Cost effective innovations for port operations and process improvements

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- Company presentation

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- Challenges

- Big data analytics

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- Conclusion

Liebherr – a family business

- Company founded in 1949 by Dr.-Ing. E.h. Hans Liebherr

- The Liebherr Group today: over 130 companies worldwide, more than 42,000 employees and around € 9 billion turnover (2016)

- Decentralised structure with straightforward, autonomous corporate units – divisional structure

- Holding company: Liebherr-International AG, Bulle/Switzerland

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Liebherr – a family business

Left to right: Patricia Rüf, Stéfanie Wohlfarth, Jan Liebherr, Sophie Albrecht, Isolde Liebherr and Willi Liebherr

- Dr. h.c. Dipl.-Ing. (ETH) Willi Liebherr, President of the Administrative Board

- Dr. h.c. Dipl.-Kfm. Isolde Liebherr, Vice-President of the Administrative Board

- Patricia Rüf

- Stéfanie Wohlfarth

- Sophie Albrecht

- Jan Liebherr

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Multifaceted product range
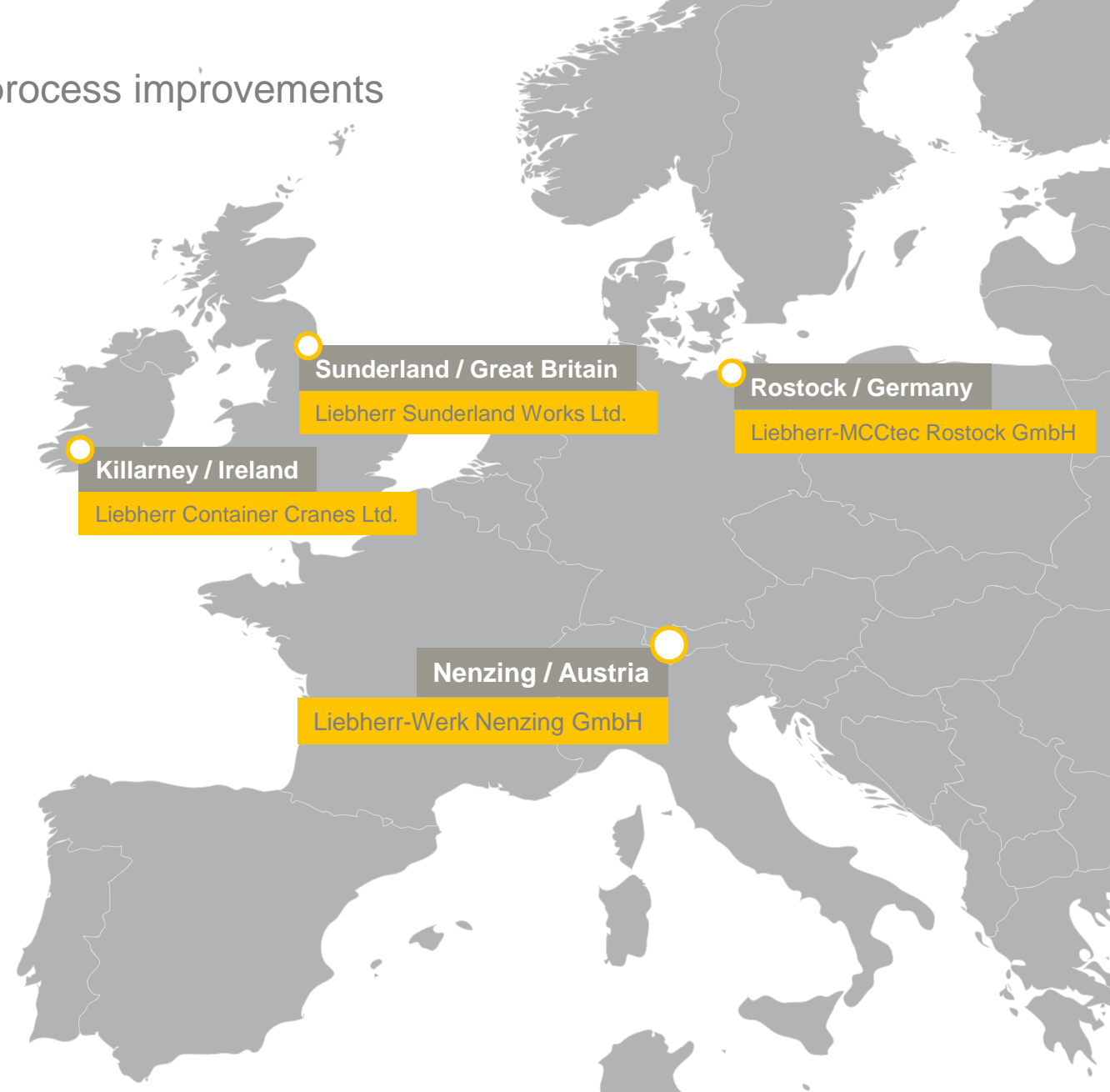
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Liebherr-MCCtec Rostock

