COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

MINUTES OF THE 43RD ANNUAL CNC/CIE MEETING

1998-November-06

The 43rd annual meeting of the Canadian National Committee of the Commission Internationale de l'Éclairage (CNC/CIE) was held on Friday, November 06, 1998 at the Institute for National Measurement Standards (Building M-36) of the National Research Council in Ottawa, Ontario.

In conjunction with the annual meeting, participants were invited to a tour of the research facilities of the NRC Institute for Research in Construction (Building M-24) and of the Photometry and Radiometry Group of the NRC Institute for National Measurement Standards (Building M-36) on Thursday afternoon, November 05, 1998.

Note: the following acronyms are used in this report:

CNC/CIE	Canadian National Committee of the Commission Internationale de l'Éclairage
NC	CIE National Committee
TC	CIE Technical Committee
CB	CIE Central Bureau (Vienna, Austria)
BA	CIE Board of Administration

1. Call-to-Order:

The meeting was called to order at 9:38 by J. Roberge, President.

Fourteen Members and Advisory Members, and 1 guest were in attendance. The list of all attendees is given in Appendix A.

The agenda, as circulated by mail (Appendix B) was accepted, with Item 10 "Other Business" left open for possible additions.

2. Minutes of the 42nd Annual CNC/CIE Meeting:

The following items arising from the Minutes were considered:

1. Item 2. W.K. Adrian indicated that he had communicated with E. Wotton.
2. Item 3. Concerning the hosting of the CIE midterm meeting in 2001: The final decision will be made in Warsaw in 1999. Basically, if the CIE Session of 2003 is held in San Diego (USA), then the midterm meeting will not be held in Vancouver.
3. Item 4. A.A. Gaertner indicated that a location for a CNC/CIE WWW site has been been made available on the NRC server, but that no action had been taken to create the site.

4. Item 5. Concerning 'master copy' for CIE Publications, A.R. Robertson indicated that he has used this procedure for CIE Draft Standards.
5. Item 6. Concerning the CNC/CIE award for H.W. Budde, A.A. Gaertner indicated that this has not yet been done. It was considered that this award could be given at next year's joint meeting with the USNC. A.A. Gaertner is to be responsible for having the award developed.
6. Item 7/15. Ralph Smith and Radosveta Topalova were welcomed to this meeting.

R.W. White moved, seconded by J.A. Veitch, that the minutes be accepted as circulated. Passed.

3. Election of reporter for lighting press:

J. Roberge explained that this appointment was in response to E. Wotton's letter of 1998-January-13 to prepare material in the form acceptable by the editors of the lighting press. The election would be for only a one-time trial for the purpose of publicizing the content of this annual meeting. Jim Love volunteered to do this.

4. President's Report:

J. Roberge presented his report, which is enclosed as Appendix C.

He noted that the disbanding of CIE Division 7 is presently being voted upon. Alan Robertson indicated that Christine Hermann of the CIE-CB was taking over responsibility for one of the Division 7 TCs (TC 7-06 Lighting Terminology).

J. Roberge indicated that he had more information concerning CISET if anyone is interested. J.A. Veitch pointed out that CISET has criteria which they use to judge whether or not they would pay the dues of scientific societies such as the CNC/CIE.

J. Roberge noted that the European location for the CIE mid-term meeting in 2001 would probably be either Turkey or Iceland.

The report was approved.

5. Secretary / Treasurer's Report:

A.A. Gaertner presented his report, enclosed as Appendix D.

The report was approved.

6. Publications Report:

A.R. Robertson presented his report, included as Appendix E. He noted that our annual sales appear to have stabilised at approximately $2000. The other expenses this year included support to W.K. Adrian to attend the midterm meeting in Durban and hospitality expenses (to J.A. Veitch) for the CIE Division 3 meeting in Ottawa. He also indicated the problem that many of the payment cheques for publications are deposited by NRC into their account, and this requires considerable effort to recover.

The report was approved.

7. Reports from the Division Members:

(Note: The CNC/CIE Division Member's Reports are attached as a separate document, i.e. they are not labeled with an Appendix number. This has been done to enable these reports to be made available to various individuals, independently of the Minutes of this Annual Meeting.)

DIVISION 1 Vision and Colour — S.M. McFadden

S.M. McFadden presented her report. She noted that, in addition to herself, Alan Robertson and Werner Adrian attended the last CIE Division 1 meeting in Baltimore, Maryland on the 28th and

30th of September, 1998. She pointed out the concept of the Study Group, and added that they hoped to use electronic communication as their medium of operation. She highlighted some of the TCs, indicating that she has more information available for anyone who is interested.

W.K. Adrian indicated that Division 4 has established two TCs, one for visibility and one for visual acuity—two topics which overlap with Division 1. It was pointed out that Division 1 decided not to establish a TC concerning visual acuity due to the fact that Division 4 was working on this topic.

DIVISION 2 Physical Measurement of Light and Radiation — J.C. Zwinkels

J.C. Zwinkels presented her report. She highlighted some of the committees which had Canadian members.

S.M. McFadden asked whether TC 2-42 (The Colorimetry of Visual Displays) would be moved to the new Division 8 (Image Technology). Alan Robertson indicated that it probably would not, since the CIE/BA did not like to move TCs around.

W.K. Adrian noted that Dr. G. Woo has retired from the University of Waterloo and is now Dean of Optometry in Hong Kong.

DIVISION 3 Interior Environment and Lighting Design — I.C. Pasini

I.C. Pasini presented his report. He noted that the meetings in Ottawa starting May 08, 1998 with the CIE Division 3 meeting, then the *CIE Symposium on Lighting Quality*, and followed by *International Daylighting '98*, were important because they were an occasion when the NRC, CIE and IES joined forces to provide an excellent forum for discussion. The *CIE Symposium on Lighting Quality* attracted over 70 attendees from 19 countries. The proceedings from this symposium will be available shortly from both NRC and the CIE. The *International Daylighting '98* included a mini trade show and attracted attendees from 25 to 30 countries.

He also pointed out that CIE Division 3 will be holding two half-day sessions at the Warsaw Session and they have proposed six workshops for the Session. J.A. Veitch is chairing a workshop on lighting quality to develop focused terms of reference for several of the Division 3 TCs. He noted that Canadians have submitted three papers for the Warsaw Session, all in Division 3, and challenged Canadians in the other Divisions to follow their example.

DIVISION 4 Lighting and Signalling for Transport — W.K. Adrian

W.K. Adrian presented his report. He reported that at the recent CIE Division 4 meeting, the Division Director Pieter Walraven indicated that he was intending to step down from the position. Two nominations for the position were forth-coming—P. Hautala of Finland, and H. Schmidt-Clausen of Germany. It was also decided at the meeting that Canada should host a Division 4 meeting in 2000 or 2001. A discussion followed concerning the possibility of joint CIE and IES meetings. It was considered feasible if the meetings were held in conjunction with a conference, such as the meetings held in Ottawa in May as discussed above in the Division 3 report.

The committee meeting broke for lunch at 12:35 and reconvened at 13:30.

DIVISION 5 Exterior and Other Lighting Applications — J. Roberge

J. Roberge presented his report. He indicated that he has additional information available from the workshops (1998-June-03) at the Barcelona meeting if anyone is interested. He also included in his report the letter from the editor of CIE Division 5 concerning terminology.

In reply to a question concerning the relationship between CIE and CEN, A.R. Robertson(CIE-VP) pointed out that since CEN is an European group, and CIE is an international group, the CIE cannot just accept the reports of CEN without further evaluation.

DIVISION 6 Photobiology and Photochemistry J.A. Veitch

J.A. Veitch presented her report, regretting that she has been unable to attend all the meetings of the division. However, she does plan to attend the Warsaw Session of the CIE. She pointed out that there has not yet been a nomination for the Division 6 Director.

DIVISION 7 General Aspects of Lighting R.W. White

R.W. White presented his report, noting that the division was considering disbanding, and that a ballot to this effect was presently underway in the National Committees.

DIVISION 8 Image technology

This is a new division in the process of being established. As there is not yet a division member, A.R. Robertson (CIE VicePresident) gave a verbal report on the status of this division, and indicated that he would give the secretary a written report for inclusion with the Minutes of this meeting.

8. Nominations and Appointments:

8.1 CIE Division 8 (Image Technology) Canadian Member:

The president opened the floor for nominations. A question was raised as to the existence of any Canadian companies in this field of endeavor.

Réjean Baribeau of the Photometry and Radiometry Group in the Institute for National Measurement Standards at NRC was nominated. The committee approved of his appointment as Canadian Division 8 Member, and recommended his appointment as a Member of the CNC/CIE.

8.1 CNC/CIE Members and Advisory Members:

The current list of Members and Advisory Members was circulated (Appendix F).

Members:

The Secretary noted that the two Member appointments recommended by the CNC/CIE at its 42nd annual meeting were endorsed by A.L. VanKoughnett, Director-General of NRC-INMS, and both have accepted: Arnold A. Gaertner and Ralph A. Smith.

The terms of five of the present Members expire this year—W.K. Adrian, J.A. Love, S.M. McFadden, I.C. Pasini, and J.C. Zwinkels. It was determined that all incumbents were willing to continue, and the committee agreed to nominate them for a further term of four years.

J. Roberge indicated that he would not seek re-election as CNC/CIE President when his term expires next year. He asked if there was anyone interested, or if there were any nominations or recommendations for the position. None were forthcoming. He pointed out that a potential candidate might be eligible for financial help to go to the CIE Session in Warsaw in June 1999.

Advisory Members:

The Secretary noted that he had not yet received a reply from A. Laperrière of Hydro-Québec to our invitation to become an Advisory Member. J. Roberge indicated that he would follow-up on this invitation. The Secretary also noted the resignation of Don Trotter, who had been a secretary of the CNC/CIE for three years (see the Secretary's Report, Appendix D).

It was noted that G. Woo had moved to Hong Kong and should be removed from the Advisory Member list. It was suggested that the Secretary consider sending a general letter to all Advisory Members to determine their continued interest, and whether they could recommend any others who might be interested in the work of the CNC/CIE.

9. CIE 24th Session, Warsaw, June 1999:

It was agreed that we nominate J.B. Roberge as our Canadian delegate to this General Assembly.

As alternate, it was agreed that the potential president of the CNC/CIE be considered. Since the next president will not be chosen until the next annual meeting, it was agreed that the alternate delegate to the CIE 24th Session would be chosen by a telephone conference at the time required for the decision of this nomination.

A discussion followed concerning possible CNC/CIE funding for the delegates. It was moved by I.C. Pasini, seconded by R.W. White, that the President be allowed to spend up to $1000.00 to help defray the travel costs necessary to ensure adequate representation of the CNC/CIE at the CIE quadrennial conference in Warsaw 1999. Passed.

10. Other Business:

10.1 Correspondence:

Amongst others, the following items of correspondence were noted:

1. A letter (1998-September-27) from Don Trotter indicating his past involvement with the CNC/CIE, and his resignation from the CNC/CIE as Advisory Member. This letter had already been noted in the Secretary's report.
2. The letter from E. Wotton (1998-January-13) concerning using the Minutes for the basis of articles in the lighting press, and the Secretary's reply of 1998-September-16. This has resulted in the action taken in Item 3 above.
3. The letter from R.A. Smith (1998-July-15) accepting his appointment as CNC/CIE Member.
4. A letter from A. L. VanKoughnett, Director General of NRC/INMS, to T. Nilsson (1998-July-02) thanking him for his involvement during the past years as CNC/CIE Member.
5. A letter from E. Wotton (1998-October-02) which contained a request for several items to be placed on the agenda of the CNC/CIE meeting. W.K. Adrian indicated that he would reply to E. Wotton concerning his first request—for a comparison, with references, on the merits of HPSOD and MH lamps for roadway lighting. Several points were raised concerning his second request—The presentation of solid evidence, with references, showing that improved lighting, by whatever means, improves productivity and also worker well-being. This question relates to many of the discussions in CIE Division 3, and there will be new TC's set up in Warsaw considering this matter. Also, work has been carried out in Mark Rea's group at the Lighting Research Center at Rensselaer Polytechnic Institute in Troy, New York.
6. An email from T. Nilsson (1998-October -19) concerning the acceptability of CNC/CIE ballots being returned by email. The committee decided that this was acceptable.

