

HIGH TEMPERATURE MECHANICAL TESTING COMMITTEE Minutes of 62nd Meeting

The meeting was held at NPL, Teddington, UK on Thursday 22nd November 2012.

Dates of Next Meetings :

- **63rd Meeting (AGM) :** Rolls Royce, Derby, Thursday **19th April 2013** 10.00am – 12 noon to be held in Conjunction with the QA Workshop Part II : Thurs/Fri 19th & 20th April 2013
- **Temperature Measurement WG: Wednesday 22nd May 2013** at 10.30pm at Doosan, Tipton (Birmingham), UK

<u>Item</u>	<u>Topic</u>	<u>Action</u>
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1

INTRODUCTION & WELCOME

1.1 General. Dr Klingelhoefter (Chairman) welcomed the Committee and observers who had attended the Temperature Measurement Working Group held during the morning.

1.2 The Agenda, given in **Appendix 1**, was agreed.

The meeting opened with a Tribute to Dr Bilal Dogan

[March 14, 1956- October 24, 2012]



Bilal's untimely death was a great shock to virtually all of the HTMTC members since we did not realise that he had been seriously ill. A letter condolences on behalf of the HTMTC has been sent by the Secretary to Bilal's wife, Astrid, and his daughters Selin (15) and Melissa (13). In addition the Chairman has also sent a personal letter and also attended Bilal's funeral, held in Waldfriedhof, Geesthacht, Germany which was attended by over 100 people.

Bilal joined the Executive Committee of the HTMTC just over 12 years ago and has been an active member achieving significant improvements in testing techniques in his specialist activity area. He led the Weldments HTMTC Working Group which provided a significant input into the development of some ASTM & ISO Standards.

Dr. Bilal Dogan was a native of Turkey and received his early education at the Middle East Technical University in Ankara. He received his PhD in Metallurgical Engineering at Manchester University in England and subsequently moved to Ottawa, Ontario in Canada as a Post-doctoral Fellow at the National Research Council of Canada. In 1986, he moved to GKSS, Germany, as the Head of the Section on High Temperature Materials Research.

Bilal demonstrated great dynamism and enthusiasm for his work on high temperature materials and made a significant contribution to the sector. He will be sadly missed by his many friends and colleagues.

2 ATTENDANCE & APOLOGIES FOR ABSENCE

The business cards of the members present together with a list of apologies received / attendance record are given in **Appendix 2 & 3**.

The following were present: Dr P Barnard (*Doosan*), Dr Stephen Brookes (*RR*), Mr M Brooks (*NPL*), Dr Klingelhoefter (*BAM*), Mr M S Loveday (*Secretary*) Dave McLennon, (*EDF*). Andrew Mills (*SITL*)

3 **MINUTES OF PREVIOUS MEETING**

Minutes of 61st Meeting (AGM) held at EDF Barnwood, Gloucestershire, UK on Tuesday 15th May 2012, having been distributed via E-mail were approved.

4 MATTERS ARISING (*Items not covered elsewhere on the Agenda*)

4.1 Facilities Survey – The Secretary noted that there had been no further progress

4.2 Web Site – The issue of revamping the appearance of the web site would be considered at the next meeting. The Secretary agreed to contact Larry Candler who had suggest that he might know of someone willing to consider redesigning the website as part of a student project.

MSL/LC

5 CORRESPONDENCE

5.1 The Secretary reported that the necessary documents have now been submitted to the Charity commission and to Companies House following the AGM. See the Charity Commission new website : www.charitycommission.gov.uk

MSL

5.2 The Secretary reported that a list was now maintained of the various communications / letters that been issued on behalf of the HTMTC; it was agreed at the previous meeting to circulate the list to the minutes, see separate attachment.

6 TREASURER'S REPORT

Dr Barnard presented slides summarising the financial position of the HTMTC: Facilities had been set up to allow conference fees to be paid via Paypal and a Euro Account had also been established.

QA Workshop I - EDF Gloucestershire

Outstanding monies from QA1 Conference workshop has been received

A total of 38 persons "attended" for the conference, although 2 no shows. 3 speakers stayed for 1st day and didn't attend the evening function, therefore no charge. 12 persons came with the corporate sponsors. 8 persons attended free, mainly organisers but some just arrived. 13 individuals paid for attending. 1 person paid via Euro account

We had 4 corporate sponsorships, Instron, Zwick, CCPI and STS, for £2,750. All felt the event worth while and asked to sponsor the next event.

