SATOP Success Story

FREE TECHNICAL ASSISTANCE PROGRAM SOLVES CORROSION PROBLEM FOR INDUSTRIAL HOSE COMPANY

SATOP helps Dayco Products Inc. save nearly $25,000

VERO BEACH, Fla. - Water is a natural resource that is essential to everyday living. However, it can also cause corrosion and destroy various costly materials and equipment. But, thanks to expert advice from volunteers with Florida' Technological Research and Development Authority's (TRDA) Space Alliance Technology Outreach Program (SATOP), one local company discovered a way to not only conquer water corrosion, but to also save thousands of dollars in repair costs.

Dayco Products, Inc., a global customer-focused supplier of industrial hoses, power transmission systems and related components, recently called upon the SATOP for help after discovering moisture residue at the bottom of one of their autoclaves, a pressurized vessel. "In order to cure the hose, we inject 65 pounds of saturated steam into the vessel, leave it there for one hour and then the steam automatically releases itself at the other end," said Erik McElroy, production manager for Dayco Products, Inc. "However, we discovered that since this vessel was so long, not all of the steam was evacuating out of it. This trapped moisture began causing corrosion problems," he added. This corrosion problem began to take its toll on Dayco's pocketbook, as well. The company previously spent $60,000 replacing two sections of the vessel due to corrosion.

In hopes of finding a more cost-effective solution, McElroy followed a suggestion made by his local chamber of commerce representative and applied to the SATOP. The program is a free service designed to speed the transfer of space technology to the private sector by giving free technological assistance to small businesses to help them solve their problems and increase their chances of succeeding. Made up of a group of 30 companies, universities, colleges and NASA centers, the SATOP finds professionals within these companies who volunteer their time and expertise in solving the challenges brought forth by the inquiring businesses. Administered by Florida's TRDA, the program has received over 1,000 requests.

Dayco completed a Request for Technical Assistance (RTA). Upon receipt of the RTA, the TRDA distributed it to its alliance partners asking who could help Dayco with their challenge. The Thurston Company stepped forward, examined the challenge and provided consultation within a matter of weeks. "Dayco's biggest challenge was finding something to coat the interior surface of the pipe in order to prevent corrosion," explained Tim Thurston, owner of The Thurston Company.

When he was an employee of the NASA-Kennedy Space Center, Thurston saw first-hand how NASA avoided corrosion with pressure vessels and other equipment that regularly sat on the launch pad. Based on this knowledge, Thurston recommended Dayco follow NASA's suit and use an epoxy coating to provide a barrier from the corrosive elements so the metal would not corrode. He even called a few companies that produce such an epoxy and gathered information, which was later compiled in a detailed e-mail to McElroy.

McElroy followed Thurston's recommendation and contacted a coating company out of Pennsylvania. Dayco purchased an epoxy for approximately $800. They then paid an additional $4,000 to sandblast the vessel's surface and prepare it for the epoxy treatment, which was applied at the end of December 1999.

"This solution ended up costing our company around $5,500. Compared to a new autoclave, which costs $30,000, Mr. Thurston's recommendation saved us nearly $25,000," McElroy said. "Furthermore, we have been told that the epoxy has an indefinite lifespan, so our autoclaves should be to remain rust-free for a very long time," he added. Initial cleaning processes have revealed the epoxy has successfully removed all residue from the autoclave.

"The SATOP was a great experience for us," McElroy said. "It's a resource that our tax dollars pay for, but I don't think it is being tapped very much. Smaller companies truly benefit from the SATOP because they don't have the internal structure or budget to tackle the problems on their own. These engineers work for free and provided us with an even better solution had we tried ourselves," he added.

"Whereas Dayco's challenge was puzzling to them, it was a relatively simple solution for me," Thurston said. "It's simply a matter of knowing what needs to be done. I feel very good knowing that I can share my expertise and help a small business overcome a challenge," he added.

For more information on Dayco Products, Inc., visit the Web site at www.dayco.com.

