

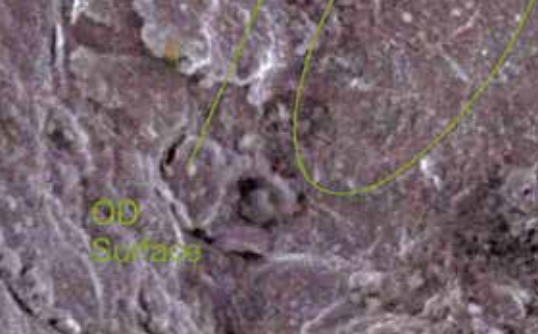
TECHNICAL EXCELLENCE INNOVATIVE SOLUTIONS



O'DONNELL
CONSULTING ENGINEERS INC.

*"If I have seen further...
It has been by standing on
the shoulders of giants."*

Isaac Newton



O'DONNELL ANALYSIS

HUBBLE TELESCOPE

O'Donnell Consulting Engineers, Inc. evaluated the nature of vibratory conditions in the framework supporting the Hubble Space Telescope. Combined analyses and tests showed that conditions were due to second order shortening of the transverse bracing members. The vibration problems were then easily solved using lateral restraints on the transverse members.

O'Donnell Consulting Engineers, Inc. provides clients with world-wide design and analysis services and solutions.

We rely on an experienced, creative team of mechanical and materials engineers to solve tough problems and provide comprehensive technical support.

Our experience spans a wide range of industries and includes a long list of unique and complex challenges in fabrication, fatigue, corrosion, fracture, vibration and failure analysis.

We take on each project with a multi-disciplinary approach that has set us apart from our competitors for over 40 years.

We Enjoy Being Challenged



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COMPANY OVERVIEW

O'Donnell Consulting Engineers, Inc. has earned a worldwide reputation for engineering excellence. Our range of mechanical design, analysis, materials and fabrication expertise and technical problem solving services has established a successful track record and built a high level of trust with some of the world's most respected companies and organizations.

Our staff collaborates with exceptional U.S. and international associates, and relies on a strong internal technical staff. This foundation of people and capability enables us to leverage technical expertise to take on challenging technical problems.

O'Donnell Consulting Engineers, Inc. was founded in 1970 as O'Donnell & Associates to meet the mechanical design and analysis needs of industry. In providing design, materials, fabrication, inspection, and mechanical troubleshooting services, we developed technology to extend the safe life of mechanical components.

For over four decades, O'Donnell Consulting Engineers, Inc. has taken on complex technical and engineering challenges, including new product development, design upgrades, problem resolution and expert witness services. Our depth of experience has evolved to encompass materials science, and state-of-the-art technology in fatigue, fracture and elevated temperature design.

ENGINEERING & TECHNICAL DISCIPLINES

O'Donnell Consulting Engineers, Inc. has a deep breadth of experience in a wide range of industry sectors, including:

- | | |
|---------------|---------------------|
| STRUCTURAL | MATERIALS HANDLING |
| MANUFACTURING | CONSTRUCTION |
| POWER PLANTS | MINING |
| MECHANICAL | NUCLEAR |
| FORENSIC | ENVIRONMENTAL |
| METALLURGICAL | FABRICATION |
| AEROSPACE | PETROCHEMICAL |
| CHEMICAL | PETROLEUM |
| MARINE | PRODUCT DEVELOPMENT |
| ELECTRICAL | QUALITY ASSURANCE |
| MATERIALS | |

*Technical Excellence...
Innovative Solutions*





CAPABILITIES

Engineering

- Finite Element Analysis
- Mechanical Design, Analysis & Troubleshooting
- Structural Analysis
- Fatigue & Design Life Evaluations
- Elevated Temperature Design & Analysis
- Design Optimization
- Dynamic Load Analysis
- Fluid Mechanics
- Heat Transfer / Thermal Analysis
- Mechanical Testing
- Vibration & Shock Testing & Analysis
- Weld Engineering

Failure Analysis / Expert Witness

- Failure Analysis
- Fatigue & Fracture Evaluations
- Metallurgy & Materials Testing
- Fire / Explosion Investigations
- Design Evaluations
- Fabrication Process Technology
- Mechanical Testing
- Patent Litigation Services
- Expert Witness Consulting & Testimony

