Zacks Small-Cap Research

September 22, 2011
Ken Nagy, CFA

www.zacks.com
111 North Canal Street, Chicago, IL 60606

Trans-Pacific Aerospace (TPAC-OTC)

TPAC: Approval Process Under Way- NEUTRAL

Current Recommendation	**Neutral**
Prior Recommendation	Outperform
Date of Last Change	03/28/2011
Current Price (09/21/11)	$0.10
Six- Month Target Price	**$0.50**

OUTLOOK

Trans-Pacific Aerospace Company (TPAC) intends to monetize its proprietary technology. TPAC and its joint venture partners intend to manufacture aerospace quality standard spherical bearings, rod ends and bushings (bearings) in China. Growth in China is two-fold: First the number of planes in China is expected to jump from 1,256 today to 4,330 over the next 20 years. With 3,000 spherical bearings on each plane the market is substantial. Second the offsets or obligations that original equipment manufacturers (OEMs) such as Boeing and Airbus owe China are approximately $16 billion. There are currently no manufacturers of spherical bearings in China. While we like the business model, investors should be aware that the firm currently has no revenues will require capital to continue as a going concern.

SUMMARY DATA

52-Week High	**$0.25**
52-Week Low	**$0.09**
One-Year Return (%)	**N/A**
Beta	**0.07**
Average Daily Volume (sh)	**115,670**
Shares Outstanding (mil)	**42**
Market Capitalization ($mil)	**$6**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**N/A**
Insider Ownership (%)	**N/A**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2011 Estimate	**0.6**
P/E using 2012 Estimate	**0.1**
Zacks Rank	**3**

Risk Level	**High**
Type of Stock	**Growth**
Industry	**Aerospace**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Jan)	Q2 (Apr)	Q3 (Jul)	Q4 (Oct)	Year (Oct)
2010	$0.0 A	$0.0 A	$0.0 A	$0.0 A	$0.0 A
2011	$0.0 A	$0.0 A	$0.0 A	$8.0 E	$8 E
2012	$7.0 E	$7.5 E	$7.5 E	$8.0 E	$30 E
2013	$18.0 E	$19.5 E	$20.5 E	$21.0 E	$79 E

Earnings per Share
(EPS is operating earnings before non recurring items)

	Q1 (Jan)	Q2 (Apr)	Q3 (Jul)	Q4 (Oct)	Year (Oct)
2010	-$0.03 A	-$0.04 A	-$0.03 A	-$0.13 E	-$0.23 A
2011	-$0.02 A	-$0.01 A	-$0.01 A	$0.10 E	$0.06 E
2012	$0.06 E	$0.07 E	$0.07 E	$0.08 E	$0.28 E
2013	$0.18 E	$0.19 E	$0.23 E	$0.24 E	$0.84 E

© Copyright 2011, Zacks Investment Research. All Rights Reserved.

WHATS NEW

The Approval Process
The qualification process for approval by the United States Navy can be obtained in two ways.

- The firm can submit parts to the Navy and they will do all of the tests.

The advantage of this is that you only have testing done one time. The disadvantage is that right now they are really busy and wouldn't be able to start until October 1, 2011, with a completion date of December 31, 2011. The other disadvantage is that if you have negative results you must start over.

- The second method is to have an independent lab (ITL) run the tests.

What that means is that when ITL is done, they will prepare a test report and submit it to the Navy. The Navy will then take that test report and do testing to verify the results obtained by ITL. By going this route the Navy can still start on October 1, but the verification testing only takes between 2 and 4 weeks, so qualification may come by November 1, 2011 saving the firm 2 months. The other advantage is that you know the results before you submit parts to the Navy and in this case they can get all of the testing done and receive qualification before November 1. TPAC opted for this path. ITL has completed all testing and all bearings passed well under the maximum allowable limits. New test bearings and the ITL test report are in the hands of the Navy.

Once approved, the Guangzhou facility would be placed on the Society of Automotive Engineers (SAE) Qualified Producers List, allowing all Chinese and international airframe manufacturers, sub-tier suppliers, MRO facilities, airlines and distributors to purchase parts produced there. The Guangzhou facility, located in close proximity to Hong Kong and Guangzhou would be the first facility in China qualified for the production of SAE-AS81820, SAE-AS81934 and SAE-As81935 spherical bearings, bushings and rod end bearings, components used extensively in commercial aircraft.

Liquidity and Capital Resources
As of July 31, 2011, TPAC had total assets of $40,892 and a working capital deficit of $449,300. Since July 31, 2011, working capital deficit has increased as a result of continuing losses from operations. The firm estimates that it will require approximately $2 million of additional working capital over the next 12 months in order to fund its expected marketing and distribution of the initial line of aircraft component products to be manufactured by Godfrey and to fund expected operating losses as it endeavors to build revenue and achieve a profitable level of operations

INVESESTMENT THESIS

- The firm already has one joint venture partner, Godfrey (Guangzhou) Bearing Company, for manufacturing, and will choose another partner for manufacturing and distribution once testing is completed.