10.3 Other Business: (discussed before item 10.2)

The item concerning the holding of a CIE Division 4 meeting in Canada in the year 2000 or 2001 was brought forward for discussion. This was first mentioned in Item 7 above, in the report by the Division 4 Member W.K. Adrian. It was decided that W.K. Adrian would prepare a report for next year's annual meeting which would contain an account of his anticipated requirements for the meeting, a budget (suggested at $2.5K to $3.0K), the proposed location, with consideration of one dinner being provided, and the transportation costs involved. I.C. Pasini indicated that support could be considered by the IES if the meeting would include IES speakers.

10.2 Date and Place for next year's meeting:

It was decided that this would be a joint meeting with the USNC. Various suggestions were put forward: seminars are essential; the meeting should be 2 days over a weekend; use a format similar to the joint meeting with the USNC held in 1997; approximate meeting dates of mid-October to the

end of the first week of November; W.K. Adrian would organise a wine tour if the meeting was held in Niagara-on-the-Lake; consideration of a registration fee if necessary; can a sponsor be found. It was decided to appoint a committee of members to plan the meeting: W.K. Adrian, J.A. Love, and R.A. Smith, with the option to add if required (M. Timmings could be asked for assistance). This committee could get assistance from the USNC for the technical sessions (J.A. Love had worked on the technical session for the joint meeting in 1997).

Jacques Roberge would issue the invitation to the USNC.

11. Adjournment:

The meeting was adjourned at approximately 16:55.

A.A. Gaertner
Secretary, CNC/CIE
Institute for National Measurement Standards
Building M-36
National Research Council of Canada
Ottawa, Ontario K1A 0R6

1999-May-19

LIST OF APPENDIXES

Appendix A: Attendees to the 43rd Annual Meeting of the CNC/CIE.
Appendix B: Proposed Agenda for the CNC/CIE 43rd Annual Meeting.
Appendix C: President's report.
Appendix D: Secretary / Treasurer's report.
Appendix E: Publications report.
Appendix F: List of CNC/CIE Members and Advisory Members.

APPENDIX A

Attendees to the 43rd Annual Meeting of the CNC/CIE

1998-November-06, Friday

Werner K. Adrian	University of Waterloo
Réjean Baribeau	National Research Council (INMS)
Arnold A. Gaertner	National Research Council (INMS)
James A. Love	University of Calgary
Sharon M. McFadden	Defense and Civil Institute of Environmental Medicine
† Thomy Nilsson	University of Prince Edward Island
Peter Parahuz	guest, University of Waterloo
Ivan C. Pasini	Public Works and Government Services Canada
Jacques Roberge	consultant
Alan R. Robertson	National Research Council (INMS)
Ralph A. Smith	Ralph Smith Engineering Inc.
Radosveta Topalova	University of Waterloo
Jennifer A. Veitch	National Research Council (IRC)
Robert W. White	Duschenes & Fish Architectes
Joanne C. Zwinkels	National Research Council (INMS)

† attended morning session via voice-conferencing

Regrets

Marion G. Bassett	Professor Emeritus, University of Toronto
Andrée C. Bichon	NRC/Public and International Relations
J. Allyson Chrysler	Lighting consultant
K. Frank Lin	Lighting Sciences Canada
Dale K. Tiller	National Research Council (IRC)
Ernest Wotton	Lighting consultant

APPENDIX B

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CNC/CIE 43rd Annual Meeting
Proposed Agenda

DATE: 1998-November-06 - Friday

TIME: 9:30 am to 5:00 pm

LOCATION: Institute for National Measurement Standards (M-36)
NRC, Ottawa, Ontario

PROPOSED AGENDA:

1. Call to Order and Approval of Agenda — J. Roberge
2. Minutes of the 42nd Annual CNC/CIE Meeting (Matters arising?)
3. Election of reporter for lighting press
4. President's Report — J. Roberge
5. Secretary/Treasurer's Report — A.A. Gaertner
6. Publications Report — A.R. Robertson
7. Reports from Division Members
   - Division 1: Vision and Colour — S.M. McFadden
   - Division 2: Physical Measurement of Light and Radiation — J.C. Zwinkels
   - Division 3: Interior Environment and Lighting Design — I.C. Pasini
   - Division 4: Lighting and Signalling for Transport — W. K. Adrian
   - Division 5: Exterior and Other Lighting Applications — J. Roberge
   - Division 6: Photobiology and Photochemistry — J.A. Veitch
   - Division 7: General Aspects of Lighting — R.W. White
8. Nominations and Appointments
   - CIE Division 8 (Image Technology) Canadian Member
   - Members of CNC/CIE
9. CIE 24th Session, Warsaw, June 1999
   - nomination of Canadian delegates
10. Other Business
    - 10.1 Correspondence — J. Roberge
    - 10.2 Date and Place for next year's meeting
      - joint with USNC- organising committee
    - 10.3 Other business
11. Adjournment

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APPENDIX C

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

PRESIDENT'S REPORT TO THE 43rd ANNUAL MEETING

November 6, 1998

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The year1998 was the third year of the current quadrennium, and was characterized by the typically lower level of activity expected for that part of our four-year cycle.

At the Commission level, the action consisted basically of Division meetings (including Division 3, which met in Ottawa this year) Technical Committee meetings, and some seminars on pointed subjects, including a few highly successful ones which took place at NRC in the Spring,and will be adequately reported upon in the Division Member's reports later on to-day.

As a result of decisions taken at the mid-term meeting in Durban, R.S.A. last fall, Division 7 has been disbanded during the course of this year, with its only remaining activity « Terminology and Vocabulary » being transferred to the Central Bureau. A new division, Division 8, on Image Technology, has been voted on and will most likely be launched during the 24th Session in Warsaw, Poland, next June.

The Board of Administration of the CIE will also be unusually well balanced in the coming four years, with the 14 individuals presently nominated to the Board representing 13 nations (excluding Canada, unfortunately).

If I should remain for one more term as member of the Finance Committee, as has been the case since 1987, it would constitute Canada's one remaining close official link with CB administration.

On the home front, I was called upon to represent the CNC/CIE and INMS at the October 1998 full-day meeting of NRC's Committee on Internationnal Science, Engineering and Technology (CISET), having also attended the only one other meeting of that group in 1994.
About 25 Canadian learned societies were represented, a number of which adhere directly to the International Council of Science Union (ICSU),
others, like the CIE, adhering as NRC partners, their number being augmented by 6 or 7 members at large.
A distinguished guest, Dr. J-F. Stuyck-Thaillandier, ICSU Executive Director, also attended the full session, making a few very interesting presentation on the ICSU itself, as well as on an upcoming World Conference on Science, to be held in Budapest, (not very far from Warsaw) from June 26 to July 1st 1999, on the theme « Science for the Twenty-first Century- A New Commitment « .
More details and tentative program available from myself or from Jennifer Veitch, who attended the same meeting, representing another society of which she is an active member.

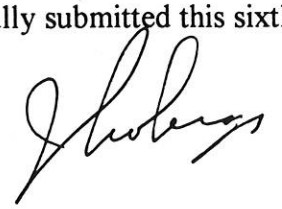
In last year's report, I mentionned that we had invited the CIE to hold its 2001 mid-term meeting in Vancouver, in conjunction with a Lux Pacifica meeting planned for the same time.
It now appears that most Europeans would favour a location in Europe, in view of tightening budgets for travel to distant places, and the fact that the U.S.A. have made a serious bid to hold the next Session in 2003 on this side of the Atlantic.

Other « hot » topics, like;

- the improvement of CNC/CIE communications with the Canadian lighting community,
- the upcoming Session in Warsaw, followed by
- a second joint USNC/CNC meeting ,in Canada this time,

appear individually on the agenda, and have been or will be dealt with separately.

Respectfully submitted this sixth day of November 1998.



APPENDIX D

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CNC/CIE SECRETARY'S REPORT TO THE 43rd ANNUAL MEETING

1998-NOVEMBER-06

The following acronyms are used in this report:
CIE-CB: CIE Central Bureau in Vienna, Austria
CIE-BA: CIE Board of Administration
CNC/CIE: Canadian National Committee of CIE
This report covers the period from 1997-October-31 to 1998-November-05.

CIE MATTERS:

1. Annual Membership Fee:

The annual membership fee of the CNC/CIE as a member of the CIE for 1998 is 94,847 Austrian Schillings. This is approximately $10,424.00 Cdn. The NRC Public and International Relations branch is responsible for making this payment, and has continued to do so.

2. CIE 24th Session:

The 24th Session of the CIE will be held in Warsaw, Poland from June 24 to 30, 1999. A Call for Papers/Proposed Workshops/Proposed Invited Papers was sent to all of our mailing lists on 1998-January-09. Three papers were submitted, refereed, and forwarded to the CIE-CB for final acceptance by the CIE-BA. All three were accepted either as a Presented Paper or Poster at the Stand. The papers are:

1. Claude MH Demers, "Light and the Digital Image: A Proposed Framework for Design and Analysis".
2. Dale K. Tiller, Guy R. Newsham, and Roger Marchand, "An Automated System for Surveying Illuminance".
3. Jennifer A. Veitch and Guy R. Newsham, "Preferred Luminous Conditions in Open-Plan Offices: Implications for Lighting Quality Recommendations".

I have received some First Invitation Packets for this session, copies of which were mailed to all CNC/CIE Members, and are available to anyone else who is considering attending the Session.

Information is also available on the website: `http://www.ee.pw.edu.pl/cie99` .

3. CIE Divisions:

3.1. Establishment of a new CIE Division on Image Technology (CIE Division 8):
The CIE-BA has proposed the establishment of this new CIE Division. The terms of reference for this division would be:

"To study procedures and prepare guides and standards for the optical, visual and metrological aspects of the communication, processing, and reproduction of images, using all types of analogue and digital imaging devices, storage media and imaging media."

A letter ballot containing the rationale for this was mailed to all CNC/CIE Members and Advisory Members. Eighteen replies, all positive, were received, and our approval of the establishment of this new division was sent to the CIE-CB.

3.2. Closing down of CIE Division 7 "General Aspects of Lighting":
The CIE-BA has proposed the closing down of CIE Division 7. A letter ballot including the rationale for this action has been mailed to all CNC/CIE Members and Advisory Members. The deadline for returning the ballot to the CNC/CIE Secretary is 1998-December-11.

4. CIE Draft Standards:

DS 004.4 *Colours of Light Signals*. Copies of this draft standard were sent to all CNC/CIE Members and several Advisory Members. Nine replies were received, which included editorial comments and one negative vote. These were passed on to the CIE-CB, together with our approval for the publication of this document as a CIE Standard, with the included comments.

DS 005.4 *CIE Standard Illuminants for Colorimetry*. Copies of this draft were sent to all CNC/CIE Members for final voting. The comments which were received (seven replies) were summarised and sent to the CIE-CB along with our positive vote. This standard has now been published as a new CIE Standard.

DS 006.5 *Road Traffic Light—200mm Roundel Signals Photometric Properties.* Copies of this draft were sent to all CNC/CIE Members for final voting. Six replies were received, and our approval of the publication of this document as a CIE Standard was sent to the CIE-CB. This standard has now been published as a new CIE Standard.