Materials Science

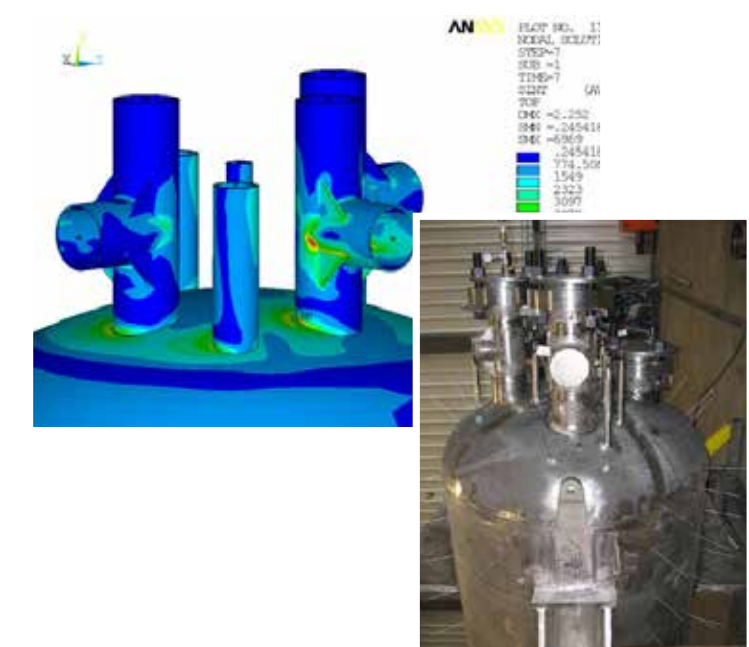
- Physical & Chemical Properties
- Metals, Refractories, Laminates
- Metallurgical Services
- Corrosion Services
- Surface Treatment Technology
- Cladding & Coatings
- Corrosion Evaluations

Power Plant Consulting

- Preventative Maintenance
- Inspections & Evaluations
- Pressure Vessel Design & Analysis
- Vibration Suppression
- Boiler Life Evaluations
- Corrosion Fatigue
- Piping Systems Design & Analysis

Technical Due Diligence

- Site Evaluations
- Quality Assurance
- Fitness-For-Service Evaluations
- Codes & Standards Compliance
- Risk Analysis

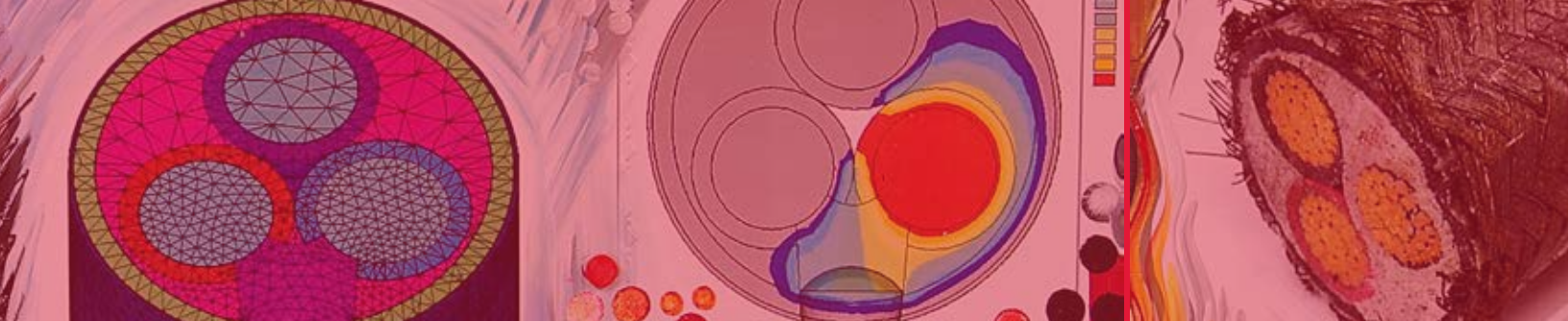


O'DONNELL ANALYSIS

ENGINEERING & TECHNICAL DISCIPLINES

O'Donnell Consulting Engineers, Inc. has a rich breadth of experience in a wide range of industry sectors, including:

Aerospace • Chemical • Civil / Structural • Electronics • Environmental • Fabrication
 Forensic • Fossil Power / Power Plants • Manufacturing • Marine • Mechanical
 Medical / Biomedical • Metallurgical • Mining • Nuclear • Petrochemical • Petroleum • Steel



O'DONNELL ANALYSIS

POWER PLANT ENGINEERING

O'Donnell Consulting Engineers, Inc. has performed design and analysis services and managed refurbishments in more than 40 power plants worldwide.