- TPAC will only target countries for business where it is the sole domestic manufacturer.

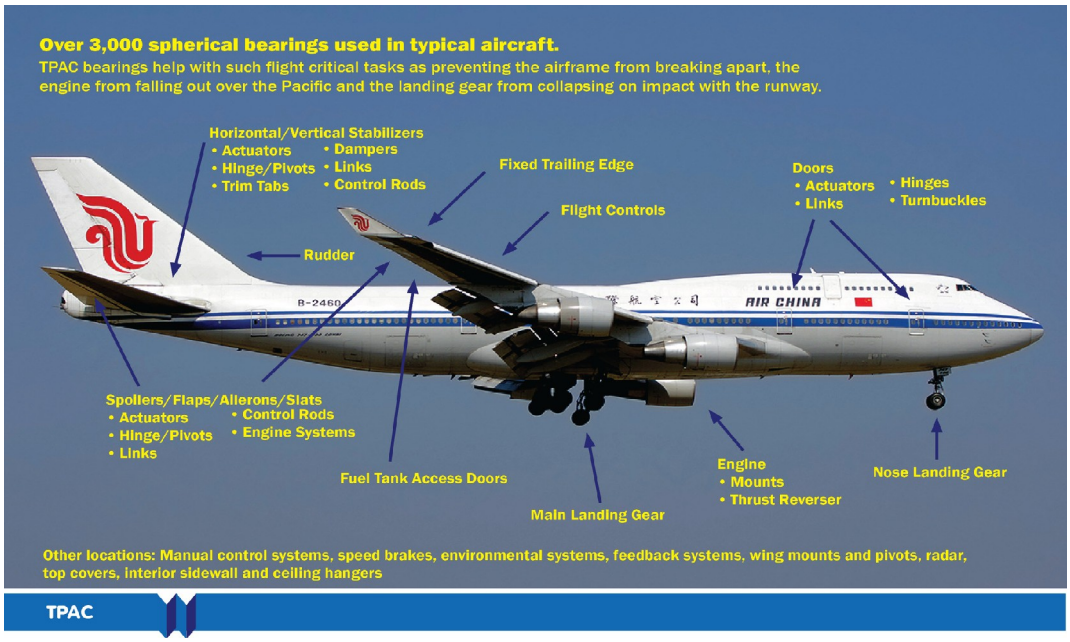
- An estimated $1.1 billion worth of standard spherical bearings were sold in 2009, that number is expected to jump to $1.6 billion by 2011.

- On December 9th 2010 the firm's self-lubricating liner system and bearings successfully completed wear testing at Independent Testing Laboratories in Costa Mesa, California.

- TPAC requires capital to fund equipment and tooling purchases, working capital buildup (raw material, work-in-process and finished goods inventories), and startup corporate overhead.

TPAC's proprietary technology associated with the bearings is the self-lubricating liner system, which will be manufactured in the U.S. at a TPAC facility. This liner is an integral component of TPAC finished parts, which are used in aircraft where lubrication is undesirable, difficult to perform or impossible. In practice, the liner system is bonded to race surfaces, and during use, forms a lubricating film on the mating ball surface that is continually replaced throughout the life of the liner material. Parts with this liner system conform to SAE-AS specifications, operating under dynamic load at temperatures between -65° F and 350° F while being exposed to contaminants that include jet fuel, de-icing chemicals, oil and water. (Dynamic loads are defined as light to heavy, uni-directional or alternating loads; intermittent to continuous misalignment; and intermittent to continuous oscillation

Over 3,000 of these parts (approximately $500,000 worth) are used in every aircraft and must be replaced regularly. The TPAC/Guangzhou manufacturing facility will be the sole source in China for certified standard spherical bearings.



To get a typical idea of a common application for a spherical bearing, picture a windsurfer. In these devices, the mast can both rotate and swivel 180 degrees. The mast primarily swivels or misaligns, with only some rotation. This misalignment is done through a spherical bearing. Similarly, two different struts of a landing gear are mated together with a plain spherical bearing. This bearing allows the mating surfaces to move in different directions and still be attached to each other. The bearing allows for the folding of the gear. The bearings are used to hold the engine onto the aircraft. They are necessary, since the engine sways back and forth due to flight conditions and vibration. The bearings are used in any number of applications on an aircraft where there is some rotational movement and/or misalignment between mating parts. In examining an airplane where structural components are exposed one will see thousands of these bearings being used in a wide variety of applications.

