We make the world safer and more productive.
Dealing Colleagues and Friends,

On August 28, 2017, Concurrent Technologies Corporation (CTC) commemorated its 30th anniversary as an independent, nonprofit, applied scientific research and development professional services organization serving the public interest. We are proud to have achieved this milestone and gratefully acknowledge the many employees, clients, and others whose support made this possible.

In addition to highlighting the work and events that shaped CTC and its affiliates, Enterprise Ventures Corporation (EVC) and the CTC Foundation, in fiscal year 2017 (FY17), this annual report presents numerous breakthrough technologies and innovative solutions that CTC has developed for the benefit of U.S. Warfighters and our national security.

Celebrating 30 Years of Innovation

Over the past three decades, our work has led to advanced technology contributions that made Americans safer and more productive. CTC’s expertise in advanced engineering and manufacturing processes; energy and environmental sciences; information technology and software development; readiness; and training solutions are enhancing U.S. weapons systems and human performance while answering real-world challenges.

EVC is our technology commercialization arm, taking Research, Development, Test & Evaluation (RDT&E) to the next level. Their sales, service, and production capabilities allow CTC and other companies to successfully transition technologies. Together, CTC and EVC provide full lifecycle support services to clients.

Our outstanding contributions to the public good have long distinguished CTC and its affiliates as responsible organizations, technology partners, and community citizens.

Investing in Emerging Technology and New Ideas

To best serve our clients, our focus on RDT&E remains paramount. As a respected research and development organization, CTC invests in new technology and new ideas. Most recently, CTC acquired additional additive manufacturing equipment, contributing to our multi-million dollar investment in this emerging technology.

The new equipment includes a VRC Metal Systems Gen III Max Cold Spray system and an AMBIT™ Hybrid Additive Manufacturing multi-task system (installed in a HAAS VF-11 multi-axis machine tool). With these additions, CTC is now able to offer clients three metal processes: cold spray, hybrid additive manufacturing, and laser powder bed fusion.

Additive manufacturing, or 3D printing, is growing exponentially in the U.S., and we are committed to applying CTC’s rich, 30-year history in metals and metal processing to be an all-encompassing service provider for additive manufacturing solutions.

Establishing a Technical Advisory Board

Our success is incumbent upon our ability to innovate. Toward that end, we have assembled a highly accomplished group of technical and business leaders, forming the company’s first Technical Advisory Board.

Led by Dr. Anthony J. “Tony” Tether, the new Technical Advisory Board is an impressive group of individuals whose wealth of experience is bringing new recommendations, mentorship opportunities, and unique, forward-thinking insights to CTC.

continued
The five-member board includes individuals with extensive military and business experience, all leaders with long records of achievement and a willingness to contribute to our continuing success.

Dr. Tether was Director of the Defense Advanced Research Projects Agency (DARPA) from 2001 until his retirement in 2009. Previously, he served as Director of National Intelligence in the Office of the Secretary of Defense.

Arthur J. Bruckheim, Ph.D., has more than 30 years of executive, financial, and management responsibility coupled with government/commercial/academic/international consulting and marketing experience.

Nickolas H. Guertin has 23 years of Navy military experience and a civilian service career that includes leading engineering and development of various technologies on Navy ships.

Jeffrey K. Harris has contributed to U.S. national security in both government and industry for 40 years, where he has fostered new technologies and programs that have contributed significantly to U.S. national capabilities, serving as director of the National Reconnaissance Office and the assistant secretary of the Air Force for Space. He also served as president of two Lockheed Martin Divisions, namely Missiles and Space Division and Special Programs Division.

Jeffrey K. Harris, who is also a member of the new Technical Advisory Board, and retired U.S. Army Lieutenant General (Ret.) Joseph Yakovac.

LTG Yakovac has 41 years of experience in tactical, operational, and strategic guidance of U.S. Army tactical units; Department of Defense research, development, production, and total package fielding activities; and currently, the defense industry. He held leadership positions for a number of major Army programs, including Program Executive Officer Ground Combat Systems. LTG Yakovac is currently a Senior Counselor at the Cohen Group.

Welcoming New Board Members

CTC’s Board of Directors also welcomed two new members: Jeffrey K. Harris, who is also a member of the new Technical Advisory Board, and retired U.S. Army Lieutenant General (Ret.) Joseph Yakovac.

Focusing on the Future

We are pleased to have assembled leaders who bring outstanding credentials and talent to CTC. They are impressed with our organization and dedicated to assisting us progress, build upon CTC’s strengths, and further enhance our service to government and industry.

As you will read in this annual report, CTC, EVC, and the CTC Foundation are aggressively pursuing opportunities and exploring new ways to serve the government and private sectors and achieve their overall missions.

We are extremely grateful for our employees’ dedication to innovation that exceeds our clients’ expectations. Their professionalism and commitment to quality drives all that we do.

As we commemorate our 30th year, we continue our commitment to strive to excel and innovate. Our employees deserve a collaborative environment; CTC’s Board of Directors, Technical Advisory Board, and Senior Leadership Team are dedicated to that end.

On behalf of our Board of Directors, we want to thank each and every employee and client. You are vital to CTC and our affiliates, and we are committed to serving your best interests.
Over the past three decades, we have delivered the best total solution for each client by bringing together the right scientists, engineers, business talent, technology transfer experts, and more...CONCURRENTLY...so that the process is cost-effective and efficient, and the results are enduring and sustainable.

CTC’s advanced engineering and manufacturing solutions—including prototyping and test services—are strengthening U.S. weapons systems. For example, our technical experts have increased the structural integrity of welds and have repeatedly proven the superior performance and cost effectiveness of friction stir welding relative to other conventional welding processes.

We develop sustainable energy and environmental solutions that are solving real-world problems and helping preserve the world’s nonrenewable resources. Our innovative System for Laundry and Shower Recycle/Reuse (SYLAS-R2), for example, recycles 90 percent of greywater generated by large commercial, governmental, or institutional users. It was originally developed for U.S. Warfighters to reduce water resupply needs at forward operating bases.

CTC’s advanced intelligence solutions are at work in highly secure areas of the Defense Department and U.S. Intelligence Community. For example, CTC developed the Readiness Reporting System to track continuity readiness for the Federal Emergency Management Agency (FEMA) and the Life Cycle Modeling Integrator program to report equipment readiness status for the U.S. Marine Corps.

In the battlefield, U.S. Warfighters are better trained because of the advanced distributed learning courses we have developed for more than two decades. Our employees teach classes on battlefields, develop sophisticated immersive environments, and dedicate themselves to teaching Service men and women in the way they would have liked to be educated.

Concurrent Technologies Corporation. Living up to our name every day.

Our success depends upon the outstanding quality of our employees and their ability to deliver innovative solutions to our clients.

Since our founding in 1987, our contributions to the public good have long distinguished Concurrent Technologies Corporation (CTC) as a responsible contractor, technology partner, and community citizen.
CTC Provides:

• Additive Manufacturing Product and Process Development
• Advanced Joining Technologies
• Manufacturing Process Development and Optimization
• Vehicle & Platform Subsystem Design, Prototyping, Test and Integration
• Combat Survivability Technologies
• Material Characterization and Testing
• Corrosion and Coating Solutions
• Fleet Readiness Services

Experienced engineers and scientists, many with military backgrounds, create and implement advanced metalworking solutions that improve the way materials are fabricated and integrated into complex structures.

Our full systems approach allows CTC to have a major impact on reducing clients’ total ownership costs.

Additive Manufacturing Totals Multimillion Investment

CTC is applying its 30-year history in metals and metal processing to be an all-encompassing service provider for additive manufacturing solutions.

Additive manufacturing, also known as 3D printing, is growing exponentially in the U.S., and we have the in-house expertise to continue leading metal-based solutions in this emerging arena.

CTC’s total investment in additive manufacturing equipment is over $2 million with the fiscal year 2017 purchase of several new machines.

The new equipment includes a VRC Metal Systems Gen III Max cold spray system and an AMBIT multi-task system from Hybrid Manufacturing Technologies.