Proceeding were distributed by EDF on memory sticks. Unit cost per stick based upon 100 off order size was £4.27 each including art work and VAT.

The total income was £4,115 and the profit was £3,216

General

The Treasurer reported that Total Estimated Expenditure for 2012 would be approximately £2,966 and that the estimated disposable funds at year end would be approximately £27,595.

However it was noted that there are further expenses to be paid for copies of the Journals containing papers presented at the TMF Conference and their distribution. In addition monies had been allocated for the purchase of thermocouples for drift experiments.

In addition the Treasurer noted the following:

- Organisation/Registration for QA1 was not optimum particularly towards the day of the event.
- Follow up of Corporate Sponsorship for QA2
- Plan for QA2 and other 2013 events

It was agreed to transfer monies from the Paypal A/C to another A/C and only leave approximately € 250 in the Paypal A/C.

Members of the main EDF committee were asked to consider submitting proposals prior to the next meeting for appropriate use of the residual funds in line with the Business Plan which the Secretary agreed to circulate.

7 **MEMBERSHIP OF COMMITTEE (COUNCIL)**

7.1 Membership The Secretary reported that he had been notified of the following

Resignations since last meeting because they had changed jobs:

- i) M Fajfrowski, (*MTS*) & ii) N. Wrigley (*INCOTEST*)

The Chairman agreed to speak to MTS, Germany, to see if there was a suitable candidate to join the committee. The Secretary agreed to contact INCOTEST to see if a successor would like to join the Committee.

HK
MSL

In addition Alfred Scholz asked the chairman to be invited for the next main committee meeting. It was agreed to invite Dr Alfred Scholz, Darmstadt, Germany, to attend the committee and the Temperature Measurement Working Group as a guest and to discuss his committee membership on the next meeting

MSL

7.2 Contact Details. It was noted that the SERCO laboratory at Risley had now been taken over by AMEC.

8 PAST & FUTURE HTMTC Symposia / Workshops

8.1 General Following general discussion the following outline schedule was suggested of possible meetings to be organised or sponsored by the HTMTC :

Date	Location	Topic
18/4/2013 (am)	Rolls Royce, Derby	HTMTC Main Committee
18/4/2013 (pm) & 19/4/2013	Rolls Royce, Derby	QA Workshop II
22/5/2013	Doosan, Tipton	HTMTC Temperature Measurement WG
9-13/9/2013	Aachen, Germany	LCF7 Low Cycle Fatigue Testing
Sept 2013 23 -27 th Sept ? tbc	Derby (Riverside Centre)	Accelerated Testing – Joint IOM Meeting / Informal HTMTC Committee
Nov 2013 ? tbc	EMPA Switzerland	Creep – Fatigue / HTMTC Committee
April 2014	Imperial College, London	HT Non –Contact Strain Measurement / HTMTC AGM
Autumn 2014	? tbc [Swansea ?]	Temperature Measurement for HT Mechanical Testing

PB

Details and actions are indicated below:

8.2 TMF Workshop

Dr Klingelhoefter reported that the editing of the papers to be published in the International Journal of Fatigue was complete and it was hoped that the special issue would be issued shortly. There had been some delays with the preparation of the special issue of the papers to be published in the special issue of Materials at High Temperatures. The Information about the TMF Workshop will be lodged on the HTMTC Website. After removing the COP for TMF testing from the website of JRC Petten the COP is now available on the TMF workshop website www.tmf-workshop.bam.de .

PB

Payments will need to be made to the publishers when the Journals are issued in order to purchase the special issues and to send them to the delegates.

8.3 Quality Assurance Issues for High Temperature Testing Workshop I & II

The QA Workshop I held at EDF Barnwood, Gloucestershire on 15th May worked very well and was greatly appreciated by all the attendees. Thanks were expressed to Mr McLennon and all the team at EDF who helped everything run smoothly.

The Workshop II scheduled to be held at INCOTEST, Hereford on Tues/Wed 13th & 14th November 2012 had to be cancelled at late notice since INCOTEST realised that it would clash with their UKAS audit.