SATOP Success Story

SATOP HELPS GLASS ARTIST SLAVE OVER A HOT STOVE

Some people think "slaving over a hot stove" is an awful chore. But, glass artist Ed Kozlowski, Jr., thinks differently. In fact, he needed a hotter stove in order to sculpt his various glass paperweights, ornaments and vases. But, rather than call a local repair shop, or purchase a new furnace, Kozlowski called upon a unique source for technical assistance - NASA and the space program. "I was having trouble keeping heat in my furnace," said Kozlowski, owner of Budda Belly Glass Studio located in Pinellas Park. "That can be an expensive problem. The colder the furnace, the more I have to rely on the electric company to finish my various jobs."

Kozlowski, who has been in the glass business for 14 years, has always had an admiration for NASA and their knowledge of heat technology. "I always knew that NASA went to great lengths to layer the space shuttle with protection heat tiles," he said. "If it is good enough for NASA, then that technology would be good enough for me." The challenge, however, came in obtaining that information.

One day, while talking to a friend who was a former NASA employee, Kozlowski asked him, "What do you think my chances are of getting some of the scratch sheets of heat tiles from the shuttle to use for my furnace?" This friend gave him an answered prayer, and told him about the Space Alliance Technology Outreach Program (SATOP). The SATOP, sponsored by the Technological Research and Development Authority (TRDA), is a program designed to speed the transfer of technology into small businesses in Florida by partnering them with space industry employees for free technological assistance. Since its inception in 1995, the SATOP has had numerous success stories.

After a brief fact-finding mission, Kozlowski received the phone number for the SATOP. After an initial phone call, he later e-mailed an official Request for Technical Assistance (RTA) to the program for help. The SATOP took Kozlowski's request to The Thurston Company for advice and technical support. Within two months, they found a positive resolution for Kozlowski and his company.

"Budda Belly Glass Studio is the perfect example of a small business that is benefiting first-hand from this program and space technology," said Bob Allen, deputy director of the TRDA. "Here is a man who sells his glass sculptures at Disney World and museums across the country, and who turns to our program for guidance. That is a great feeling."

Kozlowski received his plan on how to insulate his furnace and is saving nearly $200 a month in electric bills. "This is a big savings for me. As a small business, such high electrical bills could have made me go nuts," he said. Having had such a positive experience with this program, Kozlowski plans to sit down in a few months and seek the SATOP's help on a new electrical design project. "If I can build Item A for less than purchasing it in the store, and learn something in the process, then I'll do that," he said.

Kozlowski recommends the SATOP to any small business needing technical assistance. "These guys are great. They care about helping us small guys succeed," he said. "They are full of knowledge and resources, and if they don't know an answer to a problem, they will find out for you."

For more information on Budda Belly Glass Studio, call Ed Kozlowski at (727) 545-4451.

SATOP Success Story

SPACE ALLIANCE TECHNOLOGY OUTREACH PROGRAM PROVIDES PROOF THAT PRODUCT PERFORMS

Ed VerVane knew his internal storm windows worked, he just needed the research to prove this to potential customers. "I was selling the Winsulator windows out of common sense, but I needed hard documentation and this costs millions of dollars," said VerVane. Winsulator sales increased dramatically after the Space Alliance Technology Outreach Program provided that proof for free. He had sold the product "up north," but needed to confirm the performance characteristics of the internal storm window system as an effective energy conservation measure in Florida. "I knew it did well in cold, and felt it would do well in Florida," VerVane explained. "I needed help on the UV (ultraviolet) aspect and light infiltration."

VerVane contacted the Small Business Development Center at the University of South Florida, which got him in touch with the Technological Research and Development Authority's (TRDA) Space Alliance Technology Outreach Program (SATOP). NASA, which belongs to the TOP Space Alliance, got its engineers involved. "They came back with some real good reports," VerVane said. Reports were conducted by the Oak Ridge National Laboratories and the Center for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET) program which exchanges leading edge technology with countries throughout the world.

The CADDET program and the State of Florida Energy Conservation Assistance Program (ECA), in a collaborative effort, provided testing and proved the Winsulator system reduced window-related electricity consumption for heating and cooling by 29 percent. Noise levels decreased by 60 percent, dust levels by 78 percent and condensation levels by 91 percent. The payback period was estimated at 2.3 years.