Total Market	2011	2012	2013	2014	2015
OEM Units (000)	3,000.00	3,168.00	3,345.00	3,533.00	3,731.00
After Market Units (000)	6,000.00	6,264.00	6,540.00	6,827.00	7,128.00
Total Units	9,000.00	9,432.00	9,885.00	10,360.00	10,858.00
Avg Unit Price	$ 167.00	$ 168.00	$ 169.00	$ 170.00	$ 171.00
Total Revenue	$ 1,503.00	$ 1,585.00	$ 1,671.00	$ 1,671.00	$ 1,671.00

Business Model

TPAC, with its China domestic partner, Godfrey (Guangzhou) Bearing Company, has established a manufacturing facility in the Scientific and Technology Center in Guangzhou, China to manufacture aerospace quality standard spherical bearings, rod ends and bushings (collectively, "Bearings"). The venture represents the first and only manufacturer of SAE-certified Bearings in China, and has already received approval from central, provincial and local government entities. Boeing has pledged full technical support; which is key, since 59% of China's collective fleet is comprised of Boeing aircraft.

TPAC has been engaged in ongoing dialogue with Aviation Industries of China (AVIC) to form a joint venture with AVIC for the manufacture and distribution of Bearings. To that end, TPAC and AVIC have signed a non-binding letter of intent to form a joint venture. TPAC has also engaged in ongoing dialogue with several of the largest bearing manufacturers in China as potential joint venture or supply chain partners. TPAC has determined that it is in the best interests of the Company to enter into a formal joint venture agreement with a Chinese JV partner only after the Guangzhou facility has been qualified by the US Navy for the manufacture and sale of Bearings. TPAC anticipates that it will send personnel to China in the fourth quarter of 2010 to manufacture Bearings for US Navy qualification and that it will receive qualification approval by the US Navy on or about May 1, 2011.

The partner will supply the manufacturing labor, machinery/equipment and raw materials when full operations commence. TPAC and Godfrey (Guangzhou) will supply the manufacturing facility, manufacturing know-how, blueprints for approximately 1,500 parts, and a proprietary liner that is integral to the finished product. Additionally, should TPAC/Godfrey elect to form a joint venture with AVIC, AVIC would supply domestic marketing of the product, negotiations with Boeing and Airbus for international sales (AVIC presently is a major supplier of products to Boeing and Airbus, and has well-established relationships with Boeing and Airbus for the sale of products.)

On December 9th 2010 the firm's self-lubricating liner system and bearings successfully completed wear testing at Independent Testing Laboratories in Costa Mesa, California. According to the company the bearings were subjected to 10,000 lb. loads for 25,000 cycles at both ambient and high temperature ranges. The liner wear for the TPAC test parts was substantially less than the maximum allowable wear for qualification. The test program is identical to Navy qualification tests, and since TPAC will be producing test parts in China using the same components, liner and tooling, TPAC confident it will achieve similar results for products made in China.

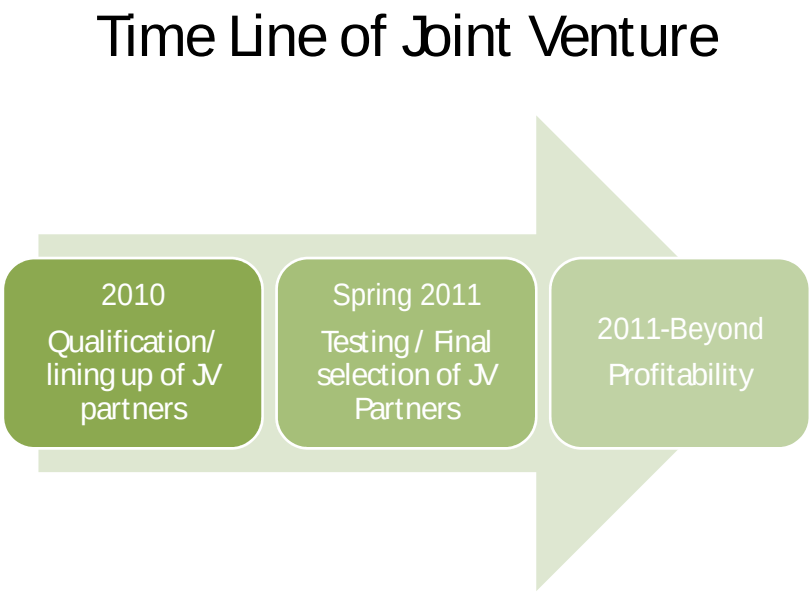
The firm expects Trans-Pacific Aerospace engineering and quality control staff will depart for China the first week of January 2011 with qualification production commencing immediately upon arrival in China. Qualification test parts will be submitted to Independent Testing Laboratories for first-pass testing in February, and to the Navy in mid-March. The company expects qualification approval from the Navy on or about May 1, 2011.

TPAC's plan is to sell its bearings to OEM's directly, through AVIC and through a series of established sales representatives. For sales to its aftermarket customers it will use an established third party distributor network in addition to AVIC. The firm expects the bearings will be sold on the basis of high quality, competitive cost, short lead times, compliance with and surpassing of product application and

SAE specifications, and sourcing from production facilities qualified by the U.S. Navy. Presently, AVIC purchases approximately $100 million of these Bearings annually and pays an import duty on the Bearings of approximately 24%. AVIC has estimated that the joint venture could enjoy sales of $20 million from China during the first year of full operations.

