Corporate Overview

TEAM DIVERSIT-E

2009
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**Executive Summary**

China-based Xi’an System Sensor Electronics, Ltd. is a joint venture between the firm and System Sensor USA, a wholly owned subsidiary of Honeywell International Inc. System Sensor USA is part of Honeywell’s Automation and Control Solutions (ACS) reportable operating segment. System Sensor Electronics, Ltd. manufactures fire, carbon monoxide and heat detection and notification devices. The firm employs state of the art technology production processes, quality assurance systems and modern manufacturing equipment in order to create high quality products for the Joint Venture. The firm manufactures System Sensors complex products such as the Intelligent and Conventional Ion Smoke Detector, Photo Smoke Detector, Heat Detector and Accessories. (Sensor System, 2009)

Xi’an System Sensor Electronics, Ltd is located within the Xi’an High-Tech Development Zone. (Appendix B) The production facility, funded by Honeywell, was the largest of its kind in China when constructed in 2003. Over 60% of the products manufactured at this facility are distributed globally to U.S., Canada, Australia, New Zealand, Singapore, Malaysia, India and Pakistan. As an important element of the 2009 Strategic Plan, System Sensor, as part of Honeywell’s ACS unit, plans to focus on achieving sales growth, technological excellence and manufacturing capability through global expansion, in emerging regions in China, India and the Middle East. Based on the strategic location in China and production capabilities, Xi’an System Sensor Electronics, Ltd. will play a key role in the implementation of this strategy with System Sensor USA. (Sensor System, 2009)
Industry Environment - Overview

The automatic electric fire alarm was invented in 1890 by Francis Robbins Upton. (Hall, 2009) During the late 1930s, developments made by Swiss physicists Walter Jaeger and Ernst Meili, paved way to the modern smoke detector. By 1951, these life saving devices were available in the United States, primarily used in mines, factories, warehouses and public buildings. While commercial smoke detectors became widely available during the 1960s, the price of these devices was expensive. Only major businesses and theaters could afford them. During the next 30 years, as a result of advances in nuclear chemistry and solid-state electronics the sensor became more affordable for most companies. The first units mass produced units were supplied by the Statitrol Corporation in 1975, a company based in Lakewood, Colorado. Today, smoke detectors are estimated to be present in 93% of US homes. (Hall, 2009; Smoke 2009) There are two basic types of smoke detectors for general use. The first is an ionization chamber smoke detector (ICSD), used in most homes, and the second, a photoelectric smoke detector. In 1992 R&D Magazine selected home smoke alarms as one of the “30 Products that Changed Our Lives.” (Hall, 2009)

Fire disasters continue to result in significant loss of life and property despite advancement of fire protection systems and revisions in building standards and codes. According to the U.S. Fire Administration, in 2007, fires killed more Americans than all natural disasters combined. There were 3,430 lives were lost, in addition to the 17,675 civilians injured as a result of fires. Eighty-three percent of all civilian fire deaths occur in residences. Direct property loss due to fires was estimated at $14.6 billion. (NFPA, 2008) In China, the Ministry of Public Safety released 2005 data detailing 235,941 reported fire disasters. During 2007, there were 2,496 lost lives and 2,506 persons injured. The total cost of these fires was approximately 1.4B RMB or $200 million. (China, 2007)

Fire protection systems are the best means of preventing and reducing damages and losses from fire disasters. They are comprised of active and passive systems. Active fire protection systems are fire detection and suppression devices utilized in buildings and homes. Passive fire protection systems are fire and smoke “resistant” material and construction design as defined by building codes and technical standards. (Helmut, 2008)
Fire detection units have been the primary industry standard of active fire protection systems for over forty-five years. However, there is a growing trend for more passive fire protection systems with an expected growth in this sector during the next several years. Beginning in 2001, demand for improved integration of security and fire protection systems improvement increased in industrialized nations following the awareness created as a result of the “9-11” terrorism incident in the US. Government and the private sector developed an enhanced awareness to both the security and fire protection against terrorism. In addition, a construction boom in China, and Eastern Europe added momentum to the market growth. (Gemeny, 2008)

In 2004, the global fire protection market experienced a growth rate exceeding over 10%, increasing to $80 billion, by 2007. The market had also become more dynamic and competitive through advances in nanotechnology and information technology. These developments delivered better and more efficient fire protection systems. There are more than two hundred (200) firms accounting for more than forty percent (40%) of the world market. Several thousand firms account for the rest. (Helmut, 2008) Together with governments and international agencies, companies continue to develop products and portfolios with comparable standards and quality designed to meet codes and standards developed by many nations.

