



Industry Expansion Solutions

Solutions Overview

*Engineering success for
North Carolina businesses,
one solution at a time.*

NC STATE Industry Expansion Solutions

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We are **NC STATE** **Industry Expansion Solutions**



Building a Stronger North Carolina

As the statewide extension service of **NC State's College of Engineering**, Industry Expansion Solutions (IES) partners with North Carolina industry to catalyze the transfer of knowledge and technology in support of economic development. IES supplies North Carolina businesses with the tools and services they need to help increase productivity, efficiency, quality and profit. Our extensive partnerships with business, industry, education and government generate a unique culture of collaboration that provides access to cutting-edge expertise, research and technology.

Combining our **improvement specialists** and experience with NC State's College of Engineering resources and expertise, IES supplies North Carolina organizations with the tools and services they need to help increase

productivity, efficiency, quality and profit. We are proud to work alongside clients in **manufacturing, healthcare, the military, energy and public sector.**

Delivering Value

We offer a **broad portfolio** of solutions and services and have more than 60 years of experience serving organizations across North Carolina and beyond. Don't see your perfect fit? Don't worry—we can also develop custom solutions for your organization's particular needs. Contact your local regional manager for custom solutions not found in this brochure.

Empowering our Clients to Be their Best





Continuous Improvement

Today's successful organizations are flexible, efficient and responsive to change. They have efficient processes, and a safe working environment for employees who are engaged and committed to results.

IES's continuous improvement solutions prepare organizations to implement the behaviors that ensure a continuous flow of value to the customer. Here are some of the many services we offer.

ISO Quality Management

More and more often, customers require their suppliers be certified to one or more standards and certification is frequently required for government contracts and international export. IES experts coach and support clients through the certification process, with training tailored to each company's unique needs. We can assist you toward certification in the following featured standards:

- › ISO 9001 (General Industry)
- › IATF 16949 (Automotive)
- › AS 9100 (Aerospace)
- › ISO 13485/21 CFR 820 (Medical Device)
- › ISO 14001 (Environmental)
- › ISO 45001

Other onsite services include: quality management standards overview, internal auditor training and quality core tools, including Advanced Product Quality Planning (APQP), Part Production Approval Process (PPAP), Failure Mode and Effects Analysis (FMEA) and control plans, to name a few.



Industrial & Systems Engineering

Consistent quality and minimal variation across products equals more satisfied customers. Using **Industrial & Systems Engineering** strategies like work measurement time and motion studies, facilities layout improvement, statistical process control, measurement system analysis, design failure mode effects analysis, failure mode and effects analysis, work instruction and training modules, ergonomic assessments, supervised student projects and cost estimation ensures that productivity, quality and operations are efficient and effective.

Practical Project Management

Often, workers, with no formal project management experience, are tasked to lead major projects. **Practical Project Management** teaches the tools, techniques and best practices necessary for confidently managing projects through planning, execution, monitoring and review.

Business Growth & Innovation

Whether you want to grow your business by entering new markets, creating innovative products or improving your marketing message—IES can help with multiple **Business Growth and Innovation** solutions. Innovation fuels organizations for survival and growth in the future. Our Innovation Academy equips your staff with a complete “Innovation system” with tools, training and approaches that greatly **increases innovation speed**. We offer many solutions, including innovation academy, technology driven market intelligence and tech scouting.



Performance Excellence Coaching

The Baldrige Model for Performance Excellence encapsulates our intent to develop and institutionalize a comprehensive, organization-wide, strategic-level Continuous Process Improvement (CPI) approach. We capitalize on using knowledge from other role model organizations and validated business practices to help you improve every business process within your organization.

Using a systems perspective, we challenge you to examine processes and eliminate steps in core processes that add little to no value. In other words, the aim is to take high performing organization to the next level, by reviewing how to maximize value and eliminate waste in all environments—operational, support and otherwise. We help you fully integrate Continuous Process Improvement across the key processes of leadership,

strategic planning, customer focus, data analytics, knowledge management, workforce engagement, operations and their corollary results.