DS 007.4 *Erythema Reference Action Spectrum and Standard Erythema Dose*. Our comments on Draft 007.3 were forwarded to the CIE-CB in March 1998. A final draft (007.4) was issued from the CIE-CB and copies of this draft were sent to all CNC/CIE Members for final approval. Six replies were received, and our approval of the publication of this document as a CIE Standard was sent to the CIE-CB. This standard has now been published as a new CIE Standard.

5. Mailings:

Amongst others, the following CIE materials have been received and mailed to the membership as appropriate:

CIE NEWS #44, December 1997
CIE NEWS #45, March 1998
CIE NEWS #46, June 1998
CIE NEWS #47, September 1998

CIE Press Releases:

CIE Publication 127 (1997) *Measurement of LEDs.*
CIE Publication 128 (1998) *CIE Guide to the Lighting for Open-Cast Mines.*
CIE Publication 129 (1998) *Guide for lighting exterior work areas.*
CIE Publication 131 (1998) *The CIE 1997 Interim Colour Appearance Model (Simple Version), CIECAM97s.*

CIE Special Publication x013 (1997) *Proceedings of the CIE Symposium 1997 on Standard Methods for specifying and measuring LED characteristics.*
CIE Special Publication x014 (1998) *Proceedings of the CIE Expert Symposium '97 on Colour Standards for Imaging Technology.*

CIE Standard S 005/E (1998) *CIE Standard Illuminants for Colorimetry.*
CIE Standard S 006/E (1998) *Road Traffic Light—200 mm Roundel Signals Photometric Properties.*
CIE Standard S 007/E (1998) *Erythema Reference Action Spectrum and Standard Erythema Dose.*

CNC/CIE MATTERS:

1. CIE Division 3 Meeting:

The CNC/CIE hosted the CIE Division 3 meetings held on 1998-May-07 and 08 at NRC/Institute for Research in Construction(IRC). These were held in conjunction with the *First CIE Symposium on Lighting Quality* held on 1998-May-09 and 10, also held at NRC/IRC-INMS, and also organised by Dr. Jennifer A. Veitch of NRC/IRC. Another conference—*Daylighting '98*—was held in Ottawa after the CIE Symposium. Further details may be found in the Division 3 report to this meeting.

2. Mailing Lists:

At present I maintain 3 mailing lists: Members(12), Advisory Members(38), General Interest(33). In general, the difference between the first two and the third is that the third list tends to receive only CIE material (press releases of CIE publications, CIE NEWS) and notices of international conferences. Members and Advisory Members receive more CNC information such as various ballots, and the Minutes of the annual meeting and related information.

Journals: I have contacted Mr. Jim Norris, Editor/Publisher of the journal *Professional Lighting*, indicating that I would be happy to include him in my mailings concerning CIE and CNC/CIE matters. I have not received any reply.

3. Membership:

A list of our Members and Advisory Members is available and will be discussed during the annual meeting for the purposes of making any changes.

3.1. Members:
At last year's annual meeting (42nd), two Member appointments were recommended by the CNC/CIE, and letters of appointment were sent to these people by A.L. VanKoughnett, Director-General of INMS. Both have accepted. They are:
Arnold A. Gaertner
Ralph A. Smith.

3.2. Advisory Members:
I extended our invitation to André Laperrière of Hydro-Québec, but have not yet received any reply.

Professor Don Trotter has retired from active research in mine lighting and has resigned as an Advisory Member. In addition to serving on various CIE Technical Committees, particularly in Division 5, he was Secretary of the CNC/CIE for 3 years, from 1982 to 1984.

4. CNC/CIE Web site:

Permission has been obtained to post information concerning the CNC/CIE as part of the INMS website on NRC's server. This is intended to be on an experimental basis and on the understanding that the CNC/CIE will send html files to the INMS webmaster in English and French in a form which can be added to the site with no editing required. It is also assumed that there will not be a large amount of space-consuming graphics.

5. NRC support of CNC/CIE.

There is a partnership agreement between NRC/INMS and NRC/Corporate Services in support of Canada's affiliation with the CIE. This agreement, as well as similar agreements for many other international organisations, is reviewed periodically (at present every five years) by the NRC Advisory Committee on International Science, Engineering and Technology (CISET). This year the INMS-CS partnership was reviewed, and an in-depth questionnaire/assessment considering the activities of the CNC/CIE was completed. Alan Robertson was responsible for representing INMS in this evaluation. The result of the exercise is the continuation of the INMS-CS agreement for the next five years. Basically, this agreement sets out the responsibilities of NRC/CS (the national adhering member for Canada to the CIE), NRC/INMS (general responsibility for the CNC/CIE), and Canadian delegates to CIE General Assemblies.

Respectfully submitted,

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APPENDIX E

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CNC/CIE Publications Report, November 1998

A.R. Robertson

The following table summarizes publication sales and purchases for the last four years. Details for the last year are on the attached spreadsheets.

	1995 ($)	1996 ($)	1997 ($)	1998 ($)
Balance forward	5211.20	4907.82	6613.02	7258.47
Sales	7343.00	2303.00	2264.00	2125.00
Interest	3.25	0.00	17.79	14.12
Payments to Central Bureau	(7637.13)	(591.30)	(1629.84)	(2785.49)
Other expenses	(12.50)	(6.50)	(6.50)	(761.19)
Closing balance	4907.82	6613.02	7258.47	5850.91 [1]
Debt to Central Bureau	(355.46)	(1560.81)	(890.35)	(6.76) [2]
Effective balance	4552.36	5052.21	6368.12	5844.15

[1] Includes bank balance of $5347.91 and $503 held by NRC

[2] ATS 50.00 at exchange rate of 0.1351

I have now documented my procedures and organized my files sufficiently to enable Frank Lin to take over responsibility smoothly. I will be transferring responsibility to him immediately following the 1998 CNC/CIE meeting.

CIE publication sales 1997-98								
Date	Purchaser	No.	Title	Price	Cheques received	Held by NRC	Deposits	Cheques in hand
Forward								$1,126.00
97-10-30	Tim Richardson	18.2	Photometry	$88.00				$1,126.00
		D001	Photometric & colorimetric data	$82.00	$170.00			$1,296.00
97-11-25	SNC Lavalin	93	Road lighting as accident count	$147.00	$147.00			$1,443.00
98-03-03	Reid Crowther	88	Lighting of road tunnels	$90.00	$90.00			$1,533.00
98-04-02	Books for Business	39.2	Surface colours for visual signal	$147.00	$147.00			$1,680.00
98-05-08	Transport Canada	123cd	Low vision	$112.00	$112.00			$1,792.00
98-05-19	Deposit						$1,792.00	$0.00
98-06-05	Louis Garneau Sport	15.2	Colorimetry	$131.00		$131.00		$0.00
98-06-25	Health Canada	X013	Proc. LED Symp. '97	$147.00				$0.00
		127	Measurement of LEDs	$90.00				$0.00
		DS007.3	Erythema action spectrum & do	$13.00	$250.00			$250.00
98-08-13	TIR Systems	30	Calc. & meas. of lum. & illum. in	$224.00		$224.00		$250.00
98-08-18	University of Sherbro	X007	Proc. Symp. '93 Colorimetry	$167.00	$167.00			$417.00
98-08-24	Ledalite	53	Characterizing radiometers & p	$99.00				$417.00
		69	Characterizing illum. & lum. met	$107.00				$417.00
		110	Spatial distribution of daylight	$99.00				$417.00
		112	Glare evaluation	$77.00				$417.00
		117	Discomfort glare	$99.00				$417.00
		S003	Spatial distribution of daylight	$58.00	$539.00			$956.00
98-08-25	Deposit						$956.00	$0.00
98-09-30	Optikon	S006	Road Traffic Light	$58.00		$58.00		$0.00
98-09-30	Natural Resources C	105	Spectroradiometry of pulsed opt	$90.00		$90.00		$0.00
	Total			$2,125.00	$1,622.00	$503.00	$2,748.00	

Publication purchases from CB, 1997-98									
Date	Invoice	No.	Title	Quantity	Unit cost (ATS)	Cost (ATS)	Royalties (ATS)	Payments (ATS)	Running total
97-10-29	Forward					6802.25			6802.25
97-10-09	221	D001	Colorimetric data	1	364.00	364.00			7166.25
97-11-18	256	123cd	Low vision	1	455.00	455.00			7621.25
97-11-29	264	125	Standard erythema dose - Review	2	237.25	474.50			8095.75
		126	Minimizing sky glow	2	312.00	624.00			8719.75
		127	Measurement of LEDs	2	364.00	728.00			9447.75
98-01-30	014	88	Tunnel lighting	2	468.00	936.00			10383.75
98-03-04	055	X007	Proc. Symposium '93	1	679.25	679.25			11063.00
98-03-23	070	129	Lighting exterior areas	2	312.00	624.00			11687.00
98-04-22	116	128	Lighting of open cast mines	2	364.00	728.00			12415.00
		S005	Illuminants for colorimetry	2	312.00	624.00			13039.00
98-05-22	156	15.2	Colorimetry	2	533.00	1066.00			14105.00
98-06-30	198	131	CIECAMs interim colour appearan	2	312.00	624.00			14729.00
98-07-22	235	30.2	Road lighting	2	910.00	1820.00			16549.00
		X013	Proc. LED Symposium '97	2	598.00	1196.00			17745.00
98-07-30	248	S006	Road traffic light	2	237.25	474.50			18219.50
98-08-11		DS007.	Erythema action spectrum & dose	1			50.00		18269.50
98-08-17	269	105	Spectroradiometry	2	364.00	728.00			18997.50
98-09-28	313	S007	Standard erythema dose	2	237.25	474.50			19472.00
98-10-01	330	13.3	Colour rendering	2	598.00	1196.00			20668.00
98-11-03			Payment					20618.00	50.00
			Total			20618.00	50.00	20618.00	

CIE Publications Bank Account						
Date		Sales	Other income	Payments to CB	Other expenses	Balance
96-11-04	Forward					$6,132.47
97-10-31	Interest		$6.51			$6,138.98
98-04-30	Interest		$7.61			$6,146.59
98-05-01	Werner Adrian (re GA, South Africa)				$300.00	$5,846.59
98-05-19	Sales	$1,792.00				$7,638.59
98-05-12	Beaver Foods Ltd (re D3 meeting)				$435.33	$7,203.26
98-05-12	Joanne Wathier (re D3 meeting)				$11.86	$7,191.40
98-05-12	Chantal Arsenault (re D3 meeting)				$5.50	$7,185.90
98-08-25	Sales	$956.00				$8,141.90
98-10-31	Service charge				$2.00	$8,139.90
98-11-03	Payment to CB (ATS 20618)			$2,785.49		$5,354.41
	Commission on bank draft				$6.50	$5,347.91
Total	Total	$2,748.00	$14.12	$2,785.49	$761.19	$5,347.91

