



# Lakshman Santanam, PE

President

## Education

BS, Mechanical Engineering,  
Birla Institute of Technology &  
Science, Pilani, India, 1987  
MS, Materials Engineering,  
Auburn University, Alabama,  
1990

## Year Joined AMPHION

2009

## Years of Experience

Since 1990

## Professional Registrations

Professional Engineer – North  
Carolina, South Carolina,  
Alabama, Georgia, and  
Tennessee

## Additional Certifications

NACE Certified Corrosion  
Specialist  
NACE Certified Material  
Selection/Design Specialist

Mr. Lakshman Santanam has more than 20 years of experience in evaluating and engineering associated with equipment reliability, root cause failure analysis, metallurgy, corrosion, non-destructive testing, mechanical integrity, and fitness for service evaluation. Mr. Santanam is an expert in evaluating explosions and large-scale industrial failures.

Mr. Santanam has extensive experience in the United States and internationally. He has served as team leader and project manager for high profile projects, including the evaluation of process equipment for a manufacturing facility in the Philippines, quality assurance on a new boiler being fabricated in India, failure analysis of a high pressure wire wound vessel, boiler and de-aerator evaluation for a client in Latin America, and mechanical integrity programs for a client with multiple manufacturing facilities throughout the U.S. and Canada.

## Global Management Advisory Services

### Confidential Project

Project manager for a mechanical integrity program of numerous pressure vessels, storage tanks, and process piping integrity evaluation. Recommendations were made to have many of the vessels repaired. The client also received a forecast of equipment life and next inspection schedules.

### Confidential Project

Project manager for the rebuild of the ram and steam packing boxes in five pot heaters. Design, construction management, and quality assurance services were provided to this project.

### Confidential Project

Project manager for engineering analysis of the mixer extruder pelletizer, which had failed twice. The studs were shearing after being replaced. The longitudinal extruder screw force was calculated, which was used to find the shear dowel area required. Finding a viable solution to this problem saved the client \$750,000.



#### Confidential Project

Project manager for failure analysis, corrosion evaluation, and prediction of remaining useful life of cooling water system piping and process equipment for a major equipment manufacturer.

#### Equipment Reliability

Project manager for fracture mechanics analysis, non-destructive testing, and metallurgical evaluations of process equipment to ensure safety and uninterrupted production. Visited plants in North America, Latin America, China, Philippines, and India.

#### Corrosion Mitigation

Consulting services related to equipment failures, welding problems, and corrosion mitigation for several clients in the pulp and paper and chemical industry segments.

#### Plantation Pipeline Company

Project manager for material compatibility and structural integrity evaluation of 60 miles of pipeline for transport of produced water associated with coal bed methane gas production.

#### Corrosion Study

Project manager for corrosion evaluation of Inconel piping exposed to titanium tetrachloride.

#### Fitness for Service

Project manager for failure analysis, corrosion evaluation, and prediction of remaining useful life of cooling water system piping and process equipment for a major equipment manufacturer.

#### Failure Analysis of Pressure Vessel

Project engineer for a comprehensive failure analysis. In 4 years, the client had three chemical/physical explosions resulting in a catastrophic failure of a piece of equipment. With each failure, extensive structural and equipment damage occurred. A failure analysis was conducted. Based on the results of the analysis, a corrective action plan to mitigate future failures was developed and implemented.

#### Physical Explosion Cause/Origin Determination

Lead project engineer for the examination of a piece of equipment that experienced a catastrophic failure due to a physical explosion and conducted a root cause failure analysis. Examined 20 additional pieces of equipment and their structural supports to assess their suitability for continued use. This failure caused three fatalities.

#### Steam Boiler Physical Explosion Cause and Origin

Lead project engineer for evaluating the failure of a coal-fired water tube boiler. The top drum was cracked and excessive bowing of the waterwall tube headers was due to overfiring. Determined the cause of failures and made recommendations regarding the suitability for continued use of this boiler.



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#### Equipment Reliability and Mechanical Integrity

Lead equipment reliability and mechanical integrity consultant for a major manufacturer of tires and rubber products. Work with corporate and plant staff throughout the U.S. and Latin America in developing mandatory equipment modification orders and implementing them. Sourced equipment from a vendor in China.

#### Expert Witness Services

Lead expert in mechanical integrity, corrosion and failure analysis services in a lawsuit involving contamination of ground water due to leaking above ground storage tanks and process sewers.

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#### **Presentations and Publications**

Santanam, Lakshman, "Modeling of Zircaloy Cladding Degradation Under Repository Conditions," Focus 1989, Conference on Nuclear Waste Isolation in the Unsaturated Zone, Las Vegas, Nevada.

Santanam, Lakshman and Edward M. Beck, February 1993. "Corrosion and Safety of Steel Pipelines." International Pipeline Seminar, Houston, Texas.

Santanam, Lakshman and William M. Arnold, November 1995. "Nuclear Container Corrosion Testing and Evaluation." Paducah, Kentucky.

Santanam, Lakshman, 2004. "Mechanical Integrity of Process Equipment." PACE International Union Conference, Orlando, Florida.

Santanam, Lakshman, 2004. "Mechanical Integrity and Equipment Reliability of Process Equipment." Engineering Conference.

Santanam, Lakshman, 2005. "Mechanical Integrity." Auditing Roundtable Conference, Washington, DC.