TPAC requires capital to fund equipment and tooling purchases, working capital buildup (raw material, work-in-process and finished goods inventories), and startup corporate overhead. Estimates of these requirements are shown below. Corporate profits are expected to meet capital needs after 2011.

Capitalization Plan ($mil) 2011	
Equipment and Tooling	$3
Inventory Buildup	$5
Corporate Overhead	$6
Total Capital Requirements	$14



Back Drop of Growth and Offsets

China continues to transform much of its population and economy from poverty to a middle class environment. The urban population has doubled from 302 million in 1990 to 622 million in 2009 and is projected to approach one billion by 2025. There were 40 large cities that had more than one million residents in 2000. That number tripled to 122 in 2008. The Economist Intelligence Unit (EIU) forecasts that there will be more than 200 large cities by 2025. Rapid urbanization calls for an integrated modern transportation system, and China's government has responded with intense investment in infrastructure.

According to *ChinaView.com, China built six new airports in 2009, bringing the total number to 166 as of last December. The six new airports are Tuofeng airport in Yunnan Province, Batang airport in Qinghai Province, Lindu airport and Saertu airport in Heilongjiang Province as well as Shadi airport in Guangdong Province. The country's civil aviation industry invested roughly 60 billion yuan (8.82 billion U.S. dollars) in fixed assets in 2009.

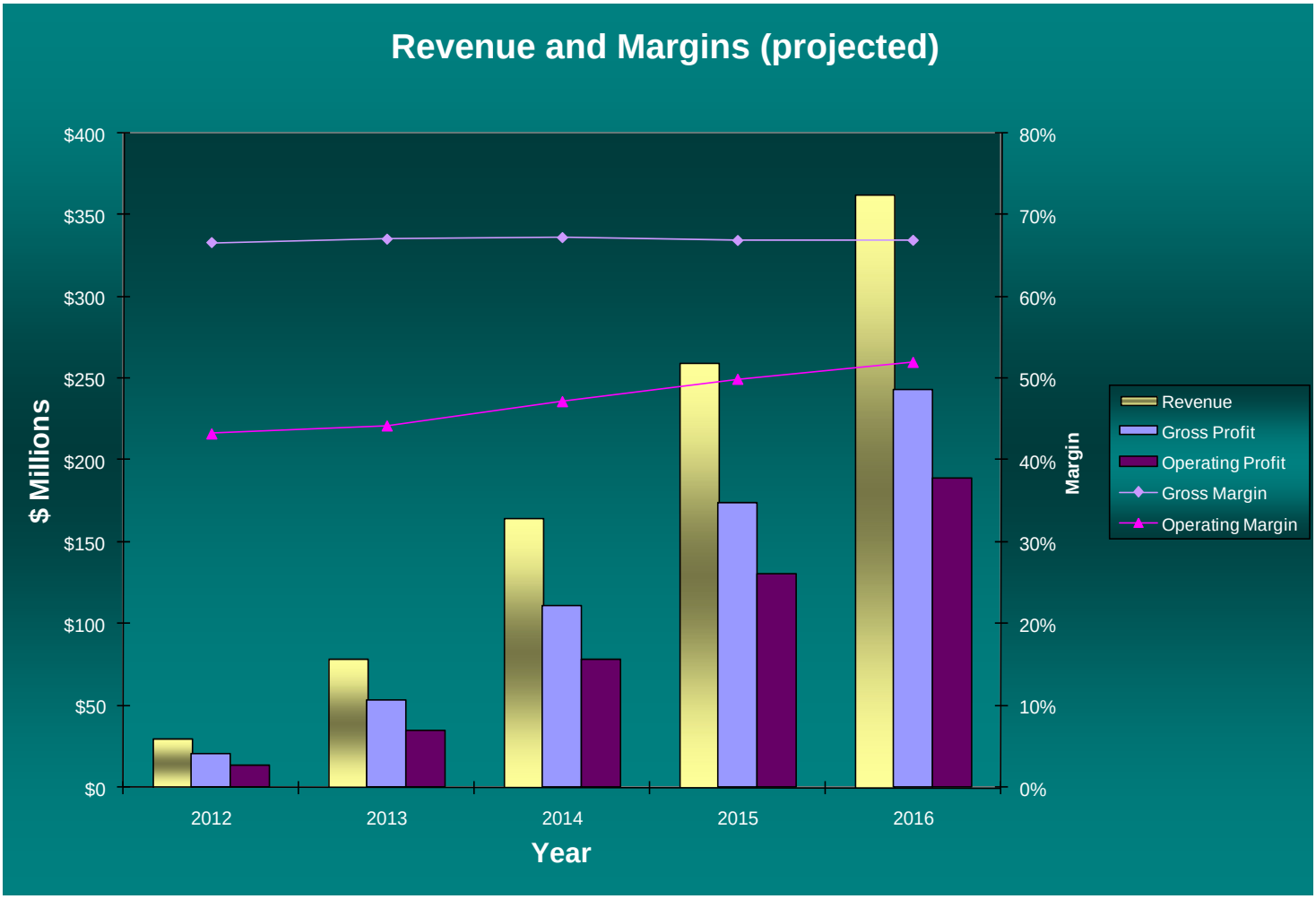
*China View uses information from the Civil Aviation Administration of China

