

### Defence Industry Symposium "NSW Collaboration for Defence" UTS 15<sup>th</sup> February



Robert Dane Chief Executive Officer Ocius Technology Ltd <u>www.ocius.com.au</u>



- **2017** Spitfire Memorial Defence "Fellow"
- 2016 Finalist User and Lifetime Achievement Awards International Windship Association IWSA SMM Hamburg
- 2015 Winner of Australian Technology Competition Best-Advanced Manufacturing Category
- 2015 Capability Technology Demonstrator (CTD) Contract Round 19
- 2014 Change name to OCIUS & focus on USVs
- 2013 Energy Globe Award for Sustainability
- 2012 WWF Future Makers Award
- 2010 Winner China Seatrade Award
- 2010 Winner of Environmental Technology Award at the Sustainable Shipping Awards
- 2009 Italian Well Tech Design Award
- 2007 Appointed as Intel Environment Laureate USA
- 2004 United Nations Awards finalist "Green Ferries for Blue Highways"
- 2002 Appointed SEDA NSW Green Ambassador
- 2001 Winner Australian Design Award of the Year 2001
- 1997 Winner of Advance Technology Boat Race Canberra

### **Key Personnel**





### Mark Bethwaite AM, Non-executive Chairman

Mark Bethwaite has degrees in Civil Engineering and an MBA. He was Managing Director of two of Australia's largest mining companies and one of Australia's leading industry associations.

Mark represented Australia in sailing in the 1972 and 1976 Olympic Games and has won World Championships in a number of classes. He has been a shareholder in Ocius since 2000 and Chairman since 2014



### Dr Robert Dane, CEO

Robert Dane is the founder and CEO of Solar Sailor Holdings Limited which became Ocius in 2014. Robert invented and patented "solar sails" in 1996.

He is a passionate sailor and an Intel Environment Laureate. In 2013 Robert was honoured to be awarded the WWF Future Makers award.



### Dr Louella Grattan-Smith, Non-executive Director

David Saxelby, Non-executive Director

Louella joined the Board in June 2013. Louella has been involved in Ocius and a major shareholder since its inception. Louella contributes substantially towards Ocius' corporate governance, shareholder representation, ethical focus and growth strategies.



### Hon Robert Hawke AC, Chairman Advisory Board

Bob Hawke was Prime Minister of Australia from 1983–1991. He has high-level industry and government relations in Australia, China, the USA, and Europe.

He was Chairman of Solar Sailor from 2000 until 2014. Ocius Technology Limited is the only commercial corporation in which he is involved.



David is one of the most senior Executives in the Construction and Infrastructure Industry in Australia. He has held Managing Director and CEO roles for the past decade, most recently with Lend Lease as CEO of Construction and Infrastructure Australia, a \$7Bn per annum business including Engineering, Building, Services and Capella Capital.

David has held a number of senior Industry positions including President and Board member of Australian Constructors Association, Board member of Roads Australia, Board member of Infrastructure Partnership Association and Board member of Mineral Council of Australia. He has been listed in the Top 100 Engineers in Australia for the past four years.

### "Capability" not a product...



- 85% of Australia's trade is by sea
- 11% world's oceans, 0.3% of worlds pop
- Since WWI 'arms race' between submariners and sailors
- Cold War 12 countries with subs now over 40
- \$350M good second hand diesel electric sub
- Talk to your customer,
- "program of record"

Australia's Exclusive Economic Zone (EEZ) is one of the largest in the world with total marine area of around 10 million square kilometres which is considerably larger than the 7.69 million square kilometres of the Australian mainland States and territories..



### **Unmanned Surface Vessels for ASW?**



### **Current technologies**

A)Unmanned powered boats – USVs

Conventional powered vessels of around 11- 12m length, with maximum "on water" operations counted in hours or perhaps days. Not 100% coverage - expensive.

# B) Self-sustaining powered by solar or wave energy USVs

Very low speed and manoeuvrability, low power and low space available for sonar payloads, not able to have meaningful speed of advance in all conditions -OK for oceanography but largely ineffective as platforms for hydrography/defence/ASW.





