

OZEQUITIES NEWSLETTER

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FEATURE

Week's Special

SMN: STRUCTURAL MONITORING SYSTEMS' CVM METAL STRESS MONITORING TECHNOLOGY IS IN PIVOTAL TRIALS WITH SEVERAL AIRLINES - FAA APPROVAL WILL BRING HUGE COMMERCIAL SUCCESS

By Jenny Prabhu and Gerald Stanley

Structural Monitoring Systems, founded in Australia in 1999, has well developed patented technology that detects early stage metal fatigue.

The focus is on aircraft, the most lucrative market by far, since the need for the most accurate, earliest monitoring of metal fatigue in aircraft can hardly be overstated.

The technology also has application in detecting fatigue in structures such as bridges, as well as in hi tech products.

The market for its products is enormous and the benefits to manufacturers and operators in early detection means a huge saving in costs, apart from reputational and other issues.

* Durable, simple to design and manufacture, easy to install and use, highly reliable and with a benchmark crack detection capability, CVM(TM) technology has application in a broad range of commercial, military and industrial market sectors.

*The technology equally applies to detecting metal fatigue in motor vehicles, power generation machinery and hi tech products.

*Metal fatigue in bridges is an area where tests have already been conducted - President Obama recently asked for \$302 billion to repair bridges and potholes - he had asked for \$302 billion to repair bridges, earlier - there are some 600,000 bridges in the US, including old iron bridges.

*The sensors can also be incorporated into fibre resin composite materials. Most conventional non destructive testing techniques are not compatible with composite materials - and that is a significant, and growing, replacement technology for metal in cars and aircraft, among others.

The global civil+military aviation industry includes some 3 mln planes

*In a March 2013 report for Boeing by Boeing's Aviation System Analyst Helen Jiang, the average of a sample of aircraft examined is 27.2 years, and growing. The 50% survival rate of aircraft was 24 years.

Other published reports:

*There are approximately 3 million airplanes, globally.

*The average age of fleets worldwide is 12.5 years.

*British Airways average age of aircraft is just over 10 years.

*Lufthansa's average fleet age is 12 years, and Lufthansa Cityline average age of fleet is 6.3 years.

*Malaysian airlines average age is 6.2 years.

*Qantas average is 9.7 years.

*Virgin Airlines average is 5.1 years.

*The 747s are the oldest aircraft still generally in commercial use - up to 45 years old.

(Smaller and regional airlines, aircraft belonging to executives and others can often be in operation for a very long time).

*The Australian government 2010 report states "The Australian General Aviation and Regional Airline fleet contains many older aircraft, with the average age being 27.0 years, which is a marginal rise (0.1 years) from 2009. A total of 616.7 thousand hours (or 29.7 per cent of all flying) was performed in aircraft

under 11 years old, 461.0 thousand hours (22.2 per cent) in aircraft aged between 11 and 20 years old, 360.7 thousand hours (17.4 per cent) in aircraft between 21 and 30 years old, and 637.6 thousand hours (30.7 per cent) in aircraft over 30 years old.

*In addition there are military aircraft fleets in every country - often significantly older.

Structural Monitoring Systems is headed by knowledgeable directors, well connected and market savvy. While the company seems to need a new injection of cash, it does not seem to have difficulty in raising funds, given its vast potential. It is 66.5% held by its major shareholders.

What the brokers say

*MacEquity Partners on January 29 (in a report by the dealing desk, not by the analysts) the broker said in the report, "CVM (Comparative Vacuum Monitoring technology) is closer than ever to commercial readiness and acceptance" after the recently announced Boeing/Delta Air Lines program was followed by Sandia's FAA Assurance Centre performing critical oversight and advisory, involving multiple aircraft from the manufactures' fleet, operated by multiple commercial carriers.

"Another world first following on from the recent SMN Delta Airlines/Boeing announcement" the report concluded, adding, "With significant reductions in fixed monthly overheads, current cash on hand and anticipated order activity, MacEquity Partners expects SMN to be already well funded into 2014 with little need to raise further capital.

The broker adds the major downside risk is if the technology isn't approved by the FAA and/or approval takes longer than expected.