Beyond just the impressive growth of China and its infrastructure, there is the issue of offsets. Offsets are typically IOUs which original equipment manufacturers (OEMs) such as Airbus and Boeing owe after the aircraft is delivered. The OEMs are currently $16 billion upside down; this means they are required to buy back aviation goods amounting to 35% of each aircraft's purchase price. With regard to new aircraft, OEMs are projected to purchase a minimum of $64.5 million worth of bearings, rod ends and bushings for the 129 new aircraft scheduled for delivery to China in 2013 at the rate of $500,000 per aircraft. Looking beyond new aircraft, airlines and MROs should collectively purchase a minimum of $65.1 million in replacement parts for the current Chinese fleet at the rate of $50,000 per aircraft as part of regularly scheduled, routine maintenance.

In addition to the need for Bearings related to China aircraft, Bearings are a commodity typically in high demand and short supply. With only six competitors in the entire industry, the attitude among the competitors is that delivery will be based on the schedule of the Bearing manufacturer, not based on the needs of the customer. Consequently, lead times for Bearings are often 52 weeks or longer with slips in delivery from the originally scheduled delivery date being all too common. Delays in Bearing deliveries have resulted in delivery or scheduling delays for such high profile projects including the Joint Strike Fighter and the Boeing 787 Dreamliner. Boeing has tasked its Technology group with finding new Bearing manufacturers and the need for new manufacturers has been a common theme at recent Airframe Control Bearing Group meetings.

There have been no new manufacturers of Bearings since the late 1970's. The TPAC/Guangzhou facility will be the first new manufacturer in more than 30 years. Because of the high demand for the products, TPAC believes that not only will it be able to sell products to Boeing and Airbus for aircraft earmarked for China, but also for other aircraft being manufactured by Boeing and Airbus for other customers throughout the world, thus opening up the opportunity to compete for the $1.1 billion in annual sales for all Bearings. In addition to the SAE self lubricating Bearings to be produced at the TPAC/Guangzhou facility, TPAC/Guangzhou also intends to produce another line of bearings specifically designed for use by Boeing, Airbus, Embraer, Goodrich Landing Gear, Honeywell and many other sub-tier contractors. These bearings are similar to the SAE Bearings and TPAC possesses the knowledge and technology to develop and produce these parts, opening up a $1 billion annual market to TPAC. TPAC intends to enter this market immediately following the qualification of its Guangzhou facility for the production of SAE self lubricating bearings. Boeing has offered full support to TPAC to assist it in developing these product lines.

China is in the process of developing a 180+ seat commercial aircraft designed along the lines of the Airbus A-320 or Boeing 737. This aircraft, designated the COMAC C-919 is scheduled for first flight in 2014 with the first deliveries to customers being scheduled for 2016. COMAC presently has in excess of 100 orders for the aircraft, with customers including General Electric. The C-919 uses a similar volume of Bearings to those used on Boeing 737and Airbus A-320 aircraft. COMAC has mandated that ultimately all parts used on the C-919 be manufactured in China and with the assistance of AVIC is presently acquiring companies and technology to comply with that mandate. TPAC anticipates that it will be the primary supplier of Bearings for the C-919 and has had discussions with AVIC related to specific bearing designs for the aircraft.



Strong Management
Despite the difficult and complex world of China aviation investors should take note of the strong well seasoned group of management.

Peter Liu. Mr. Liu is president of SoCal Metals, Inc., a company that reclaims, processes, packs and smelts non-ferrous metal, with facilities in both the United States and China. The company currently exports 500,000 tons of metal to China each year for processing and employs 300 workers.

Alex Kam. Mr. Kam has several decades of cross border business development experience, and is a stakeholder in manufacturing, banking and commercial enterprises based both in the United States and China. One of his companies, China United Industrial Co. Ltd., manufactures consumer electronics and employs over 3,000 workers in China.

Kevin Gould. Mr. Gould has over 25 years of management experience in aerospace, manufacturing and law. Most recently he served as President and CEO of Piper Aircraft, Inc. During his tenure, the company doubled its market share, outsourced its spare parts distribution, beat its competition to market with the highly successful PiperSport, overhauled and globalized its sales and distribution channel, initiated social networking marketing programs and re-launched development of its PiperJet aircraft.

