



P10 – Test of Professional Competence in Management Accounting

Tuesday 4 September 2007

Instructions to candidates

You are allowed three hours to answer this question paper.
You are allowed 20 minutes reading time before the examination begins during which you should read the question paper and, if you wish, make annotations on the question paper. However, you will not be allowed, under any circumstances , to begin using your computer to produce your answer or to use your calculator during the reading time.
This booklet contains the examination question and both the pre-seen and unseen elements of the case material.
Answer the question on page 17, which is detachable for ease of reference.
The TOPCIMA Assessment Matrix, which your script will be marked against, is on page 18.
Maths Tables and Formulae are provided on pages 23 to 27.
Your computer will contain two blank files – one Word and an Excel file. Please ensure that you check that the file names for these two documents correspond with your candidate number.

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TURN OVER

Merbatty Boat Case

Market overview

The developing luxury boat building industry is one with a growing customer base of wealthy, successful individuals and corporate clients. The industry is mostly concentrated in Europe and the USA, although new boat building companies have recently entered the market in Australia and some areas of Asia. Classification of the market and its products can be done in different ways, but the most common are by boat length, engine performance or by hull type. In 2006, the luxury boat building industry generated approximately \$5 billion in revenues and delivered nearly 3,500 engine-powered boats globally.

The material in this case is confined to boats powered by engines and does not include sailing yachts, which are a completely separate market segment.

There are a number of major international builders of luxury boats, which together produce a range of over 150 different models. Most luxury boats have living accommodation and crew quarters. The selling prices for these luxury boats range from around \$0.4 million to over \$9 million. Each boat type has a choice of different cost options, depending on customers' specifications and engine size.

Boat building companies typically appoint agents to secure sales from the end customer. The sales agent is the ongoing link with the customer from initial contact until delivery of the boat. Most boat building companies have agents in a wide variety of places globally, in order to secure sales, even though they have boat building facilities in only one or two locations. Completed boats are tested, then inspected and then delivered to wherever customers want, with the sales agent fully involved.

The individuals and corporate customers who buy these luxury boats are successful, wealthy individuals who expect the highest standards of quality and customer care. As the market has become more competitive, the need to live up to "*what the customer wants, the customer gets*" has become even more important. Boat building companies are facing the difficult task of balancing the need to deliver customer choice and a high specification at a price that is competitive. In addition, boat building companies need to generate sufficient profitability to invest in research for future designs in order to stay competitive and to give a return for their shareholders.

Merbatty

Merbatty was formed 33 years ago by its current Chairman and is based in a northern European country. Merbatty has enjoyed rapid growth in sales and profitability in recent years. Merbatty became listed on a European stock exchange in November 2006.

It currently has two boat building facilities, one at its Head Office base in Europe and a second on the West Coast of the USA. It has sales offices at the two boat building locations, staffed by Merbatty employees. The majority of Merbatty sales worldwide are secured through sales agents appointed by Merbatty.

Sales revenue is paid to Merbatty in three instalments. A deposit of 20% is paid by the customer on signing a binding contract for a boat as specified by the customer. A second instalment of 30% is paid when the boat's engines are delivered to the boat building facility. The final 50% is paid on completion of the boat only after inspection by the customer. Delivery to the customer's choice of location is at an extra cost. Merbatty's price list is in Euros for European sales. Due to pressure from customers in the USA, sales there are priced in US Dollars. Sales to other parts of the world are in either Euros or US Dollars.

Merbatty currently has a range of 15 boats varying in price from between €0.4 million for a 15 metre boat to over €4 million for a 35 metre boat. The selling prices of Merbatty's range of boats are shown in **Appendix 1** and relate to the basic model specification, as prices may vary depending on the customer's own selection of the specification for interior design and accommodation facilities.

Customers usually choose from a range of additional features, to enable them to make the boat very individual to personal requirements. To facilitate this choice, Merbatty offers a full interior design service. In 2006 these additional features generated €50 million of additional revenues. This represents a further 11% on top of basic selling prices.

The operating profit achieved for Merbatty's current range of boats in 2006 was as follows:

	<i>Small boats (up to and including 24 metres)</i>	<i>Large boats (25 metres and over)</i>	<i>Additional features selected by customers</i>	<i>Total 2006 operating revenues and costs</i>
Number of boats	223	57	-	280
	<i>€ million</i>	<i>€ million</i>	<i>€ million</i>	<i>€ million</i>
Revenue	256	196	50	502
Operating costs (including allocated overhead costs)	222	163	41	426
Operating profit	34	33	9	76
Operating profit %	13.3%	16.8%	18.0%	15.1%

During 2006, Merbatty commenced production on a record number of 280 boats, representing a global market share of around 8%. Merbatty's statistics for boat construction are based on the number of boats **commenced** in a year.

Depending on the model and the size of the boat, the time taken to build a boat varies from 3 months to around 10 months. This time represents the period from the date of the customer signing the order contract to delivery of the completed boat. The boat is only delivered to a customer after successful completion of its sea trials and subsequent inspection by the customer.

The geographical analysis of sales according to the home base of the customer in 2006 and by the target markets for 2011, is shown in **Appendix 2**.

Merbatty currently has sales agents worldwide who generate sales. Most of Merbatty's agents worldwide work exclusively for Merbatty except in a few locations, where the agents also sell boats built by several other boat building companies. The agents receive a fixed percentage of the final revenues of around 4%, including any additional features that the customer orders for the boat. The agent's fee is paid in two instalments for each sale, 50% of the agent's fee at the point of signing a sales contract with the customer and the final balance on delivery of the boat to the customer. This split in the agent's fee creates an incentive for the agent to maintain close contact with both the customer and Merbatty's boat building facility in order to monitor progress and delivery details.

Market research has established that there is a growing market for luxury boats. Recent orders from both new and existing customers have supported this research. Indeed Merbatty has several customers who regularly replace their boats every few years. It also has other customers who have bought two or three boats to keep in different locations round the world.

Merbatty's personnel

The career histories of Merbatty's Directors are shown in **Appendix 3**.

Merbatty employs almost 2,200 employees at the two boat building facilities which are currently operational. The total staff costs were €87 million in 2006. However, additional employees will need to be recruited later in 2007 when Merbatty opens its third boat building facility (see page 7).

The table below shows an analysis by function of Merbatty employees at the end of 2006:

	<i>Number of employees at 31 December 2006</i>
Skilled boat building technicians (includes supervisory staff)	1,940
Office and administration staff	188
Senior management staff	22
Sales staff (excluding external sales agents)	17
Total employees	2,167

The employee numbers shown above exclude outsourced processes. In addition to using sales agents to secure the majority of sales, Merbatty chooses to outsource several elements of its boat construction process. These include the use of an interior design service, which Merbatty uses for all interior fittings.