*On November 7, 2013 Bruce Jackson in "The Motley Fool" said, shares in Structural Monitoring Systems (ASX: SMN) have jumped 36% higher in morning trade to 30 cents after the micro-cap raised \$375,000 through a private placement of 2,343,750 shares at 16 cents - up from 4.6c.

The placement was granted to prominent New York-based hedge fund Drake Private Investments, a long term strategic supporter of SMS and the Company's largest shareholder, and professional investors.

The company noted that with the significant reduction achieved in its fixed monthly overhead in recent months, and given current cash on hand and anticipated order activity, it expects the funds raised will fully support the Company's operations well into 2014.

Structural Monitoring Systems' vision is to produce remote crack detection sensor and instrument products that will radically reduce the cost of maintenance and vehicle or plant down-time associated with performing safety critical structural integrity NDT inspections.

For the year ended June 2013, the company only generated revenue of \$144,000, and as at the end of September its cash balances were down to \$176,000.

At the end of October, SMS announced a partnership with one of the Company's long-standing commercial partners, Delta Air Lines, Inc. ("Delta"), at the time the company saying...

"It is envisaged that this Programme, with installation of CVM (TM) technology onto a number of Delta's 737-NG aircraft, will 'pave the path' to mainstream use of the technology in the global commercial aviation sector."

"Blue sky potential, but with risks to match" the analyst concluded.

STRUCTURAL MONITORING SYSTEMS PLC - A SNAPSHOT

Structural Monitoring Systems Plc was floated in June 2004, following an offer of 20m shares at 25c each with free attaching options, listing on August 16, closing at 16c.

Air Marshal Sir John Walker KCB, CBE, APC FRAeS, former Chief of Defence Intelligence and an ex deputy chairman of the Joint Intelligence Committee in the UK was SMN's non exec chair until November 2009 when he resigned for health reasons.

Structural Monitoring Systems Plc had commenced operations in 1995 in Perth with its patented Comparative Vacuum Monitoring (CVM) technology, developed by Ken Davey, a retired Western Australia airline pilot, who exchanged his intellectual property rights for a minority stake in SMN.

Ken Davey was motivated to develop the technology after 26 lives were lost in 1968, when Vickers Viscount VH-RMQ plunged into the ground near Port Hedland, Western Australia while operating for the MacRobertson Miller Airlines. The resultant inquiry found the cause to be metal fatigue - an undetected crack through the main wing spar. Ken Davey was a pilot for the airline in 1968 and had flown VH-RMQ the day before the starboard wing failed in flight, killing all on board.

SMN is headquartered in Perth, with registered offices in the UK and in the US, its principal place of business.

The technology

Comparative vacuum monitoring (CVM) consists of sensors mounted on aircraft structures at sites where flaws are expected to develop, growing from his observation that vacuum in cathode ray tubes in aircraft structures decreases quickly when there are cracks in the glass of the tube.

Dr Dennis Roach from the Sandia National Laboratories in the US along with the FAA, Boeing and a number of US airlines worked on validating the technology.

The CVM sensor is a thin, self adhesive fluoropolymer sensor, ranging from dime to credit card size that detects cracks in the underlying material. The sensor is laser-etched with rows of tiny, interconnected channels or galleries to which air pressure is applied. Any propagating crack under the sensor breaches the galleries and the resulting change in pressure is monitored (report in "Flight Safety" quoting Dr Dennis Roach from Sandia National Laboratories, US).

CVM has applications for both existing aircraft and for new built aircraft and has the potential to substantially reduce fleet maintenance and repair bills, estimated at 1/4th of fleet operating costs. Durable, simple to design and manufacture, easy to install and use, highly reliable and with a benchmark crack detection capability, CVM(TM) technology has application in a broad range of commercial, military and industrial market sectors, specifically in air, land and sea transportation systems, power-generation systems, and industrial processing plants.

The sensors can also be incorporated into fibre resin composite materials, while most conventional non destructive testing techniques are not compatible with composite materials.

CVM can detect the start of a crack and measure its growth up to a predetermined level when an alarm is raised or the structure shuts down automatically. The sensors can be made in materials suitable for deployment inside chemical and nuclear reactors. The sensors do not interfere with electronic equipment on airborne aircraft. They do not require a highly skilled technician to operate the equipment or interpret results.