SB,
LC,
HK,
MSL ,
PMcC
DMcL

After considerable difficulty a new venue and date were identified. The meeting will now be held at Rolls Royce, Derby on 18th & 19th April 2013. The draft flier was considered and inline with comments at the meeting it will be updated and distributed. The Secretary showed the revised programme and the most of speakers had now been confirmed. A number of other still need to be lined up but it was agreed to circulate the flier as soon as possible. The detailed programme and actions will be circulated to the organising committee comprising of Messers Brookes, Candler, Kinglehoeffer, Loveday, McCarthy, McLennon with support from the Treasurer. Actions will be completed to confirm speakers, arrange hotel contact details.

PB
PJ

The updated registration form will be lodged on the HTMTC Website.

8.4 Joint Meetings with IOM3 High Temperature Materials Committee (HTMC)

Dr Barnard reported that it was now proposed that a meeting on ‘Accelerated Testing Methods’ could be held in the week 23 -27th Sept Spring 2014, the week after the ISO TC 164 meeting in Amsterdam the previous week. The meeting will probable take the format of a 1½ day meeting in Spring 2013 possible at the Riverside Centre (Pride Park) Derby. The meeting will comprise three ½ day sessions: a) Testing Methodology , organised by the HTMTC, b)

Data for Lifting by HTMTC and c) Metallurgical methods, organised by the IOM3. The Testing Methodology session could include acceleration by stress, temperature & environment. The automotive sector use truncated wave forms and ‘rainfall’ analysis, mostly in the non-creep regime. P Barnard agreed to pursue the matter and try to confirm that the dates.

8.5 Creep –Fatigue Crack Initiation & Growth

The Secretary showed Dr Holdsworth communication concerning an appropriate time for a meeting on C-F Crack Initiation & Growth at EMPA, Dübendorf, Switzerland. The Secretary agreed to respond and indicate that a meeting in November 2013 would be sensible.

8.6 Non-Contact HT Strain Measurement –

Dr Klingelhoefter reported that he had a conversation with Prof Nikbin regarding a meeting at Imperial College which could include Digital Image Correlation techniques etc. The Chairman agreed to continue the discussion with Prof Nikbin.

8.7 Temperature Measurement & Control

It is proposed to hold a meeting on this topic when the Temperature Measurement WG has prepared the Code of Practice, possibly in Autumn 2014; see the WG report below.

[For other meeting of possible interest to HTMTC Members see separate attachment]

9 WORKING PARTY REPORTS

9.1 Testing in Controlled Environments WG: (Convenor: O O’Grady)

So far there had not met so there was no progress to report. A draft Scope and Objectives had been circulated with the previous minutes.

9.2 Temperature Measurement for HT Testing Working Group (Convenor Malcolm S

Loveday) : It was reported that the WG had met prior to the Main Committee meeting and that Notes of the meeting would be circulated shortly. The WG had discussed Drift of Thermocouples and the experiments that are to be undertaken of sheathed Type N T/C’s. In addition presentations had been given by Prof G Machin of NPL on a) High Temperature Fixed Point Developments and b) An Update on Hitemps Project (see <http://projects.npl.co.uk/hitemps/>). In addition Fathy Kandil had also given a short presentation showing the influence of depth of immersion of T/Cs when determining a furnace temperature gradient profile.

It was also reported the results of further calibrations of thermocouples had been forwarded to Andrew Wisbey, SERCO, who is co-ordinating the Thermocouple Calibration Inter-comparison and the aims to write up the findings early in the new year.

This data will also be included in the Code of Practice which is under preparation.

Members were asked to review the Bibliography and add more papers.

9.3 Code of practice for stress/load controlled TMF –

Dr Brookes reported that he is still seeking approval from Rolls Royce to provide a document which could provide the basis of a CoP which could be circulated to other interested parties who could form a Working Group. Mr Brooks, NPL, expressed interest and it is thought that representative from Exova, AMEC (*Risley*) together some groups in Germany would wish to participate.