The model is built upon eleven core principles and concepts. These principles and concepts are the foundation for integrating key performance requirements within a results-oriented framework. These core principles and concepts are: Visionary Leadership, Customer-Driven Excellence, Organizational and Personal Learning, Valuing Employees and Partners, Agility, Focus on the Future, Managing for Innovation, Management by Fact, Public Responsibility and Citizenship, Focus on Results, and Creating Value Systems Perspective



LEAN Suite

Lean Certification

Whether you're new to lean or an experienced facilitator, we offer multiple certificate programs. The Lean certification program combines classroom training, simulation and teachback opportunities for participants to hone their problem solving and facilitation skills. Individuals learn the basics of Lean and the various tool applications followed by an introduction to lean culture, lean organizational infrastructure and lean leadership. Participants are assigned an experienced IES "lean mentor" to help guide them in their implementation efforts. Upon the conclusion of the program, participants will select and present a project completed demonstrating the application of the skills and tools acquired through this robust training program. Other available options include a focus on targeted topics such as Managing for Daily Improvement (MDI), Hoshin Kanri (Strategic Planning & Deployment), Toyota Kata and more.

Customized Lean Transformations

Your business is unique, so your Lean transformation should be too. That's why we customize our solutions, bringing you 5-day overviews, 30-day overhauls and multiple scenarios in between. We are committed to helping affect a sustainable culture change within your organization. To that end, we offer long-term mentoring and follow-up, coaching and further improvement recommendations.

Onsite Offerings Include: Executive Overview Training, Going to Gemba with Purpose, Standard Work for Lean Leaders, Lean Leader Mentoring, Lean Facilitator Training, and Lean Culture Training.



Electronic Lean Office

Organizations that need robust, waste-free, flexible office processes that meet their customer needs and help them survive in the global marketplace turn to us for our Electronic Lean Office solution. We help organizations achieve operational excellence, while providing flexibility in the way processes are managed.

This unique paperless simulation uses an electronic process and “server” to demonstrate the effects of process variation and defects in transactional processes. Process Flow mapping and Lean methodologies are then applied to help alleviate bottlenecks, increase throughput, improve quality and customer satisfaction. Participants will see, through teaching and application, how the lean process works.

Lean for Human Resources

Lean is especially relevant to professionals in the human resources field. We are increasingly being asked to do more with less people. This requires us to do the right things, the right way, with the right people. Getting the “right” people requires us to act faster. How do you reduce time to hire? How do you meet leave of absence requests in a timely and compliant fashion? The Lean process can assist human resources in identifying value, mapping the value stream, creating flow, establishing pull and seeking perfection. We can help you address basic disciplines including Standardized Work, 5S, Error Proofing, Kanban, Visual Control and more.