	CIE Publications						
	Stock list	98-11-04					
No.	Title	Year	Price Code	Sales 1996-97	Sales 1997-98	Current stock	
1	Urban sky glow	1980	C			4	
2.2	Signal colours	1975	I			3	
12.2	Road Lighting	1977	n/a			4	
13.3	Colour rendering	1995	I	2		2	
15.2	Colorimetry	1986	H	2	1	2	
16	Daylight	1972	I			5	
17.4	Vocabulary	1987	X			1	
18.2	Physical photometry	1983	E		1	2	
19.21	Visual performance - 1	1981	K			4	
19.22	Visual performance - 2	1981	I			4	
23	Motorway lighting	1973	C			5	
24	Luminaire phot. (indoo	1973	n/a			3	
27	Luminaire phot. (street	1973	n/a			4	
29.2	Interior lighting	1986	J			1	
30.2	Calc.&meas. (road ltg)	1982	L	1	1	1	
31.2	Calc.&meas. (road ltg)	1983	n/a			2	
31	Glare (road lighting)	1976	C			1	
32A	Special road ltg (Frenc	1977	D			4	
32B	Special road ltg (Engli	1977	D			5	
33A	Road ltg depn (French	1977	C			4	
33B	Road ltg depn (English	1977	C			5	
34	Road ltg installn data	1977	E			3	
38	Char. of materials	1977	L			4	
39.2	Surf.colours for signals	1983	I		1	3	
40	Interior lighting calcs	1978	G			4	
41	Light as true vis.quanti	1978	E			4	
42	Lighting for tennis	1978	C			6	
43	Phot. of floodlights	1979	F			4	
44	Absolute reflection	1979	H			2	
45	Lighting for ice sports	1979	C			5	
46	Material refl. stds.	1979	J			4	
47	Lighting for wet roads	1979	I			4	
48	Road traffic signals	1980	E			1	
49	Emergency lighting	1981	B			3	
51	Daylight simulators	1981	D			2	
52	Interior lighting calcs	1982	L			4	
53	Radiometers & photo	1982	D		1	2	
54	Retroreflection	1982	D			2	
55	Discomfort glare	1983	F			3	
56	Proceedings 1983	1983	L			5	
57	Lighting for football	1983	B			4	
58	Lighting for sports hall	1983	A			4	

59	Polarization	1984	D			4	
60	Vision & the vdu	1984	D			1	
61	Tunnel entrance lightin	1984	I			3	
62	Lighting for swimming	1984	C			2	
63	Spectroradiometry	1984	G			2	
64	Spectral responsivity	1984	H			3	
65	Absolute radiometers	1985	D			3	
66	Road surfaces	1984	H			2	
67	Photometry of sports li	1986	A			2	
68	Exterior lighting	1986	H			4	
69	Illuminance meters	1987	E		1	1	
70	Meas. of luminous inte	1987	F			2	
71	Proceedings 1987	1987	n/a			1	
72	Retroreflectors	1987	G			2	
73	Road markings	1988	G			1	
74	Road signs	1988	K			3	
75	Spec. luminous efficie	1988	C			2	
76	Meas. of luminescenc	1988	H			2	
77	Electric light sources	1988	K	1		0	
78	Brightness-luminance	1988	M			2	
79	Road traffic lights	1988	C			1	
80	Observer metamerism	1989	C			2	
81	Mesopic photometry	1989	D			3	
82	CIE history	1989	M			1	
83	Lighting for tv sports	1989	C	1		1	
84	Luminous flux	1989	F			1	
85	Solar spec. irradiance	1989	F	2		0	
86	1988 spec.lum.eff.func	1990	B			2	
87	Self-luminous displays	1990	E			1	
88	Lighting for road tunne	1990	F	1	1	1	
89	Collection 1990	1991	F			2	
90	Sunscreen testing	1991	B			2	
91	Proceedings 1991	1992	n/a			2	
92	Lighting of urban area	1992	D			1	
93	Road lighting / acciden	1992	J		1	3	
94	Floodlighting	1993	H			1	
95	Contrast & visibility	1992	F			1	
96	Electric light sources	1993	C	1		0	
97	Maintenance/indoor	1992	C			2	
98	Personal uv dosimetry	1992	C			1	
99	Lighting education	1992	B			1	
100	Night driving	1992	G			2	
101	Parameters/colour diff	1993	B	1		0	
102	File format-photometri	1993	C	1		1	
103	CIE Collection 1993	1993	G	1		0	
104	Daytime running lights	1993	B			1	
105	Spectroradiometry	1993	C		1	2	
106	CIE Collection/Photobi	1993	F	1		1	
107	Signal colours	1994	E	1		1	

108	Daylight measurement	1994	F			1	
109	Corresponding colours	1994	B			2	
110	Spatial dist. daylight	1994	D		1	0	
111	Variable message sign	1994	F			2	
112	Glare evaluation	1994	B	1		0	
113	Retroreflective signs	1995	G			1	
114	Collection - photometr	1994	E			2	
115	Lighting of roads	1995	C			2	
116	Colour difference eval.	1995	B	2		2	
117	Discomfort glare	1995	D		1	1	
118	Collection - colour & vi	1995	G			2	
119	Proc. New Delhi Vol.1	1995	X			0	
120	Proc. New Delhi Vol.2	1996	K			0	
121	Goniophot. of luminair	1996	F	1		0	
122	Colorim. of CRTs	1996	C	1		1	
123	Low Vision	1997	L			2	
123CD	Low Vision	1997	50% of L		1	0	
124	Collection - colour & vi	1997	E			2	
125	Standard erythema do	1997	A			2	
126	Minimizing sky glow	1997	B			2	
127	Measurement of LEDs	1997	C		1	1	
128	Lighting of open cast	1998	C			2	
129	Lighting exterior areas	1998	B			2	
131	CIECAMs colour appe	1998	B			2	
D001	Phot. & colorim. data	1988	C	1	1	0	
D002	Colour rend. data	1991	J			0	
D003	CIE Roster		n/a			0	
D004	CIE Publications	1993	J			0	
D005	Daylight simulators	1994	A	1		0	
D006	Daylight AQC	1994	n/a			1	
D007	Corresponding colours	1994	F			0	
D008	Colour rendering	1995	X			0	
ISO10526	Standard illuminants	1991	B			2	
ISO10527	Standard observers	1991	G			3	
S003	Daylight	1996	A		1	0	
S005	Illuminants for colorim	1998	B			2	
S006	Road traffic light	1998	A		1	1	
S007	Erythema action spect	1998	A			2	
DS004.2	Signal colours	1996	X			0	
DS007.4	Erythema action spect	1998	$13		1	n/a	Note 1
x001	SLG-Div.5 Symposium	1989	B			0	
x002	SLG-Div.4 Symposium	1989	n/a			0	
x003	CIE-WMO Symposium	1989	J			1	
x005	Proc.sem.computer pg	1992	J			0	
x006	Japan CIE / Prakash9	1991	B			0	
x007	Proc.Symp.Colorimetr	1993	X		1	0	
x008	Urban Sky Glow	1994	E			1	
x009	Proc.Symp.Photometr	1995	L			2	
x010	Proc.Symp.Image Tec	1995	L			0	

x011	Proc.95 late papers	1995	F			0	
x013	Proc. LED Symp. '97	1997	I		1	1	
AIC1AB	AIC Proc 93 A+B	1993	n/a			0	
AIC1AC	AIC Proc 93 A+C	1993	n/a			0	
AIC1ABC	AIC Proc 93 A+B+C	1993	n/a			0	
	Total			23	19	265	
Notes							
1. Printed at NRC from master							

APPENDIX F

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CNC/CIE MEMBERS

CNC/CIE			TERM (expiry)	CIE
President	J. Roberge	Québec	1999-12-31	Division 5, Finance Com.
Vice President	W.K. Adrian	Ontario	1998-12-31	Division 4
Secretary/Treasurer	A.A. Gaertner	Ontario	2001-12-31	
	K.F. Lin	Ontario	2000-12-31	
	J. Love	Alberta	1998-12-31	
	S.M. McFadden	Ontario	1998-12-31	Division 1
	I.C. Pasini	Ontario	1998-12-31	Division 3
	J.A. Veitch	Ontario	1999-12-31	Division 6
	R.W. White	Québec	2000-12-31	Division 7
	Ralph A. Smith	New Brunswick	2001-12-31	
	J.C. Zwinkels	Ontario	1998-12-31	Division 2
ex officio	A.R. Robertson	Ontario		CIE VP, NRC/INMS Member

CNC/CIE ADVISORY MEMBERS

Eduard Alf	Ontario	Brian Liddy	Ontario
Ian Ashdown	British Columbia	P. Manning	Nova Scotia
M.G. Bassett	Ontario	J. Bruce McArthur	Ontario
J.(Joe) Bastianpillai	Ontario	Donald B. McIntyre	Ontario
J. Allyson Chrysler	Ontario	S.W. McKnight	Ontario
Vince Cimino	Ontario	Arthur H. Mendel	Québec
W.B. Cowan	Ontario	H. H. Mikaelian	New Brunswick
Biman Das	Nova Scotia	T. Nilsson	P.E.I.
R.V. Day	Ontario	Tim M. Richardson	Ontario
(Joseph Diwan)	Ontario	Nikolay Stoev	Ontario
R.B. Gibbons	Ontario	Eli Szamosi	Ontario
C.M. Henville	Ontario	B.W. Tansley	Ontario
Byron Jordan	Québec	D.K. Tiller	Ontario
Roy Kaufmann	British Columbia	M.K. Timmings	Ontario
S.M. Kaye	Manitoba	R. Topalova	Ontario
A. Ketvirtis	Ontario	James G. White	Ontario
Barbara Kolesnik	Ontario	Lorne A. Whitehead	British Columbia
Jacques Lacasse	Québec	George Woo	Ontario
R. Lakowski	British Columbia	Ernest Wotton	Ontario

November 4, 1998

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COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CNC/CIE DIVISION MEMBERS' REPORTS for the 43rd Annual CNC/CIE Meeting 1998-November-06

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Report to CNC/CIE 43rd Annual Meeting

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Activities of Division 1

The activity level of Division 1 continues to improve. Many of the moribund TCs have now been disbanded and the remainder seem to be making steady progress with several submitting essentially final drafts of technical reports. The main accomplishment during the past year was the approval of the Technical Report from TC1-34 "CIE 1997 Interim Colour Appearance Model". There has been a great demand for such a model. It is hoped that it will be tested extensively by the colour community and the results reported back to TC1-34. As well, a new reportership, Effect of Ambient Light on Color Appearance of Soft Copy Images, and a new Technical Committee, TC1-50: A Disability Glare Formula, were approved during the past year.

The annual meeting of Division 1 for 1998 was held 28-30 September in Baltimore, Maryland. However, Division 1 met only on the 28th and 30th. The 29th was devoted to a meeting of the proposed Division 8. This year three Canadians, S. McFadden, A. Robertson, and W. Adrian, participated in the Division 1 meeting. Five Technical Committees, TC1-19, TC1-21, TC1-36, TC1-37, and TC1-48, also held meetings at that time. As well, representatives from a number of other TCs were in attendance and provided reports on the work of their committees.

The primary change to the Division was the disbanding of the Visual Ergonomics Section and the transfer of the remaining Technical Committees in that Section to the Vision Section. As well, new representatives were appointed for Bulgaria and New Zealand. Portugal withdrew its membership and Slovakia joined.

During the meeting, the formation of a mechanism for Study Groups was announced. These are intended to focus on a specific topic, but they will be less formal than Technical Committees. They will primarily be a forum to discuss areas of interest without the requirement to produce a formal report. However, it was recommended that each study group have a Chairman. Participation will be primarily via the internet although the groups will be free to communicate in other ways. The hope is to encourage the participation of young scientists working in vision and colour in the work of Division 1. The technical arrangements for establishing Study Groups exists. The next step is to propose topics and recruit participants.

Technical Committees are being encouraged to put documents on the Division 1 web site, http://nml.csir.co.za/~cie1, for faster distribution to interested members. Some of these may have password protection to limit distribution. Division minutes and activity reports are currently available.

The following summaries of activities in the various Technical Committees of Division 1 are based on the Activity Report for 1998 and notes taken at the annual meeting by myself

and Alan Robertson. Thus, the information presented below should be treated as unofficial. For this report, the old structure of three different sections has been retained.

Progress in Vision Section

TC1-21: Testing of supplementary systems of photometry A fifth and final draft of a report covering the committee's evaluation of systems for assessing the relative brightness of lights was presented at the Baltimore meeting. Two sets of photometric systems based on heterochromatic brightness matching (2° and 10°) have been evaluated by this TC. The report states that the evaluation of the systems proposed is based on the relative comparison of the equivalent luminance and not the absolute. Data showing chromatic dependence of equivalent luminance are included in the report. During the meeting, there was considerable discussion over the impact of pupil size and the use of a natural versus artificial pupil on the brightness matching data used to test the various systems.