Maritime Cranes

For efficient material handling
in the maritime sector, Liebherr
manufactures a comprehensive
range of innovative cranes.

Maritime production network

Sunderland / Great Britain
Liebherr Sunderland Works Ltd.

Rostock / Germany
Liebherr-MCCtec Rostock GmbH

Killarney / Ireland
Liebherr Container Cranes Ltd.

Nenzing / Austria
Liebherr-Werk Nenzing GmbH

27.11.2017 **LIEBHERR**

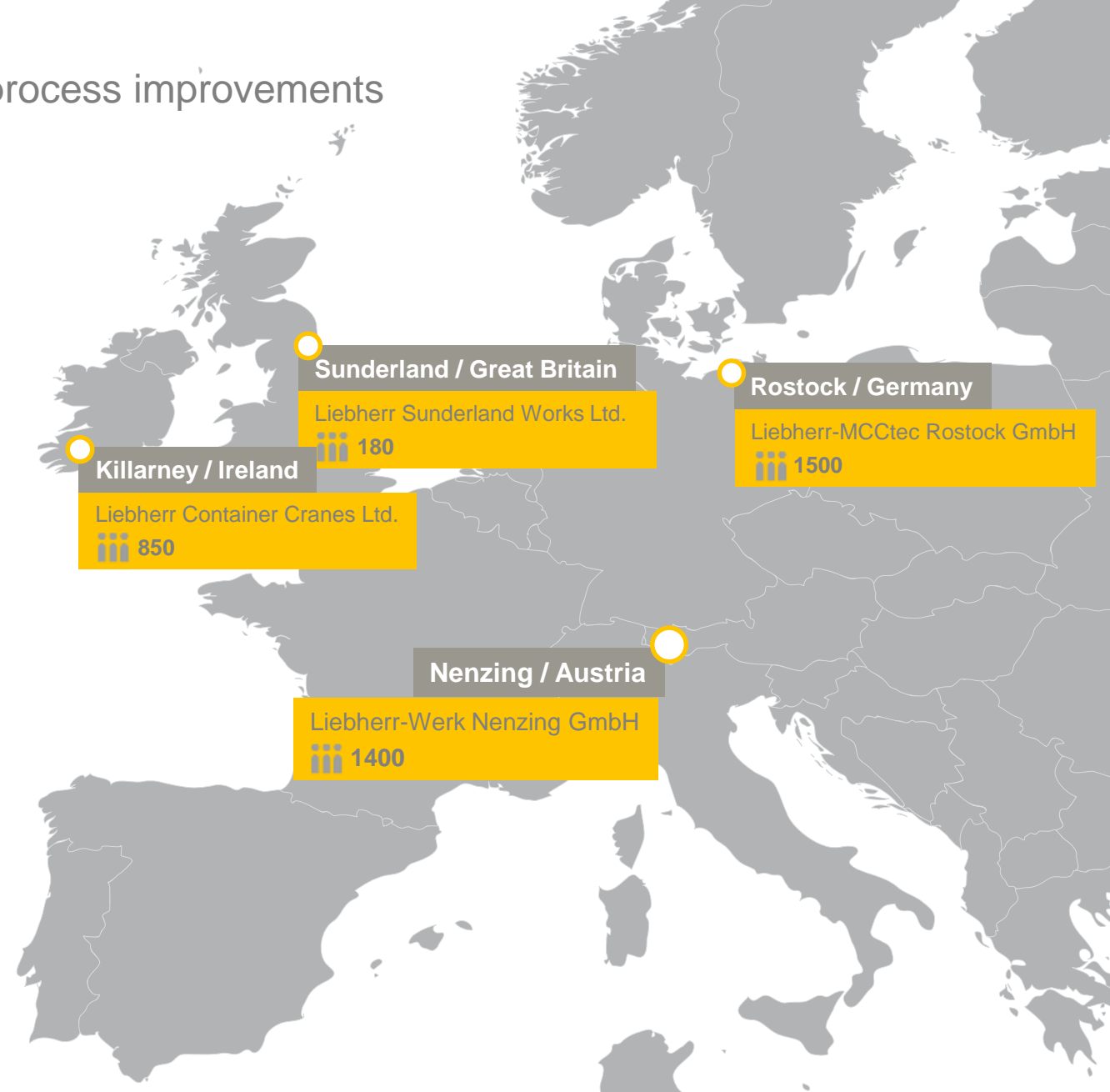# Maritime production network

Facts & figures (2016)

1.3 Billion €
Turnover

4.000
Employees in total

2,440,000
Production hours

40
Worldwide mixed sales and service companies

Sunderland / Great Britain
Liebherr Sunderland Works Ltd.
180

Rostock / Germany
Liebherr-MCCtec Rostock GmbH
1500

Killarney / Ireland
Liebherr Container Cranes Ltd.
850

Nenzing / Austria
Liebherr-Werk Nenzing GmbH
1400

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Challenges

Clean   No waste of time   Cheaper

Really fast   *The ultimate smart port* ?   No waste space

All devices connected   Fully automated

Safe

State of the art Technologies/innovations	&	Smart use of the information (Data)

Big data analytics

Virtual Reality

3D Printing

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Big data analytics

- Information level

- Numbers are everywhere in our lives, and statistics is about turning these numbers into useful information on which we can take action

- Properly represented data are more than just numbers (trends, anomalies, etc…)

- Getting the right information at the right time is the key to act on a process level

- Big data analysis

- To create benefits for our customers data have to be available on demand

- Today's question is not amount of data, but how to gain something useful out of it

