LIST OF PRESENTATIONS

Papers are numbered as follows: first two digits: section number, third and fourth digits: sequential number

SECTION 1 - ADVANCED GAS TURBINE MATERIALS

Invited Papers – 1.0. Oral Presentations

THE MECHANICAL BEHAVIOUR OF A CLASS OF Rhenium Based SX SUPERALLOYS FOR INDUSTRIAL GAS TURBINE APPLICATIONS
Toulios M., Allen D.H.

CONSTITUTIVE MATERIAL FORMULATIONS AND ADVANCED LIFE ASSESSMENT METHODS FOR SINGLE CRYSTAL GAS TURBINE BLADES
Busso E.P., Toulios M., Cailletaud G.

GAMMA TiAl INTERMETALLICS FOR TURBOMACHINERY APPLICATIONS
Nazmy M., Lupine V.

ADVANCES IN COATING SYSTEMS FOR UTILITY GAS TURBINES
Nicholls J.R., Wing R.

ENVIRONMENTAL DEGRADATION OF GAS TURBINE COATINGS: TOWARDS STANDARDISED TESTING AND DATABASES
Simms N.J., Bale D.W., Baxter D., Oakey J.E.

WROUGHT Ni-BASE ALLOYS FOR ADVANCED GAS TURBINE DISC AND USC STEAM TURBINE ROTOR APPLICATIONS
Rösler J., Böttger B., Wolske M., Penkalla H.J., Berger C.

NEW MATERIALS AND COOLING SYSTEMS FOR HIGH TEMPERATURE, HIGHLY LOADED COMPONENTS IN ADVANCED COMBINED CYCLE POWER PLANTS
Bohn D.E.

OVERVIEW OF US-DOE PROGRAM IN HIGH EFFICIENCY ENGINES AND TURBINES
Layne A.W.

Poster Presentations

1.1. Single Crystal

THE CREEP BEHAVIOUR OF AS-CAST SX CM186LC AT INDUSTRIAL GAS TURBINE OPERATING CONDITIONS
Wilcock I.M., Lukas P., Maldini M., Klabbers J., Dubiel B., Henderson M.B.
THE LOW CYCLE FATIGUE BEHAVIOUR OF AS CAST SINGLE CRYSTAL CM186LC  

CREEP BEHAVIOUR OF THE THIRD GENERATION NI-BASE SINGLE CRYSTAL  
SUPERALLOY TMS-75 AND ITS γγ' TIE-LINE ALLOYS  
Murakumo T., Kobayashi T., Nakazawa S., Harada H.

CREEP BEHAVIOUR AND γ' EVOLUTION OF A NEW NICKEL BASE SUPERALLOY FOR SINGLE CRYSTAL BLADE APPLICATIONS  
Maldini M., Lupinc V., Li H., Angella G.

CREEP OF [001]-ORIENTED Ni-20 MASS %Cr SINGLE CRYSTALS  
Terada Y., Nakamoto Y., Matsuo T.

CHARACTERIZATION OF THE PROPAGATION BEHAVIOR OF SHORT FATIGUE CRACKS IN NICKEL-BASED SINGLE CRYSTAL SUPERALLOY SC16  
Zhang X.P., Wang C.H., Chen W.Y., Ye L., Mai Y.-W.

EFFECT OF γ' VOLUME FRACTION ON THIRD-GENERATION SINGLE-CRYSTAL SUPERALLOYS  
Zhou H., Harada H., Ro Y., Koizumi Y., Kobayashi T., Nakazawa S.

ON THE EFFECT OF RENIUM ON THE EXTENT OF PRIMARY CREEP IN ADVANCED NI-BASED SUPERALLOYS  
Rae C.M.F., Kakehi K., Reed R.C.

INVESTIGATION OF POROSITY IN SINGLE-CRYSTAL NICKEL-BASE SUPERALLOYS  
Epishin A., Link T., Brückner U., Portella P.D.

INVESTIGATION AND COMPARISON OF THE MICROSTRUCTURE OF THE NICKEL-BASE SUPERALLOYS CMSX-4 AND SX CM186LC  
Danciu D., Klabbers J., Penkalla H.J.

DISLOCATION MICROSTRUCTURE OF CMSX-4 AFTER TENSILE TESTING WITH DIFFERENT STRAIN RATES AT 700 AND 1000°C  
Danciu D., Penkalla H.J., Schubert F.