O O’G
PJ

10 HTMTC: Administration & Promotional Activities

a) ‘Freebies’ – promotional materials : The memory sticks with the QA workshop II had been greatly appreciated by the delegates. Sufficient stock is held for the second QA Workshop. The Treasurer will investigate additional items.

c) Publicity flier – The Secretary agreed to update the publicity leaflet, see Appendix 4

PB
MSL

11 11.1 ESIS Feedback

Members were reminded that members of ESIS TC’s were expected to be members of ESIS and UK residents could download membership application forms from the FESI website.

ECF 19 took place from August 26 until August 31 in Kazan with over 400 participants. ESIS has a new set of Statutes that was approved by the ESIS Council. With the new Statutes, ESIS are seeking to be recognized as an official European Society. The ExCo has proposed registration in the UK through our Secretary James Marrow.

Invited papers in ESIS November Newsletter 2012 (2):

[“Ethics in Science” by K.-H. Schwalbe, A. Ingrassia, D. Lovegrove](#) , [“Theoretical Strength of Solids: A Bridge from Interatomic Bonds to Local Plasticity and Fracture” by J. Pokluda](#) , [“Solution of Crack Problems by the Optical Method of Caustics” by E.E. Gdoutos](#)

A summary of the activities of the HTMTC would be submitted to the ESIS Newsletter, see www.structuralintegrity.eu

11.2 FESI

The new issue of the FESI Bulletin, Autumn 2012 (Vol 6 No2) of *The International Magazine on Engineering Structural Integrity* is now available as a pdf download from www.fesi.org.uk. It contains interesting information including articles on i) *Celebrating 100 Years of the Health & Safety laboratory (HSL)* by Phil Heyes & Andrew Curran, ii) *The value of surveillance schemes for supporting safe continued operation of nuclear power plant* by P.E.J Flewitt, M.R. Wootton and R. Moskovic, iii) *Developing industrially-relevant models for hydrogen embrittlement in the EU-FP7 project "MultiHy"*, iv)) Compendium of Creep Assessment Tools by R K Penny and v) Obituary: Professor R K Penny

Membership- FESI www.fesi.org.uk

For membership of FESI or ESIS see the appropriate websites

12 STANDARDS ACTIVITIES

Feedback on ISO TC 164 meetings in Sao Paulo, Brazil Sept 2012

A number of members had attended various ISO TC164 Sub Committees; reports from the delegates have been circulated within the relevant BSI shadow committees and are available on request to the Secretary.

Attention was drawn to the revision of ISO 6892 Pt 1 Tensile Testing at RT which will include a new Annex concerning measurement of modulus and reference to the CEN Workshop Agreement CWA 16100:2010 '*A Guide to the development and use of standards compliant data formats for engineering material test data*' will be referenced in Annex A.

13 ANY OTHER BUSINESS

17.1 Dates of Next Meetings :

- **Main Committee: Thursday 18th April 2013** 9.30 am at Rolls Royce, Derby UK
[followed by *QA Workshop Part II*]
- **Temperature Measurement WG : 10.30 am 22nd May 2013** , Doosan, Tipton (Birmingham, UK)

17.2 Computer Compatible testing Standards

Mr Loveday gave a short presentation about the new EU funded CEN Workshop project '**SERES**'- '*Standards for Electronic Reporting in the Engineering Sector*'. The 2 year Project aims to develop computer-readable formats for engineering materials and demonstrate their use in an electronic reporting Proof-of-Concept (PoC).

HTMTC members are encouraged to join CEN/WS SERES as a registered participant or simply to learn more about the objectives of the Workshop, please see the CEN webpage at <http://www.cen.eu/cen/Sectors/Sectors/ISSS/Activity/Pages/SERES.aspx>. There is no charge or cost to register. As a registered participant in a CEN Workshop, an organization can determine its level of commitment, ranging from simply reviewing the interim report and CWA, to participation at Workshop plenary meetings or to contributing knowledge/experience to the work of the project team.

Details of the preceding CEN Workshop Agreement (CWA) which resulted in the publication of the final report CWA 16200:2010 '*A Guide to the Development & Use of Standards-Compliant Data Formats for Engineering Materials Test Data*' which is available as a free pdf download from <http://www.cen.eu/cen/Sectors/Sectors/ISSS/Activity/Pages/WS-ELSSI.aspx>

14 CLOSE OF MEETING

The Chairman gave a vote of thanks on behalf of the Committee to Matt Brooks, NPL for hosting the meeting and for organising the visit to some of the Laboratory's facilities.

