Boost your efficiency

Webinar June 18th, 2020

Marcos Diez Peña
Sales, Bids and Projects
Region Europe

MAN PrimeServ
Agenda

1. Your presenter
2. Company overview
3. Boost your efficiency
Introduction

Your presenter

Name
Marcos Diez Peña

Function
Sales Manager Region Europe

Expertise
After Sales Turbomachinery portfolio

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Introduction

Your presenter

Name
Bernd Heinl

Function
Engineering Region Europe

Expertise
Commissioning, troubleshooting, systems Engineering, instrumentation & controls

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MAN Energy Solutions AG
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MAN Energy Solutions

Company profile

Marine systems
- Two-stroke and four-stroke engines for marine applications
- Propellers and complete propulsion systems incl. fuel gas systems
- Turbocharger

Power plants
- Two-stroke and four-stroke engines for stationary applications
- Diesel and gas power plants

Turbomachinery
- Compressors, gas and steam turbines, and expanders
- Complex machine trains
- Chemical reactors
MAN Energy Solutions

Turbomachinery applications

Upstream (production)
Compressors, expanders, gas turbines

Midstream (transportation)
Compressors, gas turbines

Downstream (processing)
Compressors, expanders, steam turbines, gas turbines, reactors

Industrial products
Compressors, vacuum blowers, reactors

Industrial gases
Compressors, steam turbines, reactors

Industrial power generation
Steam turbines, gas turbines

MAN PrimeServ
Comprehensive service support
MAN Energy Solutions

PrimeServ Omnicare: your one-stop service

- Services for your entire fleet – including non OEM turbomachinery and equipment
- Strong network of multi-brand experts
- Regional Omnicare managers ensuring that global best practice is brought to you

Benefits
- Increased capacity, safety, reliability and availability
- Improved efficiency and cost-effective operation
- Same standards and quality as for OEM equipment
MAN PrimeServ
Strategic expertise

Availability
Meet rising performance expectations within increasingly complex and dynamic operating environment

Efficiency
Improve the efficiency of your turbomachinery for more attractive margins

Safety
Comply with contemporary safety standards and regulations to ensure safe operation

Capacity
Adjust the capacity of your equipment for optimum operation and to further develop your business

Sustainability
Adapt your equipment to increasingly stringed emission regulations and reduce your CO2 footprint
Efficiency

Challenge

Do you meet your efficiency targets?

Changing market environments are always accompanied by new economic challenges.

Over your asset’s service life, you straddle a gap between its achieved efficiency and the fast-evolving efficiency requirements in your market.

The key to bringing your efficiency strategy to life are our upgrade solutions.
Your turbomachinery is a core element of your production process. Our upgrade solutions help you to improve the efficiency of your turbomachinery for more attractive margins:

- **Reduce energy costs & emissions**
- **Increase output**
- **Reduce maintenance costs**
Efficiency

Reduce energy costs & emissions

Avoidance of leakage losses
Replacement of obsolete sealing systems against contemporary solutions allowing for significantly smaller gaps

Reduction of energy consumption
Realization of energy and emission savings by upgrade of auxiliary systems and reduction of parasitic power consumption

Improved efficiency
Implementation of latest design standards for increased machine efficiency

Engineering services
Assessment of existing unit design and condition to identify, validate, and propose upgrade solutions considering your specific operating conditions and business requirements
Efficiency
Reduce energy costs & emissions: Arlon® impeller seal

Arlon® impeller seal for **integrally geared compressors**:

**Features**
- New radial labyrinth seal made of Arlon®
- Optimized seal gap
- Improved behavior at off design operation and possible failure

**Benefits**
- Efficiency increase of 0.4 to 2.7 percentage points per stage
- Approx. 2 years average amortization time
Efficiency
Reduce energy costs & emissions: Arlon® impeller seal
**Efficiency**

Reduce energy costs & emissions: Brush seals

Brush seal for centrifugal and axial compressors:

**Features**
- Compact design → less space required vs. labyrinths type
- Reduces internal leakages
- Zero gap at design operating conditions

**Benefits**
- Higher mass flow (in the range of 1 to 2%)
- Lower power consumption (in the range of 1%)
Efficiency

Reduce energy costs & emissions: Brush seals

- Fiber material: haynes 25, aramid or polymer
- Angular fiber orientation (45°) enables zero gap at design operation conditions
  - Housing
  - Sealing element
  - Pressure relief chamber
  - Support ring

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### Efficiency

#### References

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**Arlon Seals**

**Brush Seals**

This four-stage centrifugal compressor benefits from approx. 2% increase in mass flow. The power consumption of the whole machine train was calculated to be almost 1% lower.
Efficiency
Reducing energy costs & emissions: Improved efficiency

Other examples for improving your machine’s efficiency

- Optimized blade profiles for axial blowers and expanders
- Optimized impellers for centrifugal compressors
- Optimized stator blade carrier for expanders
Efficiency

Increase output

Capacity increase

With our upgrade solutions for sealing systems, you can increase the capacity of your compressor for the same power consumption.

Footprint solutions

Replace your old and outdated machinery and have a direct impact on your train efficiency. Increase your output while having the same energy consumption as before.

Core machine revamps

Benefit from our revamp solutions to increase the output of your core machine, like turbines or expanders for power generation.
Efficiency
Footprint solution

Some examples of replacing outdated units:

**Screw compressors**
- State of the art design
- Smaller gaps
- Improved sealing technology

**Axial blowers**
- Improved blading
- Robust behaviour
- Smaller and lighter frame
Efficiency

Reduce maintenance costs

Design improvements

Implementation of latest developments of technology allowing for extension of maintenance intervals of components or systems

Remote Monitoring Support

Use of PrimeServ Assist with near real-time data transmission and evaluation for detection of anomalies, condition assessment, and maintenance optimization

Service concepts

Development of tailor-made service concepts adjusted to your specific equipment, operating conditions, and operation requirements
By connecting your MAN products to **PrimeServ Assist**, you get the advantage of machine data, advanced analytics and MAN expert knowledge.

1. **Ad-hoc notifications for safety and availability**  
   MAN experts monitor your data for anomalies and send notifications to you on the MAN CEON platform.

2. **Proactive advice on maintenance**  
   MAN experts send notifications and advice, focusing on current component condition, considering regular component maintenance intervals.

3. **Proactive advice on operation and performance**  
   MAN experts will advise when to perform system checks or parameter changes due to operating value degradation or long-term trends.

4. **Access to instant technical support**  
   Your engineers on site have direct access to Remote Operation Center experts to discuss anomalies or elaborate on notifications and advice, via audio or text chat on the MAN CEON platform.
Thank you!

Survey
Please stay in the webinar for a moment to give us your feedback on today’s webinar and topics you are specially interested in

Further information
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Contact
For any questions or further information, don’t hesitate to speak to your local contact or contact me directly
Thank you very much!