Merbatty's recent history

Merbatty's sales have risen by over 10% each year for the last 12 years. The founding shareholder, Alberto Blanc held the roles of Chairman and Chief Executive until September 2005, when the management team was strengthened in the lead up to the flotation of Merbatty in November 2006. The flotation issued 120 million new shares, each at a nominal value of €0.50 each. The flotation price was €2.80 a share and all shares were fully subscribed and generated a cash inflow to Merbatty of €336 million (before issue costs) in November 2006.

At the point of flotation Merbatty repaid its then existing bank loan of €120 million and its bank overdraft, which had reached over €120 million. Andreas Acosta also renegotiated a new loan at a more competitive interest rate. This new loan is for €200 million, at an annual interest rate of 7%, and is secured on Merbatty's assets. This new loan, together with some of the equity raised in the listing will finance Merbatty's capital expenditure programme over the next few years, as well as finance the increase in working capital in order to achieve the growth targets planned.

To meet the growing demand, and due to capacity constraints at its boat building facility in Europe, Merbatty acquired some land in the USA in 2002 and developed a totally new purpose-built boat building facility. This has been operational since early 2004. There were some initial operational problems but Merbatty has been able to put in place experienced and committed employees who have the required skills to meet the exacting demands of Merbatty's growing customer base. The European and USA based boat building facilities both produce all 15 of the models currently offered by Merbatty, although the USA boat building facility rarely produces boats smaller than 20 metres.

Merbatty's profit, before dividends, was €40 million for 2006, a record profit level, as shown in the extract from the accounts in **Appendix 4**. The country in which Merbatty is based charges tax at 35% of operating profits less finance costs.

Merbatty's Chairman Alberto Blanc was awarded the "Business Person of the Year" in a European awards ceremony in 2004 and this, together with Merbatty's listing, has raised the global profile of Merbatty.

Merbatty's current position

Merbatty had signed contracts, and received the required 20% deposits from customers, on future orders for 39 boats (building of which has not yet commenced) at the end of June 2007. The lead time from contract signing to start of construction usually averages six weeks. Sales are on target for Merbatty to meet the planned 300 boats commenced in 2007.

As soon as an order is contractually placed, Merbatty will order the required supplies, such as the hull, engines and other major bought-in components for the boat. Merbatty will also allocate a specific building space within the agreed boat building facility. However, until it has undertaken around 20% of the construction work, a proportion of customers' deposits will remain in the Balance Sheet (as a Current Liability) and not be recognised in the Income Statement.

The Financial Statements for 2006 (included in **Appendix 4**) include a revaluation reserve in Merbatty's Balance Sheet to reflect an increase in the value of the non-current assets, which had been valued in 2006 prior to Merbatty's flotation.

Merbatty's shareholders

Merbatty was listed in November 2006 when a major change in the shareholdings took place. Most executive directors acquired shares in the company. In addition, all of the executive directors have share options in order to encourage them to achieve the planned results, which would lead to growth in Merbatty's share price. The share options allow all directors to purchase up to 5 million shares each, any time up to 30 November 2012, at a price of €5.00.

Alberto Blanc had previously held 90% of shares and chose to retain the same number of shares (54 million shares) but after the flotation, his shareholding was reduced to 30%. The new issue of shares brought in external investors and much needed finance in order for the company to expand. Alberto Blanc believes in the huge potential of the Merbatty brand and aims to achieve the five-year plan. He then intends to retire.

Prior to flotation, Merbatty had 60 million shares at a nominal value of €0.50 each in issue and had a total of 500 million authorised shares. At flotation, in November 2006, Merbatty issued a further 120 million shares at a price of €2.80. At the end of 2006, Merbatty had 180 million shares in issue. The shareholdings at the end of 2006 were as follows:

	<i>Shareholding at 31 December 2006</i>
Directors:	
Alberto Blanc	30%
Jesper Blanc	8%
Henri Gaston	3%
Stefan Gil	3%
Andreas Acosta	3%
Tobias Houllier	2%
Lukas Dian	2%
Alain Mina	2%
Marie Lopp	1%
Bernie Ritzol	1%
Investors:	
JKL (has Board representative)	28%
Corporate fund investors	12%
Other shareholders:	
Small investors	3%
Employee-held shares	2%
Total shareholdings	100%

JKL is a listed company with a varied portfolio of investments in a range of international companies, mainly in the construction, engineering and maritime industries. At Merbatty's flotation, JKL purchased 50.4 million shares at a cost of over €140 million as it considers that Merbatty's growth to date and its range of products, together with its potential for the future, will lead to a substantial return on its investment. Following discussions prior to flotation it was agreed that JKL's Investment Director, Simone Lellet would have a seat on the Board of Merbatty and would be involved in helping Merbatty to achieve its five-year plan. Simone Lellet has been involved in some operational planning meetings and she has proved to be a useful management resource.

Merbatty's shares initially traded at €3.48 shortly after flotation and Merbatty's directors are pleased with the market's confidence in the company. By 30 June 2007 the share price had risen to €3.65.

The market sector average P/E ratio at 30 June 2007 is 15.

Future plans for expansion

As a result of the company becoming listed in 2006, the Board of Merbatty was expanded with a number of new Board members. With the input of fresh ideas from the new members of the management team, a number of options have been put forward for expansion of the business. These include producing a much wider range of new models, which would enable Merbatty to offer customers a wider selection of boat sizes and engine capabilities than that currently produced.

Merbatty's five-year plan for the period up to and including 2011 is shown in **Appendix 5**. It is this five-year plan on which the prospectus forecast was based.

Currently, Merbatty produces 15 different models of boat (ranging from 15 metres to 35 metres in length). One new model is due to be introduced early in 2008 and there are possible enhancements to existing models by the middle of 2008. Lukas Dian, the Technical Director – Design, believes that there is a strong opportunity to build larger boats which would be in the range of 35 to 40 metres in length. The main market for these very large boats would be in the Middle East. The press launch of Merbatty's first 38 metre boat in May 2007 had a good response and this new model will go into full production shortly.

In the past, Merbatty has always been very cautious and produced boats when specific orders have been placed, except for a small number of boats built for demonstration purposes. However, after talking to some of Merbatty's agents in the Middle East, Jesper Blanc is confident that the demand in this region will be so great that Merbatty could sell any large boat that it builds. He has proposed that Merbatty should begin production on a range of large boats before any definite orders are placed, in order to capture sales from customers buying impulsively.

Stefan Gil is working on a proposal for Merbatty to open sales offices in over 20 locations worldwide. This would result in the termination of some sales agents' contracts. He considers that this will be needed to generate the additional sales required in order for the five-year plan to be achieved. Additionally, it would allow Merbatty to save costs, as it is anticipated that the costs of running Merbatty's own sales offices would be lower than that paid in agents' commissions.

Detailed operational plans were prepared in the form of Merbatty's current year budget for 2007, in order to ensure that the planned level of growth in sales and profitability is monitored and achieved. Merbatty is currently on target to achieve the budgeted number of 300 new boats to be commenced in 2007. This is the highest number of new boats Merbatty will ever have commenced building in one year.