These metal additive manufacturing processes can also be combined to deliver customized solutions.
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Laser Powder Bed Fusion  
Laser powder bed fusion additive manufacturing has been available at CTC for more than two years. The company previously purchased an SLM 280th selective laser melting (SLM) machine from SLM Solutions, allowing for the creation of parts made from various materials, including aluminum, titanium, stainless steel, and cobalt-chrome.

CTC engineers applied an established process that is more than a century old and is currently used commercially to extract metals from ore.

CTC has been awarded a patent for “Additive Manufacturing Using Metals from the Gaseous State,” a novel concept in the additive manufacturing process domain.

To achieve this accomplishment, CTC engineers applied an established process that is more than a century old and is currently used commercially to extract metals from ore.

The inventors are Juan Valencia, Ph.D., Advisor Engineer; Mike Tims, Advisor Engineer; and former CTC employee Joe Pickens, Ph.D.

Engineers Earn Patent for New Additive Manufacturing Process  

Additive manufacturing refers to depositing layers of solid material to create a three-dimensional object from computer-generated designs. CTC’s patented concept uses a gas, carbon monoxide, that reacts with any of 18 different metals to form a more complex gas at elevated temperatures. The metal then deposits on hotter substrates that define the shape of the finished component. This action frees up the carbon monoxide for reuse in reacting with additional metallic atoms and continuing the additive process.

This process complements other forms of additive manufacturing. It is good for producing seamless, thin-walled, metallic components. Thin-walled components (including those with arbitrary shapes and without internal support structures) are challenging to produce with most other forms of additive manufacturing.

Participating in Landmark Metal Study  

When Optomec, a leading global supplier of production-grade additive manufacturing systems for 3D printed metals and 3D printed electronics, announced the results of a three-year landmark study, CTC was among the technical experts credited.

According to Optomec, the study “validated the repeatability and transferability of the Optomec LENS metal additive manufacturing process.

“This led to the development of the LENS material design tool that predicts part performance with high consistency and repeatability, making it easier for manufacturers to design and produce parts for production.”

The inventors are Juan Valencia, Ph.D., Advisor Engineer; Mike Tims, Advisor Engineer; and former CTC employee Joe Pickens, Ph.D.

Doubling the Life of Military Pump Components  

Tactical vehicles are essential pieces of equipment for our military. To keep them in top condition and ready to deploy at a moment’s notice, Central Vehicle Wash Facilities (CVWFs) are located at military installations.

However, if the CVWF has a corrosive water supply, the steel wash-rack pumps within the vehicles can become vulnerable to accelerated corrosion and degradation. Left unchecked, pump failure can occur with little warning, taking the CVWF out of service for unscheduled maintenance. This can negatively impact the readiness of the unit that owns the vehicles.

Under the direction of the Office of the Secretary of Defense (OSD), CTC was tasked by the U.S. Army Engineer Research and Development Center–Construction Engineering Research Laboratory (ERDC–CERL) with finding new coating materials to reduce corrosion on CVWF pump components.

The pumps were used for 15 months, then disassembled and inspected. No significant corrosion or degradation of pump components was observed on either pump.

Both the cobalt alloy and EN coatings are preferred solutions. Despite both coatings using the thermally sprayed alloy, the EN coating was also less expensive, so it may be the preferred solution.

Both the cobalt alloy and EN coatings are conservatively estimated to double pump service life when compared with the previous pumps.

A military vehicle goes through the Fort Polk Central Vehicle Wash Facility. CTC teamed with the U.S. Army to identify and demonstrate corrosion enhancements for pump components at military wash facilities.
Launching the Center for Advanced Nuclear Manufacturing

The U.S. nuclear industry’s need to develop clean, reliable, and economical technologies to fill future demand is an opportunity CTC is embracing. Our new Center for Advanced Nuclear Manufacturing (CANM) brings CTC’s considerable multidisciplinary skills and resources to bear on the challenges facing the world’s next generation of commercial nuclear power plants.

Commonly referred to as Small Modular Reactors and Advanced Reactors (SMR/AR), these relatively compact nuclear reactors can be “factory produced,” and we will fill the critical gap for affordable, applied advanced manufacturing technologies that so many manufacturers are seeking.

CTC engineers, scientists, and professional staff look forward to developing and transitioning innovative manufacturing solutions to benefit the SMR/AR industry.

CANM will:
• Conduct design for manufacturing analysis
• Solve first-of-a-kind manufacturing issues
• Prototype new component designs and manufacturing solutions
• Develop and transition innovative manufacturing technologies
• Help manufacturers become more competitive

At the CANM ribbon cutting, Congressman Keith Rothfus said, “I want to thank the U.S. Nuclear Infrastructure Council (NIC) Manufacturing and Supply Chain Working Group and NIC member companies for establishing a concept for the Center for Advanced Nuclear Manufacturing—and for selecting Concurrent Technologies Corporation to operate the Center in Johnstown, PA.

“CTC has a 30-year history and impressive track record in advanced manufacturing, large infrastructure and highbay space, equipment, testing facilities, and subject matter experts with experience in key technologies including additive manufacturing, casting, cybersecurity for manufacturing, and more.

“CANM will bring together the right mix of engineers, academics, and industry providers to develop and demonstrate cost effective solutions.

“It will also serve as a training center for the nuclear manufacturing industry to ensure the workforce is capable of effectively using SMR/AR technology both here and around the world.”

Contributing Advanced Manufacturing Technologies to the Army’s New Combat Vehicle Prototype

In 2000, friction stir welding was still considered by most in the U.S. as a novelty process. That year, CTC began developing advanced materials, design, and processing technologies for friction stir welding under the U.S. Army’s Tank Automotive Research, Development, and Engineering Center (TARDEC)-sponsored Combat Vehicle Research Program.

Over the past 17 years, CTC engineers have developed state-of-the-art friction stir welding tools, weld fixtures, and process parameters for numerous traditional and non-traditional high-performance aluminum armor alloys, such as Al-Li 2195. We have designed, produced, and delivered numerous ballistic and mine blast technology demonstrators and test articles to the U.S. Army.

Our work with mine blast test articles demonstrated improved survivability through friction stir welding over traditional arc welding processes.

Today, CTC engineers support the Army with the manufacturing of new combat vehicle prototype hulls for improved soldier survivability utilizing the friction stir welding process. Two friction stir welded blast demonstrator prototypes have been manufactured and delivered to TARDEC for testing. This work has resulted in a new $7.5 million project for CTC to further enhance and refine the friction stir welding design of future ground combat vehicles for the Army.

CTC is able to produce entire combat vehicle hulls utilizing friction stir welding, enhancing ballistic and blast performance in combat vehicles while decreasing weight. This results in improved survivability for the warfighter and reduced logistical burden.

CANM is Developing and Transitioning Innovative Manufacturing Solutions to Benefit the Small Modular Reactor/Advanced Reactor Industry.

The CANM Ribbon Cutting/Open House included remarks from Robert E. Akans, CTC Senior Director, Manufacturing Technologies; Edward J. Sheehan, Jr., CTC President & CEO; U.S. Congressman Keith Rothfus (PA-12); and David Blee, United States Nuclear Infrastructure Council Executive Director. CTC welcomed approximately 75 industry experts, manufacturers, scientists, engineers, nuclear futurists and operators, as well as regional business development leaders and elected officials. The event featured tours of nearly a dozen of CTC’s technical capabilities, including additive (3D) manufacturing, friction stir welding, prototype tool development, and much more.
New Fabrication Method Improves Submarine Decks

CTC engineers led a multi-million dollar Navy ManTech project titled “Self Locating, Self Fixtured Structures,” later consolidated to “Fast Fit Structure” by General Dynamics Electric Boat, that is contributing to the construction of Virginia and Columbia class submarine decks.

Over five years, the project is estimated to save more than $5 million. Life-of-program savings are estimated at over $28 million for the Columbia and Virginia class systems.

The Fast Fit Structure project resulted in a more efficient way of fabricating submarine deck structures, which have been traditionally constructed of many short, fitted pieces (intercostals) between continuous beams. Each piece requires a precise fit by highly skilled individuals.

