

Turbomachinery

PLANNING GROUP T

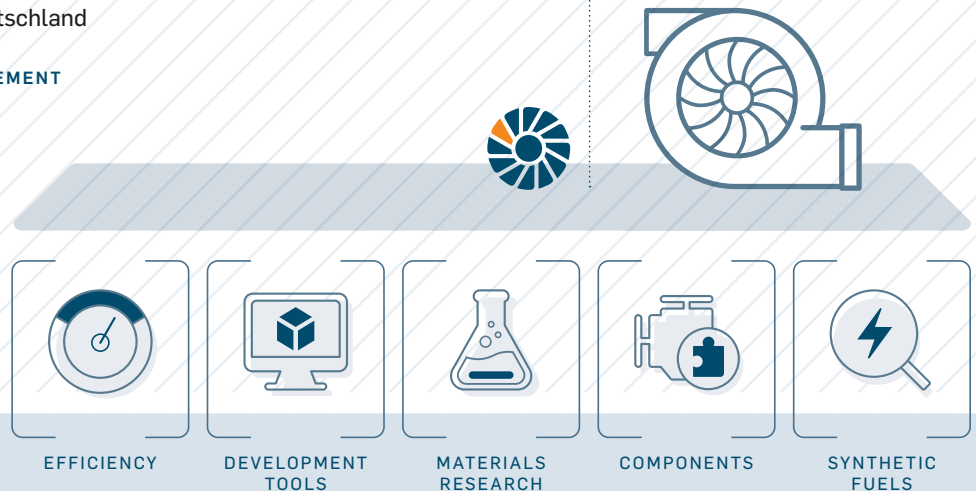
COORDINATOR

Dr. Dirk Hilberg,
Rolls-Royce Deutschland

PROJECT MANAGEMENT

Dirk Bösel, FVV

TURBOMACHINERY



RESEARCH PRIORITIES

Planning group T, >Turbomachinery<, is dedicated to the following topics:
Efficiency of turbines and compressors | Alternative fuels, hydrogen combustion |
Innovative operating fluids and coatings

And tackles the following lines of research/ focuses:

Aerodynamics of turbomachines | Turbine and centrifugal and axial compressor
as a complete system | Blade cooling, secondary air systems | Component stress,
damage and failure mechanisms | High-temperature materials and coating |
Additive manufacturing

PUBLICATIONS

- **MTZ worldwide 09/2019:** Mistuning and Damping of Turbine and Compressor Impellers
- **FVV Publication:** R592 | Engineering Guide
- **FVV proceedings:** R588 | 2019 Spring Conference, R591 | 2019 Autumn Conference and R594 | 2020 Spring Conference