MORPHOLOGICAL CHANGE IN γ PHASE IN DIFFERENT PORTIONS OF FIRST STAGE HIGH PRESSURE TURBINE BLADE OF PWA1480  
Miura N., Harada N., Kondo Y., Matsuo T.

METALLURGICAL ANALYSIS OF IN SERVICE CMSX-2 SINGLE CRYSTAL GAS TURBINE BUCKETS  
Yoshioka Y., Saito D., Ito S., Fukuyama Y.

CARBIDE PRECIPITATION IN SINGLE CRYSTAL Ni-BASE SUPERALLOYS  
Tin S., Pollock T.M.
MODELLING OF HIGH TEMPERATURE TMF TESTS OF SINGLE CRYSTALS BY A PURE CREEP LAW
White P.S., Kong C.N.

A MULTISCALE CONSTITUTIVE APPROACH TO MODEL THE MECHANICAL BEHAVIOUR OF INHOMOGENEOUS SINGLE CRYSTAL SUPERALLOYS: APPLICATION TO AS-CAST SX CM186LC
Regino G.M., Busso E.P., O'Dowd N.P., Allen D.

DEFORMATION MODELLING OF THE SINGLE CRYSTAL SUPERALLOY CM186LC
Daniel R., Tinga T., Henderson M.B., Ward T.J.

TMS-82+: A HIGH STRENGTH Ni-BASE SINGLE CRYSTAL SUPERALLOY
Hino T., Yoshioka Y., Koizumi Y., Kobayashi T., Harada H.

Poster Presentations

1.2. Ni-Base Superalloys

MICROSTRUCTURE OF A 5-COMPONENT Ni-BASE MODEL ALLOY: EXPERIMENTS AND SIMULATION
Warnken N., Böttger B., Ma D., Vitusevych V., Hecht U., Fries S.G., Dupin N.

ALLOY DESIGN FOR ULTRA HIGH TEMPERATURE STEAM TURBINE APPLICATIONS: SIMULATION OF MICROSTRUCTURE DURING FORGING
Kopp R., Wolske M.

MICROSTRUCTURE AND STRUCTURAL STABILITY OF CANDIDATE MATERIALS FOR TURBINE DISC APPLICATIONS BEYOND 700°C
Penkalla H.J., Wosik J., Schubert F.

MATERIAL DEGRADATION AND DAMAGE ASSESSMENT FOR GAS TURBINEcombustion Components
Saito D., Yoshioka Y., Fujiyama K.

EFFECT OF SOLUTION HEAT TREATMENT ON THE HOT CORROSION RESISTANCE OF A SECOND GENERATION DS SUPERALLOY
Tamaki H., Okayama A., Onay B., Yoshinari A.

CREEP PROPERTIES DEGRADATION IN A LONG-TIME THERMALLY EXPOSED NICKEL BASE SUPERALLOY
Zrnik J., Strunz P., Vrchohnsky V., Hornak P., Wiedenmann A.

EFFECT OF TENSILE HOLDS ON THE DEFORMATION BEHAVIOUR OF A NICKEL BASE SUPERALLOY SUBJECTED TO LOW CYCLE FATIGUE
Zrnik J., Semenak J., Wangyao P., Vrchohnsky V., Hornak P.
IN-SITU OBSERVATIONS OF THE DEFORMATION AND DAMAGE BEHAVIOUR AROUND LASER-DRILLED COOLING HOLES IN INCONEL ALLOY 617 USING THE SCANNING ELECTRON MICROSCOPE
Klabbers J., Wessel E., Schubert F.

DESIGN OF NI-BASE DS SUPERALLOYS FOR INDUSTRIAL GAS TURBINES
Sato M., Koizumi Y., Kobayashi T., Karada H., Ono H.

THE INVESTIGATIONS OF DEFORMABILITY AND STRUCTURE OF A-286 ALLOY AT HIGH TEMPERATURE DEFORMATION
Ducki K.J., Hetmanczyk M., Kuc D.

MODELLING THE CREEP BEHAVIOUR OF A WROUGHT NICKEL BASE SUPERALLOY IN A WIDE RANGE OF STRESS/TEMPERATURE CONDITIONS
Maldini M., Lupine V.

CREEP BEHAVIOUR OF A POWDER METALLURGY UDIMET 720 NICKEL-BASED SUPERALLOY
Dubiez S., Couturier R., Guétaz L., Burlet H.