The Lab tour included the Creep Laboratory housing approximately 30 creep machines, the miniature testing rig developed at NPL (ETMT) , the scanning micro hardness machine and a new horizontal environmental testing creep rig which is currently under development which incorporates non-contact extensometry.

15 LIST OF APPENDICIES

1. Agenda
2. Business cards, Committee Meeting
3. Apologies & Attendance Record
4. Aims & Membership Leaflet – 2012/2013 Revised November 2012

APPENDIX 1



HIGH TEMPERATURE MECHANICAL TESTING COMMITTEE

www.htmtc.com

(62nd Meeting)

Thursday 22nd November 2012 [2.00 pm – 3.30 pm]

AGENDA



	<u>ACTION</u>
1 INTRODUCTION & WELCOME	
2 APOLOGIES FOR ABSENCE [see Appendix A]	MSL
3 MINUTES OF PREVIOUS MEETING Minutes of 61 st Committee Meeting,(AGM) held on Tuesday 15 th May 2012 at EDF Barnwood, have been distributed via E-mail. <i>To be approved</i>	
4 MATTERS ARISING (Items not covered elsewhere on the Agenda)	
5 CORRESPONDENCE Charity Commission, Companies House etc	MSL
6 TREASURER'S REPORT - Financial Matters	PB
7 MEMBERSHIP OF COMMITTEE (COUNCIL) a) Resignations since last meeting: i) M Fajfpowski, (MTS) ii) N. Wrigley (INCOTEST) b) Changes in contact details	MSL
8 FUTURE HTMTC Symposia / Workshops <u>9</u> <i>Quality Assurance Issues for High Temperature Testing I & II</i> <u>10</u> Joint Meeting with IOM3 High Temperature Materials Committee (HTMC) on 'Accelerated Testing Methods' <u>11</u> Creep –Fatigue Crack Initiation & Growth EMPA, Dübendorf, Switzerland Temperature Measurement & Control <u>12</u> Non-Contact HT Strain Measurement – Digital Image Correlation etc [For other meeting of possible interest to HTMTC Members see Appendix B]	LC et al PB SH MSL C Davies,
9 WORKING PARTY REPORTS 9.1 Testing in Controlled Environments WG: <i>Scope & objectives</i> 9.2 Temperature Measurement for HT Testing: <i>feedback</i> see Notes of Meeting held at SERCO on 17 th July 2012 9.3 Stress/load controlled TMF -	O.O'G MSL SB
10 HTMTC: Administration & Promotional Activities b) Web Site – hit counter? c) HTMTC E-mail Address : htmechtest@htmtc.com d) 'Freebies' – promotional materials Publicity flier – see Appendix D	
11 ESIS Feedback a) Newsletter c) ESIS Council in see: www.structuralintegrity.eu b) Membership - FESI www.fesi.org.uk	PG PG/MSL PB
12 STANDARDS ACTIVITIES a) Feedback on ISO TC 164 meetings in Sao Paulo, Brazil Sept 2012	
13 ANY OTHER BUSINESS : a) CEN Workshop SERES b) Other items c) Vote of Thanks	MSL

APPENDIX 2. Business Cards of Attendees

HTMTC 62nd Meeting at NPL, Teddington & Temperature Measurement WG Thursday 22nd November 2012

BAM
Federal Institute for Materials Research and Testing

Dr.-Ing.
Helmut Klingelhöfer

Department 5
Materials Engineering
Unter den Eichen 87
12205 Berlin, Germany
mailing address: 12205 Berlin
phone: +49 30 8104-1501
fax: +49 30 8104-1507
e-mail: helmut.klingelhoef@bam.de
www.bam.de

beta



High Temperature Mechanical Testing Committee

Malcolm S. Loveday
BSC, C Eng, MIMMM
Beta Technology Consultant
Secretary, HTMTC-ESIS TC11
Web: www.htmte.com
Chairman: BSI - ISE/NFE 4
Mechanical Testing of Metals
Home: 0044 (0)1932 561576
E-mail: malcolm.loveday@npl.co.uk
National Physical Laboratory, UK