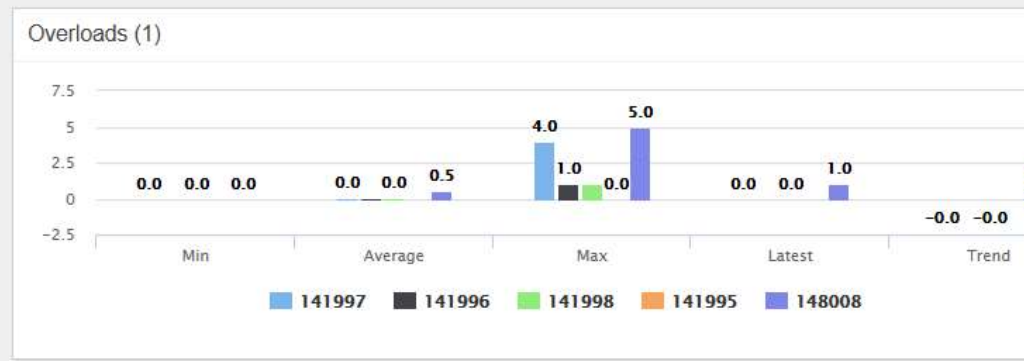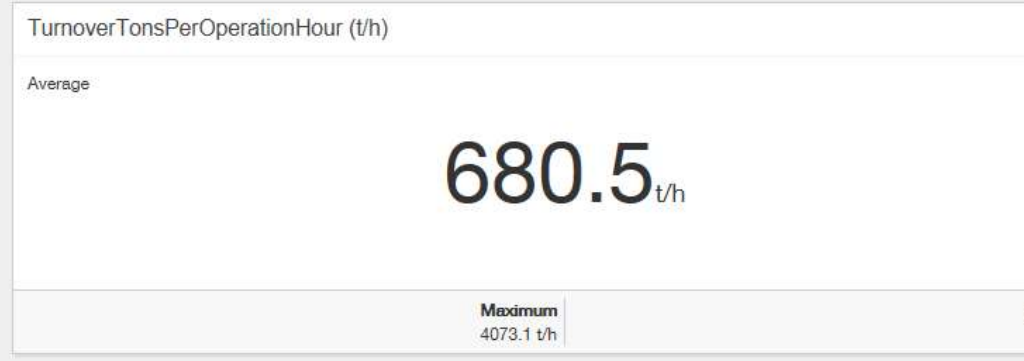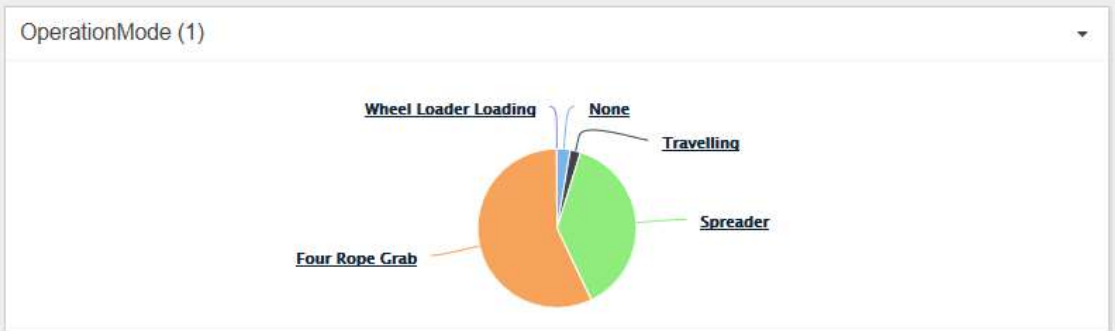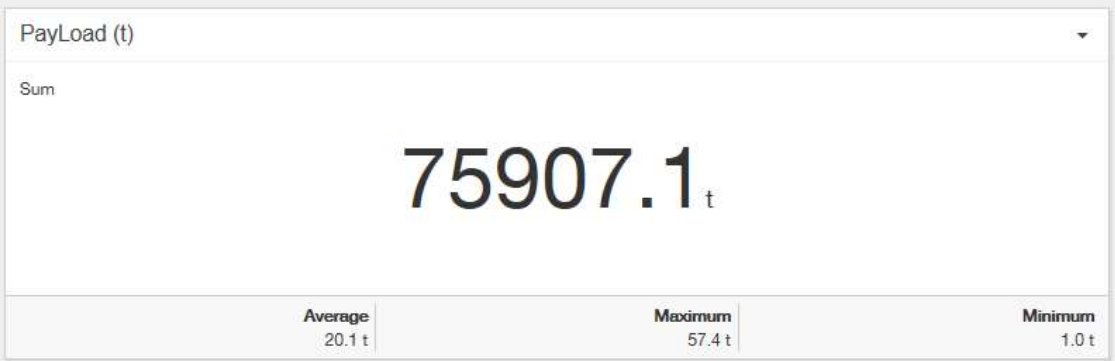- The art is to break down numbers to key performance indicators (KPIs)

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Big data analytics

- Optimise your performance with big data analytics

- Big data analytics examines large amounts of data to uncover hidden trends, anomalies and other insights

- With LiDAT® smartApp, it's possible to analyse your crane (operating and performance) data and get answers from it almost immediately

- That leads to immediate decisions. The ability to work faster gives ports a competitive edge they didn't have before