Over the past decade, international product advancements have posed challenges to traditional Chinese safety codes, design review and approval processes. Since the foundation of Chinese Fire Protection Standardization Committee in 1988, China has made notable progress in the aspect of fire protection standardization. Large amount of research achievements have become the scientific criteria for the stipulation of codes and standards. The Chinese Ministry of Public Security currently enforces 289 fire standards and 23 fire protection codes. (Index, 2009)

Currently, Xi’an System Sensor Electronics, Ltd., a major firm in the active fire protection system market, is the largest supplier and exporter of Intelligent and Conventional Ion Smoke Detector, Photo Smoke Detector, Heat Detector and Accessories in China. This firm’s product quality, performance and specification are the same as System Sensor in USA. Their manufactured products are certified by both the Underwriter Laboratories (UL) and China National Test Center and are exported to the USA, Canada, South America, India, Bangladesh, Pakistan, Australia, New Zealand, Singapore, East Asia and Europe. (https://www.honeywell.com/china/eng/acs/xisse.html, 2009)
Corporate History

System Sensor was formed commercially in 1984 as separate division of the Burke, Roberts and Kimberline Corporation (BRK), a Pittway company. In 1985, Statitrol, Inc. was acquired by Pittway Corporation, the parent corporation of BRK Electronics. With this acquisition, System Sensor began penetrating the HVAC (Heating, Ventilating & Air Conditioning) market with its line of smoke duct detectors. System Sensor also initiated production on a new series of plug-in ionization and photoelectric detectors. By 1990, System Sensor had achieved major acclaim as a leader and innovator in smoke detection systems. It had established its own line of products which included multi-alert sounders, strobes and intelligent smoke detectors. With Pittway’s acquisition of the Notifier Company in 1987, it expanded its product portfolio to include water flow detectors, and supervisory switches for the sprinkler equipment market. The firm quickly became the largest manufacturer of commercial/industrial smoke detectors in North America. The firm acquired a global footprint as result of the acquisition of CAE Electronica in Milan, Italy (Sensor System, 2009).

The 1990’s was a significant period of maturity for Pittway and System Sensor. A new manufacturing facility was built in Trieste, Italy to build products for the expanding European business. System Sensor began marketing products under its own brand. In 1992, System Sensor became a separate division under the Pittway Corporation from its parent company BRK. That same year, Pittway Corporation sold BRK to Thomas H. Lee Company, a private Boston Investment firm for $92.5 million. Pittway received $87.5 million cash and a 16.7 percent stake in the new company (Sensor System, 2009). Sensor System completed its final step toward full autonomy when it moved into its current modern facility in St. Charles, Illinois. It added 50,000 square feet a few months later. The company now boasts a 160,000 square foot office and manufacturing facility. They also opened a distribution facility in Toronto, Canada and a manufacturing facility in Juarez, Mexico. By 1998, the parent company of System Sensor, Pittway Corporation, had just emerged from a major restructuring process to focus exclusively on alarm system manufacturing and distribution. Its alarm division portfolio was composed of the Pittway Security Group (ADEMCO and ADI) and the Pittway Systems Technology Group (System Sensor Division, Notifier, Fam-Lite, Notifier UK, Inertia Fire Systems, Fire Control Instruments and Microlite). Revenue generated by Pittway’s alarm business had grown 236%, in four years to $1.144 billion in 1997, from $483 million in 1993. Operating income more than
triplled, to $104.4 million, during the same period. Significant growth was realized through expansion within the Systems Technology Group. The success of ADEMCO and ADI proved to be a major growth engine for Pittway. Pittway’s success made it an attractive takeover target. It was rumored Tyco International would launch a hostile bid. In December 1999, Honeywell, a leader in technology and manufacturing sectors, entered into a merger agreement to acquire Pittway for $45.50 per share in cash. Honeywell made a tender bid to acquire 43 million outstanding shares of Pittway’s Common Class A stock. The transaction was valued at $2.1 billion. Pittway Corporation forecasted 1999 sales to be $1.6 billion, a compounded growth rate of 23% since 1993 (Sensor System, 2009). Since the acquisition, System Sensor has maintained a leader position in innovative alarm and notification technology. Some of the notable innovations included Filtrex (1999), a harsh area detector which provided early warning smoke detection in difficult environments where traditional smoke detectors are not practical. Pinnacle (2000) and Acclimate (2003) were developed to improve ultra sensitive detection and multi-criteria detection for early warning. Eclipse (2004) was developed to improve peer-to-peer, all digital protocol, allowing for multiple application control such as fire, security and HVAC. The first carbon monoxide detector, CO1224 (2006), was introduced, using a proven electrochemical sensor developed by Honeywell Analytics gas detection business. System Sensor introduced ExitPoint, BEAM 1224S and SpectrAlert Advance in 2006 (System, Sensor, 2009).