These beneficial properties can be attributed to the Winsulator window design and materials. The pane of the storm window is 100 percent clear acrylic and therefore, it will not affect daylight levels inside the room. The frame of the storm window is also made of vinyl, which is more resistant to energy transfer than either steel or aluminum.

The window is held in place by a magnetic strip that sticks to a small L-shaped steel banding. The banding is permanently installed in the existing window opening. This rubber seal allows the trapped air to expand or contract under various temperature conditions without causing one of the two windows to break or forcing the storm window to pop out.

Once installed, the storm window can be easily removed and replaced. Residents can respond to seasonal changes, and have easy access to clean between the two windows. The meeting with the NASA engineers also led to a demonstration project in the center director's conference room at the Kennedy Space Center (KSC). "They were combating the heat by leaving the blinds pulled and were thus deprived of light," VerVane explained.

KSC officials were so happy with the results of the demonstration that South Sun Energy Conservations was nominated for KSC Small Business Subcontractor of the Year. The company was also hired for other projects at KSC. Companies throughout Florida and the Southeast are now using Winsulator windows, including the Marriott International, Denny's, Legg Mason, Nations Bank (formerly Barnett Banks) and SunTrust. South Sun Energy Conservations Corp. is a proprietary and sole source provider for The Winsulator window internationally. The manufacturing and sales office is located at 6036 Clark Center Avenue, Sarasota, Fla. The Web site is: www.Winsulator.com.

"The TRDA has opened more doors generating contracts and a demand that will continue well into the 21st Century," VerVane concluded.

SATOP Success Story

AGRICULTURAL COMPANY USES SPACE TECHNOLOGY TO FINALIZE PROTOTYPE OF FRUIT-PICKING DEVICE

Mongoose Inc. latest company to reap benefits of the Space Alliance Technology Outreach Program (SATOP)

ARCADIA, Fla. - When Mongoose Inc. was in the process of finalizing their mechanical fruit-picking device, they never dreamed they would receive free help from experts within the U.S. space program. But, through a statewide technology outreach program, the company has not only finalized their device, but sold enough units to garner $1 million in sales.

With a decreasing available labor source, Mongoose Inc. was formed in 1996 as a development company tasked with finding alternate means of fruit harvesting. The company developed a prototype of the Mongoose Mechanical Harvester, a device that uses a variety of rotating rods that mimic the hand and wrist action of a human harvester. These rods are attached to a metal frame at the end of a hydraulic arm. The machine picks citrus by inserting the rods into the tree and gently shaking it to free the citrus from the branches.

"After going through several prototypes, we still found that the vibrating motion of the device was causing some structural problems," said Greg Gaskin, vice president of operations for Mongoose Inc. "Coming from a traditional grower and manual harvesting background, we all of a sudden found ourselves trying to tackle engineering problems with our device. We weren't skilled to handle such a challenge."

A member of the local Rural Development Association (RDA) approached Mongoose Inc. with some direction after seeing an advertisement for the Space Alliance Technology Outreach Program (SATOP). The SATOP is a free service designed to speed the transfer of space technology to the private sector by giving free technical assistance to small businesses to help them solve their problems and increase their chances of succeeding. Made up of a group of 25 companies, universities, colleges and NASA centers, the SATOP

finds professionals within these companies who volunteer their time and expertise in solving the challenges brought forth by the inquiring businesses. Administered by Florida's Technological Research and Development Authority (TRDA), the program has yielded over 750 success stories since its inception in 1995.

After applying to the program, The Boeing Company, a SATOP alliance partner, was assigned to the project. Harry Garton and T.C. Ma, engineer scientists in structures and mechanical systems at The Boeing Company, led a team of engineers that reviewed the current prototype."Mongoose Inc. had already done a lot of leg work in finalizing their prototype, which made our job much easier," Garton said. "We examined drawings and provided them with modifications that would strengthen the device and dampen the vibration."

