

## Report of CCT WG4 Task Group (TG-SI) to CCT

### Members of TG-SI:

Joachim Fischer (PTB) chairman, Sergey Gerasimov (VNIIM), Ken Hill (NRC), Graham Machin (NPL), Mike Moldover (NIST), Laurent Pitre (LNE-INM/CNAM), Peter Steur (INRiM), Michael Stock (BIPM) Executive Secretary CCT (now replaced by Richard Davis), Osamu Tamura (NMIJ), Hüseyin Ugur President CCT, Rod White (MSL), Inseok Yang (KRISS), Jintao Zhang (NIM)

### Terms of reference

The Terms of Reference follow closely CIPM Recommendation 1 of 2005, (CI-2005), "Preparative steps towards new definitions of the kilogram, the ampere, the kelvin and the mole in terms of fundamental constants" and are repeated here for the convenience of the reader:

- consider the implications of changing the definitions of the above-mentioned base units of the SI, with particular emphasis on the kelvin, from the point of view of metrology in thermometry;
- present this point of view to the CCT and to other concerned Consultative Committees or their appropriate Working Groups and to work with them to prepare a report to the CIPM not later than June 2007;
- monitor closely the results of new experiments relevant to the possible new definition of the kelvin, and to identify necessary conditions to be met before proceeding with changing the definition;
- solicit input from the wider scientific and technical community on this important matter.

### Activities:

The TG-SI met twice, at PTB Berlin, Germany on 18 October 2006 and on 25 May 2007 at TEMPMEKO, Lake Louise, Canada.

During the first meeting mainly the "Report to the CIPM on the implications of changing the definition of the base unit Kelvin" was prepared.

The report dated 2 May 2007 was unanimously agreed by the full CCT by email voting in March 2007. A short note on the new definition of the kelvin was drafted summarizing the report which can be posted on the home pages of the CCT member NMIs. In addition, the full report was sent to BIPM and posted on the public area of the BIPM home page for further reference.

J. Fischer presented the report at the CCU meeting on 11 to 13 June 2007 at BIPM which was the formal submission to CIPM. The report was welcomed by the CCU and the meeting was unanimous in agreeing that a new definition of the kelvin, unit of thermodynamic temperature, should be adopted to fix the value of the Boltzmann constant. The president of CCU, I. Mills reminded the meeting that major changes of the SI would best be made all at

one time. If the change in the kelvin were agreed but the change in the kilogram were still awaiting new data, then the change would best await resolution of the kilogram issue.

The same document was the basis for the preparation of a contribution of TG-SI to the conference TEMPMEKO 2007 named “Preparative Steps towards the New Definition of the Kelvin in Terms of the Boltzmann Constant”. It was authored by all members of TG-SI and was presented to solicit input from the wider scientific community.

In conclusion, the following documents have been prepared by TG-SI:

**Report to the CIPM on the implications of changing the definition of the base unit kelvin  
Note on updating the definition of the kelvin**

Both documents can be downloaded from the public area of TG-SI:  
<http://www.bipm.org/wg/CCT/TG-SI/Allowed/Documents.jsp?wg=TG-SI>

**Preparative Steps towards the New Definition of the Kelvin in Terms of the Boltzmann  
Constant**

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TG-SI has successfully completed the first two tasks in the ToR list (implications and report to CIPM) and will continue with the remaining two tasks: monitor the results of new experiments relevant to the new definition of the kelvin and solicit input from the wider scientific and technical community.

J. Fischer, 28 April 2008