PGT
DATABASE



THEMIS

PG T | RESEARCH PROJECTS



NO	TITLE // FUNDING ORGANISATION // DURATION	PROJECT COORDINATOR
Planned projects		
836 II	Alternative bearing metals for plain bearings II	
M2419	Fuel Cell Compressor Design	Dr. Thomas Hildebrandt, NUMECA
T0118	Flexible HP-Turbines	Christoph Lyko, Rolls-Royce Deutschland
T0119	Bidirectional Aeromechanical Coupling II	Dr. Andreas Hartung, MTU Aero Engines
T0120	Multiscale-based HCF-Properties Ni-Base	Dr. Andreas Fischersworing-Bunk, MTU Aero Engines
T0218	W14 Concepts / FKM Guideline	Dr. Shilun Sheng, Siemens
T0219	Thermal Effects and Rotor Stability for Foil Bearings	Dr. Joachim Schmied, Delta JS
T0220	Sensitivity and Probabilistic (ComDynA_SP)	Dr. Andreas Hartung, MTU Aero Engines
T0317	Fill Factor Influence	Dr. Christoph Weißbacher, GTW
T0320	Heat Transfer Reduction at Turbine Casing Parts	Norbert Pieper, Siemens
T0419	Thermo-mechanically Induced Stress Gradients	Frank Vöse, MTU Aero Engines
T0420	Modelling of Primary Atomisation Using SPH	Dr. Ruud L.G.M. Eggels, Rolls-Royce Deutschland
T0520	Particle Transport in Compressor Casing Channels	Prof. Dr. Marius Swoboda, Rolls-Royce Deutschland
T0620	Constraint Effect in Component Design	Dr. Christian Amann, Siemens
T0719	Industrial Application of Usteady Fow Solvers	Stephan Behre, MTU Aero Engines
T0720	Squeeze Film Dampers II: Optimised Bearing Support	Thomas Klimpel, ABB Turbo Systems
T0818	Oil Supply Model for Axial Plain Bearings	Michael Bottenschein, Voith Hydro
T0819	Centrifugal Compressor in Flexible Operation	Dr. Matthias Schleer, Howden Turbo
T0820	Inverse Dynamic Analysis	Dr. Andreas Hartung, MTU Aero Engines
T0919	AI-based Material Data Analysis	Alexander Schult, Rolls-Royce Deutschland
T1119	Thermal TC Bearing Interaction	Uwe Tomm, BorgWarner Turbo Systems
T1219	Dynamic of Swirl and Jet Flames II II	Dr. Bruno Schuermans, GE Power
T1318	Extended Operation Range of YSZ	Dr. Arturo Flores Renteria, Siemens
T1419	Mixing Processes of Jet in Crossflow Configurations in Gas Turbine Combustors	Dr. Marco Konle, MTU Aero Engines
T1510	Plain bearing-Lubricant qualification	Cornelia Recker, Klüber Lubrication
T1519	Calculation Model for Wet Compression	Christoph Biela, Siemens
T1603	Qualification of lead-free multilayer plain bearings	Marc Witte, Rickmeier
T1618	Intelligent hybrid plain bearings	Sebastian Wolking, SAINT-GOBAIN
T1619	Correlation-Framework for NDE Data with Defects	Dr. Christian Amann, Siemens



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T1621	KI applications on plain bearing systems	Klaus Steff, Siemens Dr. Marc ter Beek, Siemens
T1629	Process media lubricated plain bearings	Dr. Christoph Weißbacher, GTW
T1818	Combined Dynamical Analyses (ComDynA): Analytics	Dr. Andreas Hartung, MTU Aero Engines
T1918	Combined Dynamical Analyses (ComDynA): Validation	Dr. Andreas Hartung, MTU Aero Engines
Ongoing projects		
1232	Secondary Flow Influence // FVV-EM // 01-10-2016 to 30-06-2021	Stephan Behre, MTU Aero Engines
1252	Failure Criteria for Plain Bearings II // DFG, FVV-EM // 01-12-2016 to 31-08-2020	Dr. Ümit Mermertas, Siemens
1259	Thick-walled Castings II // AVIF // 01-01-2017 to 31-12-2020	Dr. Martin Reigl, GE Power
1270	Self-excited Combustion Dynamics in Multiburner Systems (ROLEX) // FVV-EM // 01-05-2017 to 30-04-2021	Dr. Michael Huth, Siemens
1272	Structural Deformation with Fluid Film Bearings // BMWi/AiF // 01-04-2017 to 30-09-2020	Michael Bottenschein, Voith Hydro
1273	Radial Turbine Temperature Field II // BMWi/AiF // 01-04-2017 to 31-12-2020	Dr. Tom Heuer, BorgWarner
1279	Design and Implementation of the FVV Industrial Compressor // FVV-EM // 01-07-2017 to 30-09-2020	Dr. Matthias Schleer, Howden Turbo
1288	Lifing Methods, Multiaxial and Anisothermal (LEBEMAN) // BMWi/AiF // 01-09-2017 to 31-05-2021	Dr. Hartmut Schlums, Rolls-Royce Deutschland
1291	Squeeze Film Dampers – Elements of an Optimised Outer Bearing Support // BMWi/AiF // 01-09-2017 to 31-10-2020	Thomas Klimpel, ABB Turbo Systems
1299	Notch Support Cast Steel // AVIF // 01-01-2018 to 31-12-2020	Henning Almstedt, Siemens
1325	Crack Behaviour Multiaxial (ARIMA) // BMWi/AiF // 01-10-2018 to 31-03-2021	Dr. Andreas Fischersworing-Bunk, MTU Aero Engines
1326	Stress Relaxation Behaviour II // BMWi/AiF // 01-04-2018 to 31-03-2021	Dr. Martin Reigl, GE Power
1329	BHT-Threshold Calculation Methods // BMWi/AiF // 01-10-2018 to 31-03-2021	Frank Vöse, MTU Aero Engines
1330	Metal-graphite Composites for Plain Bearings (MeGraV) // BMWi/AiF // 01-09-2018 to 31-12-2020	Dan Roth-Fagaraseanu, Rolls-Royce Deutschland
1331	Aeroelastic Cascade DELTA // CORNET // 01-06-2018 to 31-01-2021	Dr. Sabine Schneider, Rolls-Royce Deutschland
1337	Circumferentially Inhomogeneous Centrifugal Compressor Flow // BMWi/AiF // 01-12-2018 to 31-05-2021	Dr. Thomas Hildebrandt, NUMECA
1345	Hot Gas Ingestion into Wheel Cavities in Gas Turbines – Test Turbine // FVV-EM // 01-02-2019 to 31-10-2021	Dr. Marco Konle, MTU Aero Engines

