Special Edition 38th MPA-Seminar October 1st and 2nd 2012

38th MPA SEMINAR

On October 1st and 2nd the 38th MPA Seminar took place. The predominant theme of the traditional event was „Power Generation and Energy Efficiency – Materials and Component Behaviour“.

More than 200 participants from 13 countries were welcomed by Professor Karl Maile and by Professor Harald Garrecht. The participants enjoyed making use of the opportunity of informing themselves about current problems and scientific findings from research and practice in the field of nuclear technology, alternative Power Generation, Sealing Technology and efficient steam power plants and also to maintain an exchange amongst themselves. 36 lectures and 14 posters delivered the technical background.

Further Photographs of the 38th MPA Seminar can be found under:  
http://seminar.mpa.uni-stuttgart.de

Contact:  
MPA Universität Stuttgart  
Prof. Dr.-Ing. Karl Maile  
Pfaffenwaldring 32  
70569 Stuttgart  
GERMANY  
Phone: +49 711 685-63059  
E-Mail: karl.maile@mpa.uni-stuttgart.de

Responsible for this newsletter is Prof. Dr.-Ing. Karl Maile
Lectures

The Seminar was divided in 4 sessions:

Nuclear Energy
The session was highlighted by contributions to the safety of operation of nuclear power plants after the Fukushima accident. On the basis of the specific Fukushima events possible measures to increase the basic safety and to decrease the probability of failures were discussed. Another focal point was the optimization and assurance of the safety and the structural integrity of German nuclear power plants on the basis of advanced methods and models describing the impact of fatigue load on the microstructure.

- Fukushima – A Challenge for Nuclear Research
- European Union Response to Fukushima – European Stress Test and Peer Review
- Burning Issue of Energy Problem after Fukushima Disaster of TEPCO’s Atomic Power Stations
- The Fukushima Accident
- Guarantee of Remaining Life Time – Integrity of Mechanical Components and Control of Ageing Phenomena
- Interim and Final Storage Cask
- Automatic Fatigue Monitoring based on Real Loads – Live Demonstration
- Thermal Fatigue: Fluid-Structure Interaction at Thermal Mixing Events
- Thermal Fatigue – Materials Modeling
- Microstructural Aspects of Crack Formation and Propagation in the Austenitic Steel X6CrNiNb18-10 under Low Cycle Fatigue Loading
- Fatigue Behavior and Crack Growth of Ferritic Steel under Environmental Conditions
- The Effect of Chloride on General Corrosion and Crack Initiation of Low-Alloy Steels in Oxygenated High-Temperature Water
- Research and Development in Welding and HardFacing towards Construction of Prototype Fast Breeder Reactor

Alternative Energy Generation
Hydro Power is considered to play an important role in the future energy supply mixture. Therefore results on R&D activities to improve efficiency and operational reliability were presented. With regard to maintenance and life assessments of renewable plants quality management strategies were presented:

- Guideline for the Design and Operation of High-Stress Components in Hydro Power Plants Part I: Recommendation for Design and Operation
- Guideline for the Design and Operation of High-Stress Components in Hydro Power Plants Part II: Example for Fatigue Analysis
- Life Time Analysis of Kaplan Runner Mechanism
- From conventional to renewable Power Plants – any Lesson to be learnt?
Sealing Technology
Sealing technology is an essential construction element: It guarantees the functioning of the plant as well as safety with regard to persons and environment. The observance of statutory sealing requirements is a technical challenge. The proof of blow-out safety serves this purpose. The latest results from research and practice were presented.

- GRP-Flanges for Bolted Flange Joints – an efficient Alternative to Steal Flanges
- Numeric Approach to characterize Leakage of Bolted Flange Connections
- Blow-out of a “blow-out safe” Kammprofile Type Gasket - a Failure Analysis
- Blow-out Safety of Stuffing Box Sealings in Valves
- A new Path in the Calculation of Bolted Flanged Joints

Power Plants
After the energy transition with the increasing and volatile supply of wind and solar electricity, new load profiles for existing and future conventional steam power plants are coming into use. Their essential task is to ensure the availability of power combined with other energy sources in case there should be adverse weather conditions and the supply of alternative power sources is not sufficient. The increase in efficiency is not only sensible from an economic point of view but also from an environmental aspect. This combines a variety of issues on the use of new or improved materials, quality-oriented manufacturing and processing, the impact of the change in operational demands of flexible operating methods which will be necessary in the future. In the session papers describing the progress in material development but also discussing actual quality problems with crack formation in welds of tubes have been presented. An outlook on how to optimize the design of components exposed to an increased fraction of fatigue due to the above-mentioned change in the load profile was given. Long-term prospects for the future of high efficient 700°C coal-fired power plants were delineated.

- Effect of Boron on Long-term Stability of 9Cr Steel for 650°C Boilers
- Creep Degradation in Welds of Creep Strength Enhanced Ferritic Steels
- Creep Deformation and Rupture Strength Property of ASME Grades T/P92 Steels
- Characterization and Weldability of a new SS304HCu Superheater Tube Material for 600°C USC Power Plants
- Demands on Materials and Components for existing and new Power Plants
- Latest Developments for the Flexible High Efficient Power Plant of the Future
- Development and Consolidation in Material Engineering Know-How for Pressure Parts of Fossil-Fired Power Plants – A new Version of the VGB-R 109
- High-Temperature-Materials-Test-Rig: Materials for Future High Efficient Power Plants
- Development of a heat resistant GJS-nodular Cast Iron Alloy for thick walled Components at Operating Temperatures ≥ 500°C
- More than two Years of Experience with the Operation of the HP-Control Valve Type SIRA made out of Alloy 617 at Steam Temperatures up to 725°C
- Creep Behavior and Microstructural Characterization of Alloy 617 and Dissimilar Joints
- Materials Science Based Investigations on T24 Weldments
- T24 – Investigation Program and derived Measures
Proceedings
The conference proceedings to the 38th MPA Seminar with abstracts and a manuscript CD can be purchased at a price of 40,-€. You can place your order on mpa-seminar@mpa.uni-stuttgart.de

DVD Box MPA Seminar 1975-2012
At the same e-mail address you can also order a DVD-Box with the manuscripts of the lectures (pdf files) from the 1st seminar in 1975 up to and including the 38th MPA Seminar 2012 at a price of 50,-€.

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MPA Seminar 2013
The 39th MPA Seminar will take place on October 8th and 9th 2013 at the Hotel Le Méridien Stuttgart.

If you want to register for news concerning the MPA-Seminar please contact Ms. Martens: sabine.martens@mpa.uni-stuttgart.de

We are looking forward to welcoming you in Stuttgart next year