

Engineering and Technical Risk Management Solutions



Nuclear and Bulk Power System Risk,
Reliability and Resilience

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Presentation to Energy Huntsville Forum

August 25, 2011



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Who is ARES Corporation?



ARES is a high-performing Technology Solutions provider with more than 20 offices around the world.

US Offices

Albuquerque, NM
Burlingame, CA
Cleveland, OH
Colorado Springs, CO
Denver, CO
Houston, TX
Huntsville, AL
Los Alamos, NM
Los Angeles, CA
Oakland, CA
Richland, WA
Stratham, NH
Walnut Creek, CA
Washington, D.C.



International Locations

Australia

Brisbane

Canada

Calgary
Toronto

South Africa

Johannesburg

United Kingdom

Manchester

- Over 19 years of delivering reliable services to clients
- “Strong” financial rating by Dun & Bradstreet
- Over 750 employees worldwide
- Broad range of government & commercial clients
- 95% repeat business
- Wide range of teaming partners
 - Intergraph SmartPlant® Enterprise
 - Wyle
- Strong QA program
 - Appendix B
 - ANSI/ISO/ASQ-9001
 - NQA-1
 - CSA-N286.05



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ARES' Awards for Superior Performance and Quality Products



- 2011 CMMI Level 3 Certification for software development
- 2010 NASA Dryden Flight Research Center Small Business Subcontractor of the Year
- 2010 & 2008 Rotary National Award for Space Achievement Stellar Award
- 2009 DHS SAFETY Act Certification for AVERT software
- 2008 George M. Low Award, *NASA's Most Prestigious Quality and Excellence Award*
- 2008, 2005, 2004, and 2000 Small Business Administration Administrator's Award for Excellence
- 2008 Air Force Blue Ribbon Review Award
- 2008 Northrop Grumman World Class Team Supplier and Supplier of Excellence Award
- 2007 Association for the Advancement of Cost Engineering's Industrial Appreciation Award
- 2007 NASA's International Space Station (ISS) Probabilistic Risk Assessment (PRA) Spaceflight Awareness Team Award
- 2007 AS9100 *Quality Management Certification*
- 2005 National Nuclear Security Administration Small Business Supplier of Excellence
- 2001 National SBA Subcontractor of the Year Award



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Nuclear Power Equipment Qualification

- Design and Performance of Nuclear Safety Systems
- International Nuclear Safety Standards Development
- Chaired June 2011 Gothenburg, Sweden
- Environmental and Seismic

Large and Small Reactors

- NSSS (General Electric-Hitachi, Westinghouse, AREVA)
- USA (104 Reactors -TVA, Duke, Southern, Entergy, Exelon)
- China (SNPTC, SNERDI, SIPAI, SPERI)
- EU (22 Countries, 190 Reactors)
- SMRs (NuScale, GEH, Etc)

EQ Center Huntsville

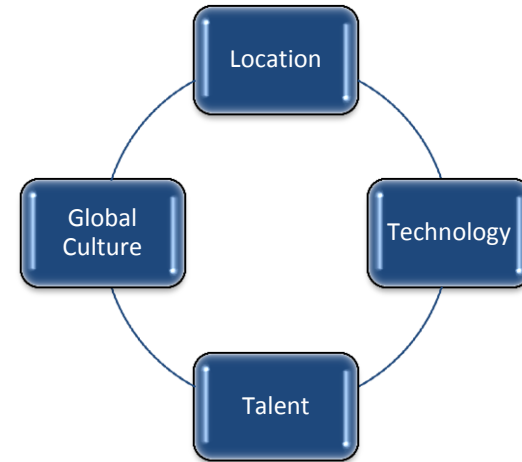
- Engineering/ Testing/Analysis/ Training
- Local Business Connections: TVA, Southern Company, Oak Ridge, Intergraph, Wyle, Qualtech NP