The project team developed the manufacturing process for a new concept—the self-locating, self-fixtured method—for fitting and joining the deck structures.

The self-locating, self-fixtured method will enable construction with notched beams that interlock and are continuous in both directions.

Implementation is expected on Columbia class and on the first Virginia Payload Module in the third quarter of FY19 at General Dynamics Electric Boat facility in Quonset Point. Current detail design has incorporated the self-locating, self-fixtured method in both programs.

Pre-Commissioning Unit Columbia (SSBN 826) will utilize the self-locating, self-fixtured method on 16 decks; subsequent ships of the class will incorporate it on 26-31 decks.

Both decks of the Virginia Payload Module will utilize the self-locating, self-fixtured method in their current design.

Team members included Columbia class Replacement Program Office (PMS 397); Virginia class Program Office (PMS 420); DDL OMNI Engineering Corporation; General Dynamics Electric Boat; Naval Surface Warfare Center, Carderock Division; the Navy Metalworking Center; and the Office of Naval Research ManTech Program.

This project was nominated by the Joint Defense Manufacturing Technology Program (JDMTP); Metals sub-panel for consideration as the ManTech Project of the Year. Although it didn’t win, the project received high praise from management at both the implementing shipyard (Electric Boat) and the government acquisition program office for the quality of work performed and the value to the U.S. Navy.

General Dynamics Electric Boat is pursuing follow-on projects with CTC that leverage the success of this effort to additional ship structures.

Making Friction Stir Welding Portable for Navy Ships

The Office of Naval Research (ONR), under the Future Naval Capability program, has funded CTC to lead a team to develop a portable friction stir welding system for repairing cracks in sensitized aluminum on Navy ships.

Friction stir welding is an ideal technology for welding aluminum and is particularly well-suited for repairing cracks in 5xxx aluminum alloys. However, friction stir welding generates large forces, and the large, fixed machines are unsuited to perform repairs onboard ships.

Other benefits:
• Part count (and associated handling costs) was reduced by 60 percent.
• Part shrinkage caused by welding was decreased by 77 percent.
• Flatness was improved by 90 percent over typical construction.

Friction stir welding can bring the benefits of friction stir welding to any large aluminum structure for repair or new construction. This opens potential for application for both construction and repair in ship, trucking, and rail vehicles, or any other large aluminum structure. CTC has filed a provisional patent for this technology solution.

The project team, comprised of CTC; the Naval Surface Warfare Center, Carderock Division (NSWCCD); and the University of South Carolina; first examined the process through tooling and parameter experimentation.

CTC fabricated an initial concept demonstrator, or Alpha circle weld unit. The Alpha unit performed a series of increasingly challenging welds, including inserts of new material in sensitized plate. After demonstration for ONR and Navy technical subject matter experts, the Alpha unit was modified to perform straight line welds.

CTC then designed and built the Beta unit, which performs oblong welds more suited to repairing long cracks.

The project has been hugely successful in developing a process and system that meets or exceeds Navy requirements. This tool has potential far beyond repair of cracks on CG 47 ships.

Portable friction stir welding can bring the benefits of friction stir welding to any large aluminum structure for repair or new construction. This opens potential for application for both construction and repair in ship, trucking, and rail vehicles, or any other large aluminum structure. CTC has filed a provisional patent for this technology solution.
CTC Provides:

- Environmental & Process Engineering
- Infrastructure Energy
- Operational Energy
- Water Recycling Technologies
- Safety and Environmental Health Services
- Strategic Advisory Services
- Energetics and Ammunition Process Engineering

**Coatings Booth Saves U.S. Air Force Millions**

The U.S. Air Force is looking ahead to facilities necessary to maintain and sustain its newest multi-role fighter, the F-35 Lightning II. Working with the Air Force Research Laboratory’s Advanced Power Technology Office (APTO), CTC led the team of scientists, maintainers, and process teams from government, academia, and industry in developing a next-generation F-35 coatings application booth at Hill Air Force Base, the first in a series of three planned units.

The booth is expected to save more than $330,000 annually in energy through the employment of advanced sensors, control logic, and sophisticated software analysis tools to monitor and improve performance over the lifetime of the booth.

“The F-35 is a huge program for the Air Force, and planning sustainment is important. It’s important to get it right,” said David Madden, the APTO Program Manager. “The F-35 program office came to us and asked for help in designing a cutting-edge, state-of-the-art, energy-efficient, and environmentally friendly facility.”

“This was a great team collaboration, and we’ve created an organic capability for the Air Force. By employing the state-of-the-art, conventional, and advanced materials and processes in its work, the APTO team leads the way in ensuring Air Force supremacy today and for generations to come,” Madden said.

The application of aircraft coatings, which offer benefits such as heat resistance and corrosion protection, are critical to the operational life of an aircraft.

Typically, coatings application is extremely costly in terms of energy consumption as well as environmental impact and maintenance staff safety needs.

CTC modeling and simulation efforts determined air flow and circulation patterns that led to an approach that filters out particulates and circulates up to 70 percent of the air in the booth, saving energy commonly associated with conditioning new air.

“Bioenvironmental engineers evaluated the models and determined that the models were good—this is safe,” said Madden.

Supporting Ammunition Software Package

Working with the U.S. Army Program Executive Office Ammunition and its Project Director Joint Services, CTC is serving as a subcontractor supporting the demilitarization of Department of Defense conventional ammunition.

In coordination with prime contractor Azimuth Consulting Services, Inc., CTC is identifying requirements for a new multi-variable demilitarization optimization software package to replace the current software.

“This specific project is focused on developing design requirements for a software tool to produce a 1- to 10-year plan for optimized demilitarization activities relating to cost, logistics, location, and more.” said Gino Spinos, Director, Environmental and Process Engineering.

CTC will create a Software Requirements Technical Report to be used to document key performance characteristics and desired attributes of any new or modified software system. We will also prepare a cost estimate for the development and testing of new or modified software to support integration to the Army’s Enterprise Resource Planning program, specifically, Logistics Modernization Planning.
Team tests ground equipment concept demonstrator at Edwards Air Force Base*

When a team working with the 412th Logistics Test Squadron at Edwards Air Force Base completed tests on the CTC-developed Hybrid Electric Flight Line Cart Technology Pathfinder, the reviews made headlines. Here are excerpts from an article by Christopher Ball, 412th Test Wing, Public Affairs.

EDWARDS AIR FORCE BASE, Calif. – Aircraft produce their own electric power when the engines are running, but when the engines are off maintaining performance system checks and other maintenance typically rely on a diesel generator to support electrical power requirements.

Tom Layne, a representative from the Air Force Research Laboratory, said this concept demonstrator—the Hybrid Electric Flight Line Cart Technology Pathfinder (HEF)—is essentially a large bank of batteries coupled with the necessary power conditioning equipment to make the machine compatible with multiple types of aircraft.

Representatives from the Air Force Research Laboratory Materials and Manufacturing Directorate, Concurrent Technologies Corporation—the contractor that built the power supply—and the 412th MXLS successfully ran the unit through its paces on the Edwards flightline, testing it with an F-16, a KC-135, and the biggest power draw, a C-17.

Layne said the idea was to leverage developing technologies to make a power unit that is cleaner, safer, and more robust with less maintenance. "Why do we have electric cars, but we're still running diesel generators for aircraft maintenance?" he asked.

The unit is designed to charge overnight on the standard power grid, or it can be quickly recharged on the flightline using existing diesel generators. Staff Sgt. Steven Schrader, a logistics test evaluator with the 412th MXLS, said that during the C-17 testing, the crew completed all the tasks before the unit needed a recharge.

"Then we threw more at it," he said. "It worked!"

Tech. Sgt. Kevin Mathis, 412th MXLS logistics test evaluator, commented on the robustness of the unit. Some of the advantages of this system, according to Layne of AFRL, are lower noise and emissions than a conventional diesel generator and less maintenance.