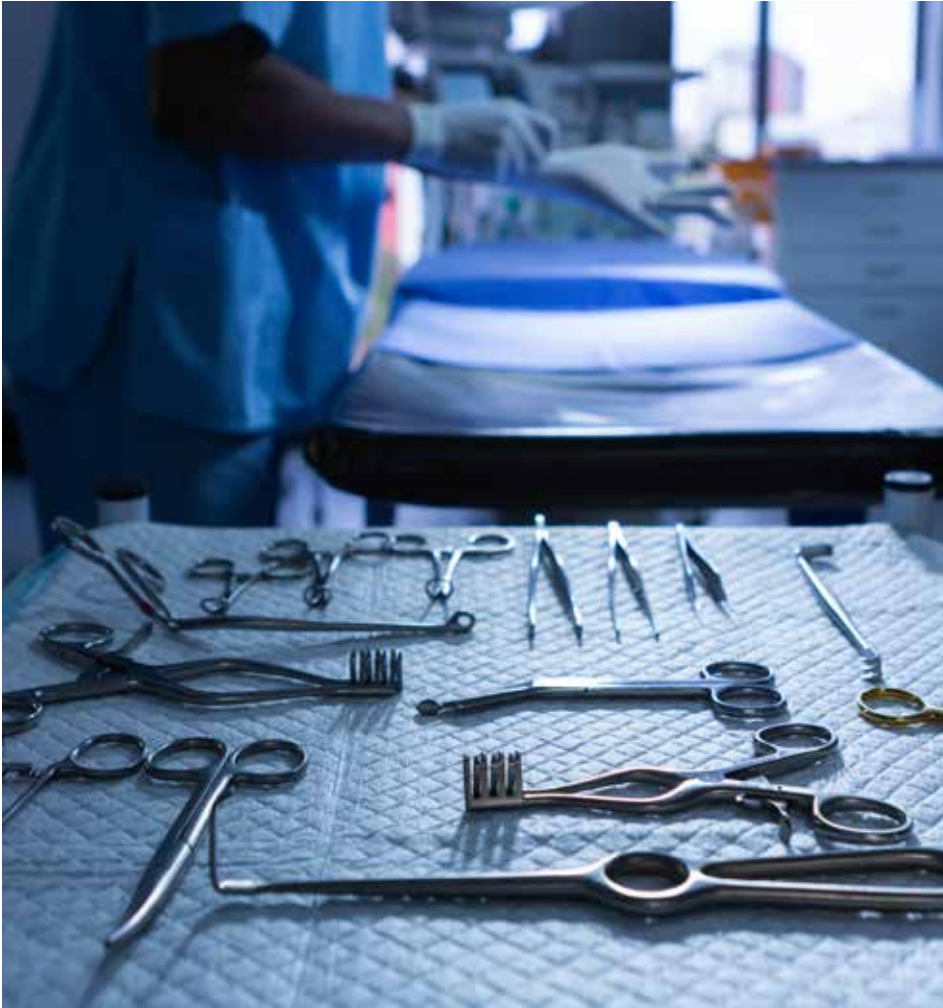
Lean Service Sector

Our Lean Government rapid implementation process means that you see results instead of endless planning committee meetings. Reveal and correct waste in administrative departments and service delivery processes, so your community enjoys the most value for its dollars. IES has successfully partnered with many local municipalities (small and large) as well as statewide agencies to improve daily work and creatively address common issues using a continuous improvement mindset.

Lean Non-Profit applications help organizations execute rapid cycle improvements to internal processes that have helped increase process efficiency, increase stakeholder involvement and customer satisfaction while decreasing errors, delays and other non value added processing steps. Individuals and organizations have made small changes

that utilize creativity over capital to brainstorm, test and implement real time solutions in their places of work.

Lean for the Service Sector applications have helped organizations primarily focused on customer service, sales and transactional functions improve the way they organize for success. Our lean experts have helped by engaging front line staff and leadership to focus on where the work is done for opportunities to improve operations. Virtual and traditional Gemba walks can help highlight areas where breakdowns in process, communication, and information sharing might occur. Lean tool applications can then be used to help eliminate variability and standardize interactions with internal and external customers ensuring optimal results.



Lean Healthcare

Lean Healthcare principles streamline processes and seek efficiency to help healthcare organizations achieve results, like decreased wait times and more face-to-face time with providers. Applying these principles may make your patients healthier, your employees happier and your organization more effective. We offer:

- › On-site educational programs and workshops to familiarize you with lean methodologies and tools
- › On-site strategic planning and assessments to help you determine your best path to continuous improvement and lean transformation
- › Customizable, transformation programs to help with your lean journey
- › Facilitation of Kaizen events and value stream maps
- › Lean Leader Coaching and Mentoring (C Suite and Facilitator level)

**Lean
Healthcare &
Government Clients**



**64 hospital
systems across
22 states**



**96 out of 100
counties across
North Carolina**



**156 Public
Health /
Community
Health /
Physician
Practices**



**Multiple
University
Colleges and
Department
Business
Processes**



Lean Manufacturing

The core idea of lean manufacturing is simple—work on identifying and eliminating waste from the manufacturing process. We can help with basic and advanced Lean tool applications including: Process Flow and Layout, SMED, TPM, LPD, Value Stream Mapping, 5S, Standardized Work, Error Proofing, Kanban and Visual Management.

Total Productive Maintenance (TPM) is a process that maximizes the productivity of equipment for its entire life cycle to extend the life of the equipment. Through the participation of both operational and maintenance associates, TPM creates an environment that encourages improvement efforts in safety, quality, cost, delivery and creativity. Our program focuses on eight pillars: autonomous maintenance; planned maintenance; early equipment management; quality, health and safety; focused improvement training and education; and TPM in the office. Participants will receive a combination of classroom training paired with real time instruction and application with an IES expert on the shop floor.

Quick Changeover (SMED): Wasteful, non-value added activity takes place both during machine runtime (external activities) and while the process is shut down (internal activities). SMED workshops focus on reducing and eliminating this waste and increasing capacity, time availability and resource availability in the process. Changeovers consist of the time between the last good piece off the current run and the first good piece off the next run, at rate.

SMED (Single Minute Exchange of Dies), or Changeover Reduction, focuses on reducing the time and impact of key elements in the changeover process including: preparation; after-process adjustment; checking, storing, and moving materials, parts and tools; removing and mounting parts and tools; machine measurements, settings and calibrations; trial runs and adjustments.