- Big data analytics helps to detect bottle necks and to identify new opportunities

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TOC Fleet

TOC Fleet

Scenario

Dashboard

Time range

Dashboard

Machines

Details

Position Optimizer

Forecast

Machine locations

141998

148008

TurnoverTonsPerOperationHour (t/h)

Average

680.5 t/h

Maximum
4073.1 t/h

PayLoad (t)

Sum

75907.1 t

Average	Maximum	Minimum
20.1 t	57.4 t	1.0 t

Overloads (1)

141997   141996   141998   141995   148008

OperationMode (1)

Wheel Loader Loading   None

Travelling

Spreader

Four Rope Grab

Settings

About

Big data analytics

LiDAT smartApp
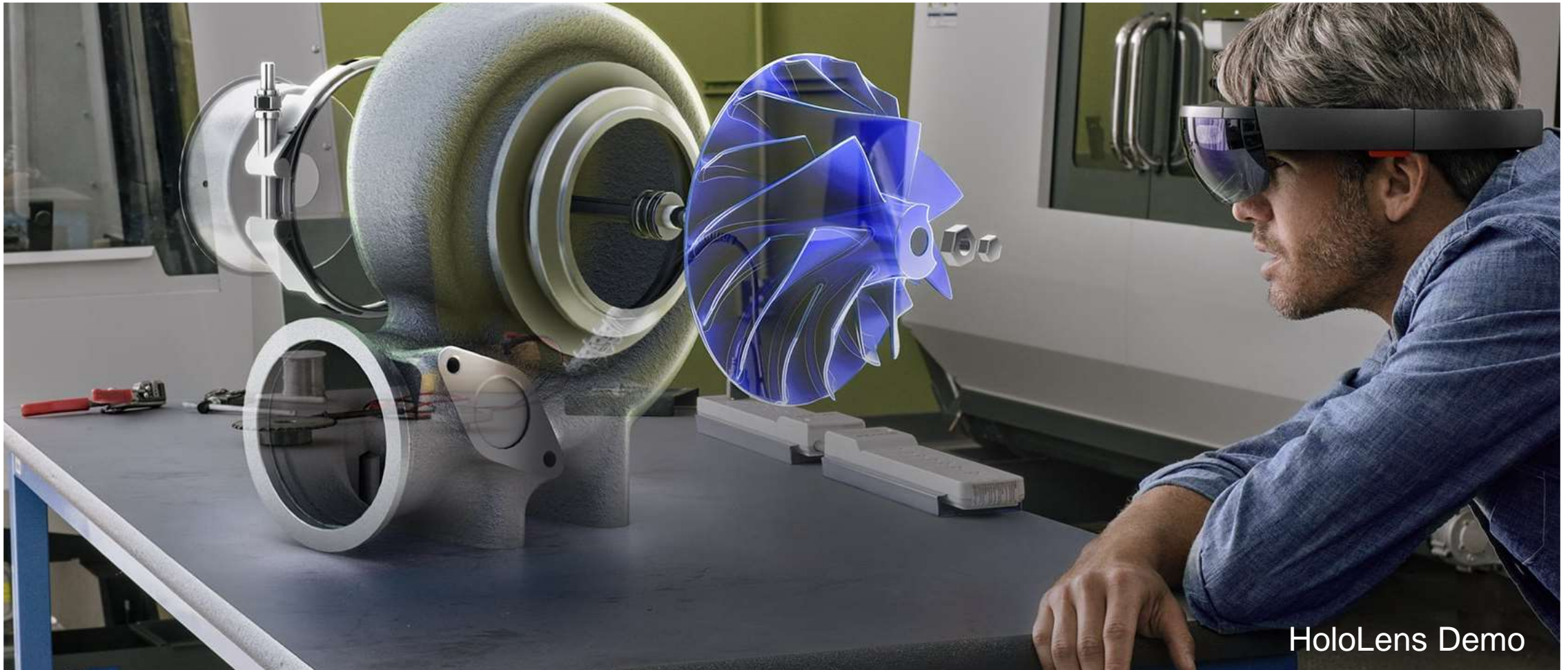

- **Status reports**
  - Customise your dashboard (KPIs)
  - Monitor your cargo handling process in real time