The team at The Boeing Company solved the challenge and provided recommendations within six weeks. Upon receipt of these suggested changes, Mongoose finalized the device within 30 days. "The Boeing people were top-notch," Gaskin said. "Although they work on big projects such as the space shuttle every day, they welcomed us - the small agricultural guys -- with open arms and provided us with excellent direction. Without their help, I would be at least six months behind my current schedule, which is an entire picking season."

After mass-producing the revamped device, Mongoose Inc. successfully sold 30 units for the 2000-2001 picking season, generating over $1 million in sales. Last picking season, the company had only three devices on the market. "For a small company that lacks on-staff engineering, the SATOP is a great way to access highly skilled individuals who are experts in their fields," Gaskin said.

Frank Kinney, executive director for the TRDA, continues to be fascinated by the variety of businesses that receive valuable help from the SATOP. "It's amazing how structural designs used to design spacecraft can be simply adapted to solidify a piece of agricultural equipment. But that's what makes the SATOP special. This program is designed to let even the smallest business owners take advantage of cutting-edge technology in order to better compete in the marketplace."

For more information on Mongoose Inc., call (863) 494-1222.

For more information on SATOP in New York City, please contact ITAC at (212) 442-2990.

SATOP Success Story

SPACE ALLIANCE TECHNOLOGY OUTREACH PROGRAM HELPS COMPANY UPRGRADE THEIR PRODUCT AND SATISFY MORE CUSTOMERS

MIAMI – When officials with Niagara Industries, Inc. decided to upgrade the computer chips in their electronic tankless water heaters, they turned to an unlikely source for consultation and assistance – the U.S. space program. The company is the latest client to emerge from the Space Alliance Technology Outreach Program (SATOP) with a free and successful solution that has saved the company thousands of dollars.

The SATOP is a free service designed to speed the transfer of space technology to the private sector by giving free technological assistance to small businesses to help them solve their problems and increase their chances of succeeding. Made up of a group of 30 companies, universities, colleges and NASA centers, the SATOP finds professionals within these companies who volunteer their time and expertise in solving the challenges brought forth by the inquiring businesses. Administered by Florida's Technological Research and Development Authority (TRDA), the program has processed over 1,100 requests.

Prior to seeking SATOP assistance, engineers at Niagara Industries, Inc. began to notice that the chip they were using in their tankless water heaters was becoming obsolete. They needed to try and redesign the circuitry, or the "brain" of the system. "We were the first company to build the electronic tankless water heater 15 years ago, so we have developed a strong customer base, "said Alex Bolivar, vice president of operations for Niagara Industries, Inc. "Our customers were crying out for new technology. If we didn't get up to speed, we faced the possibility of disappointing our customers and losing business," he said.

After a thorough international search, Bolivar and his team found two chips to upgrade the system. But, upon testing them, the company noticed the chips were not performing at optimum level. The company turned to engineering departments within local colleges and universities to see if Niagara's challenge could be taken on as a student project. "We needed a fresh perspective on this challenge," Bolivar said. "That's when the universities told me about the TRDA and the SATOP program," he said. Bolivar contacted the TRDA and completed a Request for Technical Assistance (RTA) form. Upon receipt, the TRDA distributed it to its alliance partners, asking who could help Niagara Industries, Inc. with their challenge.

Tim Thurston, of The Thurston Company, accepted the task. Bolivar sent Thurston all of the data, testing and schematics, thereby allowing Thurston to assess the challenge and work towards a solution. "The new

chips they purchased to upgrade the water heater were not communicating properly with other parts of the heater circuit, thereby causing the circuit to perform poorly," he said.

According to Thurston, the heater circuit operates in a three-step process. First, a temperature sensing circuit measures the water temperature and provides a signal to the trigger circuit to adjust the heater power. Second, the trigger circuit monitors the main power supply and signals the power switch circuit to apply heater power without causing noise in the main supply power. Third, the power switch circuit receives the commands from the trigger circuit, and appropriately, turns the heater's power on or off. These three parts of the circuit work together to maintain a constant temperature water supply within the heater.