Staff Sgt. Alex Rin, a logistics test evaluator with the 412th MXLS, commented on the decreased noise. "The lack of noise from the diesel generator gives us increased situational awareness," he said. "This means improved safety."

According to Layne, one of the next steps is to reduce the overall size of the HEF to make it more manageable for the maintainers. "We're going to see if it works, then we're going to shrink it," he said. "The most important thing is the guys using it."

And those guys spoke highly of the HEF.

"It's always impressive when a maintainer says the new product is better than the one he's been using," Rin said.

"Condensed article

Operating the Safety Management Center of Excellence

The Department of Defense (DoD) Safety Management Center of Excellence (SMCX), operated by CTC since its inception in 2006, supports the Office of the Under Secretary of Defense for Personnel and Readiness Personnel Risk and Resiliency’s goal of helping as many DoD sites as possible achieve Safety Management System (SMS) recognition, such as the Occupational Safety & Health Administration’s (OSHA) Voluntary Protection Programs (VPP) Star designation.

Star sites typically experience significant reductions in mishaps and lost time due to injuries, along with an improved safety culture.

As of August 1, 2017, 59 DoD sites have an active OSHA VPP Star recognition, and the SM CX estimated $16.7 million in annual cost savings due to reduced incidents based on data from the nearly 200 active Star or in-progress sites being supported by the SM CX.

CTC’s team of experienced safety professionals is dedicated to educating U.S. Government and industry in ways to achieve and enhance SMS performance.

For example, our experts presented “Stepping Up SMS Performance with Trend Analysis” and “Improving SMS Performance through Baseline Hazard Analysis” at the 25th Annual Joint DoD Safety and Environmental Professional Development Symposium in April 2017.

The SM CX team also created and presented 19 webinars this year, providing valuable information to help continually improve SMS processes. Topics ranged from ways to reduce work-related fatigue to hazard analysis of significant changes.

By focusing on useful techniques, the SM CX is sharing real-world solutions that reduce personal risk and ultimately support mission readiness.
Engineers Install Water Reuse System in Hotel

A working prototype of the Laundry Water Reuse System developed and tested in CTC’s lab has been installed in a hotel. Using a bank of meters that monitor hot and cold water lines for each washing machine, CTC engineers are collecting data to measure the cost effectiveness of the new system in a real-world setting.

CTC’s Laundry Water Reuse System is capable of processing 1,500 gallons of greywater a day. The system is fully automatic, requiring only periodic filter maintenance and the addition of chemicals to stabilize PH and chlorinate the recycled water. By purifying and reusing laundry greywater, the hotel will realize cost savings through reduced energy, water, and sewer costs.

PA Prison to Install Water Recycling System

A green laundry system invented by CTC and Water Energy Technologies is planned for test and evaluation at the Cambria County Prison in Ebensburg, Pennsylvania, and is expected to recycle a significant portion of the greywater generated by laundry operations.

According to CTC engineers who worked with Cambria County Prison officials to identify baseline data, the Cambria County Prison laundry uses approximately 1.5 million gallons of water per year. The system is capable of recycling 80–90 percent of greywater in a laundry operation application. In addition, the system will reduce electricity consumption by nearly 350,000 kilowatt hours per year and chemical use by nearly 40 percent.

Water Energy Technologies’ proprietary ozone treatment technology destroys bacteria 3,000 times faster than chlorine bleach. When combined with CTC’s temperature-tolerant, three-stage filtration sequence and disinfection process, most washing machine discharge water can be processed as reclaimed water.

Since ozone and cold water work much better than chlorine and hot water to kill bacteria and remove stains and odors, commercial laundry operators can save energy in addition to recycling water for every load of laundry.

CTC’s water recycling technology has global applications as pressures on freshwater resources grow and as new sources of supply become increasingly scarce and more expensive. Capturing water that has been gently used and allowing it to be reused in a variety of ways provides an economically feasible and environmentally responsible means to maximize water resources.

Healthcare, hospitality, food and beverage, pharmaceutical, oil and gas, and mining industries, for example, can utilize this innovative technology to maximize the productivity of every unit of water.

Advancing the Knowledge of Energetic Materials

Energetic materials are a class of materials that contain large amounts of stored chemical energy that can be released instantaneously or over longer, controlled periods of time. Typical classes of energetic materials include explosives, ammunition propellants, solid rocket propellants, pyrotechnic compositions, and similar high-energy-density materials. CTC is supporting the DoD and the Defense Industrial Base communities in the following ways:

- Researching and characterizing new, higher performance energetic materials
- Improving the manufacturability of new energetic materials
- Helping to transition knowledge and experience to the future energetics’ workforce
- Assisting in updating qualification programs for new energetic materials
- Developing environmentally sound energetics materials’ practices.

CTC’s goal is to couple our extensive experience in energetic-materials chemistry and ammunition manufacturing, as well as our long-standing relationship with the U.S. Army Armament Research, Development and Engineering Center (ARDEC), to the benefit of the U.S. Navy Energetics Enterprise.

Improving Energy Resiliency

Reliable access to energy and water resources is an important operational concern for the U.S. military. CTC continues to support the U.S. Air Force and U.S. Army as they develop and implement policy, guidance, and technology solutions to prepare for future challenges, reduce operational risks, and enhance mission assurance.

Over the past few years, important elements of the U.S. Army’s Energy Security framework have been developed and codified into Army policy. CTC has been instrumental in assisting the Office of the Deputy Assistant Secretary of the Army for Energy and Sustainability (DASA[E&S]) as it made significant progress in developing and implementing a strategy to improve the security posture of Army installations.

Specifically, through close coordination with Army Commands, CTC assisted the Army Secretariat in defining and measuring energy and water security. CTC provided policy and technical support toward the development of key energy and water security measures for the Army’s existing Installation Status Report and piloted the measures in the FY17 reporting cycle. The information has been influential in mapping out an overall strategy in mission assurance for the Army.

Another essential component of the Army’s strategy to ensure available and uninterrupted energy and water supplies for critical missions involves prioritizing infrastructure investments. CTC has been assisting the Army Secretariat in defining Strategic Readiness Platforms to guide investments toward those locations where the greatest risks to mission accomplishment are occurring.

CTC also provides energy security expertise to the U.S. Air Force. We have investigated, installed, and documented infrastructure upgrades to improve Air Force installation energy resiliency. In particular, CTC works with Air Force bases to define solutions that will best sustain long-term operations at critical locations in the event of power failure.

CTC’s unique combination of policy analysts, technology transition specialists, and electric and utility engineers provides our Air Force and Army clients with the complete perspective needed to link strategic goals with technology needs.
CTC’s advanced information technology solutions integrate capabilities in agile software development, cloud architecture and security, data management and analysis, machine learning, and cybersecurity to solve challenges in highly secure areas of the Department of Defense and U.S. Intelligence Community.

Our Mixed Reality Lab contributes to clients’ ongoing and emerging virtual and augmented reality needs, enhancing projects in unique new ways.

Developing Machine Learning to Support National Security

Machine learning is an emerging area of expertise that applies a form of artificial intelligence to enable systems to get smarter or “learn” over time without the need to reprogram. CTC is working on applications that assist analysts with task automation and collaboration, as well as technology to enable more accurate event predictions and decision-making.

In one project, CTC is providing the National Geospatial-Intelligence Agency (NGA) with an artificial intelligence Analyst Virtual Assistant capability. The Analyst Virtual Assistants will provide analysts with a virtual personal assistant, smart advisement, and product socializing capabilities. The vision is for them to become go-to resources that deliver recommendations and predictions based on analysts’ needs and tasking.

This project is the result of a competitively bid NGA contract award under the agency’s Boosting Innovative GEOINT (BIG) program. CTC is partnering with the Penn State University College of Information Sciences and Technology and its Artificial Intelligence Research Laboratory.

Under this contract, CTC will further advance the state of knowledge in virtual assistants by evolving from a singular user-centric orientation to a viewpoint of the user within an interdependent network of humans and cognitive machines. Specifically, CTC is developing the standards, architecture, and tools to create, run, and manage Analyst Virtual Assistant services within the U.S. Government’s cloud environment.