TC1-26: Individual variation in heterochromatic brightness matching With the removal of the second term of reference from this TC, it is anticipated that the work of this committee will be completed and written up relatively quickly.

TC1-30: Luminous efficiency functions As requested at the Kyoto meeting, the data for luminous efficiency functions of V_{b2} and V_{b10} were interpolated for smaller wavelength steps than 10nm. The amended draft was presented at the Baltimore meeting.

TC1-36: Fundamental chromaticity diagram with physiologically significant axes A ninth draft of the report of this committee was presented at the Baltimore meeting by Dr. Vienot. The report was well received and it is anticipated that the work of this committee will be completed by the Warsaw session of the CIE. The committee started with 10 degree colour matching functions and using macular density data and lens ocular density data derived colour matching functions for stimuli from 1 to 10 degrees in diameter.

TC1-37: Supplementary system of photometry The system to be proposed to the CIE is still under consideration. The fact that none of the systems investigated under TC1-21 proved superior has made the work of this committee somewhat more difficult.

TC1-40: Critical flicker fusion frequency A new chairman is still being sought for this TC.

TC1-41: Extension of $V_m(\lambda)$ beyond 830 nm The report from this TC is essentially complete. However, they have been waiting for the results from TC1-36. Now that these are available, the TC can complete their work.

TC1-42 Colour Appearance in Peripheral Vision The Chair of this TC is unable to complete the report; however, the secretary of the TC has agreed to prepare a draft.

TC1-46: Concept and application of equivalent luminance Dr. Nakano is the new Chair of this committee. He is still seeking new members. There was some discussion about what had happened to the original members. The work plan of Dr. Nakano is to prepare a draft report and submit it to Division 1 members via the internet.

R1-12: Visual acuity It was recommended that a TC be established to write a report summarizing the literature on visual acuity as a function of luminance, age, time, colour, and contrast.

R1-16: Visual Adaptation to complex luminance distribution A complete report was received in September. It concluded that there was not enough data to set up a TC in this area at the present time.

R1-19: Specification on individual variation in heterochromatic matching No report has been received since the establishment of this reportership.

R1-20 Visual performance in the mesopic range No report has been received since the establishment of this reportership.

Progress in Colour Section

TC1-27: Specification of colour appearance for reflective media and self luminous display comparison This TC was suppose to meet in Baltimore, but the Chair was ill. After having found the source of the inconsistencies in previous experiments, one final set of experiments has been designed and will be run in the US and the UK. It is still anticipated that this work will be completed by the Warsaw meeting of the CIE.

TC1-33: Colour rendering It was decided to formally terminate this TC at the Baltimore meeting. All of the work completed to date will be archived until more data on modern light sources becomes available.

TC1-34: Testing of colour appearance models A simplified model of colour appearance, called CIECAM97, combining various aspects of existing models has been being formulated. It was published in a technical report that was approved by Division 1 during 1998. The committee is to continue until the Warsaw meeting in order to monitor the use of the model and to see if progress can be made on a more comprehensive model.

TC1-38: Compatibility of tabular data for computational purposes The committee decided to standardize on the data and the formulae for computing tables of CIE spectral data rather than on the format for the actual tables. There are still some questions about the best methods for interpolating between measured data points that the committee needs to resolve. A draft report is expected by the end of the year.

TC1-43: Rod intrusion in metameric colour matches The committee appears to have reached consensus regarding the method of calculating pupil diameter. The plan is to calculate the effects of rod intrusion using the limiting cases of diameter and reference methods of estimating pupil diameter. A report is promised for the Warsaw meeting.

TC1-44: Practical daylight sources for colorimetry A detailed report of the work of this committee is available as an Annex to the 1998 Activity Report. The Chair has been extremely disappointed at the response of manufacturers of daylight simulators, colour matching booths and colour measuring instruments to the questionnaire sent to them by the TC. It was suggested that in some cases the manufacturers may be reticent about releasing confidential information and in other cases they may not have the data requested on the questionnaire. There was also some concern about the ability of the committee to adequately sample the range of lighting currently available in the marketplace. As a result of the difficulty in collecting data, the committee has fallen behind its original schedule. A revised workplan is included in their report.

TC1-45: Revision of CIE Publication No. 51 to include D50 simulators The report has been written and the TC will be closed. It was recommended that a new TC be formed to revise CIE Publication 51 and issue it as a standard.

TC1-47: Hue and Lightness Correction to Industrial Colour Difference Evaluation This TC was established in 1997 with Dr. D. H. Alman as the Chair. Its purpose is to investigate the hue and lightness dependence of industrial colour difference evaluation methods using existing experimental data. A working program has been organized with the aim of reporting proposals for hue and lightness corrections to the CIE94 industrial colour difference evaluation model. These proposals were to be presented at a meeting of TC1-47 to be held on October 1st in Baltimore.

TC1-48: Revision of CIE Document 15.2 Colorimetry This TC met in Baltimore. There was considerable discussion about what should and should not be included in the revised document. It was generally agreed that only well accepted practices should be included. Moreover, it was felt that background and supporting information should be removed from the main document and published in a separate document. It was suggested that this historical document along with other relevant information be published on a CD-ROM.

TC1-49: Liaison with ISO/TC35: Paint and Varnishes Colorimetry After considerable effort, the TC has established communication with the Chair of ISO/TC35, but no reports have been received for comment.

R1-04: Colour difference evaluation New papers were added to the list of relevant literature collected for the first report. Members of Division 1 were requested to forward information on this topic to the Reporter. It was felt that the collection of this type of information was useful and that the reportership should be continued.

R1-11: Cognitive aspects of colour A final report will be presented in Warsaw.

R1-13: Revision of Wyszecki and Stiles Apparently, Wiley is interested in publishing an updated version of the book; however, certain technical details need to be resolved first. There seemed to be a consensus at the meeting that a revised version could be useful, but that it might be difficult to find individuals that would devote the required time without compensation. Nevertheless, the Reporter was requested to determine what chapters might need revision, what material should be added, and who might be approached to write the new and revised chapters.

R1-14: Visual observation of blood-oxygen levels A formal report will be submitted after publication of the results of experiments carried out by the Reporter. There may be a case for a special colour rendering index for cyanosed blood (or skin).

R1-15: Lighting terminology A second version of the revisions of terminology for Section 2 and 3 has been submitted to the working group. It is expected that a final version will be ready this fall.

R1-17: Improved colorimetry A report was presented at the Baltimore meeting. In addition, a report by Dr. Schanda is available on the Division 1 web site. It was felt that this reportership should continue.

R1-18: The use of colour identification under various illuminance levels Dr. Ishida is still experiencing difficulty in finding published articles relating specifically to this topic.

Progress in Visual Ergonomics Section

TC1-19: Specification of visibility for real tasks A meeting of this TC was held in Baltimore. The third draft was presented at the meeting and was accepted. It should be possible to close this TC in Warsaw.

TC1-39 Discomfort Glare Experienced by Elderly People This TC was disbanded.

R1-03: Engineering applications of brightness scales Dr. Sagawa is pushing the reporter to finish by Warsaw.

R1-06: Transient adaptation No report has been received since Kyoto.

Proposals for New Reporterships and Technical Committees

1. Three new TCs were approved. The first, TC1-51, is on Visual Acuity. The second is on chromatic adaptation transforms with R. Luo as Chair. The third is to develop a standard for assessment of daylight simulators with C. S. McCamy as Chair. J. Zwinkels was proposed as a member.
2. Reporterships on factors influencing pupil size and on visibility (definition and influence parameters) will be established if suitable volunteers can be found.
3. A new reportership on conspicuity was also proposed, but it was not accepted. Apparently, a similar reportership exists in Division 4.

Next meeting

The 1998 meeting of Division 1 will be held during the 24th Session of the CIE in Warsaw, Poland in June 1999.

Canadian Participation in Division 1

Based on the latest information available to me, Canada has representatives on 9 Technical Committees. The Canadian representatives are W. Adrian on TC1-19; A. Robertson on TC1-27 , TC1-38, TC1-43 and TC1-47; W. Cowan on TC1-21 and TC1-37; and J. Zwinkels on TC1-38 TC1-44 and TC1-45.

CIE DIVISION 2:

PHYSICAL MEASUREMENT OF LIGHT AND RADIATION

Report to CNC-CIE, November 6, 1998

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The most recent CIE Division 2 meetings were held 18-19 May 1998 in Boulder, Colorado in conjunction with CORM98. I attended these meetings and the following is a summary of the main items discussed during the business meeting.

Administrative Matters

The Division 2 officers are:
Division Director - F. Hengstberger (South Africa); Associate Directors: N. Johnson (USA), T. Goodman (UK), G. Vandermeersch (Belgium); Division Editor - J. Moore. Secretary: Y.Ohno (USA).

Division 2 currently has 34 member countries. Canadian member: J. Zwinkels

The Division has a website at: http://nml.csir.co.za/~cie2/, which has been recommended as a model for other divisions.

TC Meetings on May 18th, 1998 in Boulder, Colarado:

The following nine technical committees held meetings:
TC 2-16 (Rastello, Italy) Characterization of the performance of tristimulus colorimeters
TC 2-25 (Zwinkels, Canada) – Calibration methods and photoluminescent standards for total radiance factor measurements
TC 2-29 (Goodman, UK) Measurement of detector linearity
TC 2-32 (Hodson, USA) Measuring retroreflectance of wet horizontal road markings
TC 2-36 (Rennilson, USA) Retroreflection: Definition and measurement
TC 2-37 (Ohno, USA) Photometry using detectors as transfer standards
TC 2-39 (Rich, USA) Geometric tolerances for colorimetry
TC 2-40 (Rattunde, Germany) Characterization of the performance of illuminance and luminance meters
TC 2-43 (Sauter, Germany) Determination of measurement uncertainties in photometry

*** No new TC reports were received by the Division Editor since the meeting in Durban last year.**

Technical Committee Work in Progress

TC 2-04	Secondary light sources (Moore, UK)	This bulk of this report has been completed. Chairman plans to circulate for TC ballot at the end of June.
TC 2-14	Measurement of reflectance and transmittance, including turbid media (P. Polato, Italy)	The document has passed TC ballot; Division ballot is in progress.
TC 2-17	Simulated solar radiation (D. Kockot, Germany)	A draft document has been prepared and circulated to all D2 members; Chairman is now preparing a revised draft.
TC 2-19	Measurement of spectral coefficient of retroreflection (N. Johnson, USA)	TC document is almost complete. Chairman plans to have final draft for TC voting by Warsaw Session.
TC 2-23	Photometry of street-lighting luminaires (G. Vandermeersch, Belgium)	No report at this time.
TC 2-24	Users guide for the selection illuminance and luminance meters (K. Ganesha, India)	No comments received on draft outline circulated in April 1997. Questionnaire is being circulated with strict time schedule. Chairman hopes to complete work by Warsaw Session.
TC 2-25	Calibration methods and photoluminescent standards for total radiance factor measurements (J. Zwinkels, Canada)	TC met in Boulder, and discussed 7th draft of report. An 8th draft of report will be presented at next TC meeting in Vancouver, May 1999, and be ready for TC voting.
TC 2-28	Methods of characterizing spectrophotometers (J. Verrill, UK)	Document has 8 authors (2 Canadian). Third draft was circulated in April 1998, with figures and references included. TC report should be completed and approved by June 1999.