Greg Archer. Mr. Archer has over 24 years of aerospace industry experience as an executive with Northrop Grumman Corporation. From December 2002 through March 2010, he served as director of procurement / global supply chain for the Aerospace Systems sector of Northrup Grumman.

Ray Kwong, Founder, Chief Operations Officer, Director. Mr. Kwong has over 30 years of cross border business development experience, holding senior management positions including Senior Vice President, Executive Vice President, Chief Marketing Officer, President, COO and CEO of both private and public companies. He is currently facilitating talks between China and U.S. interests on such matters as clean energy economics, nanotechnology, commercial aerospace and business aviation.

Bill McKay, Founder, Chief Executive Officer, Director. Mr. McKay has served as Chairman and Chief Executive Officer since February 2010. Mr McKay has twenty-five years experience in the aero-space/manufacturing industry, holding many senior management positions including General Counsel, General Manager, Manufacturing Manager, COO and CEO of both private and public companies. Since March 2009, Mr. McKay has been the founder and Chief Executive Officer of Harbin Aerospace Company, LLC, an aircraft component part design, engineering and manufacturing company.

INDUSTRY OUTLOOK

Commercial Aerospace.

The US Aerospace and Defense industry enjoyed record profits in 2008 largely the result of 7 years of growth in commercial aircraft and a 60% increase in the department of defense spending in Iraq and homeland security. By 2009 the division of orders versus production was apparent as there were 1000 commercial planes delivered yet only about 400 ordered. Several leading indicators turned positive in 2010, which suggests that we are off the bottom of the cycle and that 2011 should be a strong year for the group. From an original equipment manufacturer (OEM) perspective, we believe that the 2011 production outlook looks solid with continued announcements of production increases. From an aftermarket perspective, many relatively new aircraft were stalled during the downturn, which suggests that the aftermarket should turn first, as capacity cuts are over and utilization is improving.

Focusing on China, Domestic tourism has tripled in the last decade, whereas the number of international outbound Chinese visitors has grown five-fold. As the global economy recovers, international air travel has rebounded strongly. The Civil Aviation Administration of China envisions one annual trip per capita, on average, by 2030--five times today's figure. China is forecast to take delivery of 4,330 new airplanes- - including those from its own developing airplane programs-- valued at $480 billion over the next 20 years. China will remain the largest market for airplanes outside the United States.

*Sources include Deloitte

INDUSTRY POSITION

Drilling down further to the self-lubricating spherical bearing segment there are two major competitors. Minebea holds and estimated 60% market share and RBC whose market share is estimated at approximately 9%.

- Minebea is a $3 billion Japanese company that makes machined components and electronic devices. It derives roughly 21% of its revenue from standard spherical bearings and related parts with dedicated plants in Karuizawa Japan, Laconia New Hampshire and Lincoln England.

- RBC, is a $300 million U.S. company. It derives roughly 32% of its revenue from standard spherical bearings and related parts with a dedicated plant in Fairfield, Connecticut.

Neither of these competitors have production facilities in China.

RECENT NEWS

In September 2010, Godfrey opened a production facility, in Guangzhou, Guangdong. That facility is currently preparing to enter the "qualification" process for approval by the United States Navy. If approved, the Guangzhou facility would be placed on the Society of Automotive Engineers (SAE) Qualified Producers List, allowing all Chinese and international airframe manufacturers, sub-tier suppliers, MRO facilities, airlines and distributors to purchase parts produced there. The Guangzhou facility, located in close proximity to Hong Kong and Guangzhou would be the first facility in China qualified for the production of SAE-AS81820, SAE-AS81934 and SAE-As81935 spherical bearings, bushings and rod end bearings, components used extensively in commercial aircraft.

On March 30, 2010, Trans- Pacific acquired 25% of the outstanding share capital of Godfrey (China) Limited, a Hong Kong corporation ("Godfrey"), in exchange for technology used for the design and production of SAE-AS81820, 81934 and 81935 self-lubricated spherical bearings, bushings and rod-end bearings. To date, Godfrey has raised $1.2 million to fund operating expenses and the establishment of a manufacturing facility in mainland China. Godfrey has formed a Wholly Foreign Owned Enterprise (WFOE) in China through which it intends to do business in the domestic China market and export its goods globally.

Following completion of the HAC asset acquisition, TPAC's Board of Directors decided to dispose of its oil and gas business interests and focus on the aircraft component market. On February 10, 2010, the firm completed the sale of all of the oil and gas business interest in exchange for cancellation of all obligations under an outstanding promissory note. TPAC recorded a gain on disposal of assets totaling $0 and $115,527 for the three and nine months ended July 31, 2010, respectively.

VALUATION

Investors should note that the firm needs a capital infusion to continue as a going concern. Given the resources, we feel the stock will outperform as TPAC hits it's testing and performance goals and enjoys a monopolistic hold in a growth industry. To value the firm we conservatively projected earnings out over ten years. We then arrived at a value using a relative valuation model. Since the firm is in the development stages (more risky) and the number of assumptions in the model is significant we used an above average discount rate (15%) and below average relative valuation multiples (less than 1.0x). We value the shares at $0.50 based on our relative valuation model. The characteristics of the payoff could be similar that of a call option.