The company currently has two boat building facilities, in Europe and on the West Coast of the USA. The maximum annual capacity for these two facilities will depend on the mix of boat models ordered, as several smaller boats can be built in less time than one larger boat. There is an increasing demand for larger boats. Based on Merbatty's current product mix during 2006,

the existing two boat building facilities have a maximum capacity, in terms of space, of 320 boats in total each year.

The five-year plan includes forecast capital expenditure for the opening of Merbatty's third boat building facility in September 2007. Additionally, the five-year plan includes capital expenditure that would be required for a fourth boat building facility planned to be built during 2010 and 2011. Bernie Ritzol considers that this may be located in a new target market, perhaps in Asia.

Planned opening of third boat building facility in Surania in 2007

In March 2006, the Merbatty Board approved the proposal to open a third boat building facility. This is located in Surania (a fictitious country) which is a thriving country in the Middle East. The boat building facility is being constructed to meet Merbatty's exact specifications and is due to be opened in September 2007.

The decision to open a third facility was taken in preference to extending either, or both, of the existing facilities for several reasons. First, the five-year plan is based on strong growth in revenue from customers based in the Middle East, with revenue growing from €40 million in 2006 to €180 million in 2011. Revenues from sales generated in this region are forecast to grow from 8% of total revenue to 18% by 2011. Furthermore, there is an increasing trend for the boats ordered by customers in the Middle East to be for the larger models, so this new facility will specialise in building larger boats.

Merbatty's research also shows that skilled labour is available in Surania and also that there are sufficient skilled employees at Merbatty's existing boat building facilities who are willing to be seconded to the new facility.

Merbatty already has a sales agent located in Surania who has been selling Merbatty boats for over 15 years, who will continue to generate sales through his established reputation and contacts. In addition, Merbatty has recently appointed four additional sales agents in other countries in the Middle East region.

The Suranian boat building facility will enable Merbatty to build approximately 180 additional boats each year, depending on their size. However, if the number of large boats in the mix were to increase to a higher proportion than in the agreed five-year plan, it is estimated that the Suranian facility would only have the space to build 140 boats (albeit larger boats) each year.

Merbatty's development plans

Bernie Ritzol, the Global Market Development Director, would like to expand the range of models that Merbatty builds and considers that there is demand for a greater variation of designs within the range of hull sizes that are currently built. He is investigating the possibility of expanding the range of boats Merbatty builds, to have 10 new models over the next two years, instead of the planned three new models per year. He has asked Lukas Dian, the Technical Director - Design, to prepare a proposal for investment in research and development needed for this expansion, for the Board meeting in September 2007.

Lukas Dian has identified the need for €10 million expenditure on the design of new IT systems, including state of the art boat building CAD and CAM systems, both of which would minimise man hours and thus increase net margins. A further €15 million of capital expenditure would be required to improve Merbatty's existing boat building facilities, especially to accommodate large boats and the planned 3 new models each year. This capital expenditure is included in the five-year plan which is shown in **Appendix 5**.

Current use of new technology

Merbatty currently uses the latest in modern marine production technology, including Computer Numerical Controlled (CNC) machining and robotic spray systems for automated precision spray painting for maximum hydrodynamic efficiency. Investment in technology in the last two years has increased by 10% and has cost the company a total of €10 million.

Merbatty has also spent over €4 million on technology to apply glass re-enforced plastic onto each hull to add an external enhanced performance gel coat to increase hull durability and strength. This process was introduced in the USA boat building facility earlier in 2007 and is proving successful in speeding up the time taken at this stage of production of the boats. The previous hull coating technology was very labour intensive, requiring a number of skilled operators using hand-held machines to apply the external gel coating. The old technology is still used in the European boat building facility and for smaller boats built in the USA facility.

Merbatty sponsorship contracts

Merbatty has signed two different sponsorship contracts which both generate a lot of positive public relations (PR) and have helped to increase Merbatty's brand recognition. The sponsorship contracts are as follows:

- €5 million per year for three years from July 2006 to June 2009 payable to a major global speedboat race organiser which generates significant publicity for Merbatty through advertising and TV coverage of the race events. The races are also sponsored by a number of other global brands, but Merbatty is the principal sponsor.
- €5 million per year for five years from January 2007 to December 2011 to a global travel and high quality hotel chain. This company promotes Merbatty boats in a variety of ways, including advertising on all of its websites worldwide, and through promotional information at all of its hotels. Merbatty also works with this company to arrange travel for its customers to inspect their boats.

Merbatty's supplier relationships

Merbatty has a number of key suppliers. There has been a trend for more professional relationships with suppliers in Merbatty since Paul Lavie, Merbatty's new Procurement Director, joined the company earlier in 2007. Merbatty has introduced supplier rating systems and Key Performance Indicators (KPI's) for all suppliers. Paul Lavie would like to see Merbatty work more closely with a few key suppliers and to build long standing supplier relationships.

Merbatty's ability to work closer with its key suppliers has also been facilitated by the recent development of an on-line order tracking and processing system between Merbatty and two of its key suppliers, which are MNE and Marinatron (see below). This system allows Merbatty to place specific orders for standard engines and satellite control panels to be delivered to Merbatty's boat building facilities and to track the orders right through from the early stages of the boat building process to delivery and installation.

Marinatron is Merbatty's key supplier of radar and satellite navigation systems. This USA based company supplies over 30% of the market for marine satellite navigation systems and they are used in all of Merbatty's boat models. It also supplies to a number of Merbatty's competitors in the USA.

Topcrest is a manufacturer of boat hulls and is based in the same European country as Merbatty's European boat building facility. Merbatty has been a long standing customer of Topcrest and has built up a very strong relationship with Topcrest's design and manufacturing team. Topcrest has a reputation as one of the top three hull manufacturers in the world and demand for its hulls (ranging from 12 metres to over 40 metres long) has been growing rapidly in the last five years. Merbatty is a key customer of Topcrest and both companies recognise the importance of working closely together on future designs. The lead time for hulls varies from two to six weeks depending on the size of the hull and the design specifications.

Sea Safety Equipment (SSE) is a European based company, which supplies most of the on board safety equipment such as inflatable life boats and life jackets.

MNE Engines, based in Europe, is a large manufacturer of nautical engines for both commercial and military purposes and it supplies engines worldwide to a wide range of customers. MNE is one of only five specialised nautical engine manufacturers in Europe. MNE supplies all of the diesel engines for all models of Merbatty boats. The order value of engines in 2006 was approximately €38 million.