The CVM can be integrated with existing equipment management systems and computer monitoring systems.

Structural Monitoring Systems has received accreditations from The Boeing Company and the Australian Defence Force endorsing the use of CVM sensors and PM200 hand held monitoring instruments as suitable for performing structural integrity inspections.

The technology has been widened to also be applied to monitoring ageing bridges and several new patents have been acquired or have applications pending, effectively extending the life of the original patent.

*The first bridge monitoring test was installed in May 2010, covered with a sealant due to the exposed location - a remote alarm signal is sent when a crack is discovered.

THE PATENTS

SMS actively protects its intellectual property with patents and patent applications. The original 1994 "Monitoring Apparatus" patent is granted in 24 jurisdictions including the US.

"Measurement of Flaws, "Measurement of Permeability" and "Integrity of Fasteners patents are granted in the US and filed in several other jurisdictions.

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MOST RECENTLY

*On April 14 Structural Monitoring Systems plc announced it has achieved a critical milestone in the previously announced commercial in flight test program involving Delta Air Lines, the Boeing Company, the Federal Aviation Administration (FAA) and the FAA Airworthiness Assurance Center at Sandia National Laboratories.

The installation phase of its CVM technology on the 7th and final Boeing 737-700 series participant aircraft was recently completed at Delta's Atlanta, GA maintenance facility, on schedule and well within the time parameters previously announced.

Close to 100% of the targeted sensor locations on the aircraft were accessed and successfully fitted with CVM sensors, while initial monitoring indicated all sensors are performing fully as expected.

Over the coming weeks, all Program aircraft will be periodically monitored to collect and log the essential data to be provided to all organisations and to the FAA.

It is envisaged this phase will last 5-6 months.

ELECTRONICS AND ENGINEERING MARKET

On November 6 2013 SMN announced a non disclosure agreement with Cornes Technologies Ltd (CTL), to investigate the market potential of SMN's suite of CVM technology products in CTL's core activities, involving sales and marketing of electronics equipment and associated technology, electronic components, industrial machinery and scientific equipment and the manufacture and sales of diamond CVD systems.

MANUFACTURING

Manufacturing is outsourced, with minimal direct costs to the company. A formal agreement is in place with AEM Corporation was signed in February 2013. AEM is a leading designer and manufacturer of electronic components for aircrafts to manufacture all SMN's products.

In the March 4 2014 report, of the commencement of the commercial in-flight test program involving Delta Air Lines, the Boeing Company, the Federal Aviation Administration and the FAA Airworthiness Assurance Center at Sandia National Laboratories, AEM Corporation's project manager Trevor Lynch-Staunton said, "AEM is excited and proud to be involved in the manufacturing, installation and development of this structural health monitoring solution. We have brought years of design and manufacturing experience together with this innovative technology from SMS, and demonstrated the ability of CVM to be successfully installed on a commercial aircraft".

THE COMPETITION

Apart from physical inspection by engineers (both time consuming, often inconvenient to passenger traffic and not wholly effective), artificial neural networks (ANNs) have been utilized for structural health monitoring (SHM) due to the advantage that it needs only a few training data to detect damage in structures often ineffective.

There are various research projects under way in many countries designed to detect risks arising from corrosion and other potential structural risks.

STRUCTURAL MONITORING SYSTEMS PLC FINANCIALS

Code:	SMN
Last Traded price	21c.
Shares Issued	91.8m.
Market Cap	\$19.3m

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Year ended June 30, Values in \$000's

INCOME	2014 Int	2013	2012
Op Revenue	97	144	114
Op Profit (loss)	(361)	(913)	(1266)
Net profit (loss)	(361)	(913)	(1266)
(Loss)PS (Cents)	(0.41)	(1.30)	(2.23)

BALANCE SHEET	2014 Int	2013	2012
Current Assets	484	372	153
Non Current Assets..	-	-	-
Current Liabilities	209	364	93
Non Current Liabilities	-	-	-
Net Assets & Shareholders' Funds	275	8	60
Intangibles	-	-	-
Net Tangible Assets	275	8	60
Gearing (Net of Cash) %	.nil	.nil	.nil
NTA per share (cents)	0.3	0.01	0.19
Shares Issued (m's)	91.8	85.9	31.8

Cash Flows:	2014 Int	2013	2012
Cash on hand (at open)	326	142	591
Operating Activities	(244)	(317)	(1154)
Investing	-	-	(3)
Financing Activities	375	501	708
Cash on hand at Year end	457	326	142

*Although in "pre commercialisation" phase, the company receives ongoing revenues from the sale of its technology based production in the form of sensors and related hardware and peripherals.