TC 2-29	Measurement of detector linearity (T. Goodman, UK)	TC met in Boulder to discuss current status. 3rd draft is to be prepared for circulation in early Nov. 1998.
TC 2-30	Diode array radiometry (P. Wychorski, USA)	Chairman resigned due to increased work load. After the D2 meeting, James Palmer (Univ. Arizona, USA) agreed to take over Chairmanship to complete document for publication.
TC 2-32	Measuring retroreflectance of wet horizontal road markings (Hodson, USA)	The TC met in Boulder with its new Chairman. TC is looking for new members with expertise on rain simulation and visibility pavement marking. TC plans to meet in Oct. 1997, in conjunction with D4.
TC 2-34	LED measurements (K. Muray, USA)	TC document has been published as CIE 127. Follow-up work has been proposed (see new TCs).
TC 2-35	CIE Standard for $V(\lambda)$ and $V'(\lambda)$ (Mielenz, USA)	No report received from Chairman. TC member (Sauter) reported there was a conflict with document and CCPR; Chairman is now revising document; it will then go through a 2nd voting.
TC 2-36	Revision of CIE Publ. 54: Retroreflection (J.Rennilson, USA)	TC met in Boulder to discuss the 8th draft, which is close to completion. TC will meet in Bath in Oct. 1998 and then proceed to TC voting.
TC 2-37	Photometry using $V(\lambda)$-corrected detectors as transfer standards (Ohno, USA)	TC met in Boulder to discuss the 5th draft. The Chairman plans to send out the 6th draft for TC ballot within the new few months.
TC 2-39	Geometric tolerances for colorimetry (D. Rich, USA)	TC met in Boulder and held general discussions. Chairman will prepare a final draft of the report and circulate to TC members. NIST and 3M have volunteered to supply measurement data on standard materials to validate recommended tightening of tolerances. TC plans to meet at Warsaw Session.

TC 2-40	CIE standard: Characterizing the performance of luminance illuminance meters (Rattunde, Germany)	TC met in Boulder to discuss 2nd draft. The 3rd draft will be prepared for Warsaw Session.
TC 2-41	Industrial photometry in developing countries (B. Bhattacharya, India)	No report received from Chairman. If no progress made by 1999 D2 meeting, TC may be closed.
TC 2-42	Colorimetry of visual displays (A. Hanson, U.K.)	Chairman has prepared an outline of the proposed TC report which has been discussed at the CIE Expert Symposium on Color Standards for Imaging Technology in Scottsdale, Nov. 1997.

Reporterships in Progress:

R 2-05	Visual gloss (J. Taylor, UK)	No need for a TC at this time; continue to monitor situation.
R 2-06	Standardization of measuring geometry for the colorimetry of metallic paints (C. McCamy, USA)	ASTM E12 is meeting twice a year. No need for a TC at this time.
R 2-09	Absolute cryogenic radiometers (Parr, USA)	TR for a new TC will be presented at Warsaw by the reporter.
R 2-17	Aviation photometry (Ohno, USA)	It was determined that a new TC was required to address photometric terms and quantities for flashing light measurement. The reportership should continue for another year to continue discussion with ICIA on other subjects in aviation photometry.
R 2-18	OIML Matters (Sauter, Germany)	No report at this time.
R 2-21	Use of detectors as absolute transfer standards for spectroradiometry (N. Fox, UK)	No need for a TC at this time; situation will continue to be monitored.

R-22	Implementation of Photometric Units (Moore, UK)	Reportership is continuing; Div. 1 is to be contacted to determine need for document to guide future implementation of photometric units for non-V(λ) functions.

*** Reports of Liaisons:**

CCPR (Kohler) Kohler reported on the concept of the CCPR key comparisons and on the results of past international comparisons of photometric units. Euromet and NIST are developing a publicly available data base to contain the results of these international comparisons. It was emphasized that the equivalence of national standards is becoming essential for traceability requirements made in ISO Guide 25 and other quality systems, and that reduction of technical barriers to trade necessitates mutual acceptance of test methods.

ISO/ TC6 (J.Zwinkels, Canada) The working group (WG3) met in Cape Town, South Africa in November 1997. The major issues that were discussed are: comparison between NRC and PTB, new authorized laboratories, liaison with ISO/TC 130, indoor whiteness and ISO-brightness, gloss measurements at 75° and 20° and instruments for and d/8°.

The following ISO draft standards were reviewed and comments given to CIE CB:

FDIS 2471 "Paper and board - determination of opacity (paper backing)"
FDIS 9416 "Paper – determination of light scattering and absorption coefficient (using Kubelka-Munk theory)"
ISO/DIS 11475 "Paper and board – CIE whiteness, D65/10°"

*** Proposals for 5 New Technical Committees:**

TC 2-45: Measurement of LEDs – Revision of CIE 127. Muray (USA) as the Chairman. To include improved definitions of quantities and methods of measurement for total / partial flux and spectral/ colour of LEDs.

TC 2-46: CIE/ISO Standards on LED Intensity Measurements. J. Scarangello (USA) as the Chairman.

TC 2-47: Characterization and Calibration Methods of UV Radiometers. G. Xu (Singapore) as the Chairman. This TC will prepare recommendations on methods of characterizing and calibrating broad-band UV radiometers for UV-A and UV-B industrial applications.

TC 2-48: Spectral Responsivity Measurement of Detectors, Radiometers and Photometers. G. Eppeldauer (USA) as the Chairman. This TC will rewrite the technical report CIE 64 (1984) to update device and measurement technology and include the spectral responsivity measurement for radiometers and photometers.

TC 2-49: Photometry of Flashing Light. Y. Ohno (USA) as the Chairman. This TC will produce a technical report for photometric measurements of flashing light, including the derivation of relevant quantities, measurement of light sources and calibration of photometers.

*** No Proposals for New Reporterships**

Other CIE Division 2 Business:

Election of New Division Director (1999-2003): Three nominations were received by the Secretary: T. Goodman (UK), G. Sauter (Germany) and N. Johnson (USA).

Other CIE Division 2 Meetings:

CIE Expert Symposium on Color Standards for Image Technology was held Nov. 21-22, 1997 in Scottsdale, Az., in conjunction with the 5th IS&T Color Imaging Conference, and Chaired by A.R. Robertson (Canada); the abstracts of talks from this Symposium are available in the conference proceedings. A major outcome of this meeting was the **proposal for a new CIE Division devoted to Standardization in Imaging Technology**.

Opinions regarding the formation of this new Division should be sent to the D2 Director. D2 has only a few TCs that are directly involved in color imaging; however D1 will be seriously affected.

Future CIE Division 2 Meetings:

24-30 June 1999	Warsaw, Poland in conjunction with the CIE 24th Session. Joint meeting with D1 is planned. June 24-26 – technical sessions; June 28-30 – Div/TC meetings. D2 is planning a Joint Workshop with D1 on Measurement of Flashing Light.
2000	Open. CORM-Rochester and NPL have been suggested.
2001	Possibly with CORM in Gaithersburg – NIST 100th Anniversary.

Other CIE Division 2 Notes:

- Canadian participation in the work of the Division continues at a high level with the following members of Technical Committees:

TC 2-16	A.R. Robertson (NRC)
TC 2-22	A.A. Gaertner (NRC)
TC 2-25, Chairman	J.C. Zwinkels (NRC)
TC 2-28	A.R. Robertson, J.C. Zwinkels
TC 2-33	A.R. Robertson
TC 2-35	A.R. Robertson
TC 2-39	J.C. Zwinkels, B. Jordan (PAPRICAN)
TC 2-42	S. McFadden (DCIEM), R. Baribeau (NRC)
TC 2-43	A. Gaertner
TC 2-44	G. Woo (Univ.Waterloo)
TC 2-48	L.P. Boivin (NRC)

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

DIVISION 2 : PHYSICAL MEASUREMENT OF LIGHT AND RADIATION

Home Page: http://nml.csir.co.za/~cie2

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ACTIVITY REPORT
August 1998

Division 2 Physical Measurement of Light and Radiation

Director:	Dr. F. Hengstberger
Associate directors:	Ms. T. M. Goodman
	Mr. N. Johnson
	Mr. G. Vandermeersch
Editor	Mr. J. Moore
Secretary	Dr. Y. Ohno

Division 2 currently has 34 country members as below.

Argentina	L. A. Cogno
Austria	M. Matus
Australia	J. Gardner
Belgium	G. Vandermeersch
Brazil	G. Moscati
Bulgaria	V. Konstantinova
China	G. Ye
Croatia	M. Zeljko
Canada	J. Zwinkels
Denmark	L. Larsen
Finland	T. Timonen
France	J. Bastie
Germany	G. Sauter
Great Britain	T. Goodman
Hong Kong	H. W. Lai
Hungary	G. Dézsi
India	B. Bhattacharya
Italy	M. L. Rastello
Japan	M. Nishi
Netherlands	A. J. Bouman
New Zealand	J. F. Clare
Norway	B. Brekke
Poland	J. Pietrzykowski
Romania	F. Ionescu
Russia	V. Ignatyev
Slovak Republic	J. Krempasky
Slovenia	S. Erste
South Africa	F. Hengstberger
Spain	A. Corrons
Sweden	A. Ottosson
Switzerland	P. Blaser
Thailand	U. Chanchanchop
Turkey	L. Öztürk
USA	N. Johnson

Underlines indicate that the country representatives changed since the last report.

The 1997 CIE Division 2 meeting took place on May 19, 1998, at NIST, Boulder, Colorado, USA. In conjunction with this Division 2 meeting, the following TCs met on May 18, 1998 at NIST Boulder. Minutes of these TC meetings are to be distributed to TC members by the TC chairpersons. Brief reports on these TCs are included in the Division 2 Meeting minutes below.

TC2-16	Characterization of the performance of tristimulus colorimeters (Soardo substituted Rastello)
TC2-25	Calibration methods and photoluminescent standard for total radiance factor meas. (Zwinkels)
TC2-29	Measurement of detector linearity (Goodman)
TC2-32	Measuring Retroreflectance of wet horizontal road markings (Hodson)
TC2-36	Retroreflection: definition and measurement (Rennilson)
TC2-37	Photometry using detectors as transfer standards (Ohno)
TC2-39	Geometric tolerances for colorimetry (Rich)
TC2-40	Characterizing the Performance of Illuminance and Luminance Meter (Rattunde)
TC2-43	Determination of measurement uncertainties in photometry (Sauter)

The minutes of the Division 2 meeting are given in the following pages. The abbreviations as below are used.

AD:	Associate Director
Brep.	Board of Administration Report
CIECB:	CIE Central Bureau
CIEBA:	CIE Board of Administration
CM:	Country member
D2:	Division 2
DD:	Division Director
ML:	Member List
NC:	National Committee
TC:	Technical Committee
TR:	Terms of Reference
ST:	Status

Minutes of CIE Division 2 Meeting
Tuesday, May 19, 1998
Boulder, USA

Attendees:

John B. Arens (USA)
Richard Austin (USA)
Elyas Balta (USA)
Jean Bastie (France)
Anton J. Bouman (Netherlands)
David Burns (USA)
Theodore Cannon (USA)
Antonio Corrons (Spain)
Dennis Couzin (USA)
Ronald Daubach (USA)
Gyula Dezsi (Hungary)
Edward Early (USA)
David Ellis (USA)
George Eppeldauer (USA)
Arnold Gaertner (Canada)
Jim Gardner (Australia)
Teresa M. Goodman (UK, D2 AD)
Franz Hengstberger (S. Africa, D2 Dir)
Neil A. Hodson (USA)
Jack J. Hsia (USA, CIE President)
Norbert Johnson (USA, D2 AD)
Carolyn Jones (USA)
Rainer Köhler (BIPM, France)
Alan Kravetz (USA)
Lars L. Larsen (Denmark)
Calvin S. McCamy (USA)
Kathleen Muray (USA)
Yoshi Ohno (USA, D2 Secretary)
Leyla D. Öztürk (Turkey)
Albert C. Parr (USA)
James M. Palmer (USA)
Jerzy Pietrzykowski (Poland)
Reiner Rattunde (Germany)
Justin Rennilson (USA)
Robert D. Saunders (USA)
Georg Sauter (Germany)
John Scarangello (USA)
Frederick T. Simmon (USA)
Paolo Soardo (Italy)
Heinz Terstiege (Germany)
Pierce Webb (USA)
William Weber (USA)
Klaus Witt (Germany)
Philip F. Wychorski (USA)
Gan Xu (Singapore)
Richard Young (USA)
Joanne C. Zwinkels (Canada)

Total 47 persons including 13 country representatives.

