMS yachts or 6.1.5 (c) for PHS yachts but have a Stability Index greater than 110° may be eligible for entry provided no structural or ballast alterations have been made that would reduce the yachts stability. The Race Committee will be the sole judge as to the eligibility of a yacht subject to this notice. Amends IMS Reg 201

### 6.1.8 ABS Approved Plans

Yachts shall be built in accordance with RRS Addendum A Part 1 Section 3.1.1

# Telstra Cup

6.2.1 Yachts shall be self-righting, single hull vessels and be on the register of a Yacht Club affiliated with its National Authority.

### 6.2.2 For IMS Categories, yachts shall:

- (a) Hold a current valid IMS Rating and Accommodation Certificate and unless specifically amended or excluded in this Notice of Race or the Sailing Instructions comply with all of Part 2 Limits and Exclusions of the 1998 IMS Regulations.
- (b) Comply with the Minimum Stability Index for ORC Race Category 4 events (IMS Reg 201 refers).
- (c) Have an ILC Weighted Average value not less than the ILC Limit value specified in the ILC Maxi Class Rule.
- (d) Have an overall length (LOA) not less than 9.0 metres and a Waterline Length (LWL) not less than 7.3 metres.
- (e) Crew Weight Limit. IMS Regulation 204 will apply.

# 6.2.3 For PHS Category

(a) Yachts shall have a minimum LOA of 9.0 metres and maximum LOA of 26.0 metres.