Aqua Designs is an internationally renowned firm of interior designers which specialises in the design and interior fittings for luxury boats. This includes all of the teak wood panelling to cabins and decks, air conditioning, interior furnishings, on board entertainment systems, satellite telephone systems and underwater lighting facilities. All Merbatty boats have a standard specification for interior design but customers can opt to add to this specification from a vast range of options provided by Aqua Designs. These additional internal specifications can add around 11% to the price of a boat, depending on customers' preferences. Aqua Designs operates throughout Europe and the USA, but it does not have operations in the Middle East. Aqua Designs has declined all requests from Merbatty to provide the same interior design service for Merbatty's new Suranian boat building facility. Merbatty is currently finalising alternative arrangements for its interior design service for boats to be built in Surania.

Merbatty's investment in new IT systems

In 2006, Merbatty invested in a newly released "off the shelf" state-of-the-art production management software system. This software system is designed to improve productivity and increase resource utilisation. Its most significant advantage is that it enables areas for improvement in labour efficiency and workforce allocation, to be easily identified. In addition, the real time information provided can be used to manage production more effectively by providing clear information on Work-In-Progress. The result has been on-time delivery of all boats, with no penalties for late delivery of boats to customers, since this new IT system has been operational.

This software allows Merbatty's management team to respond quickly to minimise potential, and actual, disruptions to production by providing real-time data on workforce utilisation and shop floor processes, material delays, machine downtime and employee idle time. This has resulted in increased productivity. This software has been installed at both the European and USA facilities and it is intended that it will also be installed within the new Suranian facility.

Charitable work

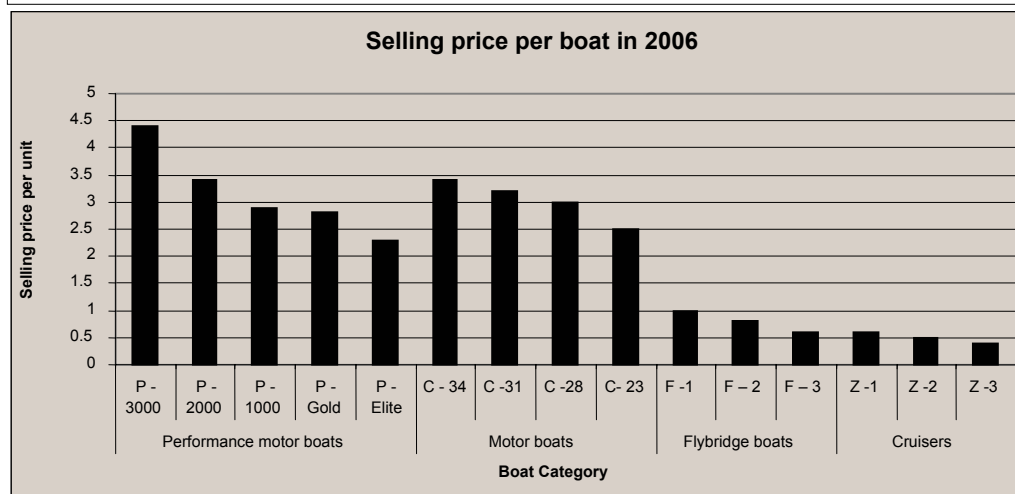
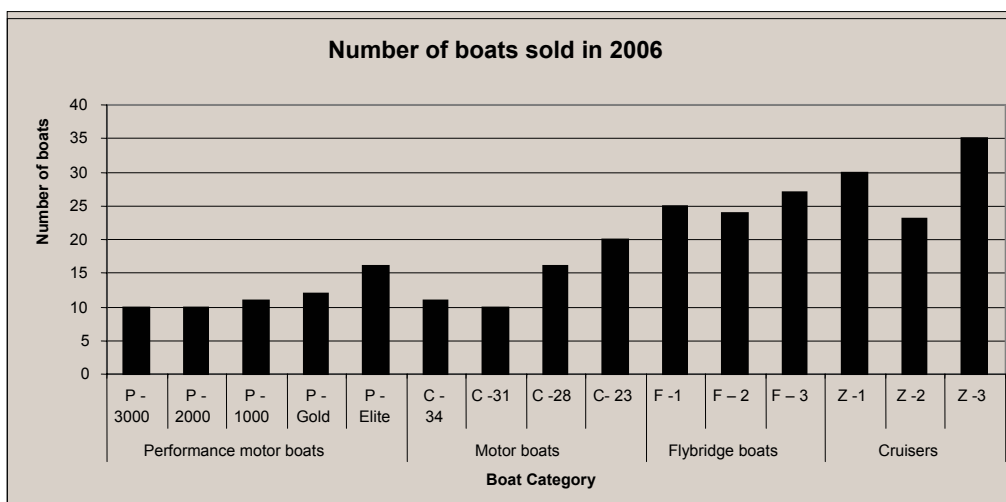
Alberto Blanc has been involved in charitable work for many years and feels strongly that Merbatty should continue to support a range of charities.

Merbatty financially supported a number of fund-raising events throughout the USA in 2006, which raised \$4 million as a contribution towards a new hospital wing. Additionally, the company made donations totalling €0.5 million towards a European Child Poverty Prevention Charity.

Alberto Blanc spends much of his spare time advising and working for charitable organisations in Europe, as he strongly believes that those who are as fortunate as he is should do as much as possible to help those less fortunate. Merbatty receives much good publicity from Alberto Blanc's charitable work and every employee is encouraged to spend two to six months seconded from Merbatty, on full pay, to undertake a range of short assignments for charitable organisations. Every member of staff is eligible to participate in one charitable assignment every four years.

Analysis of Merbatty's range of boats

Model	Length (metres)	Maximum speed (knots)	2006 Standard selling price € million	Units sold in 2006	Units sold in 2005
Performance Motor boats: P Series					
P- 3000	35	40	4.4	10	-
P- 2000	25	38	3.4	10	8
P- 1000	20	38	2.9	11	10
P- Gold	19	35	2.8	12	19
P - Elite	18	31	2.3	16	21
Motor boat: C Series					
C- 34	34	31	3.4	11	-
C- 31	31	31	3.2	10	10
C -28	28	31	3.0	16	13
C -23	23	30	2.5	20	29
Flybridge range					
F -1	22	30	1.0	25	22
F- 2	20	30	0.8	24	24
F- 3	16	32	0.6	27	27
Cruisers					
Z - 1	18	34	0.6	30	24
Z - 2	16	32	0.5	23	20
Z - 3	15	30	0.4	35	26



Sales Revenue analysed by home base of customers

	<i>Sales Revenue 2006 € million</i>	<i>Planned Sales Revenue 2011 € million</i>
		<i>Note: All figures shown are based on 2006 prices</i>
Europe	219	420
USA	148	240
Middle East	40	180
Asia	45	65
Australia	30	60
South America	18	29
Africa	2	6
Total revenue	502	1,000

Merbatty's key personnel

Alberto Blanc - Chairman

Alberto Blanc, now 62, had an interest in boats from an early age, when he used to spend his summer holidays at his uncle's boat building facility. Having a keen eye for design and a love of the ocean, he went to marine college in 1965 and became a marine engineer in 1968. He started Merbatty after his uncle gave up his business in 1974 and passed the boat building facility onto Alberto. He plays an active role in the business and is often seen in the European boat building facility, talking to and advising design and technical staff. He believes in a "hands on" management style and that the best way to learn what is happening in the business is to see the boats actually being built. He is also a strong believer in the importance of charity work.