"I performed simulations of the circuit designed by the Niagara engineers and found it not to function as desired," Thurston said. After modifying the circuit to correct the problem, he used this newly adjusted model and designed two different circuit configurations. "One circuit was less intrusive to the original design, but generated a small amount of noise in the main supply power," he said. "The second circuit recommendation eliminated the noise, but was slightly more complex."

Bolivar and his team were amazed at how fast Thurston responded with a solution. "It only took him two weeks, and we were surprised to learn that it was something simple we were overlooking," Bolivar said. Engineers at Niagara have nearly completed prototyping on the two new circuits, and upon completion of testing, the company will begin production by early summer.

Bolivar believes Thurston's solution saved the company at least three to four months of research, as well as several thousands of dollars in terms of parts and labor costs. "I am so thankful that we discovered the TRDA and the SATOP program," Bolivar said. "It's a big relief to know that if we get into another bind in the future, that there is an agency within Florida that is there to help us and provide us with a better solution than we could ever come up with on our own, he said."

Bob Allen, deputy director of the TRDA and program manager for the SATOP, is ready to help other companies reach similar levels of success through the program. "Mr. Bolivar and the Niagara success story is a perfect example of how companies can benefit from our vast network of professionals who are ready to help Florida businesses solve their technical challenges…for free."

For more information on Niagara Industries, Inc., visit the Web site at www.tanklesswaterheater.com. To obtain a Request for Technical Assistance for the Space Alliance Technology Outreach Program, visit www.spacetechsolutions.com or call your local economic development organization.

SATOP Success Story

SPACE ALLIANCE TECHNOLOGY OUTREACH PROGRAM HELPS LOCAL AIRPLANE ENGINE COMPANY CREATE A HYDRAULIC PROPELLER SYSTEM

INDIANTOWN, Fla. – For aviation fans who thrive on reconstructing old WWI and WWII replica airplanes, finding a reliable and powerful engine for these classic models can be quite a challenge. But, thanks to expert advice from volunteers with Florida's Technological Research and Development Authority's (TRDA) Space Alliance Technology Outreach Program (SATOP), one local airplane engine company is developing an enhanced engine system.

Team-38, Inc., a company that converts V-8 automotive engines for aircraft applications, needed a cost-effective modification for a proven and readily available "transmission" called a Propeller Speed Reduction Unit (PSRU). The PSRU controls the "pitch" on a propeller, or the specific blade twist that allows for optimum thrust to be developed at various speeds. TEAM-38's current PSRU was only capable of driving a "fixed pitch" or non-adjustable propeller.

They needed their PSRU to control a hydraulic, variable pitch propeller, commonly found on original airplanes, which allows for increased performance. TEAM-38's challenge came in creating a device that would communicate the thrust signal from the cockpit through the propeller's gearbox to "twist" the propeller blades in the desired manner.

Acting on the advice from a member of the Martin County Business Development Board, Len Bechtold, president of TEAM-38, applied to the SATOP for assistance. The program is a free service designed to speed the transfer of space technology to the private sector by giving free technological assistance to small businesses to help them solve their problems and increase their chances of succeeding. Made up of a group of 25 companies, universities, colleges and NASA centers, the SATOP finds professionals within these companies who volunteer their time and expertise in solving the challenges brought forth by the inquiring businesses. Administered by Florida's TRDA, the program has worked on more than 1,000 requests.

Bechtold completed a Request for Technical Assistance (RTA) form. Upon receipt of the RTA, the TRDA distributed it to its alliance partners asking who could help TEAM-38 with their challenge. The Thurston Company stepped forward, examined the challenge and provided consultation via phone, fax and e-mail.

"In order to vary the propeller thrust, we needed to connect a hydraulic signal to the propeller via a rotating coupling, or adapter," said Tim Thurston, president of The Thurston Company. "But, we didn't want this adapter to cause us to redesign the actual propeller, speed reduction gearbox or other parts of the plane," he said.