Lean Product Development (LPD)

Research shows that companies across the country indicate finding their next new product tops their list of needs and concerns. It might not be easy, but it's vital to long-term success.

Learn how lean design tools and lean product development can reduce costs, improve resource utilization and accelerate time-to-market for new products and services by eliminating the non-value-added waste in the development stages.

Lean product development can be used by those new to product development or those simply trying to improve their current product or process development.

Learn what waste and value look like in the context of new product development. Learn how to achieve significant improvements in time-to-market, and production costs by applying lean principles to the product development environment.

Lean Six Sigma

Lean Six Sigma is a well-structured data-driven methodology that enables organizations to achieve effective and accurate outcomes repeatedly over a period of time. Let us help you improve manufacturing efficiency and quality, lower costs, enhance cash flow, reduce waste and ensure process stability.

We also offer Six Sigma Yellow, Green and Black Belt training that provides a cost-effective method to train and certify individuals in Six Sigma techniques.

IES excels in onsite customized six sigma training and applications ranging from 2 to 18 days. These engagements can include: leadership overview; project selection and scoping days, Six Sigma content training, coaching and mentoring days; body of knowledge examination; final project review and Six Sigma certification.

Toyota Kata

Toyota Kata helps develop creative, scientific-thinking skills. Employees can use these skills to keep improving, adapting, and generating competitive advantage in a strategically-aligned way. By practicing the Toyota Kata routines and patterns, anyone can become better equipped to navigate ambiguity and reach challenging goals.

IES offers a variety of services in Kata including both improvement Kata (IK) and coaching Kata (CK) and their applications. Kata implementation is ideal for companies who may not require a full Lean Transformation but still wish to reap the benefits of core lean tenants including respect for people and a problem solving culture. Kata helps develop the bench strength in your organization through appreciative inquiry and a structured coaching model for kata practitioners and learners.

Training Within Industry

Training Within Industry (TWI) is a dynamic program of hands-on learning and practice, teaching essential skills for supervisors, team leaders and anyone who directs the work of others. It is an essential element of Lean and Continuous Improvement programs around the world including the Toyota Production System. TWI provides a foundation for fostering organizational excellence and transforming business culture.

IES Offers three standardized TWI programs addressing the essential skills needed by supervisors, team leaders, and trainers: Job Instruction (JI), Job Relations (JR), and Job Methods (JM).

Learn By Doing—Assures Skills are Applied. After the daily session, trainees return to the workplace to use the techniques learned and choose real-life examples to discuss and practice in class.



Organizational Development

Building a high-performance organizational culture is top of mind for many organizations. From increasing engagement and developing leadership to improving retention and accelerating innovation, this focus is driving organizations to rethink the way work gets done.

IES offers a variety of solutions to assist with facilitating and accelerating effective behavior change to support organization transformations, enhance employee engagement and develop critical teams and talent to support organizational success. IES offers targeted training, including Crucial Conversations® Training to improve communication effectiveness, accelerate decision making and enable productivity—skills training needed to create behavior change and tools to help build high performance and culture.

Leadership & Talent Development

Organizations can develop leadership and talent pipelines by adopting a strategic and systematic approach to succession management to support business continuity and growth. IES partners with companies to take succession planning beyond the C-suite. We offer leadership development solutions that address competency gaps, identify high-potential talent, facilitate engagement and drive growth throughout the organization.

IES provides coaching, facilitation, and/or training in areas related to leadership behavior, change management, team dynamics, communications, conflict resolution, decision analysis, problem solving, and systems thinking tailored to all levels within the organization.



Industry 4.0

As Industry 4.0 goes full throttle, more and more computers are connected and communicate with one another to make decisions without requiring human-to-human or human-to-computer interaction. These connected machines gather a tremendous amount of data that can inform anything from maintenance needs to performance issues, offering organizations the opportunity to optimize their operations quickly and efficiently by knowing what needs attention. As an early adopter of Industry 4.0, we can help you understand:

- › How to ensure your supply chain is digital ready
- › How to best leverage your data analytics
- › How to better manage your supply chain
- › How to ensure your leadership and culture is ready for the transformation
- › How to manage your cybersecurity risk

**\$1.89B Total Impact
for Manufacturing
in NC** (2016–2018)



**12,011 jobs
retained**



**\$587M retained
sales**



**\$196M cost
savings**



**4875 jobs
created**



**\$187.8M
increased sales**



**\$922M
investments**





Health & Safety

Southeastern OSHA Training Institute Education Center

As the [US Department of Labor OSHA Outreach Training Program](#) provider in the Southeastern region, we train employees in the basics of occupational safety and health and offer hundreds of learning opportunities throughout the Carolinas every year. We offer downloadable toolkits and free online trainings to keep your most valuable asset—your workforce—safe.