**Poster Presentations**

1.3. Coatings

**MCrAIY COATING BY AN ELECTROCHEMICAL ROUTE**
Bacos M.-P., Girard B., Josso P., Rio C.

**EVALUATION OF THERMOMECHANICAL FATIGUE RESISTANCE OF COATED SUPERALLOYS BY A LASER THERMAL SHOCK SYSTEM**
Meriggi M., Rinaldi C.

**THERMOPHYSICAL AND MICROSTRUCTURAL CHARACTERISATION OF MODIFIED THICK YTTRIA STABILISED ZIRCONIA THERMAL BARRIER COATINGS**
Bianchi P., Cernuschi F., Lorenzoni L., Ahmaniemi S., Vippola M., Vuoristo P., Mäntylä T.

**ADVANCED NITRIDE COATINGS FOR OXIDATION PROTECTION OF TITANIUM ALLOYS**
Leyens C., Hovsepian P.Eh., Münz W.-D., Peters M., Lewis D.B., Luo Q.

**HIGH TEMPERATURE NANOLAMINATE CERAMIC COATINGS PREPARED BY PVD TECHNIQUES**
Teixeira V., Monteiro A., Portinha A., Vaßen R., Stöver D.

**CYCLIC LIFETIME OF PYSZ AND CESZ EB-PVD TBC SYSTEMS ON VARIOUS NI-SUPERALLOY SUBSTRATES**
Schulz U., Fritscher K., Kaysser W.A.
CHARACTERISATION OF SIX OVERLAY COATINGS
Giannozzi M., Giorni E., Merluzzi M., Pratesi F., Zonfrillo G.

SINGLE CRYSTAL COATING OF SX TURBINE BLADES BY A LASER CLADDING TECHNIQUE
Bezençon C., Wagnière J.-D., Höbel M., Schnell A., Konter M., Kurz W.

COMPARISON OF THERMAL CYCLING LIFE OF YSZ AND LA2Zr2O7-BASED THERMAL BARRIER COATINGS
Vaßen R., Barbezat G., Stöver D.

DEPOSITION OF ALUMINIUM + YTTRIUM ON THE INTERNAL SURFACES OF COMPLEX COOLED INDUSTRIAL TURBINE BLADES

CHARACTERIZATION OF THE BOND-COAT MATERIALS FOR THE SUPER HIGH EFFICIENCY GAS TURBINES
Suzuki A., Wu F., Murakami H., Imai H.

ELASTIC BEHAVIOUR OF PLASMA SPRAYED THERMAL BARRIER COATINGS
Steinbrech R.W., Frahm J., Herzog R., Schubert F.

DEFORMATION BEHAVIOUR OF A LOW PRESSURE PLASMA SPRAYED NiCoCrAlY BOND COAT UNDER SHEAR LOADING AT TEMPERATURES ABOVE 750°C
Majerus P., Steinbrech R.W., Herzog R., Schubert F.

VISCO-PLASTIC PROPERTIES OF SEPARATED THERMAL BARRIER COATINGS UNDER COMPRESSION LOADING
Heckmann S., Herzog R., Steinbrech R.W., Schubert F., Singheiser L.

STRUCTURE IN THE SURFACE LAYER OF COATED Ni-BASED SUPERALLOYS DURING ANNEALING IN OXYDATION ENVIRONMENT
Svejcar J., Jiríkovský K., Krejčí J.

MEASUREMENT OF THE DUCTILE BRITTLE TRANSITION TEMPERATURE AND THERMAL MECHANICAL FATIGUE RESISTANCE OF COATINGS USED IN GAS TURBINE ENGINES
Saunders S.R.J., Banks J.P.

DEGRADATION OF EB-PVD THERMAL BARRIER COATINGS DURING THERMAL CYCLING
Sun X.F., Li M.H., Zhang Z.Y., Guan H.R.
Poster Presentations

1.4. Intermetallics

MICROSTRUCTURE AND TENSILE CREEP BEHAVIOR OF MULTIPHASE NiAl EUTECTIC ALLOYS MODIFIED WITH Zr OR Hf
Guo J.T., Qi Y.H., Cui C.Y., Li G.S.

CREEP STRENGTH AND MICROSTRUCTURE OF Ti-46Al-2W-0.5Si BASE ALLOYS
Dlouhy A., Arrell D., Karlsson B., Lapin J., Lupinc V., Nazmy M., Nikbin K., Staubli M.

HIGH TEMPERATURE DEFORMATION OF THE Fe28Al3Cr IRON ALUMINIDE MODIFIED WITH ADDITIVES
Haki J., Vlasák T., Kratochvil P.