Thurston created a few sketches of a rotating shaft seal that would route the hydraulic signal through the propeller's gear box and into the hollow of the propeller's drive shaft. This connection provided the necessary signal to change the "pitch" of the propeller. In addition, he provided recommendations that allowed for the capture of leakage flow from the rotating shaft seal to prevent mixing of the gearbox oil and hydraulic fluids. Finally, he advised how to remove air from the hydraulic lines. Bechtold passed along Thurston's recommendations to Robert Marmesh, TEAM-38's in-house engineer, who is currently in the process of choosing final detail components.

"Being a small company with limited money available for such consultation, we were very fortunate to tap into Mr. Thurston's state-of-the-art knowledge and experience via this program," Bechtold said. He further explained Thurston's simple solution has saved TEAM-38 revenue, as well as decreased the amount of time that would have been devoted to research and development. "We kept trying to apply difficult solutions that just weren't working," he said. "Mr. Thurston gave us a workable solution that has boosted our confidence in being able to better service our clients."

Thurston's solution will cost TEAM-38 approximately $250 per unit. Based on their other, more intricate solutions, it would have cost them nearly three times the expense per unit. "Small businesses need help from specialists every now and then, but we just can't afford it," he said. "The SATOP is an excellent way to consult with a well-qualified individual on a specific problem for free. I will definitely use them again," he added.

For more information on TEAM-38, visit their Web site at www.team-38.com. To obtain a Request for Technical Assistance for the Space Alliance Technology Outreach Program, visit SATOP's web site at www.spacetechsolutions.com.

SATOP Success Story

TECHNICAL OUTREACH PROGRAM ASSISTS COMPANY WITH A MEDICAL DEVICE RESEARCH PROJECT

TITUSVILLE, Fla. – Since 1995, the Space Alliance Technology Outreach Program (SATOP) has helped over 700 small businesses throughout Florida overcome their technical challenges via free advice from experts within NASA and the aerospace industry. Now the success of the program is reaching other companies through the Internet. Megabase Research Products, located in Lincoln, Neb., recently received reaped the benefits of the SATOP and received assistance on their medical device research project.

Megabase Research Products needed to understand how hot and cold gases mix in order to complete their prototype, a device with applications in the molecular biology and medical diagnostics arenas. According to engineer André Quintanar, this was knowledge that the company did not possess. After doing a search on the Internet for this information, Quintanar stumbled upon the SATOP and decided to apply for assistance.

The SATOP is designed to speed the transfer of space technology to the private sector by giving free technological assistance to small businesses to help them solve their problems and increase their chances of succeeding. Volunteers from 30 companies, universities, colleges and NASA centers (NASA-Kennedy Space Center in Florida; NASA-Johnson Space Center in Texas; NASA-White Sands Test Facility in New Mexico) donate their time and expertise in solving the challenges brought forth by the inquiring businesses. The program is administered by Florida's Technological Research and Development Authority (TRDA).

The TRDA accepted Megabase Research Products' request for technical assistance and forwarded it to one of its alliance partners, The Boeing Company, for consideration. Tim Cash, engineer scientist with The Boeing Company, accepted and began work immediately.

"After reviewing the system, I designed an improved prototype reaction chamber based on fluid mechanics, and a flow diffuser that would ensure the gases were mixed properly," Cash said. He also reviewed other elements of the device and made recommendations for improvement. In sum, Cash devoted 24 hours of free consultation for the project.

Megabase Research Products is now in the process of redesigning the system and finalizing the prototype, which was the result of a Small Business Innovation Research (SBIR) grant from the National Institute of Health. Quintanar said the SATOP advice generated additional ideas and will help the companies achieve their goals and improve performance of the system.

"The key in research is the interfacing of technologies," Quintanar said. "The SATOP is an excellent vehicle to bring different perspectives together. In this case, it was essential to have the space technology from Boeing coupled with our medical devices and molecular technology," he said.

"The SATOP is such a tremendous resource because it allows small businesses the opportunity to tap into enormous technical resources and receive expert advice for free," said Bob Allen, deputy director of the TRDA and program manager for the SATOP.

For more information on the Space Alliance Technology Outreach Program, visit the SATOP web site at www.spacetechsolutions.com.

For more information on SATOP in New York City, please contact ITAC at (212) 442-2990.