

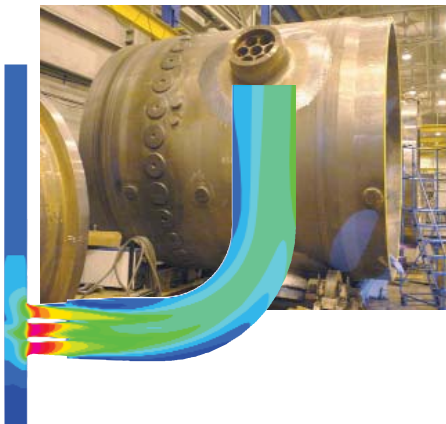
## Integrated Simulation Solutions for the Power Generation Industry

POWER GENERATION

In the increasingly competitive energy market, utilities and equipment manufacturers alike are turning to ANSYS to give them the technological advantage that comes from better understanding their equipment and its behavior. With this information, a company can identify areas where there are deficiencies and their causes. This knowledge can be used to direct design improvements or operating strategies which then can be tested with a model before final implementation. The result is improved efficiency, productivity and safety, compliance with regulatory and environmental regulations, extended equipment life cycles and minimization of downtime.

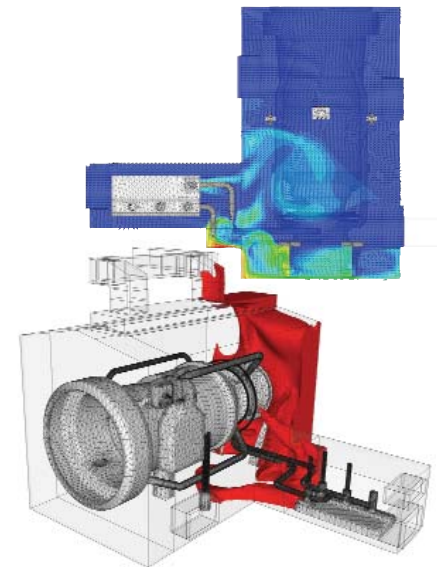
### ANSYS Simulation Solutions

- ▶ ANSYS® CFX®
- ▶ ANSYS® Multiphysics™
- ▶ ANSYS® Mechanical™
- ▶ ANSYS® DesignModeler™
- ▶ ANSYS® DesignXplorer™



#### CASE-IN-POINT

Using ANSYS solutions, the Babcock & Wilcox Company was able to meet performance requirements for the flow restrictor of the steam nozzle in a pressurized water vessel. The complex geometry was modeled, and computational fluid dynamics was used to calculate the pressure drop. The simulation shows velocity of the steam.



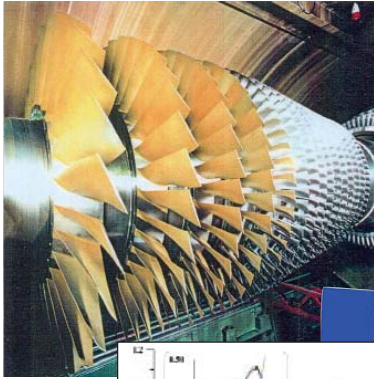
#### CASE-IN-POINT

The safety aspects of gas turbine power plants have become a major concern around the world. Many local safety authorities now require the analysis of leakage in the gas supply of turbines as part of the approval to operate plants. By using ANSYS CFX, Framatome ANP GmbH was able to optimize the positions of the methane detectors, leading to a plant that exceeds the health and safety requirements.

#### The ANSYS Advantage

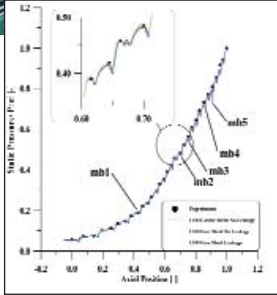
ANSYS software provides customers with a competitive advantage:

- ▶ Extensive experience in engineering simulation in the power generation industry. ANSYS software has its roots in the power generation industry; this expertise is incorporated within the software even today. ANSYS is trusted by leading companies in fossil fuels, hydropower, fuel cell development, and nuclear, wind and solar power.
- ▶ ANSYS® Workbench™, which provides a unified product development environment offering integration across a wide range of design processes — ranging from geometry modeling and editing, meshing and pre-processing, advanced analysis (structural, thermal, electro-magnetics, CFD, etc.) and robust design optimization
- ▶ Specialized turbomachinery tools for blade design, meshing, simulation and analysis of turbines and compressors



### CASE-IN-POINT

ANSYS software is used throughout the design process of rotating machinery. In a recent study with Siemens Power Generation, a 15-stage compressor was simulated. Improvements to compressor performance can be made in less time and at a lower cost using the efficient parallel capability of ANSYS CFX.



### About ANSYS, Inc. Solutions

ANSYS designs, develops, markets and globally supports engineering simulation solutions used to predict how product designs will behave in manufacturing and real-world environments. Its integrated, modular and extensible set of solutions addresses the needs of organizations in a wide range of industries. ANSYS solutions qualify risk, enabling organizations to know if their designs are acceptable or unacceptable — not just that they will function as designed. ANSYS helps organizations achieve:

- Innovative and high-quality products and processes
- Fewer physical prototypes and test setups
- Faster return on investment due to reduced development time
- A more flexible and responsive information-based development process, enabling the modification of designs at later stages of development
- A front-end simulation strategy that offers a superior method for bringing products to market in less time and with fewer costs

### About ANSYS, Inc.

ANSYS, Inc., founded in 1970, develops and globally markets engineering simulation software and technologies widely used by engineers and designers across a broad spectrum of industries. The Company focuses on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. Headquartered in Canonsburg, Pennsylvania, U.S.A., with more than 25 strategic sales locations throughout the world, ANSYS, Inc. and its subsidiaries employ approximately 600 people and distribute ANSYS products through a network of channel partners in over 40 countries.

### A Global Solution

ANSYS software is used throughout the world in a wide variety of applications in the power generation industry. ANSYS provides solutions that:

- ▶ Improve efficiency, performance and longevity of turbomachinery through a broad range of tools for simulation-driven design
- ▶ Increase safety through
  - thermal and drop analysis of nuclear transportation casks
  - cooling simulations for nuclear reactors
  - simulation of leakage in fuel entry systems for gas turbine enclosures
  - the study of loading of supports, deformation and stresses from clamps, transient thermal loads and elastic fatigue analysis of piping systems
  - modeling flow through pipe cracks
  - determining pressure drop in pressurized water reactor
- ▶ Reduce emissions through the study of combustion processes and through better design and operation of scrubbers and selective catalytic reduction systems
- ▶ Alleviate environmental concerns through simulation of fish passages, river scour and sedimentation
- ▶ Develop more efficient fuel cells and furnaces, study stresses on dam and weirs, assess wind power potential of sites, and research stress on micro miniature turbines, among others



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