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1351	TMF Crack Path Calculation for Turbocharger Hot Parts // BMWi/AiF // 01-02-2019 to 31-01-2022	Dr. Andreas Koch, Rolls-Royce Solutions
1353	Wheel-space Sealing II// BMWi/AiF // 01-04-2019 to 30-09-2021	Dr. Karsten Kusterer, B&B-AGEMA
1354	Radial Compressor with Wide Operating Range // BMWi/AiF // 01-02-2019 to 31-07-2021	Dr. Matthias Schleer, Howden Turbo
1356	Tilting Pad Bearing Dynamics // BMWi/AiF, FVV-EM // 01-03-2019 to 31-08-2021	Klaus Steff, Siemens
1358	Dynamic of Swirl and Jet Flames // FVV-EM // 01-04-2019 to 31-03-2022	Lukasz Panek, Siemens
1360	Unsteady Tandem Flow // DFG, FVV-EM // 01-10-2019 to 30-09-2021	Dr. Henner Schrapp, Rolls-Royce Deutschland
1371	Robust Fracture Deformation Parameters // FVV-EM, AVIF // 01-07-2019 to 30-06-2022	Dr. Torsten-Ulf Kern, Siemens
1373	Dynamics of TC rotors with coupled bearings // BMWi/AiF // 01-10-2019 to 31-03-2022	Thomas Klimpel, ABB
1375	Brush Seals – Statistical Approach// FVV-EM // 01-12-2019 to 31-05-2022	Joris Versluis, MTU Aero Engines
1376	Rotordynamic Casing Models and Model Update // BMWi/AiF // 01-11-2019 to 30-04-2022	Dr. Joachim Schmied, Delta JS
1380	Probabilistic Lifetime Model Comparison – Creep-Fatigue // AVIF // 01-01-2020 to 31-12-2022	Henning Almstedt, Siemens
1383	Acoustic Emission into Discharge Pipes II // FVV-EM, DFG // 01-02-2020 to 31-07-2022	Dr. Irhad Buljina, MAN
1386	Turbo High Temperature Steel // BMWi/AiF // 01-02-2020 to 31-01-2023	Dr. Markus Dinkel, Schaeffler
1388	Blade Forces and System Damping // BMWi/AiF // 01-01-2020 to 30-06-2022	Dr. Thomas Hildebrandt, NUMECA
1389	Intentional Mistuning // BMWi/AiF // 01-01-2020 to 30-06-2022	Thomas Winter, PBS Turbo
1390	Aluminum High Temperature Fatigue // BMWi/AiF // 01-01-2020 to 30-06-2022	Dr. Reiner Böschen, Rolls-Royce Deutschland
1392	Material Applications FeAl (WAFEAL) // BMWi/AiF // 01-01-2020 to 31-12-2021	Dan Roth-Fagaraseanu, Rolls-Royce Deutschland
1397	Prediction of Gas Turbine Emissions // DFG, FVV-EM // 01-04-2020 to 31-03-2022	Dr. Ruud L.G.M. Eggels, Rolls-Royce Deutschland
1399	Validation TISG // FVV-EM // 01-04-2020 to 31-08-2020	Frank Vöse, MTU Aero Engines
1401	LPBF High-Temperature Lifetime// BMWi/AiF // 01-05-2020 to 30-04-2023	Dr. Roland Herzog, MAN
836 I	Alternative bearing metals for plain bearings // BMWi/AiF // 01-06-2018 to 30-11-2020	Martin Limmer, RENK
847 I	Micro-Structuring of plain bearing surfaces // BMWi/AiF // 01-11-2018 to 31-01-2021	Dr. Oliver Alber, MAN