MICROSTRUCTURE AND CREEP OF γ-TIAL BASED INTERMETALLIC ALLOY
Lapin J., Pelachová T.

HIGH CYCLE FATIGUE BEHAVIOUR OF INTERMETALLIC γ-TIAL BASED ALLOYS
Koolloos M.F.J., Arrell D.J., Henderson M.B., Gallet S.

Ti2AlNb-BASED TITANIUM INTERMETALLIC ALLOYS FOR HIGH TEMPERATURE APPLICATIONS
Hagiwara M., Emura S., Tang F.

MANUFACTURING AND TESTING OF A NOVEL ADVANCED NiAl-BASE ALLOY FOR GAS TURBINE APPLICATIONS
Palm M., Sauthoff G.

HIGH-RATE SPUTTER DEPOSITION OF NiAl ON SAPPHIRE FIBERS
Reichert K., Martinez C., Cremer R., Neuschultz D.

INTERFACIAL THERMAL STABILITY IN BN-COATED CONTINOUS Al2O3 FIBER REINFORCED NiAl COMPOSITES
Wen K.Y., Reichert K., Hu W., Frommert M., Gottstein G.

MECHANICAL PROPERTIES AND OXIDATION BEHAVIOUR OF A CAST TiAI INTERMETALLIC

COATING OF Ni-ALUMINIDES ON TiAl INTERMETALLICS THROUGH UP-HILL DIFFUSION
Izumi T., Nishimoto T., Narita T.

INFLUENCE OF MICROSTRUCTURAL EVOLUTION ON HARDNESS OF A γ TiAl INTERMETALLIC CONTAINING W AND Si
Munoz-Morris M.A., Gil I., Morris D.G.
STRENGTHENING MECHANISMS IN DUCTILE FeAl INTERMETALLIC PROCESSED BY MECHANICAL ALLOYING
Morris D.G., Garcia Oca C., Munoz-Morris M.A.

Poster Presentations

1.5. Miscellaneous Topics

EXTRAPOLATION OF LIMITED CREEP DATA BY PARALLEL FITTING WITH DATA FOR SIMILAR MATERIALS
White P.S.

DEVELOPMENT OF A VIRTUAL TURBINE SYSTEM FOR NEW MATERIALS DESIGN
Saeki H., Fukuyama Y., Yokokawa T., Odaka T., Yoshida T., Harada H.

DRILLING OF COOLING HOLES AND SHAPING OF BLOW-OUT FACILITIES IN TURBINE BLADES BY LASER RADIATION
Willach J., Horn A., Kreutz E.W.

REPAIR AND (RE)CONDITIONING OF COMPRESSOR AND TURBINE BLADES BY CO$_2$ AND Nd: YAG LASER RADIATION
Kelbassa L., Gasser A., Backes G., Keutgen S., Kreutz E.W., Pirch N.

HIGH TEMPERATURE REACTOR (HTR) MATERIALS
Buckthorpe D., Couturier, Van der Schaaf B., Riou B., Rantala H., Moormann R., Buenaventura A., Friedrich B-C.

PROPERTIES OF OXIDE/OXIDE CMCs FOR HIGH TEMPERATURE APPLICATIONS IN GAS TURBINES
Innocenti M., Del Puglia P., Pappas Y.Z., Dassios C.G., Steen M., Kostopoulos V., Vlachos D.

SECTION 2 - FUEL ISSUES AND NOVEL COMPONENTS

Invited Papers - 2.0. Oral Presentations

IN-SITU FIRESIDE CORROSION TESTING OF ADVANCED BOILER MATERIALS WITH DIVERSE FUELS
Henderson P.J., Karlsson A., Davis C., Rademaker P., Cizner J., Formanek B., Goransson K., Oakey J.

DEGRADATION OF BOILER AND HEAT EXCHANGER MATERIALS: DATA GENERATION, DATABASES AND PREDICTIVE MODELLING
Saunders S.R.J., Simms N.J., Osgerby S., Oakey J.E.

COMPLEX FIRESIDE CORROSION MECHANISM IN BOILERS USING STAGED COMBUSTION SYSTEMS
Bakker W., Kung S., Blough J., Seitz W.
Fabrication of a Gas Turbine Combustion Hardware in ODS Ferritic Materials 2004
McColvin G., Munasinghe D., O’Driscoll J., Jacobs M.

Mao C., Scarpellini R., Valarani M.

Electrical Swing Adsorption for CO₂ Separation and Capture 2006
Judkins R.R.