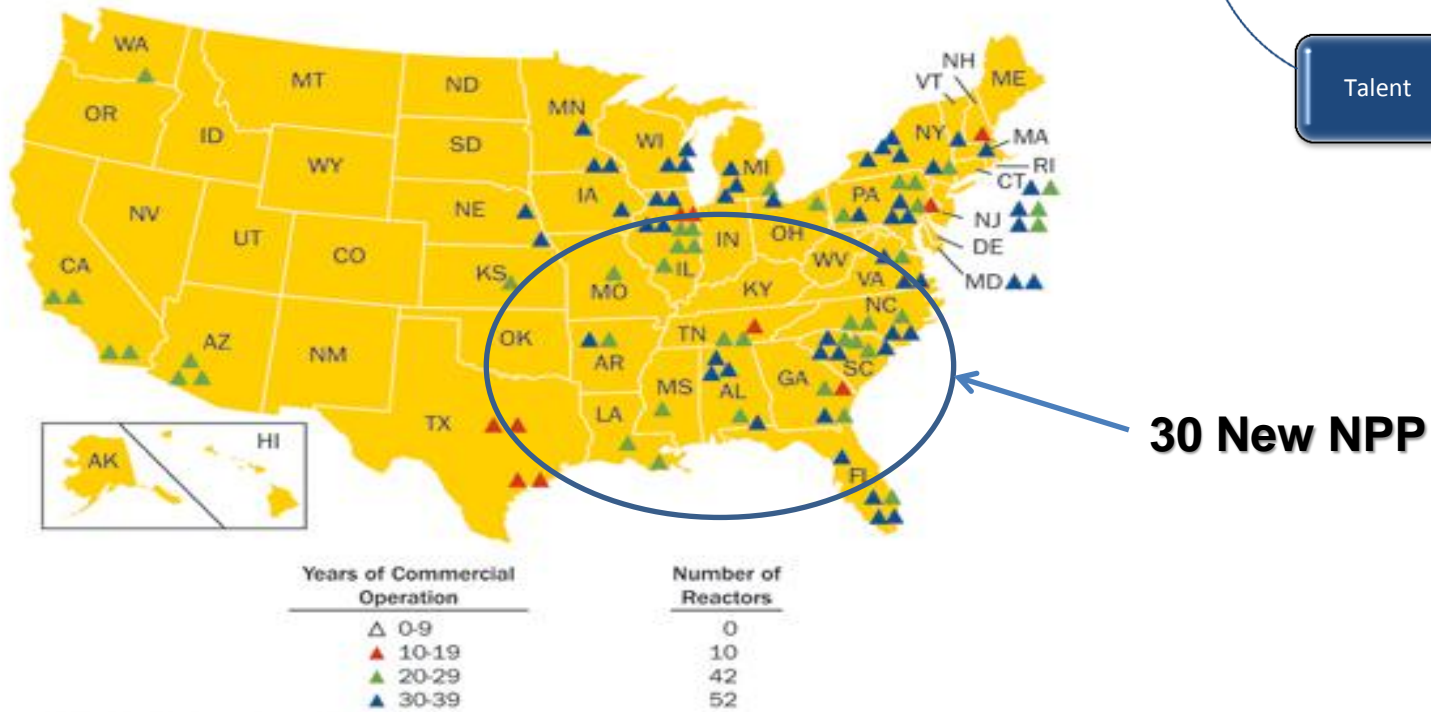
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Why Huntsville? Why Nuclear?



U.S. Commercial Nuclear Power Reactors—Years of Operation



Source: U.S. Nuclear Regulatory Commission



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Nuclear EQ Center Huntsville



ARES takes advantage of modern worldwide communication to provide showcase NEQ testing facilities and global test witnessing

180 New NPP



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Fukushima

- Fukushima Nuclear Power Plant Site experienced high acceleration from a series of earthquakes on March 11, 2011 and destroyed offsite power.
- Fifty-five minutes later an extraordinary Tsunami approximately 46 feet tall crashed into the site and overwhelmed Onsite Power
- Safety Systems lost at the end of the 8 hour Batteries
- Resultant Fuel damage and radiation leakage

Events

ARES Engineering

- Lessons Learned
- Improved Standards
- Technology in Advanced NPP Designs

- ARES Corporation has designed a Long Duration Battery Module (LBDM) for nuclear plant safety applications
- > 72 Hour Battery Power
- Safety Evaluations
- EU, Japan, China, USA

ARES Answering the call



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Long Duration Battery Modules



For Nuclear Safety Enhancement

Nuclear Long Duration Battery Modules (LDBM)

72 Hour Stationary Battery Modules with 125 - 250 VDC Designs

AMETEK
SOLIDSTATE CONTROLS

BAE

ARES
CORPORATION

Extends Station Black Out Coping Time: Extends the typical 4 to 8 hour coping time by 72 to 100+ hours or more; sized to adequately to achieve cold shut down or restoration of AC power.

Self Contained: The LDBM is designed for (beyond design basis) emergency applications in safety-related incidents for nuclear power plants. Complete with proven long duration batteries, integral battery charger, specialty cable to minimize voltage drop for long runs, HVAC to maintain charged batteries in optimal state, and multiple safety features.

International Shipping: The LDBM modules are shipped in containers meeting international shipping dimensions for fast and sure deployment.

Advantages of Long Duration Battery Modules: Ready to deploy; pre-configured to protect individual or multiple nuclear reactor sites; modular expansion capability.