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880 I	Material qualification // BMWi/AiF // 01-11-2019 to 30-04-2022	Martin Limmer, RENK
T0318	Robuste Bruchverformungskennwerte (3D-Messsystems) // FVV-EM // 01-07-2019 to 30-06-2022	Dr. Torsten-Ulf Kern, Siemens
Completed projects		
1217	Crack Behaviour of Welded Joints // AVIF // 01-01-2016 to 30-09-2019	Dr. Shilun Sheng, Siemens
1218	Thermally-induced Stress Gradients (TISG) // FVV-EM // 01-05-2016 to 30-04-2019	Dr. Kathrin Anita Fischer, Siemens
1238	Thermally influenced TC Bearing Friction // FVV-EM // 01-07-2016 to 30-06-2019	Uwe Tomm, BorgWarner Turbo Systems
1240	Wheel-space Sealing // BMWi/AiF // 01-10-2016 to 31-03-2019	Dr. Karsten Kusterer, B&B-AGEMA
1251	Simulation-Crack Behaviour-Coarse Grain // BMWi/AiF // 01-11-2016 to 31-10-2020	Markus Fried, MTU Aero Engines
1255	Brush Seals – Material Combinations // FVV-EM // 01-04-2017 to 30-04-2019	Joris Versluis, MTU Aero Engines
1258	Thermally Extended Rotordynamic of Turbochargers // BMWi/AiF // 01-01-2017 to 30-09-2019	Thomas Klimpel, ABB Turbo Systems
1261	Aerodynamics of Tandem Stators II // BMWi/AiF // 01-01-2017 to 30-06-2020	Dr. Henner Schrapp, Rolls-Royce
1267	Foil Bearings II // BMWi/AiF // 01-03-2017 to 31-08-2019	Dr. Joachim Schmied, Delta JS
1269	Mistuning with Aerodynamic Coupling II // DFG, FVV-EM // 01-07-2017 to 31-12-2019	Dr. Harald Schöenborn, MTU Aero Engines
1308	Bidirectional Aeromechanical Coupling // DFG, FVV-EM // 01-06-2018 to 31-05-2020	Dr. Andreas Hartung, MTU Aero Engines
1334	Model-based Rotor Monitoring (Literature Study) // FVV-EM // 01-10-2018 to 31-03-2019	Dr. Joachim Schmied, Delta JS
314 V	Damage Tolerance on Plain Bearings // BMWi/AiF // 01-10-2016 to 30-06-2019	Michael Lutz, MAN