- **Detailed view**
  - In depth analysis
  - Detailed view of variables over time, dependencies and distribution
  - Compare multiple cranes

- **System integration**
  - SmartApp calculates forecasts
  - SmartApp proposes optimisation measures
  - Results can be sent to the crane/driver for immediate action

- **Training & simulation**
  - Data can be used to create realistic training scenarios on a simulator
  - Improve operating skills in a safe environment
  - Simulator based training can be monitored

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Virtual reality

HoloLens Demo

3D Printing

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3D Printing

CAD data
Powder bed
Laser
Laser

Top lasered layer

End product
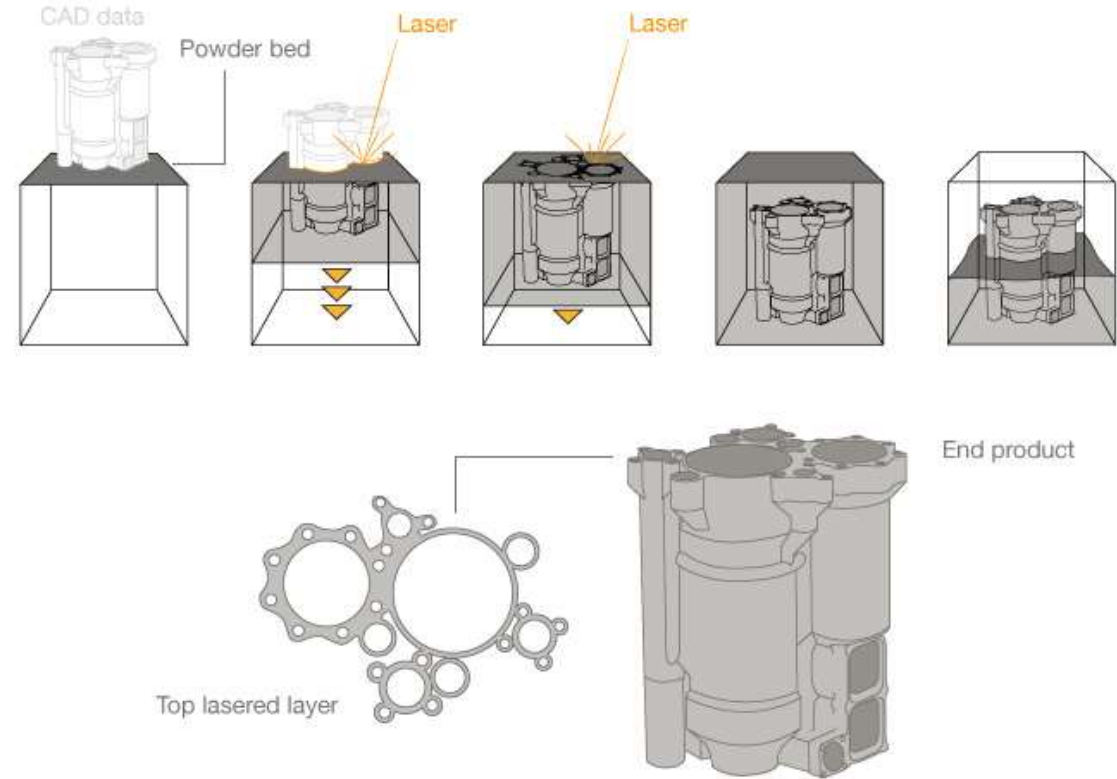
| Laser travel across the titanium powder | Laser is metling the material layer by layer | Vacuums |

3D Printing

Airbus recently flew with a 3D printed primary flight control component from Liebherr on a flight test A380

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Thank you for your kind interest.

Anthony MARTIN-GARIN – Division Manager Maritime Cranes LIEBHERR