Giving Museum Visitors Immersive Experiences

Using augmented and virtual reality technology, museums, galleries, zoos, science centers, historic sites, monuments, parks, and more can engage and excite visitors in new ways. For example, visitors come face-to-face with a congressional leader thanks to a 3D immersive simulation that CTC developed for the John P. Murtha Center for Public Service and National Competitiveness on the University of Pittsburgh at Johnstown campus.

Through a grant from the John P. Murtha Foundation and using the latest interactive technology, CTC programmers created Congressman Murtha as a holographic avatar standing behind his physical desk. Using Microsoft HoloLens headsets, visitors can learn about his leadership by experiencing it.

The Murtha Foundation intended the John P. Murtha Center for Public Service and National Competitiveness to educate and inspire students and the general public to become active in community, military, and public service while providing a venue for public debate, discussion, and academic inquiry.

CTC is heavily invested in the future of emerging concepts—specifically, 3D learning technologies. We bring nearly two decades of award-winning experience in gaming technology, interactive design, and augmented and virtual reality to each project.

Hackathons Aid Rapid Solution Development

As part of CTC’s Internal Research and Development (IR&D) efforts, CTC solution architects, system engineers, and developers are evolving the hackathon concept into a tool that can be applied to future IR&D work, proposal development, mentoring, and even as a formal part of an agile development project. A hackathon is an event, typically several days long, in which a number of people meet to engage in collaborative computer programming.

One CTC hackathon, for example, resulted in a prototype system referred to as the Secure Remote Computing Environment (SRCE). The core technologies used to implement SRCE include Linux containerization, Red Hat OpenShift, Apache Guacamole, and OrientDB. The IR&D project delivered a highly tailorable proof-of-concept system comprised of a web-based, next-generation, remote computing environment.
Advanced Readiness & Training

CTC Provides:

- Readiness and Continuity of Operations Technology-Based Solutions
- Custom Educational & Training Solutions
- Identity, Credential and Access Management (ICAM) Engineering
- Strategic Communication & Media Services
- Technology-Based Training Solutions

Force readiness, continuity of operations, and disaster response planning and preparedness are high priorities...to the U.S. Military, federal, state, and local governments; and CTC. Education and training on the battlefield and in traditional and electronic classrooms prepare learners for the rigors of their jobs.

Clients rely on CTC’s first-hand military experience and integrated readiness and learning techniques to meet their mission-critical demands, as in these recent examples.

CTC’s Tracking System Used for 2017 Presidential Inauguration

CTC’s Technology Group directly supported the 2017 inauguration of President Donald J. Trump on January 20, 2017. The CTC-developed Emergency Response Official Accountability tracking system (ATS) provided an identity, credential, and access management (ICAM) capability to the District of Columbia Homeland Security and Emergency Management Agency (DC HSEMA) to enable unescorted facility access during the inauguration.

Tim Spriggs, DC HSEMA Chief of Operations, said, “This operational demonstration proved to be a most successful smart credential interoperability event for federal and other augmented personnel with smart identity cards supporting DC HSEMA. This demonstration also included the ability to electronically read certain elements of state driver’s licenses as an alternative capability to enable tailored accountability and situational awareness reports for leadership.”

Matt Majcher, CTC Principal Software Engineer, spent two days in Washington, D.C., during inauguration week, assisting DC HSEMA personnel with the use of the ATS system.

DC HSEMA processed more than 1,200 common access cards and personal identity verification cards along with numerous driver’s licenses for personnel entering the Unified Communications Center. The system performed exceptionally well in a real-world setting and helped DC HSEMA successfully execute its mission to ensure the security of the inaugural events.

Training Law Enforcement Personnel Who Protect 9,300+ Federal Facilities

Under a task order with the U.S. General Services Administration’s One Acquisition Solution for Integrated Services (OASIS) contract vehicle, CTC is providing National Weapons Detection Training for the Federal Protective Service (FPS) National Training Academy. Our expert instructors are training law enforcement personnel and Protective Security Officers who are responsible for ensuring the safety of more than 9,000 federal facilities, their occupants, and visitors.

CTC is honored to have been chosen to provide security screening training that will help law enforcement more accurately assess situations and provide protection within the critical mission response window.

In this effort, CTC is partnering with EVC and ScaVet Technologies to provide instructionally sound classroom and lab instruction, including the utilization of security screening equipment, X-ray screening machines, walk-through metal detectors, and handheld metal detectors.

This work is taking place at the Department of Homeland Security’s Federal Law Enforcement Training Center (FLETC) headquarters in Glynco, Georgia. FLETC is the primary provider of basic and advanced law enforcement training to federal law enforcement agencies, as well as a significant contributor to advanced training for local, state, and international law enforcement officers and agents.
Awards

Security Program Earns Distinction

CTC has been chosen for the prestigious Defense Security Service James S. Cogswell Outstanding Industrial Security Achievement Award. As such, our security program has been distinguished as one that far exceeds National Industrial Security Program requirements.

Facilities are eligible for the award only if they achieve a minimum of two consecutive “Superior” industrial security review ratings and show a sustained degree of excellence in their overall security program management, implementation, and oversight.

Supporting Our Veterans

We are incredibly proud of the service of our veterans (who make up 15 percent of our workforce). It is inherent in our corporate culture to uphold the rights of uniformed employees and go above and beyond to support their families, especially during deployment.

As a result, for the seventh year, Military Times has named CTC as a “Best for Vets” employer—an honor that recognizes the quality opportunities we provide for America’s veterans.

Just 82 organizations made this year’s list, which evaluates each company’s corporate culture, veteran recruiting, veteran policies, and accommodations for reservists.

In addition, the Pennsylvania Employer Support of the Guard and Reserve (ESGR) has presented CTC with the Soaring Eagle Award for outstanding support of its employees serving in the Pennsylvania Guard and Reserve.

Winning With Workplace Safety

For the third consecutive year, our employees’ exceptional work habits earned two National Safety Council honors:

Million Work Hours Award – for working more than one million hours (October 1, 2015 – December 31, 2016) without a lost-time incident

Perfect Record Award – for working more than 807,000 hours (all of 2016) without a lost-time accident

CTC has also won the 2016 National Safety Council Safety Committee Award. Our Safety Committee earned first place in this newly created competition based on its extensive work to create a world-class safety culture.

Thanks to the employees who work hard to make our Safety Committee visible and engaged. Their work goes a long way toward achieving the most important award: an injury-free, illness-free, safe working environment for colleagues.

Board Diversity Recognized

For the second time, CTC has been recognized as a Winning “W” Company by 2020 Women on Boards, a nonprofit dedicated to increasing the percentage of women who serve on U.S. company boards to at least 20 percent by the year 2020.

CTC’s Board of Directors includes long-standing members Margaret DiVirgilio and E. Jeanne Gleason. Ms. DiVirgilio is also a member of the company’s Senior Executive Leadership Team, where she serves as Senior Vice President, Chief Financial Officer and Treasurer.

The James S. Cogswell Award is Presented to Only 36 of 13,500 Cleared Facilities.

Concurrent Technologies Corporation accepted the 2017 James S. Cogswell Award at the National Classification Management Society Training Seminar on June 22, 2017, in Anaheim, CA. Left to right: Daniel Payne, Defense Security Service (DSS) Director; Edward J. Sheehan, Jr., CTC President and CEO; Ron Newsom, CTC Security Manager; and Gus Greene, DSS Director of Industrial Security Field Operations.
It’s the way we do business that sets CTC apart. It’s about doing the right things. Mentoring. Contributing. Encouraging. Adding value to our workplace and to the communities we serve.

We gratefully acknowledge our employees’ hard work, dedication, and spirit of volunteerism, as demonstrated in these examples.

Helping Youth through the Challenge Program

Through The Challenge Program, Inc., high school sophomores, juniors, and seniors are introduced to careers in their own communities and challenged to compete in five award categories that are directly linked with academic and workforce success: attendance; STEM (Science, Technology, Engineering, and Math); academic improvement; academic excellence; and community service.