Given the capital infusion Trans Pacific Aerospace should achieve its goals and outperform the market based on the following factors.

- The number of planes in China is expected to jump from 1,256 today to 4,330 over the next 20 years.
- With 3,000 spherical bearings on each plane, the market is substantial.
- Offsets or obligations that original equipment manufacturers (OEMs) such as Boeing and Airbus owe China are approximately $16 billion.
- There are currently no manufacturers of spherical bearings in China.

RISKS

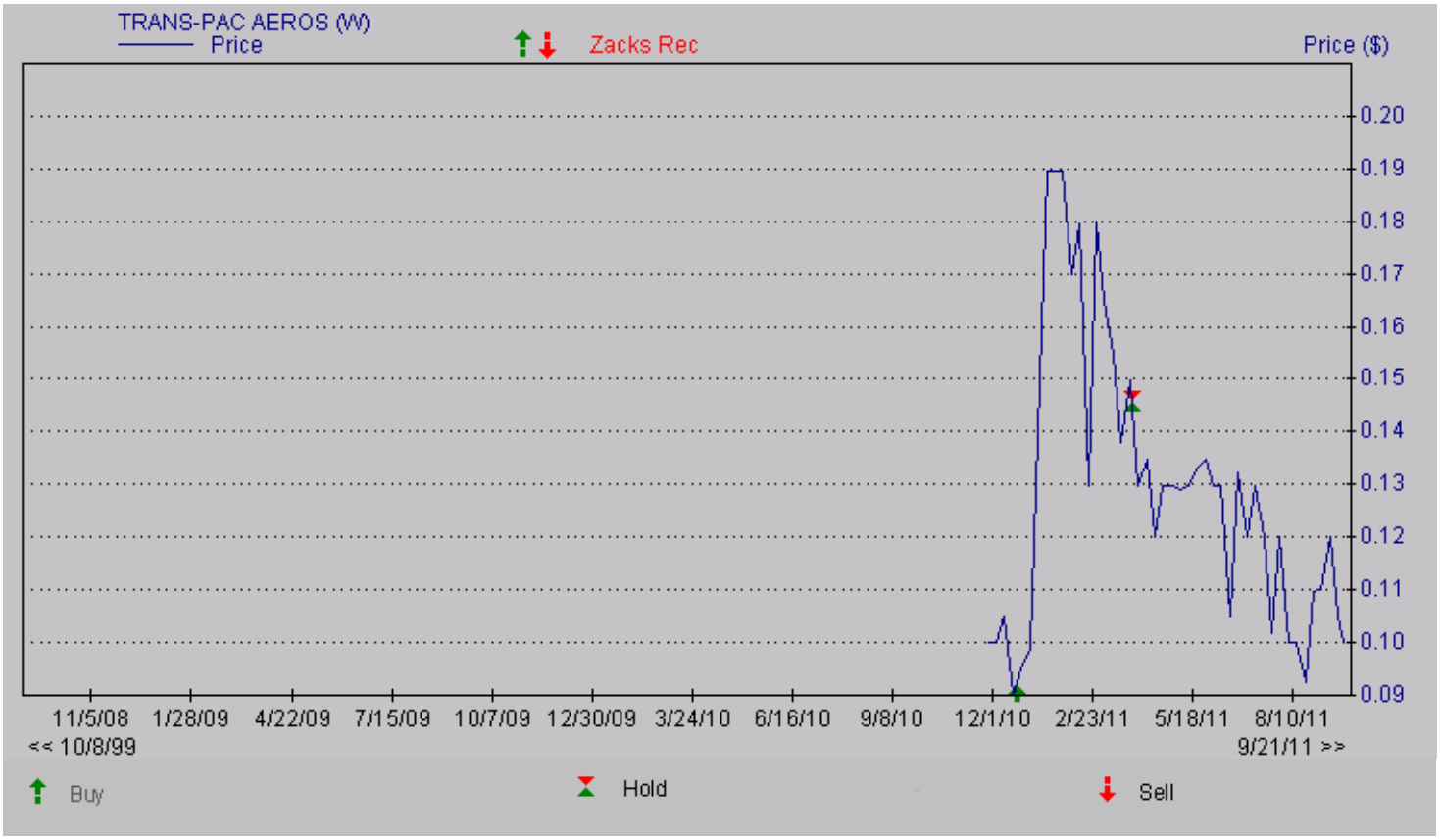
- TPAC has not yet recorded revenues. Future revenues are based on testing and being approved in China.
- The possibility of a double dip recession would hurt the aerospace industry and perhaps make future revenues less certain.
- The majority of business will be done in foreign countries where political risk exists.
- Delays in testing and approval are a concern and could impact revenue amounts and timing.