Henri Gaston - Chief Executive

Henri Gaston is a 35 year old MBA graduate who joined Merbatty in September 2005. He has previously worked for one of Merbatty's major overseas rivals and has a number of contacts throughout the industry.

Stefan Gil - Sales Director

Stefan Gil, who is 52, has worked for Merbatty for 14 years and was previously a sales director of one of the main engine suppliers, where he worked for 10 years. He has a very strong technical knowledge and previously spent five years in the Middle East as an engineer. He is a keen sailor and has recently sailed single-handed across the Atlantic for charity. His main challenge since joining Merbatty has been to create a strong brand image for Merbatty in order to appeal to the wealthy European and American customer base. He is a great asset to Merbatty.

Andreas Acosta - Finance Director

Andreas Acosta, aged 45, joined Merbatty in 2000. He previously worked as a management consultant for a large international firm of auditors. It was during this time he developed a keen interest in the boat building industry after being in charge of an international investigation of the industry. His main concern is the management of cash and the potential costs involved in overseas developments. Andreas leads a team of 10 accountants in the European office and a further 8 in the US office.

Jesper Blanc - Marketing Director

Jesper Blanc is the 30 year old son of the Chairman. He graduated from university 6 years ago with a degree in Media Studies and has worked in the company since then. He has worked within the engineering department and in the Systems and IT department for short periods but did not feel that his talents were in either area. His father initially appointed him as a Marketing Assistant, which he enjoyed immensely. His father later promoted him to the role of Marketing Director 12 months ago. Since his appointment he has visited many different countries, talking to customers and agents and establishing contacts.

Tobias Houllier - Operations Director

Tobias Houllier, now aged 50, started as a junior carpenter and has now worked for Merbatty for the last 30 years. During his time he has worked in the engineering department, the design department and he has been the European boat building facility manager. He has held the role of Operations Director for the last 10 years and is probably the most experienced person in the whole company. He is very keen on training and encourages all of the designers and engineers to become qualified.

Alain Mina - Technical Director - Systems and IT

Alain Mina, aged 35, has worked for Merbatty for the last 8 months. Previous to this he was a senior IT project manager for an organisation specialising in building and distributing military radar equipment. This is his first role at Director level and he is finding it difficult to take a less hands on role than he has previously been used to.

Lukas Dian - Technical Director - Design

Lukas Dian aged 36, has worked for Merbatty for 5 years. He started as the Chief Designer, but due to his leadership and his personnel management skills he was promoted to Director level within 1 year of joining. He leads a team of over 20 designers who meet on a regular basis and he encourages an open door policy in order to create a feeling of freedom of thought and creativity.

Marie Lopp - HR Director

Marie Lopp, now aged 40, has worked for Merbatty for 3 years. She is the first HR director as previously Alberto Blanc did not believe in Human Resource departments. However, as the organisation expanded and staff issues and legislation became more complex, he finally agreed to appoint a HR director. Marie Lopp has a difficult job persuading Alberto Blanc of the importance of human resource issues and in particular, she struggles to get him to invest in training for staff other than the engineers and designers.

Paul Lavie - Procurement Director

Paul Lavie, aged 38, joined Merbatty in March 2007. He has many years of experience working for a large supplier of components to the automotive industry. He is also concerned that the procurement department had not established a close relationship with some of its major suppliers.

Bernie Ritzol - Global Market Development Director

Bernie Ritzol, now aged 46, joined Merbatty 12 years ago and has been responsible for a number of strategic developments including the acquisition of land in the USA and the opening of Merbatty's second boat building facility. He has also worked closely with Tobias Houllier in the development of new boat models and also with the Technical Director - Design, since Lukas Dian was appointed to this new position four years ago. Bernie Ritzol was one of the driving forces behind Merbatty's listing, to enable the company to raise additional finance in order to fund expansion of the company. Bernie Ritzol was also instrumental in the selection of the site in Surania for Merbatty's third boat building facility.

Simone Lellet - Investment Director, JKL

Simone Lellet, aged 42, is JKL's Investment Director and she was appointed to the Board of Merbatty in November 2006, when Merbatty became listed and JKL bought 50.4 million shares, resulting in a holding of 28% of Merbatty's issued shares. Simone Lellet is very enthusiastic about Merbatty's five-year plan and wants to participate in the decision making process to help Merbatty achieve the goals set out when the company became listed. She has attended every Board meeting and has also been involved in some operational planning meetings, with the Board's permission.

Non-executive directors

Merbatty has six non-executive directors. The six non-executive directors hold various other directorships, in a variety of industries. Four of the non-executive directors are based in Europe and two hold directorships of USA listed companies and are based in the USA.

Appendix 4

Merbatty's Balance Sheet, Income Statement and Statement of Changes in Equity

Note: All data in this Appendix is presented in international financial reporting format

Balance Sheet	As at		As at	
	31 December 2006	31 December 2005	31 December 2006	31 December 2005
	€ million	€ million	€ million	€ million
Non-current assets (net)		535		362
Current assets				
Inventory (including Work-in-Progress)	165		126	
Trade receivables and accrued revenue	93		76	
Cash and short-term investments	171		7	
		429		209
Total assets		964		571
Equity and liabilities				
Equity				
Paid in share capital	90		30	
Share premium reserve	318		42	
Revaluation reserve	80		-	
Retained profits	133		113	
		621		185
Non-current liabilities				
Bank loan at 8% interest per year (repayable in 2010)	-		120	
Bank loan at 7% interest per year (repayable in 2014)	200		-	
Payables: amounts falling due after more than one year	7		2	
		207		122
Current liabilities				
Bank overdraft	-		126	
Trade payables and accruals	101		112	
Customers' deposits	13		9	
Tax	22		17	
		136		264
Total equity and liabilities		964		571

Note: Paid in share capital represents 180 million shares of €0.50 each at 31 December 2006

Income Statement	Year ended		Year ended	
	31 December 2006	31 December 2005	31 December 2006	31 December 2005
	€ million	€ million	€ million	€ million
Revenue	502		445	
Total operating costs	426		380	
Operating profit	76		65	
Finance costs	-14		-17	
Tax expense (effective rate is 35%)	-22		-17	
Profit for the period	40		31	

Statement of Changes in Equity	Share capital	Share premium	Re-valuation reserve	Retained earnings	Total
	€ million	€ million	€ million	€ million	€ million
Balance at 31 December 2005	30	42	-	113	185
New shares issued during 2006	60	276	-	-	336
Profit for the period	-	-	-	40	40
Revaluation reserve	-	-	80	-	80
Dividends paid	-	-	-	-20	-20
Balance at 31 December 2006	90	318	80	133	621