### **Unmanned Underwater Vessels**

- Advantages
  - Avoid the weather
  - Stealth
  - Underwater ops

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OCIUS

- Disadvantages
  - Don't use the weather so limited power
  - No GPS
  - No Communications



### Long term view...



2008: Enquiry in USA, Decision by board to invest \$500,000 + \$120,000 2008 - 2012: Development/testing of Engineering Development Model 2013: Team with NSW boat builder Steber & meet Sam Wong, Les Sutton 2013: Display 2 non-working models Oct at Pac 2013 meet Thales 2014 - 15: Apply CTD, build, test, sea trial BlueBottle 'Nemo' - Pac 2015 Dec 2015: First cheque for defence (...so keep commercial business)





### 9 yrs. USV Research & Development into USVs OCIUS



- Performance Meaningful speed in all conditions to get out of currents
- Payload 250kg
- Power for payload 50W average 24/7, kW short periods
- 2/20' shipping container

### **Unmanned Surface Vessels**

## OCIUS

	"Nemo"	"Bluey"	"Bruce"	Wave Glider
Speed	2-3 knots	3-4 knots	5-6 knots	Speed 0.4-1 knot
Power	2x	5x	25x	Low power & Low energy
Energy & payload	2x	5x	25x	Small
Solar not shaded	2x more	5x	25x	Small
Collision Avoidance	Yes	Yes	Yes	No
Roll Dampened	Yes	Yes	Yes	Νο
Others	<ul> <li>Can take photos and do hydrography</li> <li>Inmarsat</li> </ul>	• Roll dampened mast with radar high above water	• Can carry, deploy and retrieve 85m cable and 25m array	Not very big Cant retract



2.8m oceanographic

3.5m Defence and security



5.6m Defence and security

Wave Glider (USA)Market LeaderEst. 2007.

- <u>Sold to Boeing ></u> <u>US\$200M in Feb 2017.</u>
- Validates market

### performance payload power

## CTD Rd 19 Project ASW USV Exec Summary OCIUS

**Sept 2015:** Under SEA 5000 Future Frigate Program, the RAN is acquiring a Task Group anti-submarine warfare (ASW) capability. ASW is typically conducted either by large platforms, such as frigates or submarines fitted with a towed array, or airborne assets. This is expensive, commits valuable resources, and limited by the endurance of the platform. Consequently, the RAN lacks low cost, persistent, acoustic ASW assets. The Buyer proposes to demonstrate an Ocius Unmanned Surface Vessel coupled with a Thales thin-line towed array. This system is uniquely suited for ASW surveillance being acoustically covert, able to operate autonomously on station indefinitely, enables tactical situational awareness through remote sonar data, and acts as a force multiplier - complimenting RAN ASW sensor suites.

The aim of this project is to demonstrate a fully integrated, remotely controlled ASW sonar system on board a highly manoeuvrable, persistent USV platform ready for further evaluation by the RAN. This would produce a proof of concept ASW USV demonstrator which provides a remote and persistent ASW sonar capability, and is able to be deployed to tactically significant distances from a task group.



## CTD Rd 19: one ASWUSV demonstration in OCIUS

**Oct 2017** 



### 5.6m BlueBottle V1 "Bruce"

- 1) 5 6 knots hull speed
- 2) Payload 105kg winch diameter 1400 can be cassette
- 3) 5m aft coms and weather mast options
- 4) Active array tube forward of winch in keel
- 5) 2/20' shipping container
- 6) Boat ramp or crane launch
- 7) 50W average/kW max power to payload sustainably with 8 hours sun



## OCIUS





Hull Form Powering Comparison (Averaged across resistance methods)(Array Deployed)

### **Ocius System/Software – HMI V2**







### **Testing Botany Bay**







## Collaboration



DSTGroup – Strategic Intelligence and Strategy Group Thales Steber 123 Naval Architects UNSW & NSW Innovations Connections

**Spitfire Memorial Defence Association – Lysle Roberts** 



### **Capability not a product**



### 'Fleet' of USVs – one every 5 miles = 100% overlap



- ✓ Continuous coverage 24/7/365
- $\checkmark$  Above the water and below the water
- ✓ Low CAPEX (300 USVs = \$150M)
- ✓ Low OPEX (no fuel, no crew, no supplies non overtime)
- ✓ No errors due to fatigue
- ✓ No people or expensive assets in harms way

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- 1. Procurement is about a Defence Capability not a product however "never been a more exciting time" Talk to your customer
- 2. Collaborate DSTG, Thales, Steber, UNSW, Spitfire, 123
- 3. Keep commercial business cash, P&L, debt, equity
- 4. Partner or not? Have a strategic plan.
- 5. Long term view patience..!

**Thank You** 



## Questions and comments. Thank you.

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