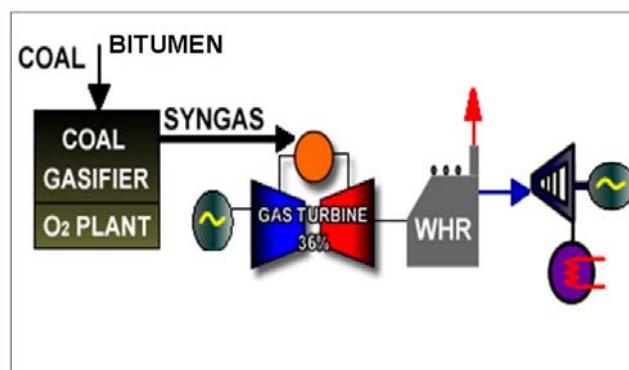
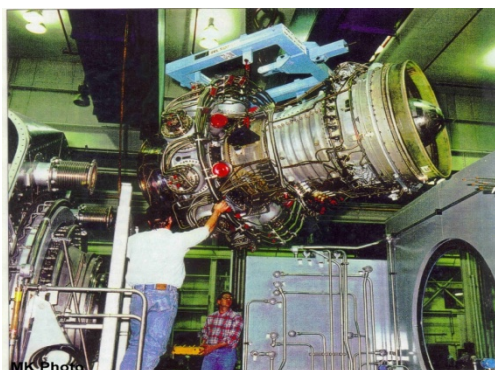


Challenges and Opportunities in Future Gas Turbine Development and Operation



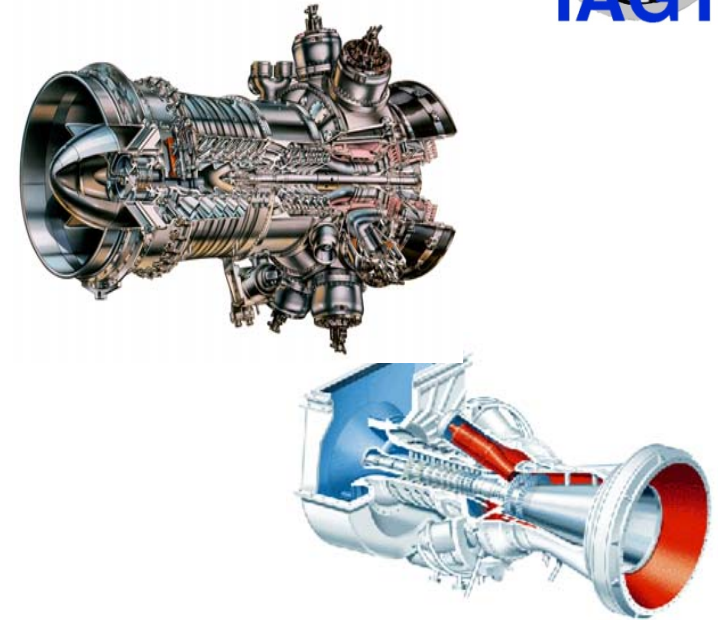
Industrial Applications of Gas Turbines Committee
Canadian Gas Association
National Research Council Canada
Gas Turbine Laboratories (Combustion, Aerodynamics & Propulsion)
Structures and Materials Performance Laboratory

Industrial Applications of Gas Turbines Committee



Technical Advisory Group to Canadian industry and government;

- Formed in 1974, and led by NRC
 - 'Transferred' to CGA in 1990
 - In 2006, co-sponsored by NRC and CGA
 - 18 members (OEMs, Users, Gov't)
- Exchange of ideas for new developments related to the industrial application of gas turbines in Canada,
- Research and Development, and review of codes and practices issued by Regulatory Agencies



Typical Industrial Gas Turbine Energy Systems

- Simple Cycle
- New Gas Combined Cycle
- Combined Cycle Repowering
- Utility Coal Gasification
- Large Industrial Cogeneration
- Oilsands Gasification
- Pipeline Compression, LNG
- Small Industrial Cogeneration
- Municipal District Energy
- Micro-T Distributed Power & Heat
- Waste Heat Recovery
- Process Off-Gas Recovery, Biofuels

About 20 000 MW in Canada



Gas Turbine Issues in Energy and Aerospace

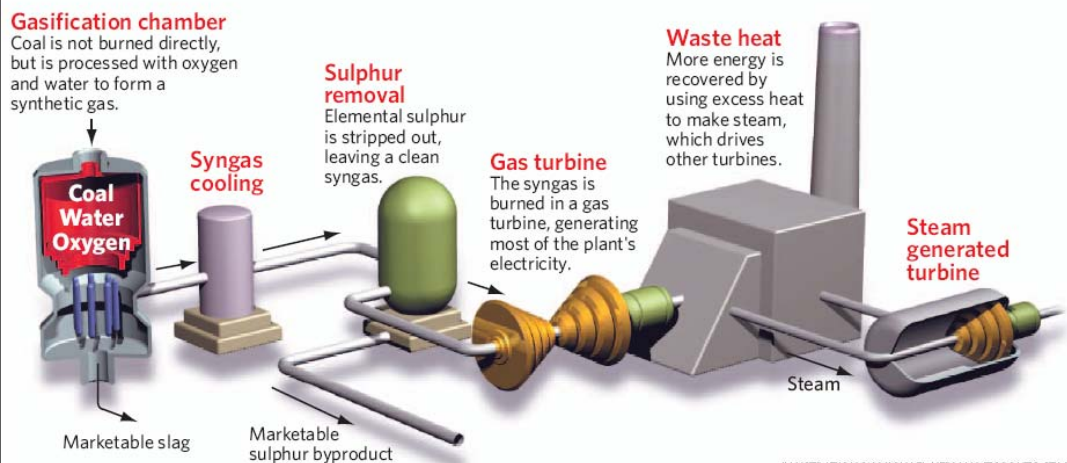
- *Energy Security, Reliability*
- *Alternative Fuels (Bio and Syngas)*
- *System Performance, Efficiency*
- *Preventing Air Pollution*
- *Minimize GHGs, CO₂ Capture*
- *Noise and Water Impacts*
- *Health Monitoring, Maintenance*
- *Advanced Materials and Coatings*
- *Component Life*