Today, System Sensor produces twenty (20) million devices a year which equates to a new system installation every four seconds somewhere in the world. Its mission is to design and market products for the professional fire alarm industry. The company began with ten employees, growing to over 2,000 employees on five continents. System Sensor has manufacturing facilities in the United States, Italy, Mexico, Canada, Russia and China. Currently, Xi’an System Sensor Electronics, Ltd. is the largest fire detector manufacturer in China and Asia. The Xi’an plant was built in 2003, with a current production output of five million fire alarm units and accessories. The plant is located in the Xi’an High Tech Development Zone (Appendix B). This firm company routinely ranks in the Top 30 of fire detection companies in China (System Sensor, 2009).
**System Sensor Timeline**

1852
The first municipal fire alarm system was installed. That system - in Boston - was such a success that other cities installed their own by the end of the century.

1900
Reichel commercial zoned fire alarm system was manufactured in New Zealand. Became the first UL listed automatic fire alarm.

1950
The predecessor of today’s Delaware-incorporated Pittway was incorporated in Pennsylvania in 1950 and was known as the Pittsburg Street Railroad Company. It was a majority owned subsidiary of the Standard Gas & Electric Company.

1969
Pittway purchases BRK Electronics in 1969 to support Ademco’s residential smoke detection systems.

1975
BRK Electronics in 1975 becomes a separate business unit within Pittway. Becomes Fortune 500 Company.

1984
BRK splits off its small industrial smoke detector business into a separate sub-division, System Sensor.

1990
System Sensor became the largest manufacturer of system smoke detectors. The company opened a distribution facility in Toronto, Canada.

1997
System Sensor opened a manufacturing facility in Juarez, Mexico.

1999
Pittway was acquired by the Honeywell International Limited, making System Sensor a member of the Honeywell family.
2003

Xian System Sensor Electronics JV and construction of manufacturing facility in Xi’an China

2009

System Sensor has manufacturing facilities in the United States, Italy, Mexico, China, Canada, and Russia, with sales offices throughout the United States, and in Canada, Europe, China, Hong Kong, Australia, Russia, and South Asia. System Sensor’s high quality, innovative products are the most comprehensive in the industry. The company’s approximately 2,000 employees produce over 20 million quality units annually.

Financial Background

Joint ventures are a common practice for U.S. – China business relationships. Chinese agencies encourage Foreign Domestic Investment of this structure in order to obtain the advanced technology and management skills in exchange for low labor and production costs as an enabler to increased global market share (Sayer & Butler, 2002). The joint venture between Xi’an Electronics, Ltd. and System Sensor (a wholly-owned subsidiary of Honeywell International, Inc.) provides an opportunity to for Honeywell to increase revenues through global expansion and gain access to emerging markets, such as the rapidly growing Chinese economy (Honeywell International, 2008).

International joint ventures can be complex financial structures. In 2002, the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) issued a memorandum of understanding ("Norwalk Agreement"), marking a significant step toward formalizing their commitment to the convergence of U.S. and international accounting standards. At the present time, a single set of international accounting standards that is accepted in all capital markets still does not exist. According to the International Company & Commercial Law Review, “Each jurisdiction’s standards may conflict on the legal, currency choice, accounting, taxation, and reporting requirements (FASB, 2009). The standards used to report the financial data for Xi’an Electronics, Ltd. and System Sensor are those of its wholly-owned subsidiary, Honeywell International, Inc. Honeywell does not detail financial information on subsidiaries. Rather, it segments its business into five operating segments, ACS (Automated
Control Systems) segment, one of them. Within ACS, there are eight companies which comprise ACS China including Xi’an System Sensor Electronics (Honeywell International, 2008).