**Poster Presentations**

2.1. Hot Gas Corrosion

High Temperature Corrosion in Gas Turbines: Fuel Model and Experimental Results 2010
Bordenet B., Boßmann H.P.

Henderson P.J., Högborg J., Mattsson M.

Effect of Fuel Type on the Fireside Corrosion of Boiler Materials for Advanced Clean Coal Technologies 2013
Pinder L.W., Davis C.J.

Fate of Trace Contaminants from Biomass Fuels in Gasification Systems 2014
Kilgallon P., Simms N.J., Oakey J.E.

Materials for Gasifier Heat Exchangers 2015
Kilgallon P., Simms N.J., Norton J.F., Oakey J.E.

Simms N.J., Encinas-Oropesa A., Kilgallon P., Oakey J.E.

Low Cycle Fatigue in Aggressive Environments – A New Testing Method Using Controlled Atmospheres 2017
Andersson H.C.M., Lindblom J.

Chlorine Corrosion of Thermally Sprayed Coatings at Elevated Temperatures 2018
Uusitalo M.A., Vuoristo P.M.J., Mäntylä T.A.

High Temperature Corrosion in Straw Fired Power Plants: Influence of Steam/Metal Temperature on Corrosion Rates for TP347H 2019
Montgomery M., Biede O., Hede Larsen O.
**Poster Presentations**

### 2.2. Miscellaneous Topics

**EROSION CORROSION OF STEEL TUBES IN THE LOOP SEAL OF A BIOFUEL FIRED CFB PLANT**
Nafari A., Nylund A.

**PERFORMANCE OF EROSION CORROSION RESISTANT COATINGS IN DIFFERENT COMBUSTION ENVIRONMENTS**
Hjörnhede A., Nylund A.

**HAFNON – A POTENTIAL CERAMIC MATERIAL FOR LIQUID SLAG REMOVAL IN PRESSURIZED PULVERIZED COAL COMBUSTION?**
Müller M., Hilpert K., Singheiser L.

**HEAT RESISTANT SILICON NITRIDE CERAMICS WITH RARE-EARTH SILICON OXYNITRIDE**
Nishimura T., Guo S., Hirosaki N., Yamamoto Y., Mitomo M.

---

**SECTION 3 – ADVANCED STEAM POWER PLANT**

**Invited Papers – 3.0. Oral Presentations**

**BENEFIT OF ADVANCED STEAM POWER PLANTS**
Blum R., Hald J.

**DESIGN AND MATERIALS FOR TURBOSETS IN ADVANCED STEAM POWER PLANTS**
Wieghardt K., Kern T.-U.

**BOILER DESIGN AND MATERIALS ASPECTS FOR ADVANCED STEAM POWER PLANTS**
Chen Q., Scheffknecht G.

**ALLOY DESIGN AND MICROSTRUCTURAL CONTROL FOR IMPROVED 9-12% Cr POWER PLANT STEELS**
Vanstone R.W.

**THE EUROPEAN EFFORT IN DEVELOPMENT OF NEW HIGH TEMPERATURE ROTOR MATERIALS UP TO 650°C – COST 522**
Kern T.-U., Staubli M., Mayer K.H., Escher K., Zeiler G.

**DEVELOPMENT OF CREEP RESISTANT CAST STEELS WITHIN THE EUROPEAN COLLABORATION IN ADVANCED STEAM TURBINE MATERIALS FOR ULTRA EFFICIENT, LOW EMISSION STEAM POWER PLANT / COST 501-522**
WELDABILITY AND WELD PROPERTIES FOR ADVANCED POWER PLANT MATERIALS
Cerjak H., Letofsky E., Jochum C., Nies H.

NEW BOILER MATERIALS FOR ADVANCED STEAM CONDITIONS
Scarlin B., Stamatelopoulos G.N.

MATERIALS FOR ULTRA-SUPERCritical COAL-FIRED POWER PLANT BOILERS
Viswanathan R., Purgert R., Rao U.

THE STEAM OXIDATION RESISTANCE OF 9-12% CHROMIUM STEELS
Ennis P.J., Quadakkers W.J.

COATINGS FOR STEAM POWER PLANTS UNDER ADVANCED CONDITIONS
Aglero A., Muelas R., Scarlin B., Knoedler R.

Poster Presentations

3.1. Microstructure

MARTENSITIC/FERRITIC SUPER HEAT-RESISTANT 650°C STEELS - MICROSTRUCTURE
Agamennone R., Blum W.