Appendix 5

Extracts from Merbatty's 5 year plan

Financial data	Actual	Plan				
		<i>Note: All figures shown in the financial data below are based on 2006 prices</i>				
	2006 € million	2007 € million	2008 € million	2009 € million	2010 € million	2011 € million
Revenue (analysed by home base of customers):						
Europe	219	240	275	310	350	420
USA	148	160	170	190	210	240
Middle East	40	50	80	110	140	180
Other areas	95	105	120	130	145	160
Total revenue	502	555	645	740	845	1,000
Operating costs	426	471	552	634	725	863
Operating profit	76	84	93	106	120	137
Post tax profit for the period	40	45	51	60	69	80
Dividends	20	23	26	30	34	40
Capital expenditure:						
New boat building facilities	90	30	0	0	60	100
Other capital expenditure	40	25	15	20	20	25
Total capital expenditure	130	55	15	20	80	125

Key business statistics	Actual	Plan				
		2006 € million	2007 € million	2008 € million	2009 € million	2010 € million
Number of boats commenced in the year	280	300	340	385	435	500
Number of new models introduced	2	3	3	3	3	3
Satisfied customers (as surveyed)	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Staff turnover (calculated as number of staff leaving as a percentage of total employees)	20%	18%	15%	12%	12%	12%
Charity - funds donated (€ million)	0.5	0.6	0.7	0.8	0.9	1.0
- man years on secondment for charity work	3.0	4.0	5.0	6.0	7.0	8.0

End of Pre-seen material

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Merbatty – Unseen material provided on examination day

Additional (unseen) information relating to the case is given on pages 19 to 22.

Read all of the additional material before you answer the question.

ANSWER THIS QUESTION

You are the consultant appointed by the Merbatty Board.

Prepare a report that prioritises, analyses and evaluates the issues facing Merbatty and makes appropriate recommendations.

Note: The TOPCIMA Assessment Matrix, against which your script will be marked, is on the next page for your reference.

September & November 2007 – Assessment Matrix for TOPCIMA – Merbatty Boat Case

Criterion	Marks	Clear Pass	Pass	Marginal Pass	Marginal Fail	Fail	Clear Fail
Technical	5	Thorough display of relevant technical knowledge. 5	Good display of relevant knowledge. 4	Some display of relevant technical knowledge. 3	Identification of some relevant knowledge, but lacking in depth. 2	Little knowledge displayed, or some misconceptions. 1	No evidence of knowledge displayed, or fundamental misconceptions. 0
Application	15	Knowledge clearly applied in an analytical and practical manner. 13-15	Knowledge applied to the context of the case. 9-12	Identification of some relevant knowledge, but not well applied. 8	Knowledge occasionally displayed without clear application. 6-7	Little attempt to apply knowledge to the context. 3-5	No application of knowledge displayed. 0-2
Diversity	5	Most knowledge areas identified, covering a wide range of views. 5	Some knowledge areas identified, covering a range of views. 4	A few knowledge areas identified, expressing a fairly limited scope. 3	Several important knowledge aspects omitted. 2	Many important knowledge aspects omitted. 1	Very few knowledge aspects considered. 0
Focus	5	Clearly distinguishes between relevant and irrelevant information. 5	Information used is mostly relevant. 4	Some relevant information ignored, or some less relevant information used. 3	Information used is sometimes irrelevant. 2	Little ability to distinguish between relevant and irrelevant information. 1	No ability to distinguish between relevant and irrelevant information. 0
Prioritisation	10	Issues clearly prioritised in a logical order and based on a clear rationale. 9-10	Issues prioritised with justification. 6-8	Evidence of issues being listed in order of importance, but rationale unclear. 5	Issues apparently in priority order, but without a logical justification or rationale. 3-4	Little attempt at prioritisation or justification or rationale. 1-2	No attempt at prioritisation or justification. 0
Judgement	20	Clearly recognises alternative solutions. Judgement exercised professionally. 16-20	Alternative solutions or options considered. Some judgement exercised. 11-15	A slightly limited range of solutions considered. Judgement occasionally weak. 10	A limited range of solutions considered. Judgement sometimes weak. 5-9	Few alternative solutions considered. Judgement often weak. 1-4	No alternative solutions considered. Judgement weak or absent. 0
Integration	10	Diverse areas of knowledge and skills integrated effectively. 9-10	Diverse areas of knowledge and skills integrated. 6-8	Knowledge areas and skills occasionally not integrated. 5	Knowledge areas and skills sometimes not integrated. 3-4	Knowledge areas and skills often not integrated. 1-2	Knowledge areas and skills not integrated. 0
Logic	20	Communication effective, recommendations realistic, concise and logical. 16-20	Communication mainly clear and logical. Recommendations occasionally weak. 11-15	Communication occasionally unclear, and/or recommendations occasionally illogical. 10	Communication sometimes weak. Some recommendations slightly unrealistic. 5-9	Communication weak. Some unclear or illogical recommendations, or few recommendations. 1-4	Very poor communication, and/or no recommendations offered. 0
Ethics	10	Excellent evaluation of ethical aspects. Clear and appropriate advice offered. 9-10	Good evaluation of ethical aspects. Some appropriate advice offered. 6-8	Some evaluation of ethical aspects. Advice offered. 5	Weak evaluation of ethical aspects. Little advice offered. 3-4	Poor evaluation of ethical aspects. No advice offered. 1-2	No evaluation of ethical aspects. Unethical, or no, advice offered. 0
TOTAL	100	© CIMA – July 2007					

September 2007

Merbatty – unseen material provided on examination day

Read this information before you answer the question

Proposal to enter the boat chartering market

The boat chartering market is defined as the renting of boats, which are owned and operated by a company, and rented on a weekly basis to private individuals or companies. A boat chartering company puts its own crew on board and pays all the fixed costs. The end customer who charters (rents) a boat typically pays the fixed weekly fee plus some additional charges. There are many boat chartering companies globally.

The prospectus forecast for Merbatty at the time of flotation included a number of new areas of revenue generation, one of which was a proposal to enter the boat charter market. Bernie Ritzol, Merbatty's Global Market Development Director, is very keen to see Merbatty generate revenues from new sources. He believes that the time is right for Merbatty to enter the highly competitive boat chartering market. Bernie Ritzol has prepared a proposal for Merbatty to initially build 10 large boats specifically for chartering, all 10 of which will be based in Europe. If this initial trial into the chartering market is successful, then Merbatty will build and operate additional charter boats to meet market demand worldwide.

If the Board approves this proposal, Merbatty would need to commence the building of all 10 boats by November 2007, so that they will be available for chartering during Summer 2008. Therefore a Board decision on this chartering proposal will need to be made by mid-October 2007.