Chairman

Secretary



Doosan Power Systems

Pete Barnard
MSc, BSc
Principal Engineer

Birmingham New Road, Tipton,
West Midlands, BPA 8YU, United Kingdom
T: +44 (0)121 539 5000
D: +44 (0)121 539 5164
F: +44 (0)121 885 3854
M: +44 (0)7731 329 383
E: pete.barnard@doosan.com



Rolls-Royce

Dr. Stephan Sczesnik
Test Engineer - Materials Testing

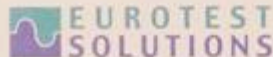
Rolls-Royce (Tech) Ltd Turbine Operations Centre GmbH
Klosterstraße 1, Dülmen, 49123 Dülmen/Steinfurt-Markow, Germany
Tel: +49 39718 61538 Fax: +49 39718 61168
email: stephan.sczesnik@TCO.dulmen-royce.com



Trevor Ford
Group Head of Laboratory
CCPI EUROPE Ltd

Temperature Technology Centre
Vector 31, Business Park
Waleswood Way - Wales Bar
SHEFFIELD S26 5NU, ENGLAND

T: +44 (0)1908 775333
F: +44 (0)1908 772225
M: +44 (0)775 160355
E: tford@ccpi-europe.com
www.ccpi-europe.com



Fathy A Kandil PhD MSc BSc CEng MIMechE
Director

T: 828 8541 5244
F: 828 8541 5328
E: fak@eurotest-solutions.co.uk
www.eurotest-solutions.co.uk

PO Box 1226
Kingston
Surrey KT2 5TJ
United Kingdom



National Physical Laboratory
Prof Graham Machin (retired) OBE FRS FInstP
Chief Physicist
Heat, Temperature Standards
Engineering Measurement
Direct Line: +44 20 8943 6742
Mobile: +44 7718 193 725
Fax: +44 20 8914 0491
E-mail: graham.machin@npl.co.uk

David McLennan
Mechanical Testing Engineer
Automotive Technology Group

EDF Energy
Russett Way, Barnwood
Gloucester, GL4 3PL

Tel: +44 (0) 1452 857980
dave.mclennan@edf-energy.com



SIEMENS

Energy

Siemens Industrial
Turbomachinery Limited
Energy Sector

Ruston House
Waterloo South
London, SE6 2JQ

Andrew Mills
MEng (Hons) Prof/Lead/MSM
Senior Metallurgist
Metallurgy Laboratory

Phone: +44 (0)20 522 584334
Fax: +44 (0)20 7522 584072
andrew.mills@siemens.com

Cards not supplied:

Matt Brooks, NPL

Xi Lin (SITL)

Jonathon Snell (Instron)

Phil Roper (CCPI)

APPENDIX 3. List of Apologies

[UPDATED with replies 21/11/2012]

	Members 2011-12		58 th Meeting SITL Lincoln	59 th Meeting BAM, Berlin	60 th Meeting	61 st Meeting	62 nd Meeting	62 nd Meeting Apologies
			Nov 2010	May 2011	Nov 2011	May 2012	Nov 2012	Nov 2012
			<i>Attend</i>	<i>Attend</i>	<i>Attend</i>	<i>Attend</i>		<i>Apology</i>
Chairman	Dr H. Klingelhofer	BAM, Berlin, Germany	A	✓	✓	✓	✓	
Vice-Chairman	Mr L. Candler	Exova, UK	A	A	✓	✓		A (20/11/2012)
Secretary:	Mr M. S. Loveday	Beta Technology (NPL)	✓	✓	✓	✓	✓	
Treasurer	Dr P Barnard	Doosan, Birmingham, UK	✓	✓	✓	✓	✓	
Council Members								
	Miss Kate Abbott	Siemens Ltd, UK	✓	✓	✓	(A Mills)	*	A (21/11/2012)
	Mr Colin Austin	AMEC, Risley, UK	✓	<i>A.Wisbey</i>		A		A(19/11/2012 Hospital
	Prof. M Bache	Univ. Swansea, UK	A	✓		A		A (20/11/2012)
	Mr Carl Barrett	UKAS, UK	A	--		A		A (20/11/2012) RR work
	Dr Stephen Brookes	Rolls Royce MTOC, DE		✓	✓	✓	✓	
	Mr Matt Brooks	NPL, UK	-	-	-		✓	
	Dr. B. Dogan	ETD, USA	A	A		A	Died (Oct 2012)	
	M Fajfpowski,	MTS					R	
	Dr S Holdsworth	EPMA, Zurich , CZ	A	✓		A		A(20/10/2012)
	Philip G Jones	Alstom, UK	A	A	✓	✓		A(20/11/2012) Cellulitis
	Mr P. McCarthy	Consultant, UK	A	✓		✓		A (28/10/2012)
	Mr D McLennon	EDF, UK	✓ *	✓	✓	✓	✓	
	Prof K Nikbin	Imperial College, London, UK	A	A	✓	A		A (19/10/2012)
	Mr O. O'Grady	Exova, UK	✓	✓		✓		A (22/11/2012)
	Mr J Snell	INSTRON, UK				✓		A (21/10/2012)
	Mr N Wrigley	INCO, Hereford, UK			✓	A	R	