**Review of Business Segments – Honeywell**

Revenue for Honeywell International Inc.’s ACS segment increased 12% in 2008 to $14B. This represents 38% of the firm’s consolidated revenues for the year. Foreign exchange had minimal impact on sales for the year, which included a 9% negative impact of foreign exchange on fourth quarter sales (Honeywell International, 2008).

As stated in the latest annual report, operating results for ACS were impacted by the reduced level of global residential and commercial construction. This included retrofits and upgrades, capital spending and operating expenditures on building and process automation, industrial plant capacity utilization and expansion, and global economic growth. System Sensor USA delivered revenue of $166.8M in 2007. Based on the ACS revenue increase of 12% in 2008, it is estimated 2008 sales for System Sensor USA were $186.8M (Honeywell International, 2008).

<table>
<thead>
<tr>
<th>2008</th>
<th>2007</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Dollars in millions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net sales</td>
<td>$14,01</td>
<td>$12,47</td>
</tr>
<tr>
<td>% change compared with prior year</td>
<td>12 %</td>
<td>13 %</td>
</tr>
<tr>
<td>Segment profit</td>
<td>$1,622</td>
<td>$1,405</td>
</tr>
<tr>
<td>% change compared with prior year</td>
<td>15 %</td>
<td>15 %</td>
</tr>
</tbody>
</table>

**Table 1: Results of operations for ACS business segment, 2006-2008**

Revenues and operations in non-U.S. jurisdictions continue to increase. Honeywell stated in its 2008 Annual Report, 49% of total revenues were outside the US; 10% in Asia. Over the past three years the aerospace segment ($2.3B) ranks first, in profits. ACS ranks second at $1.6B. From 2006 to 2008, growth for the ACS division has averaged 15% annually, compared to Aerospace, Honeywell’s largest segment to date, had experienced a decrease in profits (16% in 2007 to 5% in 2008). Xi’an System Sensors Electronics provides Honeywell with increased
productivity savings and improved pricing which are primary reasons for the increased profit in ACS (Honeywell International, 2008). (Appendix A)

Profits for Honeywell increased 4% in 2008. The ACS segment grew 15%. Foreign manufactured products represent 57% of sales in 2008. ACS generated 38% of the consolidated revenues for Honeywell while 49% of total sales were outside of the U.S., 10% percent in Asia. Honeywell’s total net sales for 2008 were $36B (Honeywell International, 2008). (Appendix A)

**Corporate Strategy / Xi’an Location**

Sensor Systems has attained leadership in developing and offering high-quality products at a reasonable price with additional focus on the “supply chain”. The latter includes timely fulfillment of customer’s orders and service in the global market. The firm intends to be a partner to regulatory agencies, customers and in some cases competitors in the “fire protection system industry” developing standards and warning devices. The Xi’an location employs the same innovative technology, design, quality systems, and processes consistent with company practices throughout the world. The Xi’an facility is the Asian production point of this US-Based company, a joint venture with a Chinese partner, an expected arrangement for a US firm doing business in China. The primary purpose and strategy of this venture and location is to provide manufacturing and service support to System Sensor’s business strategy in Southeast Asia, Australia, China and South America from this location. This location was cited in 2008 by the parent company Honeywell for exceeding expectations during its first five years of operation. This is in addition to two recognitions by Chinese Fire Protection Association (CPFA), a peer industry organization. (Lyons, 2009)

Exceeding expectations in China is likely a challenging task. There are twenty-three (23) prescriptive fire protection codes in China which cover a wide range of standards and requirements. These range from building design to installation, to inspection and acceptance. Building codes in China are considered consistent with international standards. Consistent with the Chinese government’s involvement in business strategy, and commercial firms, a change in technical standard requires, at a minimum, approval of multiple government agencies. The Ministry of Construction has national responsibility for fire protection norms. Second, construction standards are classified as “state standards” under the auspices of this entity.
Lastly, local standards can be adopted and implemented by provincial and municipal entities. It should be noted, China employs “prescriptive codes”, requiring strict enforcement, with no authority for local deviations or exceptions. Given the rapid expansion of construction activity in the country, there is speculation, demand for quality, performance-based designers and equipment will soon exceed supply. An unintended consequence may be poorer quality systems, resulting in unsafe buildings over time. (Brown, 2009)