The average capital cost of each boat is forecast to be €3.2 million, post-tax. The post-tax net cash inflows (excluding the capital cost and residual values of the 10 boats) are forecast to be:

Forecast post-tax net cash inflows	2008	2009	2010	2011	2012
(Total for all 10 charter boats)	€ million	€ million	€ million	€ million	€ million
Post-tax net cash inflows (nominal values)	10.5	13.9	16.9	17.9	26.6

These post-tax net cash inflows are based on the expected number of weeks that all 10 boats would be chartered each year and represent only about 40% of the year. Andreas Acosta, the Finance Director, recommends that a suitable risk adjusted discount rate is 14% post-tax and considers that this investment should be appraised over a five year period. The post-tax residual value at the end of year five is forecast to be €0.75 million for each boat.

Shortage of skilled employees

Marie Lopp has been actively recruiting skilled boat builders during 2007. Merbatty needs more employees at its existing facilities to build the increased number of boats and also to cover for employees who have been seconded to Merbatty's new boat building facility in Surania. However, there is a high demand for skilled boat builders in this sector and recruitment of new employees has been lower than required. Merbatty will need to recruit a total of over 100 skilled boat builders over the next two years to be ready to meet the forecast growth in the number of boats to be built.

Merbatty currently spends approximately €1 million per year on training, the majority of which is for designers and engineers. However, this is significantly less than its major competitors, two of whom spend in excess of €5 million per year. Alberto Blanc's philosophy is that too much time

spent on training detracts from the actual boat building activity and that the best form of training is done whilst working on the job. A number of skilled employees and new apprentices have recently resigned from Merbatty. Some apprentices stated that they considered their future would be more secure if they worked for an employer who can support their studies.

Stock discrepancy

Andreas Acosta has received an internal audit report that states that there is a discrepancy of €0.2 million of electric power tools which Merbatty purchases for employees to use during boat construction work. This discrepancy was discovered at a stock take at the end of June 2007. On investigation, it has been established that many employees have taken these electric tools for personal use over the last few years. Recently, one long standing employee was dismissed for the theft of a €300 power drill when it was discovered in his possession on a random and unannounced check of employees when leaving the boat building facility.

Problem at Merbatty's boat building facility in the USA

A serious problem has been identified in Merbatty's boat building facility in the USA. This problem has arisen from the use of new technology, which was introduced only at the USA facility in February 2007. The new technology involves the application of glass re-enforced plastic onto the hull of each boat to improve its durability and strength. The glass re-enforced plastic technology has been used on a total of 32 boats.

However, in July 2007, sea trials were held for 4 boats whose hulls had been coated with this new technology. (Sea trials are defined as a rigorous series of "in-water" tests which are designed to test the boat under a variety of sea and weather conditions and are conducted as a final test before delivery to customers). The sea trials identified cracks in the hulls and significant water leakage on all 4 boats. During earlier tests on these 4 boats at the USA boat building facility, no faults had been identified at all and therefore these boats had been completed and prepared for sea trials prior to delivery to customers.

Following the discovery of these cracks, the problem was reported to Tobias Houllier. He immediately instructed a team of senior engineers be sent out to inspect the 24 boats built using this new technology which have already been delivered to customers. These inspection tests were conducted during August 2007. All 24 boats were comprehensively inspected and 6 of these boats were found to have similar cracks in their hulls.

Therefore at the end of August 2007, it had been identified that there are 10 completed boats with these serious cracks; 6 which have been delivered to customers and 4 which failed their sea trials. There are a further 4 boats that are still under construction where this technology has already been applied.

It is not yet known whether these serious cracks can be repaired, or whether the boats will have to be re-built. Andreas Acosta has estimated that if the 10 completed boats need to be re-built, then the additional cost to Merbatty, including penalty payments, would be around €11 million.

Fortunately, the previous technology is still available and is used within the USA boat building facility for some of Merbatty's other boat models. The boats built in the USA facility using the previous technology have shown no evidence whatsoever of leakages or cracking.

Delayed opening of Merbatty's new boat building facility in Surania

Merbatty was planning to open its third boat construction facility in Surania at the start of September 2007. This new facility was planned to cost a total of €120 million during 2006 and 2007.

However, there have been delays at the final stages of construction and also in the issue of import permits for specialised equipment. The Suranian facility was opened for trials and safety testing in August 2007 but it quickly became apparent that the air conditioning for this large

building was not adequate. Therefore, the safety certificate was not issued by the relevant authorities.

Merbatty will not be able to install the remaining equipment, or install and test the more powerful air conditioning, required to ensure a safe working temperature in this hot country, until December 2007. The updated estimated date for the opening of this new facility has been put back to the end of January 2008, due to the time required for the authorities to test the working environment and to issue a safety certificate. It is also forecast that there will be cost over-runs of €20 million.

In the month of August 2007 alone sales in the Middle East region exceeded all sales targets. Sales of Merbatty's top of the range boats generated €25 million in August 2007. The total planned sales revenue for the whole of 2007 for the Middle East region was forecast to be €50 million.

At the end of August 2007, Merbatty had 13 signed contracts for large boats which were due to be built at the new facility in Surania, which was originally scheduled to open in September 2007. The latest forecast is that there will be further orders for 17 large boats in the Middle East region up to the end of 2007. Therefore there could be a forecast total of 30 large boats for the Middle East region that need to be built somewhere, as the Suranian facility has not opened on time. Tobias Houllier has stated that once construction on a boat has started in a boat building facility, it is not feasible to move the partially completed boat to another facility.

The boat building facilities in Europe and USA have the capacity to build all 30 large boats. However, if the location of the building of these boats were to be moved to Europe and the USA boat building facilities, neither of these boat building facilities would have any further spare space to commence any additional large boats until all 30 of these large boats are completed, which would be around the middle of 2008.

Therefore, there would not be any spare capacity to build the 10 large boats required for Merbatty's boat chartering proposal (detailed above).

If the location of the boat building for the orders from the Middle East were to be moved to Europe and the USA, this would necessitate additional costs. These additional costs include payments to compensate customers who would need to inspect their new boats at a different location and also to pay sub-contractors additional fees to relocate their employees to a different boat building facility. The additional direct cost of moving the building of these 30 boats to either of Merbatty's other two boat building facilities is forecast to be €4 million in total.

Alternatively, Merbatty could advise its Middle East customers of the five-month delay in commencement of construction of these boats. If the building of these 30 boats were to remain in Surania and the commencement of their construction is delayed for five months to the end of January 2008, the forecast effect on the company's operating profit for 2007 would be a reduction of €9 million, as the operating profits on these boats would be recognised in the 2008 accounting year. Additionally, Merbatty would be liable to pay an estimated €2 million as penalties for late delivery if all 13 boats currently contracted for, were to be delivered five months late.

Stock market analysts have advised Andreas Acosta that it is important that Merbatty achieves its planned profit target for 2007, as well as the target of 300 boats commenced in 2007.