PRECIPITATION OF Z-PHASE AND DEGRADATION BEHAVIOUR OF MOD.9Cr-1Mo STEEL
Kimura K., Suzuki K., Toda Y., Kushima H., Abe F.

DISTRIBUTION OF MX CARBONITRIDES AND ITS EFFECT ON CREEP DEFORMATION IN 9Cr-0.5Mo-1.8W-VNb STEEL
Sawada K., Kubo K., Hara T., Abe F.

THE EFFECT OF MICROSTRUCTURAL STABILITY ON LONG-TERM CREEP BEHAVIOUR OF 9-12%Cr STEELS
Sklenicka V., Kucharova K., Kloc L., Svoboda M., Staubli M.

SYSTEM FREE ENERGY APPROACH TO THE PRECIPITATION OF THE LAVES PHASE IN Fe-Cr-W-C QUATERNARY STEELS
Murata Y., Koyama T., Morinaga M., Hashizume R., Miyazaki T., Doi M.

MICROSTRUCTURAL PHYSICALLY BASED CREEP MODELLING ON 9-12 % Cr STEELS
Weinert P.

Z PHASE CHARACTERISTICS IN MARTENSITIC 12CrMoVNb STEELS
Vodarek V., Strang A.
MICROSTRUCTURAL ISSUES IN THE DESIGN OF AUSTENITIC AND NICKEL BASED MATERIALS FOR SUPERHEATER SYSTEMS IN 700°C STEAM PLANT
Starr F., Shibli A.

PRECIPITATION OF INTERMETALLIC PHASES DURING MARTENSITE AGING IN STEELS CONTAINING 10% Cr
Pigrova G.D.

A NEW MODELLING APPROACH TO MICROSTRUCTURAL EVOLUTION IN FERRITIC STEELS
Yin Y.F., Faulkner R.G.

Poster Presentations

3.2. Alloy Development

EVALUATION OF A NEW 11 % Cr STEEL FOR STEAM CHESTS
Bates P., Vanstone R.W., Osgerby S., Mulvihill P.

DEVELOPMENT OF HIGH WCoB-CONTAINING 12Cr ROTOR STEELS FOR USE AT 650°C IN USC POWER PLANTS
Arai M., Doi H., Fukui Y., Azuma T., Fujita T.

MARTENSITIC/FERRITIC SUPER HEAT-RESISTANT 650°C STEELS

MARTENSITIC/FERRITIC SUPER HEAT-RESISTANT 650°C STEELS – DESIGN OF MODEL ALLOYS
Knezevic V., Sauthoff G.

MARTENSITIC/FERRITIC SUPER HEAT-RESISTANT 650°C STEELS – THERMODYNAMICS AND KINETICS OF PRECIPITATION REACTIONS
Vilk J., Schneider A., Inden G.

IMPROVEMENT OF CREEP RUPTURE STRENGTH OF HIGH STRENGTH 12Cr FERRITIC HEAT-RESISTANT STEEL
Uehara T., Toji A., Komatsubara S., Fujita T.

DEVELOPMENT OF A NEW 18Cr-9Ni AUSTENITIC STAINLESS STEEL BOILER TUBE
Ishitsuka T., Mimura H.

ALLOY DESIGN FOR ULTRA-HIGH TEMPERATURE STEAM TURBINE APPLICATIONS: PHASE FIELD SIMULATION OF THE REMELTING PROCESS
Böttger B., Steinbach L., Fries S.G., Chen Q., Sundman B.

WORKABILITY AND DEVELOPMENT OF T/P23 (2.25 % Cr-1.6W-Nb-V STEEL) FOR FOSSIL BOILER AND COMBINED CYCLE APPLICATIONS
Gabrel J., Lefebvre Bo., Vaillant J.C., Vandenberghe B.
NEW WROUGHT Ni-BASED SUPERALLOYS WITH LOW THERMAL EXPANSION FOR 700°C STEAM TURBINES
Yamamoto R., Kadoya Y., Kawai H., Magoshi R., Noda T., Hamano S., Ueta S., Isobe S.

DEVELOPMENT OF A NEW 12% Cr-STEEL FOR TUBES AND PIPES IN POWER PLANTS WITH STEAM TEMPERATURES UP TO 650°C
Bendick W., Gabrel J., Vaillant J.-C., Vandenberghhe B.

HIGH PERFORMANCE LOW ALLOY STEEL CASTING FOR STEAM TURBINE
Ishii R., Tsuda Y., Yamada M., Ikeda K., Kaneko J.