CTC joined with other companies in Cambria County, Pennsylvania, who collectively donated $90,500 to help 15 schools.

Partnerships between schools and businesses contribute to the workforce and economic development by motivating students to succeed in academics and in their future careers. CTC supports the Challenge Program’s drive to develop good habits, behaviors, and attitudes in students so they will be better prepared for challenges, competition, and rewards of the workforce.

We “Deck the Halls” for Charity

More than a dozen employee groups participated in the first-ever Deck the Halls event on December 7, 2016. While the day provided fun memories as employees visited different decorated areas and enjoyed refreshments at celebration stations throughout the buildings, the real beneficiaries were those served by local food pantries.

Information Technology employees decorated their areas elaborately, including this bank of monitors that created one big holiday scene.

Concurrent Technologies Corporation’s Director of Corporate Communications and Brand Marketing, Mary Bevan, (holding the right-side of the giant check) attended the ceremony where $90,500 was gifted to 15 high schools through the Challenge Program, Inc.

Phil Guta (left) and Ron Oswalt load a vehicle with boxes of food to be delivered to a food pantry in Johnstown, PA.

CTC held a Deck the Halls competition in which employees decorated their cubicles and received votes based on donations.

Each area received votes in the form of non-perishable food items or $1 donations. As a result, boxes of canned goods as well as cash and gift cards were collected and distributed to help those in need before the holidays.

“I wanted to find a way to increase contributions to our annual food drive, and I thought adding a bit of competition might do the trick,” said Kathy Jones, Senior Director, Human Resources. “I was so impressed with the level of participation and the creativity employees displayed.”

From paper ornaments to golden ones and every kind of flashing light, employees decked the halls, cubicles, offices and yes, even a photocopier.
Safety and Security Have Their Own Day

CTC and EVC hosted Safety and Security Day on June 14 to promote awareness and compliance. Employees were invited to take a few minutes to refresh their safety and security knowledge and enjoy games, prizes, and snacks.

Our offices in Johnstown, PA; Annapolis Junction, MD; Crystal City, VA; and Huntsville, AL; had hands-on activities, and a virtual booth was available to all employees who were unable to participate in person.

Our industrial security and safety professionals, along with safety committee volunteers, discussed threats, common problems, and best practices. They also provided services such as disposal of sensitive material, foreign travel security training, vehicle registration, and more.

“Performance metrics show our corporate culture truly reflects safety and security as a mindset,” said Tom Monito, Environmental, Health, and Safety Professional. “Safety and security are well integrated with daily business operations and routine procedures in office areas, laboratories, and industrial spaces.”

Pledging Allegiance on Flag Day

It’s no accident that CTC’s Safety and Security Day planning committee schedules their annual event on Flag Day.

This year, we saluted the Stars and Stripes on its 240th birthday. Embroidered flags were given as prizes.

Because an important part of flag protocol is ensuring proper disposal of faded, worn, and torn flags, employees were invited to bring their old flags to work on the 14th; Security staff made arrangements for appropriate, respectful disposal of “old” Old Glories.

Hosting Hazardous Waste Event

CTC hosted the Cambria County Household Hazardous Waste event on Saturday May 20, 2017. Fifteen tons were collected from 398 participants.

The event provides county residents a safe disposal option for common household chemicals like cleaners, paints, stains or varnishes, batteries, motor oil, and pesticides. Paint products, aerosols, and used motor oil are among the most common drop-offs.

Over the past 13 years, this event has collected more than 162 tons of hazardous waste.

The event was organized by the Pennsylvania Resources Council in collaboration with the Cambria County Solid Waste Authority.

Parents Enjoy Bringing Kids to Work

Once a year, Take Our Daughters and Sons to Work Day sparks fun at CTC and EVC offices. Lunch with their parents, shadowing Mom or Dad, and enjoying some pretty cool yet educational activities made the day memorable for everyone.

This year, laser scanning, cybersecurity, safety, immersive technology, and additive manufacturing were on the tour.

Kids couldn’t stop smiling, and parents and co-workers had their share of laughs, too, as the CTC family celebrated its 13th consecutive Take Our Daughters and Sons to Work Day.

Office Olympians Compete With Paperclips

While they didn’t bring back any medals, the CTC team in the 2017 Easter Seals Western & Central Pennsylvania Office Olympix walked away winners in other ways.

“We had a great time representing CTC at this community event. More importantly, we contributed to a fundraiser for a good cause,” said Mark Pashargian, CTC Principal Risk Management Lead and Easter Seals Western & Central Pennsylvania Board Member.

The light-hearted competitive events included bouncing pencils on their erasers in an effort for them to land in a coffee mug and rolling ping pong balls into binder-clip targets. Money was raised through each team’s $200 entrance fee, which included dinner, beverages, snacks, and team gifts.

This is the 29th year that the Easter Seals Western & Central Pennsylvania held the Office Olympix fundraiser, an event that helps children and adults with speech and hearing disabilities.

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Giving From the Heart

CTC and EVC employees have a reputation for giving generously to their neighbors in need. This holiday season was no exception as they donated their time and treasure in a variety of ways to these charities:

Salvation Army Treasures for Children and Senior Citizens – Employees took tags with the names of children and seniors in need. They purchased gifts for 50 children and 10 adults.

Salvation Army Kettle Collection – Not only did some employees and their families donate several hours of busy holiday time, they braved an ice storm and a power outage to ring bells at the kettles. Yes, they even raised money during the storm.

Learning Lamp “The Giving Tree” – Employees responded generously to a last-minute request to help provide Christmas gifts to children in need. In 2016, CTC and EVC employees also raised $6,600 for charities through Jersey Days. By paying for the privilege of wearing their favorite team jerseys, employees show their pride for their favorite teams. Charities have been able to purchase medical equipment, appliances, and offer utility assistance to those who are in need, among other things.

Great Metrics in Safety and Environmental Programs

In FY17, the company’s environmental programs attained the following metrics at CTC office locations.

Waste Management/Recycling
- Volume of paper recycled was equivalent to 225 trees.
- Water refilling stations have eliminated 305,000+ bottles.

Travel
- Employees carpooled on 363 trips. This resulted in 436 fewer rental cars, which saved the company $17,440 in rental fees.
- By carpooling, employees saved 160,884 miles at 27 miles per gallon (average), resulting in 5,959 fewer gallons of gas, or $14,000 cost savings.

Safety Voluntary Protection Programs
In addition to being awarded the National Safety Council’s Million Work Hours and Perfect Record Awards for the third year in a row, CTC completed the five-year VPP Recertification Audit conducted by the Office of Safety and Health Administration (OSHA) to become fully recertified.

CTC’s Safety Committee:
- Hosted a fire safety station that included a BullEx digital fire extinguisher trainer for Take Our Kids to Work Day.
- Participated in Safety and Security Day, which had over 200 participants and the largest on-line participation in the history of the event.

CTC Golf Tournament is 25-Year Tradition

From the shotgun start to the tasty picnic, CTC’s annual golf tournament is a fun tradition that brings employees—current, former, and retired—together.

No suits and ties or PowerPoint presentations here. Everyone steps out of the office setting and onto beautiful North Fork Golf Club in Western Pennsylvania for a great day to relax with friends.

Serving Up Thanks for Employee Appreciation Day

We know that whatever we do on National Employee Appreciation Day is a small gesture of thanks for the enormous personal contributions made by our employees throughout the year.

Our Employee Appreciation Day themes change over the years, but our heartfelt appreciation remains constant. This year, we said “Thank You—You Take the Cake!”

Festive cupcakes were waiting for employees who attended our Johnstown get-together. Co-workers enjoyed good company and a little sugar high on March 3. Other employees enjoyed a sweet treat in the form of a Starbucks E-card.

All employees received the same message of praise and thanks from management and the Board of Directors. CTC’s 30-year milestone has been made possible by many talented employees. Our thanks to all those who have contributed throughout the company’s history.