Regrets received by Secretary

B. Bhatacharya (India)
P. Blaser (Switzerland)
P. Bhagat (USA)
J. Clare (New Zealand)
G. Czibula (Germany)
K. Ganesha (India)
A. Hanson (UK),
C. Hermann (CIECB)
I. Lewin (USA)
J. Moore (UK)
M. Nishi (Japan)
A. Ottoson (Sweden)
P. Polato (Italy)
M. Racz (Hungary)
L. Rastello (Italy)
A. Robertson (Canada)
J. Schanda (Hungary)
B. Theron (South Africa),
J. Verrill (UK)
J. Walker (USA)
P. Walraven (Netherlands)
G. Ye (China)

Underlines indicate country representatives.

1. Call to order

The Division Director, F. Hengstberger, opened the meeting, and welcomed all present. He thanked the Council for Optical Radiation Measurements (CORM) for inviting this Division 2 meeting as a joint event, and thanked NIST Boulder that offered the venue for the meeting. He asked all present to introduce themselves.

2. Approval of agenda

The circulated agenda of this meeting was approved by an addition of "0. Opening".

The Director asked the attendees the impression of the last D2/D4 joint meeting in Durban. Rennilson mentioned that it was very worth while and made a good progress on the cooperation between the two divisions on some overlapped issues. Terstiege supported it. Div.2 will plan more joint meetings with other Divisions (1, 4, and 6) in the future.

3. Approval of 1997 Division 2 meeting minutes

The circulated minutes of 1997 Division 2 Meeting in Durban were approved with no change.

4. Secretary's report (Y. Ohno)

(1) Div. 2 now has 34 country members, the same as last year. Hong Kong became a part of China, but we still have its country member because CIE considers it as a "geographical area" which is defined in the CIE Statutes and it can be treated as a country. There were changes of three country members since last meeting:

Hong Kong: H. W. Lai replaced T. M. Chung.
Argentina: J. A. Cogno replaced R. D. Rozano.
New Zealand: J. Clare replaced M. G. White.
Netherlands: A. Bouman. replaced J. M. M. Claassens

(2) The 1997 Activity Report, which included the minutes of the 1997 D2 meeting, was prepared and distributed in December 1997. This was distributed by mail also. The Call for Nomination of DD was distributed to all CM by mail also. 15 circulars in total were distributed by e-mail and fax. All the circulars, except small follow-up e-mails, are published also on the CIE D2 Website.

(3) The D2 mailing list now contains 98 persons, that includes 34 country members and 23 TC chair persons. Among them, 81 have e-mail addresses (82 %), a rapid progress from 64 % at the last meeting in Sep. 97. 9 persons are accessed by fax, 8 by mail. The Secretary is using e-mail and the website as a main communication means. Those who still do not have e-mail addresses are strongly recommended to get one. Documents are often sent as e-mail attachments. Now, MS Word file (doc) is used, but PDF file (more platform-independent) will also be used. CIE CB plans to use PDF for electronic balloting. Suggestions and/or information on any problems in e-mail circulars are welcome to the Secretary.

(4) The D2 website, established in March 1997, was reconstructed in January 1998, to include much more information. We had Division Secretaries meeting in October 1997 at CIECB

regarding division websites, and it was agreed that Division 2 website is recommended as a model for other divisions. Div. 1, 3 and 6 are now developing their websites. In the D2 website, we have pages for each Technical Committee. All the TC chairpersons are encouraged to send to the Secretary any materials to be published in this TC page. Any other ideas how to use our website are welcome.

(5) CIE Workshop and Symposium - Standard methods for specifying and measuring LEDs – was held on Oct.22-25, 1997, at CIECB, Vienna. This meeting was organized by CIECB and Division 2, and attended by about 50 participants. There were a two-day tutorial session and a two-day workshop session. Hengstberger, Moore, Sauter, Ohno, Muray, Sliney, and Schanda were the lecturers of the tutorial. During the workshop session, the new publication on LED measurements (from TC2-34) was introduced and discussed by the participants. The key part of the document is the definition of the Averaged LED Intensity (in A and B geometries), which should bring uniformity in the intensity measurements. The discussion identified some improvements to be made particularly on the luminous (and radiant) flux measurements. The LED document was published as CIE Pub. 127, and the proceedings of this meeting was published as CIE x013-1997.

(6) CIE Expert Symposium on Color Standards and Imaging Technology, was held on Nov. 21-22, 1997 in Scottsdale, USA, in conjunction with IS&T Color Imaging Conference, Nov. 17-20. This meeting was organized by CIE Div. 1 and the CIECB, and chaired by A. Robertson. Talks from Div. 2 included Berns (former TC2-26 chair), Hanson (TC2-42 chair), Ohno (D2 Secretary), and Rich (TC2-39 chair). Schanda also attended representing CIECB. There were representatives from many committees in different organizations and groups (ISO, IEC, JTC1, ITU, etc.), and overlaps and chaotic situation between organizations were addressed. The discussion at the end of this Symposium lead to a proposal for CIE to create a new Division to take a leadership in the standardization in imaging technology area. Abstracts of talks at this Symposium are available in the Proc. 5th IS&T Color Imaging Conference. (The issue on the new CIE Division proposal is also reported in Section 11. General.)

5. Editor's report

A written report from the Editor was read by the Secretary as below.

No new material has been received by the Editor since the Division meeting in Durban in September last year.

(1) TC 2-22 Luminous Flux of HP Sodium Lamps

Documentary material obtained from the former TC Chairman was handed to the Editor at the Durban meeting with a request that he should compile from it a report on the conclusions of the intercomparison. The report will appear in the next appropriate CIE Collection which is likely to be published towards the end of 1998.

(2) TC 2-34 Measurement of LEDs

Publication CIE 127-1997, Measurement of LEDs, has now been published. It was launched by a four day Tutorial Workshop and Symposium on LEDs which took place at the CIE Central Bureau in October last year.

Although they appeared in the Editor's Report last year, work on the Technical Reports prepared by TC 2-14, TC 2-33 and TC 2-35 has still to be completed. Details will be given in the reports of the individual TCs.

6. Progress report of Technical Committees

6.1 Technical Committees

Progress reports on the technical committees were given by Associate Directors, Goodman and Johnson, and by Director, Hengstberger for AD Vandermeersch.

TC2-04 Secondary standard sources
Chair: J. Moore (Great Britain) **AD:** Goodman
ML: Bandyopadhyay (India), Corrons (Spain), Gaertner (Canada), Jiang (China), Low (USA), Metzdorf (Germany), Nishi (Japan), Schanda (Hungary)
TR: Produce a technical report on the selection and operation of stable secondary standard sources.
ST: The greater part of the report has been completed for some time. Objections were made in Durban relating to planned photographs and illustrations, which might be able to be identified. Increasing the number of different types of lamps illustrated may solve this. Chairman plans to circulate for TC ballot at the end of June.

TC2-14 Measurement of Reflectance and Transmittance, Including Turbid Media
Chair: P. Polato (Italy) **AD:** Johnson
ML: Bianchini (Italy), Gundlach (Germany), Hsia (USA), Morren (Belgium), Verrill (Great Britain)
TR: Define the standard geometric conditions for the measurement of transmittance and reflectance.
ST: The document "Practical methods for the measurement of reflectance and transmittance" went through TC ballot. The document is now going to be sent for Board and Division ballot. CIECB is proposing to do electronic balloting using PDF file at an FTP site. Divi.2 supported this idea with no objection. Suggestion was made to include instructions how to download Acrobat reader (from Adobe website). A possibility of turning this document into CIE standard should be considered in the future. (Brep9807- The Division ballot is in progress. The BA ballot will follow.)

TC2-16 Characterization of the performance of tristimulus colorimeters
Chair: M. L. Rastello (Italy) **AD:** Goodman
ML: Denner (South Africa), Goodman (Great Britain), Hengstberger (South Africa), Moore (Great Britain), Muray (USA), Ohno (USA), Rattunde (Germany), Robertson (Canada), Sauter (Germany), Schanda (Hungary), Steindl (Austria), Terstiege (Germany)
TR: To produce a report recommending methods for assessing the performance of tristimulus colorimeter heads for measuring chromaticity coordinates.
ST: Report given by P. Soardo who held a TC meeting for Rastello on May 18th in Boulder with about 30 participants. The fourth draft (changes marked on the third draft) was distributed and discussed. Suggested changes will be compiled by the chairperson to

make the fifth draft, which will be distributed before Warsaw Session when the next TC meeting is planned.

TC2-17 Recommendation for integrated irradiance and spectral distribution of simulated solar radiation

Chair: D. Kockott (Germany) **AD:** Goodman

ML: Aydinli (Germany), Goodman (Great Britain), Ignatiev (Russia), Justus (USA), Kaase (Germany), Kasten (Germany), Kok (South Africa), Wilkenson (Australia), Zerlaut (USA)

TR: Revise and update CIE Publication No.20 (1972)

ST: The draft document 'Solar simulators for testing purposes' was circulated to all D2 members for comments following the Durban meeting, to ensure a wide range of applications was considered. This has generated some response and the chairman is now preparing a revised draft.

TC2-19 Measurement of the Spectral Coefficient of Retroreflection

Chair: N. Johnson (USA) **AD:** Johnson

ML: Arens (USA), Brekke (Norway), Fisher (USA), Hsia (USA), Hubert (France), Kurioka (Japan), Price (Great Britain), Rendu (France), Rennilson (USA), Richey (Germany), Schreiber (Germany), Sugiyama (Japan), Terstiege (Germany), Vandermeersch (Belgium)

TR: Identify the critical measurement parameters, tolerances, and requirements for, and conduct an international intercomparison of, the spectral coefficient of retroreflection.

ST: The TC document is mostly finished. Some data are to be included in the document. The chairman plans to send the final draft for TC voting by Warsaw Session. Further TC meetings are not planned.

TC2-23 Photometry of Street-Lighting Luminaires

Chair: G. Vandermeersch (Belgium) **AD:** Vandermeersch

ML: Arens (US), Blaser (Switzlerland), Blochouse (Belgium), Claassens (NL), Corrons (Spain), Price (Great Britain), Rattunde (Germany), Rossi (Italy), Simons (Great Britain), Sorensen (Denmark)

TR: Prepare a technical report on the photometry of street lighting luminaires.

ST: No report this time.

TC2-24 Users guide for the selection of illuminance and luminance meters

Chair: K. Ganesha (India) **AD:** Goodman

ML: Andor (Hungary), Arens (USA), Austin (USA), Bastie (France), Chang (Taiwan), Dibbern (Germany), Eppeldauer (USA), Gardner (Australia), Goodman (UK), Hengstberger (S. Africa), Moore (UK), Muray (USA), Ohno (USA), Rennilson (USA), Ritzol (USA), Sauter (Germany), Sojourner (USA)

TR: Prepare a user's guide for the selection and use of illuminance and luminance meters.

ST: A letter from the chairman was received by Secretary prior to the meeting. The chairman reports as follows. He has not been receiving any responses, from the members of the TC, on the draft outline circulated in April, 1997. He presumes that the current TC members do not appreciate urgent need for the guidelines of the draft. The chairman has prepared the third draft outline but needs some data to be collected from the users at

large. He has prepared a questionnaire for wide circulation. He is mailing these along with a brief note on the need for the guidelines, a copy of a paper presented by him in the ISLE Symposium in New Delhi in Jan. 1997, with additions by 10th June, 98. An advance copies of these papers will be sent by May 30th. The program will go now with a strict time schedule requesting every member to respond within a given date. Depending on the response received by 15th of July, the TC will be formalized and further communications sent. The chairman hopes to complete this work by Warsaw Session.

