



Combustion Parts Repairs for Alstom Legacy Fleet

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Innovation and Service for a world
with Clean Power

Partnering and Supporting
Customer Needs by providing a
Flexible, Reliable & Multi-
Platform Portfolio to improve life
cycle costs

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A History Spanning More Than 130 Years



Thomassen built first in-house designed gas engine

Start of mfg GE-gas turbines under license

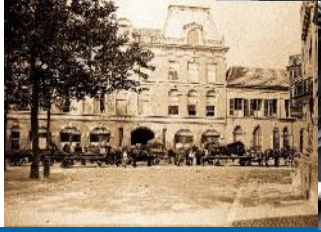
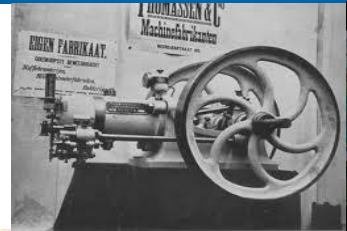
Split up of Thomassen

Acquired by Ansaldo Energia

Renamed to Ansaldo Thomassen

Service Provider Innovating for Future Energy

1896 **1968** **1997** **2006** **2008** **TODAY**



1886

1906

1989

2003

2007

2010

Geurt Thomassen starts workshop wind mill tools

Thomassen & Co., manufacturing and servicing gas engines

JV of Production of GE-type aero derivative gas turbines

Acquired by Calpine

Introduction Multi Platform Service

Opening Ansaldo Thomassen Gulf Workshop (UAE)

Gas turbine full service provider with broad portfolio of capital parts



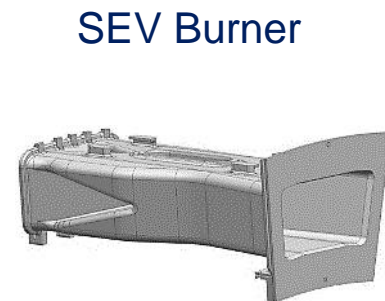
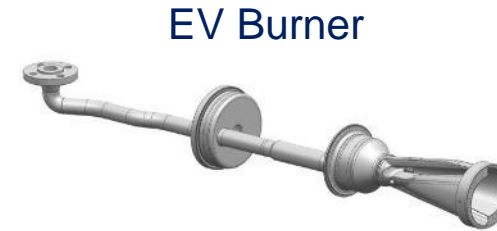
Ansaldo Thomassen offers combustor parts servicing for Alstom Legacy Fleet

- Reconditioning utilizing proven advanced repair technologies
- Repair capabilities for Alstom Legacy engines GT11, GT13, GT24 and GT26 include:
 - EV Burner
 - EV Lance
 - SEV Burner
 - SEV Lance
- GT26 reconditioning references:
 - EV Parts: more than 150 parts – typically less than 1 piece rejected out of a 24 pieces set
 - SEV Parts: more than 250 parts - typically less than 1 piece rejected out of a 24 pieces set

More than 400 parts have been reconditioned with typically less than 1 piece rejected out of a 24 pieces set

Reconditioning of Fuel Injection Burner & Lance:

- Performance Improvement
 - Fuel & airflow calibration (NOx reduction possible)
 - Sealing surface restoration
- Lifetime Extension
 - Reconditioning
 - Redesign / Upgrade



SEV Lance



Repair Capabilities EV/SEV Burners & Lances



Manual TIG Welding



Fluid Flow Bench



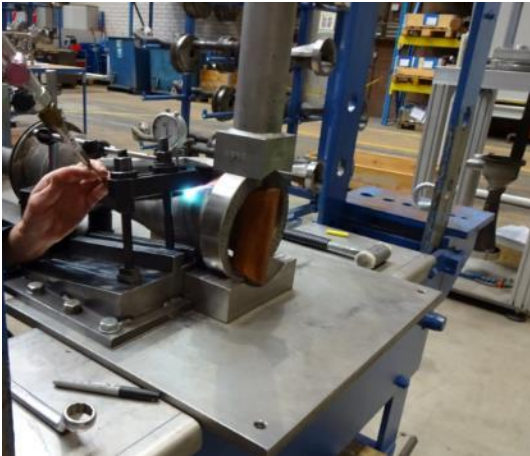
Airflow Bench



Grit Blasting / Cleaning



Straightening / Dimensional



CMM



SEV Lance Reconditioning



Inlet sealing & thread damage – new restrictors

New repair & upgrade implemented



Flange sealing surface damage

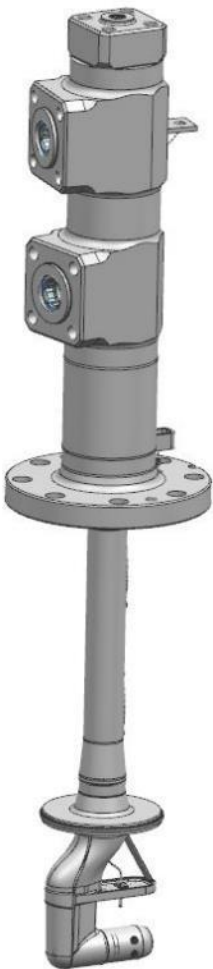


Piston ring slot
Wear and deformation

New repair & upgrade implemented



Balcony deformation



Balcony wear

New repair & upgrade implemented



Fuel nozzle misalignment

New repair & upgrade implemented



Cracked or oxidised
Thermocouple sleeve

New repair & upgrade implemented



Heel oxidation and cracking



Over 250 SEV Burners Reconditioned – Low Rejection Rate

EV Burner Reconditioning



Incoming inspection



Borescope inspection and cleaning



Non destructive testing



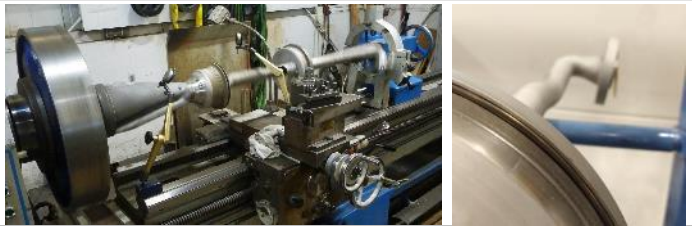
Roundness correction and Straightening



Repair welding



Machining



Flow testing and tuning



Engine ready sets



Over 150 EV Burners Reconditioned – Low Rejection Rate



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