EXPERT WITNESS SERVICES & FORENSIC ENGINEERING

Our broad range of technical expertise and years of experience has increasingly led to work in the forensic and legal arenas. As experts in a number of related disciplines, O'Donnell engineers are often consulted for comprehensive engineering investigations, failure and forensic analysis, including product liability, mechanical and structural failures, fires and explosions.

In taking on forensic engineering projects, we thoroughly examine the physical evidence, analyze drawings, material specifications, and supporting documentation, and review all operational issues. Finite element analyses are often used to evaluate materials and fabrication/ construction defects, and to quantify the precise root cause of failure. Our failure analyses often includes metallurgical examinations and materials tests.

- chemical and mechanical analyses
- metallographic examinations
- materials characterization & testing

Based on our findings, we issue comprehensive expert reports – our conclusions and testimony are based on quantified results that are easily understood by Judges and Juries.

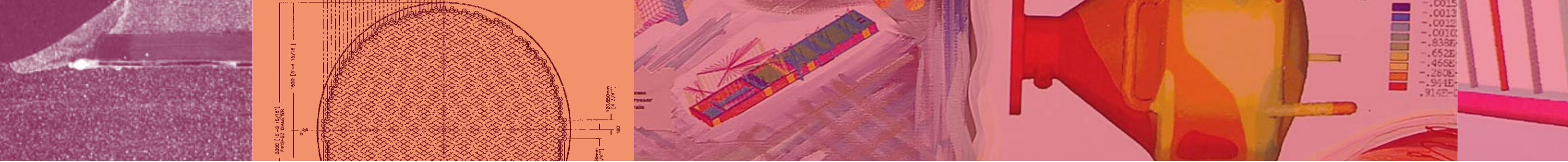
We work closely with litigation teams to prepare professional exhibits, graphics, and animations that effectively demonstrate analysis results and conclusions. Our litigation experience is balanced between plaintiff and defense cases. We have worked with legal, insurance, and industrial firms, and have successful litigation experience in State, Federal, and International Courts.

FORENSIC APPLICATIONS

O'Donnell Consulting Engineers, Inc. provides forensic engineering services for clients in numerous sectors, including:

- Power Plants
- Consumer Products
- Industrial Facilities
- Chemical
- Marine
- Fabrication
- Petrochemical
- Materials Handling
- Transportation: Air, Ground, Rail
- Aerospace
- Manufacturing
- Civil/Construction





CLIENTS

National

AK Steel
 ALCOA
 American Electric Power
 AMOCO
 Argonne National Laboratory
 Autoclave Engineers
 Babcock & Wilcox
 Becht Engineering
 Bechtel Incorporated
 Carlisle Tire & Rubber Company
 Celanese Chemicals
 CMU Robotics
 Columbian Chemicals
 DC Fabricators
 Dow Chemical
 Electric Power Research Institute
 Environmental Elements
 Federal Reserve Bank
 General Chemical
 General Electric
 General Public Utilities Service
 Hanford Engineering Development
 Kiewit Offshore Services
 Kvaerner Songer
 Long Island Railroad
 Mellon Institute
 Mississippi Power & Light
 New Jersey Division of Public Safety

National Aeronautics and Space Administration
 NIRO, Inc.
 Northeast Utilities Services Company
 Oak Ridge National Laboratory
 Office of Naval Research
 Ohio Edison
 PennDOT
 Pennzoil
 Perkin-Elmer
 Pressure Vessel Manufacturers Association
 Rhodia, Inc.
 Rolls Royce
 Sandia Laboratory
 Sargent Controls & Aerospace
 Sempra Energy
 Shell Development Company
 Shell Venezuela
 Standard Oil
 State Farm Insurance
 Stone & Webster
 United States Steel
 US Army
 US Department of Energy
 US Department of Justice
 Waste Management
 Westinghouse Electric
 Wyoming Public Service Commission
 Yankee Atomic

International

Areva
 Citic
 Commissariat Energie Atomique
 Dragados
 Électricité de France
 Hitachi
 Interatom

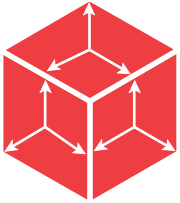
Kansai Electric Power
 Leffer
 Lurgi
 Mitsubishi Heavy Industries
 Monsanto
 Rio Tinto
 United Kingdom Atomic Energy Authority

“We are frequently asked how we have been
SO SUCCESSFUL in **creatively solving** difficult
 engineering and materials problems.

I believe the key has been **OUR ABILITY** to combine
interdisciplinary talent, comprehensive engineering
capabilities, and exposure to diverse industries and
challenges.”

- Bill O'Donnell, PH.D., P.E.
 President





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