DEVELOPMENT OF HIGH STRENGTH 9Cr STEEL BY COMBINATION OF FINE MX-TYPE NITRIDES AND NO CARBIDE
Taneike M., Sawada K., Abe F.

DEVELOPMENT STEPS OF NEW STEELS FOR ADVANCED STEAM POWER PLANTS
Mayer K.H., Blum R., Hillenbrand P., Kern T.-U., Staubli M.

GUIDING PRINCIPLES FOR DEVELOPMENT OF ADVANCED FERRITIC STEELS FOR 650°C USC BOILERS
Abe F., Okada H., Wanikawa S., Tabuchi M., Itagaki T., Kimura K., Yamaguchi K., Igarashi M.

Poster Presentations

3.3. Mechanical Properties

LONG TERM CREEP AND CREEP FATIGUE PROPERTIES OF THE MARTENSITIC STEELS OF TYPE (G)X12CrMoWVNbN10-1-1
Schwienheer M., Haase H., Scholz A., Berger C.

TWO SPECIMEN COMPLEX THERMAL-MECHANICAL FATIGUE TESTS ON THE AUSTENITIC STAINLESS STEEL AISI 316 L
Rau K., Beck T., Löbe D.

CREEP PROPERTIES OF AUSTENITIC STAINLESS 353 MA AT 1100°C AND 1200°C
Wu R., Seitisleam F., Sandström R.

PROPERTIES AND EXPERIENCES WITH A NEW AUSTENITIC STAINLESS STEEL (TEMPALOY AA-1) FOR BOILER TUBE APPLICATION
Minami Y., Tohyama A., Hayakawa H.

IMPROVEMENTS IN THE SHORT TERM CREEP STRENGTH OF AISI 304L BY MEANS OF GRAIN BOUNDARY DESIGN AND CONTROL
Spigarelli S., Cabibbo M., Evangelista E., Palumbo G.
MICROSTRUCTURAL FEATURES INFLUENCING THE CREEP PROPERTIES OF 9-12 % Cr-STEELS FOCUSING ON LAEVES-PHASE PRECIPITATION
Stocker Ch., Spiradek K., Zeiler G.

CREEP PROPERTIES OF PRECIPITATION STRENGTHENED CARBON FREE MARTENSITIC ALLOYS
Muneki S., Okubo H., Okada H., Yamada K., Igarashi M., Abe F.

MICROSTRUCTURE AND PROPERTIES OF MODIFIED 3% Cr STEELS

AN ASSESSMENT OF CREEP RUPTURE DATA ON STEEL E911
Allen D.J., Servetto C.

EFFECT OF Cr CONTENT ON THE CREEP STRENGTH AND MICROSTRUCTURAL CHANGE IN HIGH Cr HEAT RESISTANT STEEL
Miki K., Azuma T., Ishiguro T., Hashizume R., Murata Y., Morinaga M.

THE EFFECT OF THE ELEMENT CARBON ON THE TOUGHNESS AND THE CREEP RUPTURE STRENGTH IN 12Cr HEAT RESISTANT STEELS

STRAIN RANGE PARTITIONING ANALYSIS FOR CREEP-FATIGUE LIFE OF FERRITIC HEAT-RESISTING MATERIALS
Kimura M., Kobayashi K., Yamaguchi K.

HIGH TEMPERATURE CREEP BEHAVIOUR AND MICROSTRUCTURAL CHANGES OF TAF 650 STEEL
Svoboda M., Bursik J., Podstranska I., Kroupa A., Sklenicka V., Mayer K.-H.

STRESS CHANGE EXPERIMENTS IN LOW STRESS CREEP REGIME OF P-91 TYPE STEEL
Kloc L., Sklenicka V.

INVESTIGATIONS AND ANALYSIS ON THE STATIONARY CREEP BEHAVIOUR OF 9-12 % CHROMIUM FERRITIC MARTENSITIC STEELS
Dimmler G., Weinert P., Cerjak H.

ALLOY DESIGN FOR ULTRA HIGH TEMPERATURE STEAM TURBINE APPLICATIONS: CREEP BEHAVIOUR AND MODELLING OF CREEP
Thoma A., Scholz A., Berger C.

EFFECT OF ALLOYING ELEMENTS ON CREEP PROPERTIES OF Pd ADDED 9Cr FERRITIC STEELS
Okada H., Muneki S., Yamada K., Okubo H., Igarashi M., Abe F.