Manager of Environmental Safety and Health (MESH) Certificate Program

The 100-hour [Manager of Environmental Safety and Health \(MESH\)](#) Certificate Program is designed for environmental, safety and health professionals who want to improve their practical knowledge while earning a valuable credential. We offer six MESH certificate programs in partnership with NC Department of Labor and the Safety and Health Council of NC:

- › General
- › Construction
- › Industrial Hygiene
- › Public Sector
- › Emergency Planning
- › Advanced

OSHA Public Sector Safety & Health Fundamentals Certificate Program

The [72-hour OSHA Certificate](#) can be completed in as few as ten days, with a focus in either Construction or General Industry. With this program, you gain working knowledge of occupational safety and health best practices to reduce incident rates.

ISO 45001

ISO 45001 is an international standard that sets out the criteria for managing Occupational Health and Safety concerns, including job hazards, OSHA regulatory requirements and potential emergencies. Learn to manage Occupational Health and Safety concerns with our suite of assistance programs and training classes.

Hazardous Materials and HAZWOPER Training

Employees who manage, transport or mitigate hazardous waste must be able to identify and control physical and health hazards. Ensure compliance with DOT and OSHA regulations with our [Hazardous Materials and HAZWOPER](#) training and onsite assistance offerings.

Safety Audits

OSHA requires employers to provide a safe and healthy workplace for their employees and ensure that a workplace does not have serious recognized hazards. [You can support your compliance initiatives and cultivate an effective safety and health program by inviting](#) our health and safety experts to visit and assess your workplace, conduct a [safety audit](#), explain OSHA and other state and federal regulations, and provide confidential reports with recommendations.

Free Downloadable Toolkits

We offer complimentary resources you can use to enhance your safety training. These tool kits are specifically designed to meet the unique needs of youth workers, agricultural and temporary workers.







Professional Learning

We deliver flexible, **high-quality instruction** to adult learners spanning the experience spectrum. Our instructors have expertise in subject matters including project management, industrial engineering, disaster preparedness, health and safety, environmental and quality auditing, process improvement and many more. Receive training online, onsite, or in the classroom. We offer the following:

- › **Online Training**
- › **Southeastern OSHA Training Institute Education Center**
- › **Regulatory and Compliance Training**



Instructional Design

Instructional design makes learning more efficient, effective and appealing to learners through experiences like engaging and interactive workshops, custom seated, online and blended learning experiences. Our Instructional Design team provides course design and development services, as well as collaborative training planning sessions, to provide and enhance learner-centered courses, trainings and workshops. Instructional Design services can help align your training to your workforce needs. Partner with our team to analyze your training needs, design and develop materials to meet targets, plan for training delivery and evaluate training alignment and success.

We offer the following services:

- › Knowledge or skills gap analysis
- › Learning outcomes development
- › Lesson planning and student handbook development for seated courses
- › Interactive online lesson development
- › Course evaluation
- › Train the Trainer sessions on best training practices and engaging delivery methods

Business Assessments

Our business assessment solutions can be the first step in determining where your business is today, where you would like it to be and missed opportunities for improvement. They enable you to optimize performance across multiple aspects of your organization. We can help small and medium-size businesses identify competitive strengths, key gaps in business strategy and the challenges and opportunities you need to focus on first. Our business assessment solutions include:

- › Core Value Assessments
- › Smart Manufacturing Readiness Assessment
- › Cybersecurity Assessment
- › Digital Supply Chain Maturity Assessment
- › Competitiveness Review

Cybersecurity Awareness & Compliance

Cyber threats are constantly evolving. They are becoming more sophisticated, targeted and sustained. According to research, approximately 60% of all attacks are aimed at small and medium-sized businesses (SMBs)—companies, that often times, have fewer resources to invest in cybersecurity.