Honor Roll

Join us in honoring our colleagues who were on Active or Reserve Military duty in the past fiscal year:

- Oliver Bugarin
- Jack Crone
- Johnathon Dulin
- Peter Hanson
- Kevin Hillegas
- Robert Johnson
- Kevin Kauffman
- Sidney Johnston
- Todd Riviezzo
- Dakita Samuels
- Derrick Wiltshire

Lynne Hood, CTC’s Senior Director of Procurement and Subcontracts, has organized the event since its inception.

“We honestly enjoy being together and playing golf,” says Lynne. “It’s about having fun, playing a game we love, and eating very well!”

“You can’t stop smiling. It’s like a family picnic. We enjoy each other’s company, are happy to see each other outside the office, and look forward to doing it again the next year,” she says.

Enjoying the CTC Golf Tournament, this foursome includes (left to right) Tom, Brady, and Sharon Paterson, and Rich Jones.
CTC Foundation’s mission is to educate Americans about emerging ideas and mainstream emerging technologies while serving as the philanthropic affiliate of Concurrent Technologies Corporation (CTC).

The Foundation has gifted nearly $5 million since it was formed in 1998. We direct charitable gifts to nonprofit organizations in communities where CTC and affiliate employees work and live.

CTC Foundation has launched diverse local, regional, national, and international programs focused on education, energy, and the environment. These initiatives are supported by endowments and grants from the private sector.

For example, CTC Foundation facilitated the public television (PBS) broadcast of On The Edge, a documentary about epilepsy, ensuring that the film was available for National Epilepsy Awareness Month in November. Approximately 125,000 Americans are diagnosed with epilepsy each year. A neurological disorder, epilepsy is characterized by unprovoked seizures or periods of unusual behavior, sensations, and sometimes loss of consciousness.

Education is vital to helping epilepsy patients, their families, and caregivers navigate the complexities of this disorder. To date, On The Edge has attracted over seven million viewers. Scores of private individuals, small businesses, and diverse corporations have donated to the CTC Foundation for this ongoing initiative.

Another project includes a 13-member, highly credentialed Science Committee that is very carefully evaluating the manner by which the U.S. Environmental Protection Agency (EPA) undertakes the risk assessment of human exposure to chemicals. Historically, safe standards have been established by using a mathematical model whereby the thresholds were set artificially low—near zero (any exposure to anything is life threatening). If EPA health standards were set using modern, widespread toxicological measurements and were scientifically derived, the cost of compliance would be lower for industry and government agencies, with no additional risk to the public’s safety.

The Science Committee’s work is being funded by various foundations and the private sector. Our overarching plan is to ensure that future environmental regulations are based on science and that the public’s health and well-being are safeguarded. Considerable cost savings in remedial projects are an expected result.

These two projects represent the goals of “innovation, science, and technology,” which are central to CTC Foundation’s ongoing mission.
The mission of Enterprise Ventures Corporation (EVC) is to transfer advanced technologies designed and created by CTC and others to the industrial base and to deliver high quality, competitively priced products and services to customers. To accomplish CTC’s corporate strategy, an effective synergy has been established between EVC and CTC, enabling each to do what it is organized to do most effectively.

EVC is a healthy, growing, profitable business distinguished by exceptional, motivated employees who enjoy their work; long-term and mutually successful relationships with partners and customers; products and services that consistently result in customers’ success; and contributions to the communities where our employees live and work.

On June 30, 2017, EVC completed its fifth consecutive year of profitability. Since restructuring in 2012, average annual revenue has grown 11 percent. In FY18-19, EVC will focus on bringing maturity to its technology transition and commercialization processes, build on FY16-17 business development activities, expand sales training, deploy new business approaches, and continue to build long-term, mutually beneficial partnerships.

EVC’s large weapons system contract is transitioning from original equipment manufacturing to sustainment, spares, and repairs; yet many possibilities in the mine countermeasures market remain and are being captured.

EVC’s Professional Services Business Unit will intensify its pursuit of key opportunities over $5 million in value in the Special Missions, Intelligence, and Education and Training Markets; continue to grow its qualified pipeline; and improve marketing and capture activities at our geographic-specific campaigns at Naval Surface Warfare Center Crane and the Huntsville region.

Within EVC’s Product Sales and Development Business Unit, a specialty coating will be scaled for production and marketed in FY18, and AGIS software marketing and development will be expanded. Additionally, EVC is pursuing the manufacturing of military vehicle components, UUV deployment products, mine countermeasures components; and pursuing sales, both domestically and abroad, of its existing products.

On behalf of EVC leadership and the EVC Board of Directors, we want to thank our employees, customers, and our partners for their significant contributions to EVC’s success.
Enterprise Ventures Corporation
A for-profit affiliate of CTC

Enterprise Ventures Corporation (EVC) is CTC’s technology commercialization arm and is organized as a wholly owned for-profit affiliate of CTC. Together, CTC and EVC provide full lifecycle support services to clients, from innovative concepts through production and deployment.

Business Consulting
The evolution of our cybersecurity software, the Advanced Guard for Information Security (AGIS), exemplifies what we mean when we describe EVC as the technology commercialization arm of CTC.

Technology transfer occurs when EVC takes a product to market that originated at CTC through applied research and development (R&D). AGIS began as a cross-domain technology that CTC developed for the U.S. Government. Now, EVC is selling AGIS 2, our next-generation cybersecurity solution, to government and commercial clients.

Selling Software that Mitigates Cyber Threats

AGIS 2 is currently being used by the U.S. Department of Justice, the U.S. Department of Treasury, and other high-profile federal departments and agencies. Both the government and private sectors can benefit from the product’s ability to inspect and remove malicious, hidden, and inappropriate content, while preserving electronic files in their original format. After it inspects and sanitizes files, AGIS provides users with clean, safe versions.

To mitigate cyber threats, the system can scrutinize nearly 30 different file types including Microsoft Word, Excel, PowerPoint, Portable Document Format (.pdf), imagery file formats, zipped or compressed files, and more.

AGIS also provides organizations with the ability to set policies using blacklists (such as dirty word searches) as well as whitelists (such as acceptable word variations) as a means to prevent data loss. These policies are configurable based upon the type of file being examined. AGIS not only provides data loss prevention (DLP), but helps ensure that the intended content is passed to the intended receiver.

David R. Davis, Managing Director of Software Sales and Consulting for EVC, explains, “The functionality of AGIS helps mitigate the threat of malware and other malicious content that can cause significant financial and operational disruptions to an organization.”

“Intellectual property theft costs U.S. companies over $250 billion each year. Hospitals are being held hostage by ‘ransomware.’ Trade secrets are being stolen, and identity theft is rampant. What sets AGIS apart from other cyber solutions is that it not only can serve as a guard, but it also can sanitize dirty files so that the good content is preserved and transmittable. As a result, data loss is prevented.”

Performing Technology Transfer for Other Companies

When companies and entrepreneurs are seeking feasibility at various states of commercialization, EVC can help. Just as we have successfully commercialized technology and ideas developed by our parent corporation, CTC, we assist outside companies.

For example, QPS Company came to EVC because they were looking for opportunities to expand technologies to covert surveillance systems.

pFlex Corporation developed equipment that can be added to networks to diagnose computers, printers, etc. when they go offline. Their solution automatically gets equipment back online.

EVC has a defined process for repeatable, structured technology transfer that these and other companies require to be successful in today’s competitive marketplace. We welcome inventors, entrepreneurs, and both government and industrial entities.

Professional Services

EVC supplies management, training, industrial hygiene, and other professional services to clients worldwide. We embed ourselves, as necessary, with clients. We join with client teams. And we seamlessly relate with people, places, and details to understand the intricacies of each task.

The projects with the U.S. Air Force exemplify our professional services work.

Providing Industrial Hygiene Support to the 711th Human Performance Wing

Through a multi-year subcontract from BTL Technologies Inc., EVC is providing industrial hygiene support to the U.S. Air Force School of Aerospace Medicine (USAFSAM). The award was made under the 711th Human Performance Wing Small Business contracting vehicle.

The 711th Human Performance Wing is a unique combination of three units: the USAFSAM, Airman Systems Directorate, and the Human Systems Integration Directorate. The synergies of combining the ideas, resources, and technologies of these units position the 711th as a world leader in the study and advancement of human performance. EVC is proud to support their mission of advancing human performance in air, space, and cyberspace through research, education, and consultation.