Coal and Petcoke Gasification

A cleaner alternative

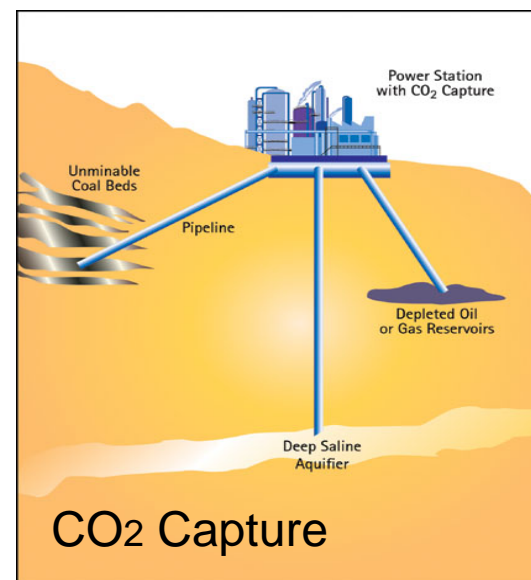
How a clean-coal gasification plant works.



Alternative H₂ and Bio-Fuels

Fuel Combustion Systems

- Syngas (H₂, CO, N₂)
- Hydrogen
- Ethanol
- Liquid Bio-fuels
- Fischer-Tropsch fuels





Challenges and Opportunities in Future Gas Turbine Development and Operation

Monday

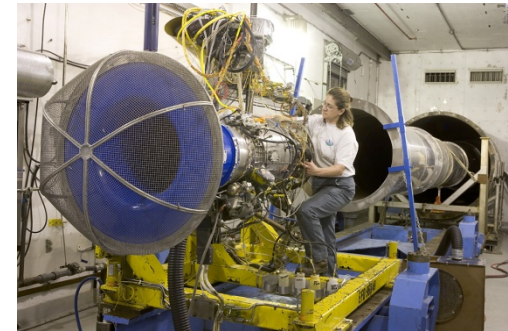
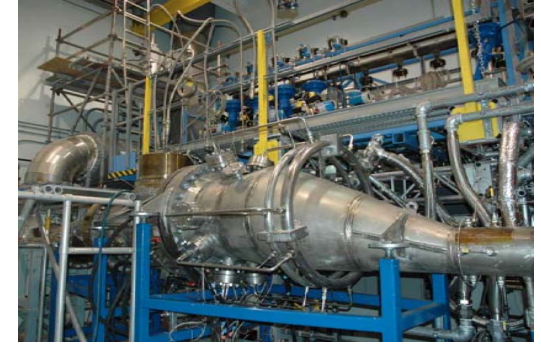
- Fuel Flexibility & Alternative Fuels
- Performance & Health Monitoring

Tuesday

- Materials, Components & Coatings
- Tour of NRC Facilities

Forum Objectives;

- Meet new colleagues
- Discuss tech challenges, Industrial & Aero
- Explore collaborative solutions





Concluding Remarks

Fuel Flexibility & Alternative Fuels

Performance & Health Monitoring

Materials and Components



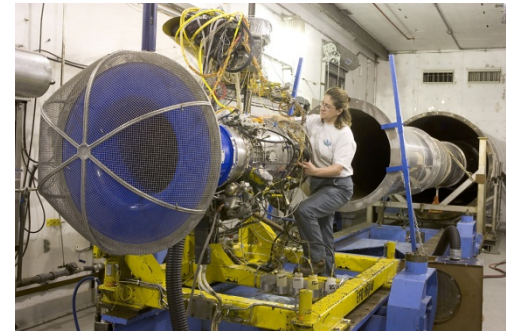
NRC Institute of Aerospace Research, Montreal Rd Campus

IAR Gas Turbine Facilities

Aerodynamics and
Combustion (M10)



Performance Testing and
Certification (M7)



Structures and Materials
(M13, M14, M17)



2009

IAGT Symposium Call for Papers



NRC · CNRC
Aerospace/Aérospatiale



Banff Springs Hotel, Banff, Alberta.

October 19-21, 2009

The Industrial Application of Gas Turbines (IAGT) Committee is a Technical Advisory Group to Canadian industry and government. It provides a forum for the exchange and dissemination of ideas and the communication of new developments related to the industrial application of gas turbines in Canada.

The vehicle for communication is a biennial technical symposium for the presentation of technical papers and expert panel discussions. Sectors of industry involved include research and development, application, performance, operation, maintenance and user experience.

www.IAGTcommittee.com

Papers are welcome in the following areas:

Theme 1

Fuels, Combustions and Emissions

Theme 2

Cogeneration and Combined Cycle

Theme 3

Reliability in the Oil and Gas Industry