As a result, cybersecurity is getting a lot of attention. Businesses and government alike share grave concerns about these risks. In fact, all organizations who provide services through contracts with the Department of Defense (DoD), are required to document and affirm their compliance with the DFARS 252.204-7012 cybersecurity requirements—requirements that were put in place for all DoD contractors at the end of the 2017.

To assist you with your compliance initiatives to the new DoD requirement, we offer a complete Cybersecurity Toolkit, complete with downloadable materials. The IES Cybersecurity Awareness Toolkit is designed to provide the materials you need to understand the requirements, document your compliance, and train your employees on cybersecurity awareness.

If you're interested in speaking with someone about more in-depth and customized cybersecurity solutions, please contact your local IES Regional Manager today.





Grant Services

Competition for grant money is fierce, but our **Grant Services** team can help organizations increase their chances of securing funding. Whether you need help identifying the best grant opportunities for your organization, or you need professionals to manage your entire grants program, from proposal writing to evaluation, let our team help you put your best foot forward. We offer the following:

- › Grant opportunity identification
- › Grant needs assessment/research
- › Grant proposal writing and development
- › Grant management
- › Grant evaluation

Grant Evaluation Services

In response to increased oversight of program management, including questions around program effectiveness, the demand for evaluations is rising to demonstrate funder accountability. Moreover, third-party **grant program evaluation** can be critical to determining eligibility for future funding and for renewals of multi-year awards. Our team can assess implementation of program activities as well as long-term impacts. We work closely with you to evaluate and report on the achievement of your stated program goals. Engage our team to enhance your ability to: successfully compete for funding opportunities; measure and report on achievement of program goals and deliverables; and demonstrate program impact for sustainability. We offer the following evaluation services:

- › Third-party evaluations
- › Pre/post-intervention assessments
- › Logic model/evaluation design
- › Formative, summative and developmental evaluation
- › Evaluation capacity-building to enable long-term internal evaluation support



Energy Solutions

Facility Energy Assessment

Facility improvements can offer huge opportunities for cost savings. We can take a magnifying glass to your business's utility bills, HVAC operations, motor efficiency and the building envelope, and compile the data into a technical report with recommended conservation actions, potential savings, estimated cost of implementation and simple payback period through a **facility energy assessment**.

Environmental Solutions

Carbon Footprint/Greenhouse Gas Emissions Inventory

Some of the largest retailers now require their suppliers to complete a **Greenhouse Gas Emissions Inventory, or Carbon Footprint**; the EPA also requires it of some industrial facilities. Together, we can help calculate your GHG and develop CO2 reduction goals and action plans.

Sustainability

Businesses that operate with environmentally sound and **sustainable processes** improve their bottom line through cost savings and enhanced marketability. Let our specialists help establish environmental management systems, support you in your regulatory compliance requirements, and assist with Carbon Disclosure Project Surveys, wildlife habitat applications, certifications and more.





Other Resources

IES, through NCMEP, helps North Carolina manufacturers with important networking opportunities through a membership-based MNC Network and Manufactured in North Carolina (MNC), an online supply chain database of NC manufacturers.





Manufactured in North Carolina (MNC)

Manufactured in North Carolina (MNC) is the premiere, searchable supply chain directory for North Carolina manufacturers. It showcases the capabilities and innovations of NC companies to domestic and global B2B markets and a one-stop shop for finding and vetting suppliers within the state.

Any North Carolina manufacturer is eligible to join. Enrollment takes only minutes. Any company in the world can search for free.

MNC Network

MNC Network is North Carolina's premier knowledge management, B2B hub and networking program for the state's vibrant manufacturing base. Membership in the MNC Network gives North Carolina's manufacturers the opportunity to share best practices and connect with peers as well as suppliers and customers.

NCAfE

Based upon the prestigious Malcolm Baldrige National Quality Award, the North Carolina Award for Excellence (NCAfE) is the top state-level recognition presented to an organization that has demonstrated, through its practices and achievements, the highest level of performance excellence by applying the principles of the Baldrige Excellence Framework.

For More Information

To learn more about IES and the solutions it offers, please contact your **IES Regional Manager** or visit our website: ies.ncsu.edu



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Industry Expansion Solutions (IES) is the engineering-based, solutions-driven, client-focused extension unit of NC State's College of Engineering. Our broad portfolio and deep industry expertise help organizations grow, innovate and prosper. Our extensive partnerships with business, industry, education and government generate a unique culture of collaboration that provides access to cutting-edge expertise, research, and technology.

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