IMPROVEMENT OF CREEP STRENGTH OF PRECIPITATION STRENGTHENED 15Cr HEAT RESISTANT FERRITIC STEELS
Toda Y., Tohyama H., Kushima H., Kimura K., Abe F.
LONG-TERM CREEP STRENGTH PREDICTION OF HIGH Cr FERRITIC CREEP RESISTANT STEELS 3319
Kushima H., Kimura K., Abe F.

EVALUATION OF CREEP PROPERTIES AND MICROSTRUCTURES ON THERMO-MECHANICAL AND MAGNETIC TREATED 9Cr FERRITIC STEELS 3320
Okubo H., Muneki S., Okada H., Yamada K., Igarashi M., Abe F.

Poster Presentations

3.4. Steam Oxidation and Coatings

OXIDATION OF ADVANCED FERRITIC/MARTENSITIC STEELS AND OF COATINGS 3401
IN FLOWING STEAM AT 650°C
Knödler R., Scarlin B.

STEAM OXIDATION OF 9-12Cr MARTENSITIC STEELS: CHARACTERISATION AND MODELLING THE SPALLING OF OXIDE SCALE 3402
Osgerby S., McCartney L.N.

MECHANICAL AND OXIDATION TESTING OF ADVANCED MATERIALS FOR STEAM POWER PLANTS 3403
Bontempi P., Guardamagna C., Ricci N., Torri L.

IMPROVEMENT OF STEAM OXIDATION RESISTANCE FOR FERRITIC HEAT RESISTANT STEELS 3404
Kutsumi H., Itagaki T., Abe F.

STEAM OXIDATION OF HIGH CHROMIUM FERRITIC STEELS CONTAINING PALLADIUM 3405
Itagaki T., Kutsumi H., Igarashi M., Abe F.

Poster Presentations

3.5. Welding

DESCRIPTION OF THE MATERIAL BEHAVIOUR IN GIRTH WELDS DURING WELD FABRICATION AND FOR HIGH TEMPERATURE SERVICE 3501
Mohrmann R.

AN ASSESSMENT OF CREEP RUPTURE DATA ON E911 STEEL WELDMETS 3502
Servetto C., Allen D.J.

CHARACTERIZATION OF MATCHING FILLER METALS FOR NEW FERRITIC-BAINITIC STEELS LIKE T/P23 AND T/P24 3503
Heuser H., Jochum C.

EVALUATION OF THE WELDED JOINTS IN P92 AND P122 PIPE STEELS 3504
Ryu S.H., Lee K.W., Chi B.H., Lee S.Y., Kong B.O., Park S.H., Nam S.W., Lim B.S., Kim B.J.
CREEP STRENGTH AND MICROSTRUCTURES FOR HAZ OF WELDMENTS OF HIGH Cr FERRITIC STEELS
Matsui M., Tabuchi M., Watanabe T., Kubo K., Abe F.

RESEARCH AND DEVELOPMENT OF NEW MARTENSITIC STEELS
Artinger A., Rozsavolgyi Z.

**Poster Presentations**

**3.6. Applications**

THE FIRST SUPERCRITICAL POWER UNIT IN POLAND. WELDABILITY EVALUATION OF NEW MARTENSITIC CHROMIUM STEELS WITH TUNGSTEN ADDITIONS AND PROPERTIES OF WELDED JOINTS Bróžda J., Zeman M., Pasternak J.

APPLICATION OF A NEW ROTOR STEEL FORGING FOR MEDIUM RATING SINGLE CYLINDER STEAM TURBINES Yamada M., Tsuda Y., Kaneko J.

THE FIRST INDUSTRIAL CAST OF CrMoCoB ADVANCED STEEL FOR CAST TURBINE COMPONENTS Contessi E., Del Vecchio D., Ghidini A., Valenti S., Carosi A., Di Gianfranceso A., Ielpo F.M.

**OUTLOOK**

**Invited Papers – 4.0. Oral Presentations**

MATERIALS DEVELOPMENT FOR ADVANCED VISION 21 POWER PLANTS Ruth L.A.

TRENDS IN POWER ENGINEERING IN JAPAN AND REQUIREMENTS FOR IMPROVED MATERIALS AND COMPONENTS Masuyama F.

POWER GENERATION IN SOUTHERN AFRICA De Beer J.A., Olsha Z.

ENERGY RESEARCH IN THE SIXTH FRAMEWORK PROGRAMME Busquin P.