REPORT PRESENTED TO THE CCT BY WORKING GROUP 1

September, 2001

1. MEMBERSHIP

Working Group 1 members are: Dean Ripple (Chairman, NIST), Bernd Fellmuth (PTB), Martin de Groot (NMi-VSL), Yves Hermier (BNM-INM), Ken Hill (NRC), Piero Marcarino (IMGC), and Anatoly Pokhodun (VNIIM). In addition, Mikhail Matveyev (VNIIM) and Pieter Bloembergen (VSL, retired) are providing assistance.

2. TERMS OF REFERENCE

The terms of reference of Working Group 1 (WG 1), as expressed in the Report of the 19th Meeting of the CCT (1996) are:

1. to improve techniques for the realization of defining fixed points and for interpolating instruments ($T_{90} \geq 3$ K);
2. to study non-uniqueness; and
3. to update the *Supplementary Information for the International Temperature Scale of 1990*.

3. ACTIVITIES SINCE THE LAST CCT MEETING.

3.1 Meetings

We met at PTB, following the TEMPMEKO 2001 conference. We also had a meeting Tuesday afternoon, this week, at BIPM.

3.2 In progress: Updating the Supplementary Information (SInf) for the ITS-90.

Presently, the primary task of WG1 is the updating of the SInf. Particular issues or activities pertaining to this task are described in each of the paragraphs below.

3.2.1. References

An important part of the revision of the SInf is the updating of the lists of references. For this task, we will need the assistance of all the CCT members in suggesting references to add to the SInf.

3.2.2 Subjects of special interest

WG1 will continue to emphasize improvements in the realization of fixed points and in the use of defining interpolation instruments. Additionally, recent results on the reproducibility and non-uniqueness of the ITS-90 will be incorporated.

3.2.3 Dissemination mechanism

WG1 would like the revised SInf to be available in electronic format, such as Adobe Acrobat.

3.2.4 Results of the Key Comparisons

The consensus of the WG1 is that the results of the Key Comparisons will be included in the SInf, but without interpretation on such subjects as the degree of equivalence of the participants.

3.2.5 Coordination with Working Group 3 on Uncertainties

It is the desire of Working Group 1 to continue to study and document the physical mechanisms underlying various uncertainty subcomponents in the realization of the ITS-90. It is our understanding, based on the draft documents prepared by WG3, that WG3 will focus on the terminology, the propagation, and the harmonization of uncertainty subcomponents. As documents are prepared by WG3 on these subjects, it will be necessary to decide whether to include the information as part of the SInf or to publish the uncertainty information as a separate volume. We do not yet have consensus on whether to publish the materials on uncertainties as a separate document or as a part of the SInf. Of course, the action of WG1 will depend on the final length of the material. Tentatively, we propose that the SInf contain the final recommendations and results on uncertainties, but that detailed background information should be published elsewhere. If a separate document on uncertainties is created, care will need to be taken that it is not perceived to be subordinate to the SInf.

3.2.6 Inclusion of the PLTS – 2000: coordination with Working Group 4

At the WG1 meeting in June, 2001, we agreed that the best method for preparation of supplementary information for the Provisional Low-Temperature Scale of 2000 would be to rely on material produced under the auspices of WG4. When WG4 has draft supplementary information available, WG1 can coordinate with WG4 in editing the material for inclusion in a combined document on Supplementary Information for the ITS-90 and the PLTS-2000. As with the material prepared on uncertainties, the practicality of including all of the information in a single volume will depend in large part on the quantity of material produced by WG4 on the PLTS-2000.

4. PLANS FOR THE FUTURE

4.1 First draft of the updated SInf: ~February 2002?

The first draft of the revision of the *Supplementary Information for the International Temperature Scale of 1990* can be prepared at the earliest four months following completion of CCT Key Comparisons 1 through 5. The data of the Key Comparisons clearly illustrates the present capabilities of NMIs around the world in realizing the ITS-90 and will be a valuable component of the SInf. Unless there are additional substantial delays in completion of the Key Comparisons, WG1 will be certain that results of all of these Key Comparisons are included in the first draft of the SInf.

4.2. Final draft of the updated SInf: ~ by the end of 2002.

After having received the comments of the members of the CCT we will attempt to have the final draft of the revised version ready by the end of 2002.

4.3 Planning for revisions to the ITS-90

As the work on the SInf nears completion, WG1 will embark on a new task: the formulation of recommendations to the CCT on possible revisions to the ITS-90. This task will obvioiusly require coordination with WG4, which is responsible for the field of thermodynamic temperature measurements. WG1, on the other hand, will focus on identifying weaknesses and solutions pertaining to aspects of the ITS-90 other than its thermodynamic correctness, such as the choice of defining instruments, fixed points, and interpolation schemes.

Dean Ripple, August, 2001.