Directors:

Toby Chandler, managing director

Mr Chandler is co-founder and Chief Investment Officer of SEAL Capital Ltd, a Los Angeles based hedge fund specialising in global macro strategies designed to provide risk adjusted absolute returns investing in an array of global markets, under all market conditions.

Before forming SEAL Capital, Mr Chandler was a Partner and Portfolio Manager with private equity and macro hedge fund Seagate Global Advisers. Prior to relocating to Los Angeles, Mr Chandler was a managing director with Morgan Stanley Inc, New York, where he ran the Bank's Specialist Hedge Fund desk servicing key clients in an array of financial products in all markets.

He received his B.Comm in Finance from the University of Western Australia and his masters in Applied Finance and Investment from the Securities Institute of Australia.

Andrew Chilcott, non exec director

Mr Chilcott has an extensive international aerospace background including engineering and marketing positions at Rolls-Royce Aero-Engines, sales positions with Airbus and Structural Monitoring Systems which brought Andrew and his family to their current home in Perth, Western Australia. Mr Chilcott was heavily involved in raising the awareness of the patented CVM technology internationally during 2006-08. Since 2008 Mr Chilcott has been the State Manager, Western Australia and South Australia for Landis+Gyr, a global leader in smart metering infrastructure.

Michael Reveley, non exec director

Mr Reveley is managing partner, CEO and co-portfolio manager of SEAL Capital Ltd. Before forming SEAL Capital he was a founding partner and deputy chief investment officer at Seagate Global Advisers in Los Angeles, having earlier been director of the syndicate and derivatives group at SBC Warburg in London and New York, vice president of global derivatives for Swiss Bank Corporation and vice president

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of the global derivatives group at First Interstate Bank, where he co-managed a \$US20 billion derivatives portfolio.

David Veitch, non exec director.

Mr Veitch is the President and founder of Anodyne Electronics Manufacturing Corp. AEM Corp design, manufactures and markets its own line of Aviation communication equipment. It also utilises its expertise in these areas under contract with several OEMs. Before founding AEM Corp he worked with Northern Airborne Technology Ltd where his career progressed from manufacturing to Operations Manager, helping Northern Airborne Technology grow from a 10 person shop to a corporation with over 200 employees and \$40 million in annual sales.

Michael Reinstein, non exec director

Mr Reinstein is the managing director of Archetype Capital, a Los Angeles based private equity firm. Archetype's holdings include a diverse portfolio of companies in the automotive aftermarket, beauty, healthcare and e-commerce space. Throughout his career, Mr Reinstein has built and sold technology and media companies in both the private and public markets.

Among them, in 2006 Reinstein purchased a London based interactive TV channel on the British Sky Broadcasting platform that he sold in 2009.

From 2010 to 2011 he also served as CEO of the Franklin Mint, one of the world's leading brands for fine coins and collectibles.

He is also involved in various political and charitable causes in both the US and UK. He is a member of the State Bar of California.

Company secretary: **Sam Wright**.

Mr Wright is currently a non exec director and company secretary of PharmAust Ltd. He is also company secretary for Buxton Resources Ltd, Cove Resources Ltd and Structural Monitoring Systems Plc and various unlisted companies. He is the managing director of Perth based corporate advisory firm Straight Lines Consultancy, specialising in the provision of corporate services to public companies.

Major shareholders:

Drake Private Investments LLC 11.29%

Bryant James McLarty and the McLarty Family a/c 8.4%

Anodyne Electronics Holding Corp 8.17%

Drake Private Investments LLC 7.06%

Toby Chandler 5.65%.

The Top 20 hold 66.56% of SMN

Our last Week's Special was on January 28 2011. SMN was trading at 1.2c.