New Members(2012) : * Joined the Committee ; A- Apology , R- Resigned

Apologies: Nigel Ryder(Seven TS) , A. Wisbey (AMEC) Peter Quested(NPL), Bryan Roebuck (NPL)



HTMTC / ESIS TC11

Company Registration No 02149907

Registered Charity 800892

Established 1982



High Temperature Mechanical Testing Committee 2012 / 2013

www.htmtc.com

Aims: *To improve high temperature testing by:*

- Providing a Forum for discussion
- Organising conferences and laboratory visits
- Publishing conference proceedings and Codes of Practice
- Initiating research activities

A Council usually meets twice a year for conducting formal business, and arranging one- or two-day Symposia. Current measurement High Temperature Working Groups include: a) Testing in Controlled Environments, b) Temperature Measurement for Mechanical Testing,

Chairman:	Dr H. Klingelhöffer	BAM, Berlin, Germany
Vice-Chairman:	Mr L. Candler	Exova, UK
Hon. Secretary:	Mr Malcolm S. Loveday	Beta Technology Consultant / NPL
Treasurer:	Dr Peter Barnard	Doosan-Babcock, Tipton, Birmingham, UK
Council Members:		
	Miss Kate Abbott	Siemens Industrial Turbomachinery, Lincoln, UK
	Mr Colin Austin	AMEC, Risley, UK
	Prof. Martin Bache	Univ. Swansea, UK
	Mr Carl Barrett	UKAS, Feltham, UK
	Dr Stephen Brookes	Rolls Royce MTOC, Dahlewitz, DE
	Mr Matt Brooks	NPL, Teddington, UK
	Dr Stuart Holdsworth	EMPA, Zurich, Switzerland
	Mr Phil Jones	Alstom Power Turbo-Systems, Rugby, UK
	Mr P. McCarthy	Consultant, Crawley, UK
	Mr Dave McLenon	EDF, Barnwood, UK
	Mr I. McEnteggart	INSTRON, High Wycombe, UK
	Prof. Kamran Nikbin	Imperial College, London, UK
	Mr Owen O'Grady	Exova, UK

Corresponding Members (~100) receive Minutes of the twice-yearly meetings, with Appendices on Technical Material

No Membership Subscription is payable

The HTMTC is a non-profit making company limited by guarantee (Reg. No. 2149907)

If you are interested in the activities of the HTMTC (ESIS TC11) or would like to be added to the Corresponding Members mailing list please contact one of the following

HTMTC e-mail address: htmechtest@htmtc.com

Mr M. S. Loveday, National Physical Laboratory, Queens Road, Teddington, Middx., TW11 0LW,

Tel.+44 (0) 1932 561576 , E-mail: malcolm.loveday@npl.co.uk

Dr Hellmuth. Klingelhöffer, BAM, Federal Institute for Materials Research & Testing, Unter den Eichen 87,12205 Berlin, Germany. Phone +4930 8104 1521. Fax +4930 8104 1527 E-mail: hellmuth.klingelhoeffe@bam.de

(please indicate your particular interests and whether you wish to take an active part in the Working Groups)

Revised Nov 2012