It has come to the attention of Andreas Acosta that two new boat contracts for customers based in the Middle East have been given an immediate start date at Merbatty's boat building facility in Europe. Building of these two boats has commenced despite prior orders for other boats that should have commenced before these Middle East orders. On investigation, Andreas Acosta has established that the customers have made unofficial payments to several of Merbatty's employees and the sales agents involved, in order to speed up the delivery dates. Andreas Acosta has reported this to Alberto Blanc, who stated that payments are often made by established Merbatty customers in order to secure an earlier completion date.

Proposal to increase sales in Australia

Jesper Blanc, Merbatty's Marketing Director, has spent the last four months in Australia, reviewing the market position and meeting with boat builders and agents. He met with a very positive response to the possibility of Merbatty opening a sales office and renting space in a marina for the display of Merbatty boats in a key coastal city in Australia. This would enable Merbatty to service an ever growing market for luxury boats in this part of the world and its own sales office would replace Merbatty's current sales agent.

Jesper Blanc has proposed to the Merbatty Board that the full range of 15 Merbatty boat models should be on display within the sales marina. These boats could be sold if a customer wanted to buy a boat for immediate delivery. Usually, Merbatty only has 2 or 3 of its boats on display at any location, or at any of the international boat exhibitions. It had never before had such a large display of its range.

The total cost of the proposal is €31 million in 2008 and €10 million in 2009, including new boat models introduced. Jesper Blanc is confident that over the next few years this would increase boat sales in Australia from the 35 boats sold in 2006 to over 150 boats per year by 2011. The current agreed five-year plan only includes sales of 70 boats (generating sales revenue of €60 million) in 2011. The proposal also includes a marketing campaign, spread over two years.

If Merbatty were to be able to increase sales to 150 boats by 2011 by setting up its own sales office and undertaking the proposed marketing campaign, Andreas Acosta has calculated that this could generate a post-tax NPV of €30 million over four years. For this proposal to generate a break-even NPV, Merbatty would need to sell an average of at least 70 boats every year for four years.

Navigation control panels

One of Merbatty's major bought-in components for each boat is the navigation control panel. This is a highly sophisticated computerised system which guides a boat automatically and is linked to satellite navigation systems. At the end of July 2007, the manufacturer of this system, Marinatron, advised all of its customers, including Merbatty, that one particular model of its navigation control panels, supplied in the four-month period between March and June 2007 had a possible technical fault. As a precaution this panel was recalled by Marinatron.

During the period March to June 2007, Merbatty had installed this potentially faulty control panel into 100 boats. Marinatron supplied Merbatty with 100 replacement control panels (free of charge) in August 2007. Of the 100 boats fitted with this faulty component, 80 boats have been completed and delivered to customers. The other 20 boats, which are still under construction, have had the possibly faulty control panel removed and have been refitted with Marinatron's replacement control panel. Alain Mina, Merbatty's Technical Director - Systems and IT, is reluctant to send engineers to refit this control panel on boats already delivered to customers as he considers the risk of a fault to be negligible. He also does not want to inconvenience customers with the refit. Alain Mina does not consider that this operational problem should be referred to the Board.

Marinatron has asked Merbatty to return all of the faulty control panels to it for testing. Alain Mina's assistant, Joe Pickard, is very concerned that Merbatty has not yet changed these control panels. Joe Pickard has informed Tobias Houllier about his concerns.

Appointment of a consultant

At the Merbatty Board meeting held at the end of August 2007 it was agreed that a consultant would be appointed to advise the Board on the issues facing Merbatty.

APPLICABLE MATHS TABLES AND FORMULAE

Present value table

Present value of 1.00 unit of currency, that is $(1 + r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Cumulative present value of 1.00 unit of currency per annum, Receivable or Payable at the end of each year for n years $\left[\frac{1-(1+r)^{-n}}{r} \right]$

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

FORMULAE

Valuation Models

- (i) Irredeemable preference share, paying a constant annual dividend, d , in perpetuity, where P_0 is the ex-div value:

$$P_0 = \frac{d}{k_{\text{pref}}}$$

- (ii) Ordinary (Equity) share, paying a constant annual dividend, d , in perpetuity, where P_0 is the ex-div value:

$$P_0 = \frac{d}{k_e}$$

- (iii) Ordinary (Equity) share, paying an annual dividend, d , growing in perpetuity at a constant rate, g , where P_0 is the ex-div value:

$$P_0 = \frac{d_1}{k_e - g} \text{ or } P_0 = \frac{d_0[1 + g]}{k_e - g}$$

- (iv) Irredeemable (Undated) debt, paying annual after tax interest, $i(1-t)$, in perpetuity, where P_0 is the ex-interest value:

$$P_0 = \frac{i[1 - t]}{k_{\text{dnet}}}$$

or, without tax:

$$P_0 = \frac{i}{k_d}$$

- (v) Future value of S , of a sum X , invested for n periods, compounded at $r\%$ interest:

$$S = X[1 + r]^n$$

- (vi) Present value of £1 payable or receivable in n years, discounted at $r\%$ per annum:

$$PV = \frac{1}{[1 + r]^n}$$

- (vii) Present value of an annuity of £1 per annum, receivable or payable for n years, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r} \left[1 - \frac{1}{[1 + r]^n} \right]$$

- (viii) Present value of £1 per annum, payable or receivable in perpetuity, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r}$$

- (ix) Present value of £1 per annum, receivable or payable, commencing in one year, growing in perpetuity at a constant rate of $g\%$ per annum, discounted at $r\%$ per annum:

$$PV = \frac{1}{r - g}$$

Cost of Capital

- (i) Cost of irredeemable preference capital, paying an annual dividend, d , in perpetuity, and having a current ex-div price P_0 :

$$k_{pref} = \frac{d}{P_0}$$

- (ii) Cost of irredeemable debt capital, paying annual net interest, $i(1 - t)$, and having a current ex-interest price P_0 :

$$k_{net} = \frac{i[1 - t]}{P_0}$$

- (iii) Cost of ordinary (equity) share capital, paying an annual dividend, d , in perpetuity, and having a current ex-div price P_0 :

$$k_e = \frac{d}{P_0}$$

- (iv) Cost of ordinary (equity) share capital, having a current ex-div price, P_0 , having just paid a dividend, d_0 , with the dividend growing in perpetuity by a constant $g\%$ per annum:

$$k_e = \frac{d_1}{P_0} + g \quad \text{or} \quad k_e = \frac{d_0[1 + g]}{P_0} + g$$

- (v) Cost of ordinary (equity) share capital, using the CAPM:

$$k_e = R_f + [R_m - R_f]\beta$$

- (vi) Weighted average cost of capital, k_0 :

$$k_0 = k_e \left[\frac{V_E}{V_E + V_D} \right] + k_d \left[\frac{V_D}{V_E + V_D} \right]$$

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*P10 – Test of Professional
Competence in Management
Accounting*

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