PROJECTED INCOME STATEMENT & BALANCE SHEET

INCOME STATEMENT ($ Mil)	FY 2010	FY 2011 E	FY 2012 E	FY 2013 E	FY 2014 E	FY 2015 E	FY 2016 E
REVENUE							
Net Revenue	**-**	**8.00**	**30.00**	**79.00**	**165.00**	**260.00**	**363.00**
Sequential Growth							
OPERATING EXPENSES							
Cost of Revenues	-	3.00	10.00	26.00	54.00	86.00	120.0
% of Revenue							
Gross Profit -	**-**	**5.00**	**20.00**	**53.00**	**111.00**	**174.0**	**243.0**
Proforma Gross Margin		*62.5%*	*66.7%*	*67.1%*	*67.3%*	*66.9%*	*66.9%*
Cost of Sales	-2.4	0.3	2.0	4.0	8.0	13.0	18.0
% of Revenue		*3.1%*	*6.7%*	*5.1%*	*4.8%*	*5.0%*	*5.0%*
Corp Overhead	-	2.75	6.00	13.00	25.00	31.00	36.00
% of Revenue		*34.4%*	*20.0%*	*16.5%*	*15.2%*	*11.9%*	*9.9%*
GW Amort, Restructuring, other	(2.5)	-	-	-	-	-	-
% of Revenue							
Total Operating Expenses	(4.84)	3.00	8.00	17.00	33.00	44.00	54.00
% of Revenue		*37.5%*	*26.7%*	*21.5%*	*20.0%*	*17%*	*15%*
Operating Income -	**(4.84)**	**2.00**	**12.00**	**36.00**	**78.00**	**130**	**189**
Operating Margin		*25%*	*40%*	*46%*	*47%*	*50%*	*52%*
NON-OPERATING ITEMS							
Non operating Income/Expense	-0.1		-	-	0.0	0	0
% of Revenue		*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Tax Provision	0.00	0.00	2.00	6.00	13.0	22	32
Effective Tax Rate	*0%*	*0%*	*17%*	*17%*	*17%*	*17%*	*17%*
Net Income -	**(4.93)**	**2.00**	**10.00**	**30.00**	**65.00**	**108.0**	**157.0**
Net Income Margin		*25.0%*	*33.3%*	*38.0%*	*39.4%*	*42%*	*43%*
EARNINGS PER SHARE							
EPS - Basic	-$0.23	$0.06	$0.28	$0.84	$1.82	$3.02	$4.39
EPS - Diluted	-$0.23	$0.06	$0.28	$0.84	$1.82	$3.02	$4.39

Ken Nagy, CFA Zacks Investment Research

HISTORICAL ZACKS RECOMMENDATIONS



DISCLOSURES

The following disclosures relate to relationships between Zacks Investment Research ("ZIR") and Zacks Small-Cap Research ("Zacks SCR") and the issuers covered by the Zacks SCR analysts in the Small-Cap Universe.

ZIR or Zacks SCR Analysts do not hold or trade securities in the issuers which they cover. Each analyst has full discretion on the rating and price target based on their own due diligence. Analysts are paid in part based on the overall profitability of Zacks SCR. Such profitability is derived from a variety of sources and includes payments received from issuers of securities covered by Zacks SCR for non-investment banking services. No part of analyst compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in any report or blog.

ZIR and Zacks SCR do not make a market in any security nor do they act as dealers in securities. Zacks SCR has never received compensation for investment banking services on the small-cap universe. Zacks SCR does not expect received compensation for investment banking services on the small-cap universe. Zacks SCR has received compensation for non-investment banking services on the small-cap universe, and expects to receive additional compensation for non-investment banking services on the small-cap universe, paid by issuers of securities covered by Zacks SCR. Non-investment banking services include investor relations services and software, financial database analysis, advertising services, brokerage services, advisory services, investment research, and investment management.

Additional information is available upon request. Zacks SCR reports are based on data obtained from sources we believe to be reliable, but is not guaranteed as to accuracy and does not purport to be complete. Because of individual objectives, the report should not be construed as advice designed to meet the particular investment needs of any investor. Any opinions expressed by Zacks SCR Analysts are subject to change. Reports are not to be construed as an offer or the solicitation of an offer to buy or sell the securities herein mentioned. Zacks SCR uses the following rating system for the securities it covers. Buy/Outperform: The analyst expects that the subject company will outperform the broader U.S. equity market over the next one to two quarters. Hold/Neutral: The analyst expects that the company will perform in line with the broader U.S. equity market over the next one to two quarters. Sell/Underperform: The analyst expects the company will underperform the broader U.S. Equity market over the next one to two quarters.

The current distribution of Zacks Ratings is as follows on the 1032 companies covered: Buy/Outperform- 14.7%, Hold/Neutral- 78.1%, Sell/Underperform – 6.0%. Data is as of midnight on the business day immediately prior to this publication.