The opportunity to “participate” in the Chinese “building boom” seems precisely the reason a leadership firm such as Sensor Systems, a division of Honeywell would develop a joint venture. This company has developed a global business using innovation, technology, quality control and customer service as primary values of its business model. The firm is viewed an industry leader in the design of commercial fire alarm systems, working with government agencies, globally and industry associations to develop, standardize and bring to market innovative products. As noted in the Honeywell Annual Report, the intention is to utilize the Xi’an plant to serve customers throughout the southern hemisphere from South America to Southeast Asia. The location provides both manufacturing and service support. (Honeywell International, 2008)

Sensor Systems has a record of innovation as evidenced by a continuous stream of new product introductions. Many of the products, including fire and CO2 detectors and alarms are “global introductions” intended to maintain industry leadership. As is customary in the US, many countries have UL (Underwriter Laboratories) locations, locally. Sensor Systems routinely tests and registers products with UL China for approval by Chinese Ministry of Public Security to obtain “3c Compulsory Certification”. Sensor Systems earned recognition in 2002 for efforts and is routinely ranked among the TOP 30 Chinese firms in the area of fire safety. (Gemeny, 2008)

The Xi’an China production facility is located to take advantage of lower labor rates (50% of average rates in Mexico), a location designed to serve customers in the Pacific Rim more efficiently, and a robust construction market. There also exists a supply of engineering talent, required to support the innovative technical strategy of the company. Service support is also a function at this facility, a skill provided from this region by many multi-national firms, notably in the computer industry, given the availability of trained labor. (Lyons, 2009)
Summary

Sensor Systems has evolved from the early days of the fire protection and warning industry to become a respected global leader in this business. While the firm has experienced multiple ownership changes, its mission, record of innovation and focus on customers has changed little in the past 100+ years. Acquisition by Honeywell and the Xi’an joint venture are two recent examples of how this company has benefitted by quality ownership and global expansion. The company appears to be well funded and positioned to retain a leadership role in its industry, able to take full advantage of economic and cultural development in Asia and the southern hemisphere.

Questions

1. How is the executive management team of the joint venture structured? Are there both Chinese and Americans represented? How is this determined? How often has it changed?

2. What is the involvement of Honeywell or Sensor Systems U.S. in strategic planning and development related to the joint venture?

3. Has Xi’an Sensor System Electronics Ltd. used Honeywell system processes such as Functional Transformation and Velocity Product Development to increase their manufacturing efficiencies? If so, how?
REFERENCES


### APPENDIX A


<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2007</th>
<th>2006</th>
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<tbody>
<tr>
<td><strong>Net Sales</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerospace</td>
<td>$12,650</td>
<td>$12,236</td>
<td>$11,124</td>
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<tr>
<td>Automation and Control Solutions</td>
<td>14,018</td>
<td>12,478</td>
<td>11,020</td>
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<tr>
<td>Specialty Materials</td>
<td>5,266</td>
<td>4,866</td>
<td>4,631</td>
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<tr>
<td>Transportation Systems</td>
<td>4,622</td>
<td>5,009</td>
<td>4,592</td>
</tr>
<tr>
<td>Corporate</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$36,556</td>
<td>$34,589</td>
<td>$31,367</td>
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#### Segment Profit

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<tr>
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<th>2008</th>
<th>2007</th>
<th>2006</th>
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<tbody>
<tr>
<td>Aerospace</td>
<td>$2,300</td>
<td>$2,197</td>
<td>$1,892</td>
</tr>
<tr>
<td>Automation and Control Solutions</td>
<td>1,622</td>
<td>1,405</td>
<td>1,223</td>
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<tr>
<td>Specialty Materials</td>
<td>721</td>
<td>658</td>
<td>568</td>
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<tr>
<td>Transportation Systems</td>
<td>406</td>
<td>583</td>
<td>574</td>
</tr>
<tr>
<td>Corporate</td>
<td>(204 )</td>
<td>(189 )</td>
<td>(177 )</td>
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<tr>
<td><strong>Total</strong></td>
<td>$4,845</td>
<td>$4,654</td>
<td>$4,080</td>
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