Installation Options: Permanently installable on Class 1E bus at reactor locations or connectorized versions can be warehoused for quick and easy deployment upon emergency event.

Earthquake Proof: Seismically Qualified to IEEE Std 344.

Reliable: Utilization of extremely reliable BAE batteries and Ametek Solidstate Controls charger, ensures battery power is the most reliable power.

Applications: Configurable for Reactor Core Cooling, Fuel Pool Cooling, Control Room Operation, Emergency Facility Operation.

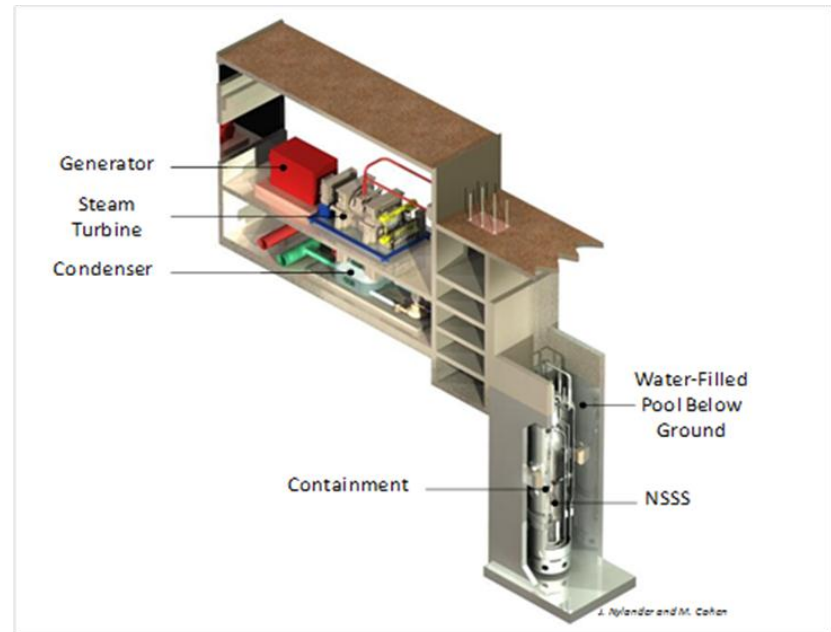


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Small Modular Reactors



- Less costly to build, operate and maintain
 - Factory manufacturing and shorter construction time
 - Natural circulation for passive “always-on” cooling
 - Does not require external water or power for shutdown
 - Factor of Safety 10K X current NRC requirements
 - Reduced water requirements/multiple methods for cooling
 - Up to 12 modules (45 MWe) producing 540 MWe
- Global and Regulatory Roles:
 - ARES is on the SMR Standards Development Council
 - ARES Presentation to NRC/ASME on Safety Standards for SMRs – August 2011



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- Critical Infrastructure Resilience
 - ARES is currently supporting North American Electric Reliability Corporation (NERC) on the Geomagnetic Disturbance Task Force
 - Lead role in creating the industry strategy for how to address this threat to the bulk power system (the grid)
 - High-visibility energy industry (utilities) topic
 - A “HILF” Risk
 - U.S. and Canada
- Operational Components:
 - Space Weather Forecasting
 - Modeling and Simulation
 - Acquisition
 - Equipment Design and Vulnerability
 - Awareness, training and Outreach
- Work closely with Power System Operators at TVA



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ARES Huntsville Operations



- Supports both Energy Services Division and Aerospace & Defense Division
 - Uniquely positioned with experts in:
 - Spacecraft and Launch Vehicle Design and Development
 - System Requirements Development and Management
 - Propulsion Engineering
 - Nuclear Engineering
 - Nuclear Equipment Testing (including Commercial Grade Item Dedication)
 - Risk Management (PRA, Human Factors, FMECA)
 - Critical Infrastructure Security and Resilience
- ARES Corporation
 - Risk Management is a core capability
 - Professional Engineers in all disciplines with Aerospace and Nuclear Experience
 - ARES's QA Program is NQA-1, ISO-9001, Appendix B, and CAN/CSA-N286.2 compliant
 - Project work with over 30 commercial nuclear utilities, A/E firms, and Nuclear Steam Supply System (NSSS) vendors



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Summary

- a) ARES is a strong corporate citizen that brings diversified work to the betterment of Huntsville
- b) ARES services are in demand locally and internationally thus contributing to the high tech future and global market reach of the Tennessee Valley
- c) ARES innovation expands technology and growth opportunities from infrastructure to power to the quality of life
- d) ARES core elements of safety, security, and reliability equal sustainability to Huntsville



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