In this effort, EVC’s industrial hygiene experts are working with biomedical engineers to audit data, monitor hazards and controls, provide training, and post audit resolutions. We make sure that if hazards are found, they are properly documented in the Defense Occupational and Environmental Health Readiness System (DOEHRS).

DOEHRS enables management of health risk data for U.S. Service members worldwide. For example, DOEHRS manages lifetime exposure records, makes medical surveillance recommendations, and issues public health information.

In collaboration with BTL Technologies, Inc., EVC is working directly with biomedical engineers at the USAFSAM to ensure consistency and proper documentation of such pivotal issues as respiratory protection, potable drinking water, noise exposure, and all data that supports the U.S. Air Force’s complex and vast occupational and environmental health needs.

EVC has built upon key enterprise metrics to develop methods to audit occupational and environmental health records. Our industrial hygienists are now auditing specific U.S. Air Force Bases and providing training and support to resolve audit findings. Every hazard must have an associated control.

This effort has one goal: keeping airmen and women and the civilian workforce healthy.

“Our experts continue to reduce the human and financial cost of industrial illness and injury,” said Jeff Anderson, EVC’s Managing Director of Professional Services. “We’re excited to work with USAFSAM as part of the Air Force Occupational and Environmental Health Program to protect health while enhancing combat and operational capabilities.”

Megan Hinderliter, Enterprise Ventures Corporation Safety and Occupational Health Professional, monitors plating hazards and controls.

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Assisting Headquarters Air Force Materiel Command

Through a multi-year subcontract from Dakota Consulting Inc. under the One Acquisition Solution for Integrated Services – Small Business (OASIS SB) contracting vehicle, EVC will provide support to Headquarters Air Force Materiel Command (AFMC), Directorate of Logistics, Civil Engineering and Force Protection (HQ AFMC/A4).

AFMC leads the U.S. Air Force’s acquisition and sustainment efforts. EVC is providing direct support to their complex, worldwide logistics challenges.

Specifically, EVC is helping the Air Force identify and understand risks to nuclear weapons and nuclear weapons systems and developing procedures and methods to reduce these risks. In evaluating risk assessment, we focus on performance, safety, and security risks with regard to nuclear logistics.

Overall, EVC is providing a range of professional acquisition, engineering, scientific, research, technical services, financial, and administrative capabilities to support effective and responsive integrated program management of aircraft research, development, production, and lifecycle acquisition and sustainment activities.

The HQ AFMC/A4 has the AFMC mission responsibility to shape the workforce and infrastructure to provide logistics, sustainment, and installation support for acquisition logistics, supply management, depot maintenance, and base-level logistics operations. They are responsible for delivering responsive strategic facility and infrastructure oversight and over-arching direction for all Major Command (MAJCOM) security operations, resulting in war-winning expeditionary capabilities.

EVC’s ongoing support to the AFMC logistics mission leverages our experience with professional services delivery, MAJCOM, and the U.S. Air Force.

Delivering a Situated/Social Learning Program to the U.S. Navy

EVC’s education and training directorate provided the Commander of Naval Personnel a Situated Learning System pilot program that effectively reaches millennials.

Reaching and teaching mobile, just-in-time learners is accomplished by combining key factors from both situated and social learning theories.

Hazing, irresponsible drinking, drug use, sexual harassment, and rape are tough issues for young people, and the U.S. Military sought a training solution for these and other issues that included mobile delivery; entertaining, objective-based media, peer-to-peer and guided social interactions; and accountability.

EVC delivered a unique system that uses the mediums and practices these learners use—from Facebook to binge watching. The system includes a one-stop mobile-ready web site for trainers, supervisors, and learners; an e-zine that highlights monthly organizational goals and objectives; a storytelling component (video and animation) that spurs further exploration of the topic content; a set of curated social media activities and collaborative exercises; and an optional testing scheme.

Each training target is associated with a Navy policy and designed to support a specific area of that policy.

Data farming tools give Navy leadership the analytics necessary to gauge program success.

More than 80 percent of today’s military are under 37. These individuals demand to be shown the purpose or benefit of learning, or even of memorizing things. They are used to searching for answers on whatever point-and-click technology is at hand.

EVC’s Situated Learning System also takes into account that these learners are masters at rapidly assessing available content, only focusing on content they consider relevant, while potentially missing or ignoring information necessary for ultimate success.

For this reason, the system is more than a collection of social media sites where learners are set loose to find their own solutions. First and foremost, it is a training system with targeted inputs, actions, and expected outcomes. This system engages learners. They become active participants in their own training and development.

Instead of a formal classroom in which students are “taught” about policy once a year, EVC has created an ongoing conversation for learners.

The EVC Situated Learning System is equipped to give the modern learner:

- In situ learning and development opportunities
- Curated web-based social content
- Legacy training products reconstituted for easy access
- Training opportunities for personnel to reskill or cross train
- Collaborative activities emphasizing critical thinking
- Expertise tracking and assessment systems
- A training team prepared to implement the Situated Learning System

Using social media, learners can watch video series such as “The Morning After” on YouTube. Storylines spark conversations about everyday challenges from underage drinking to irresponsible financial management. At every point, EVC has curated content that speaks to millennials, helping Sailors build resiliency, change behaviors, and understand Navy policy.

Production Solutions

CSTERS Production Continues

Our work with the U.S. Navy on a system that improves mine countermeasure capabilities in shallow (littoral) waters is a good example of the synergy between CTC and EVC that seamlessly creates and delivers quality scientific products and solutions in the public interest.

In 1999, CTC began working with the U.S. Navy to better protect Navy crews, ships, and equipment from the hidden threat of mines in shallow waters.

CTC designed, developed, tested, and produced a working prototype of the Carriage, Stream, Tow, and Recovery System, or CSTERS (pronounced C-stars). This modular deployment system is capable of accommodating both towed and non-towed mine sensor systems from Navy MH-60S Helicopters, enabling Littoral Combat Ships to respond readily to mine threats, which has emerged as a highly successful countermeasure effort.
Investing in the Future

CTC and its Affiliates ended FY17 with 102 new contracts. These new contracts represented a total gross value of $70.7 million and contributed $11.7 million to revenue in FY17.

CTC continued to fund training, technical innovation, bid and proposal, independent research and development, and business development at high levels to better position the Company for future growth.

Building on CSTRS’ Success

Testing is now underway for the next-generation of CSTRS launch kits—technology that can accommodate Unmanned Undersea Vehicles, or UUVs.

To meet this emerging need for the U.S. Navy, we are testing a rotary wing deployment of UUVs. Our UUV release kit provides the Navy with a cost-effective, quickly deployable, crew- and ship-safe answer for the expanded use of UUV in combat and operational settings.

The CSTRS aerial launch kit for UUVs is an electromechanical system designed to interface with a wide variety of UUV sensors and to the existing CSTRS hardware.

Prototype testing is underway with a simulated UUV and helicopter subassembly—the first step toward our overall goal of a UUV launch and recovery system.

Within the past two years, EVC has participated in exercises demonstrating the CSTRS’s capability to a foreign government and is working with NAVAIR to provide tooling, processes, and training to establish CSTRS sustainment capability in Panama City, FL.
Concurrent Technologies Corporation (CTC) is an independent, nonprofit, applied scientific research and development professional services organization. Together with our affiliates, Enterprise Ventures Corporation and CTC Foundation, we leverage research, development, test and evaluation work to provide transformative, full lifecycle solutions. To best serve our clients’ needs, we offer the complete ability to fully design, develop, test, prototype and build. We support our clients’ core mission objectives with customized solutions and strive to exceed expectations.

CTC’s quality management system is certified to the ISO 9001:2015 (Quality) and 14001:2015 (Environmental) standards. CTC’s for-profit affiliate, Enterprise Ventures Corporation (EVC), is certified to the AS9100 standard for aerospace activities.

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A publication of CTC Corporate Communications.

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