TC2-25 Calibration Methods and Photoluminescent Standard for Total Radiance Factor Measurement

Chair: J. Zwinkels (Canada) **AD:** Johnson

ML: Bristow (Sweden), Erb (Germany), Leland (USA), McCamy (USA), Nayatani (Japan), Puebla (Germany), Racz (Hungary), Simon (USA), Witt (Germany), Verrill (Great Britain)

TR: Prepare a CIE report on methods for measurement of total radiance factors of photoluminescent materials. Recommendations for realizing and calibrating photoluminescent standards by the one and two-monochromator method will be included.

ST: The TC met on 18 May in Boulder. The 7th draft, distributed in Feb. 98, was discussed. The document is essentially complete. Outstanding action items are: inclusion of figures, editorial changes, expansion of Appendices in Section 3.2 on Two Monochromator Methods, and inclusion of Serial Filter Method in Section 3.1 on One Monochromator Methods. The next meeting is planned in conjunction with ISCC and TAGA Annual Meeting, May 5-7, 1999, Vancouver, B.C. The 8th draft of the document should be ready for TC voting.

TC2-28 Methods of characterizing spectrophotometers

Chair: J. Verrill (Great Britain) **AD:** Goodman

ML: Andor (Hungary), Bastie (France), Berns (USA), Distl (Germany), Eckerle (USA), Konstantinova (Bulgaria), McCamy (USA), Robertson (Canada), Sugiyama (Japan), Ulyanov (Russia), Zwinkels (Canada)

TR: Write a CIE report on the characterization of spectrophotometers by means of reference materials and other methods, with particular reference to linearity, wavelength error, stray light, and integrating sphere errors.

ST: The third draft was circulated to TC members in April. The text completed by the chairman and figures and references have been added. It is expected that there will be one more draft before voting and then a 5th draft for the vote, which should be completed before the end of this quadrennium.

TC2-29 Measurement of detector linearity

Chair: T. Goodman (Great Britain) **AD:** Goodman

ML: Andor (Hungary), Bastie (France), Bittar (New Zealand), Budde (Canada), Distl (Germany), Dezsi (Hungary), Mihailov (Russia), Mostl (Germany), Ohno, Parr (USA)

TR: Prepare a CIE guide on methods for the characterization of the linearity of detectors of optical radiation, including different principles by which the linearity of detectors can be determined and causes of non-linear behavior, to aid users of optical radiation detectors in the selection and use suitable devices for specific applications.

ST: A brief TC meeting was held on 18 May 1998 to summarize current status and request additional inputs by the end of June in order for the third draft to be prepared for circulation in early November. Comments on the third draft will be requested by the end of the year.

TC2-30 Diode Array Radiometry
Chair: **AD:** Johnson
ML: Abasari (Hungary), Andoh (Japan), Goodman (Great Britain), Jones (USA), Mihailov (Russia), Pfleger (Austria), Sauter (Germany)
TR: Prepare an annotated bibliography for the CIE journal on diode array radiometry. Make appropriate recommendations for future work in diode array radiometry.
ST: The chairman, Wychorski, has resigned due to his increasing work load. But, he was present at the meeting, and gave a report. The document is currently the 4th draft, having 78 pages in 3 sections. None of them is copyrighted. Small part of the document is not complete. There is also a separate database file with about 800 entries of references. This data base is copy-righted, and payment is needed for use. About 1/3 of the references are in the written document which is not copy-righted. There was discussions, and Div.2 agreed to publish the document in the CIE Collection coming up at the end of the year. Whychorski will work with AD Johnson to publish this document in the Collection.
(After the D2 meeting, James Palmer (Univ. Arizona, USA) agreed to take over the chairmanship to finish up the document for publication.)

TC2-32 Measuring Retroreflectance of Wet Horizontal Road Markings
Chair: N. Hodson (USA) **AD:** Johnson
ML: Dibbern (Germany), Hubert (France), Johnson (USA), Meydan (Australia), Meseberg (Germany), Rennilson (USA), Schmidt-Claussen (Germany), Schreuder (Netherlands)
TR: To prepare a guide for the methods of measuring coefficient of retroreflected luminance (specific luminance) of horizontal road markings under wet weather conditions.
ST: The new chairman, Hodson, has taken over the TC. The TC met on May 18th in Boulder with 11 participants. The partial draft document was distributed and discussed. The TC is looking for new members who have expertise on rain simulation area and visibility pavement marking. The TC plans to meet again this year in October in conjunction with the Div. 4 meeting in Bath, England, hopefully to attract Div.4 people. The TC also plans to meet in Warsaw in 1999.

TC2-33 Reformulation of CIE Standard Illuminants A and D65 (Revision of CIE/ISO 10526)
Chair: K. Mielenz (USA) **AD:** Johnson
ML: Hsia (USA), Moore (Great Britain), Robertson (Canada), Terstiege (Germany), Verrill (Great Britain)
TR: To rewrite CIE Standard S001 in terms of thermodynamic temperatures, and in a manner such that the spectral distributions of the standard illuminants are preserved, but are independent of international temperature scales.
ST: The final national committee ballot is complete, and the document has been published as CIE S 005 "CIE Standard illuminants for colorimetry". Voting by ISO members for a

joint ISO/CIE Standard is in progress. This document will supersede the ISO/CIE 10526. This TC is closed.

TC2-34 LED Measurements

Chair: K. Muray **AD:** Goodman

ML: Angerstein (Germany), Bando (Japan), Bym (USA), Carr (USA), Distl (Germany), Goodman (Great Britain), Heidel (Germany), Hwang (Taiwan), Jones (USA), Lester (USA), Moore (Great Britain), Ohno (USA), Rastello (Italy), Sauter (Germany), Scarangello (USA), Schanda (Austria), Schumacher (Germany), Sojourner (USA)

TR: To investigate and recommend standard LED measurement methods including parameters to be measured.

ST: Report given by the chairperson. A CIE Workshop on LED measurements was held in October 1997, and after the Workshop, the TC document was published as CIE 127. The new term Averaged LED Intensity is introduced in the document. More work is to be done on the total flux measurement and spectral measurement, and a follow-up TC may be necessary. Jones commended the work by the TC referring to the usefulness of the CIE 127 in industry. Ohno and Scalangello commented on the need for further standardization on LED total flux (forward or partial flux) measurement. Sauter added that this LED document (luminous intensity part) should be published as a CIE/ISO standard. In any case, as the document has been published, this TC is now closed. The follow-up work should begin under newly proposed TCs (See Section 8).

TC2-35 CIE Standard for $V(\lambda)$ and $V'(\lambda)$

Chair: K. Mielenz (USA) **AD:** Johnson

ML: Bastie (France), Gardner (Australia), Hengstberger (South Africa), Moore (Great Britain), Ohno (USA), Parr (USA), Robertson (Canada), Sauter (Germany), Schanda (Hungary)

TR: To prepare a new CIE Standard on the present $V(\lambda)$ and $V'(\lambda)$ functions.

ST: No report received from the chairman. Sauter reported as an active member. There was a problem of the document status interfering with the competence of CCPR. Sauter had a discussion with the CCPR president, and in January this year, sent to the chairman suggested changes to the document to solve this problem. The Secretary added that, according to recent conversation with the chairman, he is working to revise the document, once again, to respond to Sauter's comments as well as many other comments he received from several other members after editing in 1996 by the Editor. The document will go through another voting.

TC2-36 Retroreflection: Definition and Measurement (Revision of CIE Publication 54, Liaison with CEN/226) **AD:** Johnson

Chair: J. Rennilson (USA)

ML: Arens (USA), Couzin (USA), Dibbern (Germany), Heenan (USA), Johnson (USA), Kramp (Germany), Nanjo (Japan), Schmidt-Clausen (Germany), Terstiege (Germany), Werner (Sweden)

TR: To revise and update publication 54. To standardize test methods and measurement geometry for measuring the photometric and colorimetric properties of all types of

retroreflectors under both day and nighttime conditions. To prepare this CIE document in ISO format to be issued as a joint CIE/ISO standard.

ST: The TC met on May 18 in Boulder, for two hours, with 6 members and 10 observers. The 8th draft report was distributed and discussed. The new draft incorporates the comments for the 7th draft which were previously distributed. A few sections need improvement, and a further version to be prepared for discussion in Bath, October 1998, after which, the document is to be approved by TC. The chairman plans a short meeting in Warsaw, too. The liaison with CEN is maintained only through the members of the TC who also serve on CEN committees. There has been no official liaison function established, and the work of this TC is not recognized by CEN at the moment. Some official channels of communication need to be established at the top level of CEN and CIE.

TC2-37 Photometry Using Detectors as Transfer Standards

Chair: Y. Ohno (USA) **AD:** Johnson

ML: Andor (Hungary), Austin (USA), Bastie (France), Bittar (New Zealand), Czibula (Germany), Corrons (Spain), Dézsi (Hungary), Eppeldauer(USA), Gardner (Australia), Goodman (U.K.), Kohler (BIPM), Muray(USA), Pietrzykowski (Poland), Rattunde (Germany), Rastello(Italy), Sauter (Germany), Schanda (Hungary), Sojourner (USA), Wychorski (USA)

TR: To prepare a report on the properties of $V(\lambda)$-corrected detectors that are suitable for disseminating and maintaining photometric units. This report will include methods for the use of these detectors.

ST: The TC had a short meeting on May 18 in Boulder with 38 participants including 13 members. The fifth draft was distributed and discussed. The new draft was previously distributed to the members in April. The draft is complete except for correcting some wording and bringing consistency in usage of a few terms. The Ω_0 issue will wait for an advice from the CCU. The chairman plans to send out the sixth draft for the TC ballot within a few month.

TC2-39 Geometric Tolerances for Colorimetry

Chair: D. Rich (USA) **AD:** Johnson

ML: Baba (Japan), Bittar (New Zealand), Decarreau (France), Erb (Germany), Fisch (USA), Hanssen (USA), Jordan (Canada), Johnson (USA), Kravetz (USA), Ladson (USA), Terstiege (Germany), Pietrzykowski (Poland), Verrill (Great Britain), Zwinkels (Canada),

TR: Compile a technical report and recommendations specifying the geometric tolerances for the various geometries in colorimetry, including 0/45, 0/d and others. Parts of this technical report may be suitable for inclusion in a CIE standard specifying several geometric tolerance levels.

ST: The Committee met for the fourth time on May 18th in Boulder. Four Committee members and six guests were present. Discussions during the meeting resulted in the following actions:

1. There was a general agreement that the use of the terminology "bidirectional" should be reserved for instruments with nearly parallel rays and multiple angles of illumination or view. The normal 45/0 instrument has biconical beams and the committee recommends

that the change in notation be communicated to Michael Pointer, editor of Publication 17.3.

2. Comments from guest C. McCamy indicated that the current CIE tolerances are tolerancing the wrong information. Based on publications from the NPL, the tolerances for 45°/0° will result in maximum color differences of 3.0 CIELAB units. Tightening the tolerances will result in improvements in the color differences but tolerancing the uniformity of the illumination and viewing cones will result in a greater improvement.
3. ASTM standard 1763 recommends the use of a very small sampling aperture to verify the uniformity of the specimen port. It was recommended by the committee that the committee report include recommendations for using a sampling aperture of physical and angular size (1/20) of the specimen aperture. The committee will also try to include a recommendation for a material standard for testing the uniformity of hemispherical geometry.
4. C. McCamy requested that the report make a clear distinction between the surface reflectance and the specular reflectance.

During the next few months, the chairman will prepare a draft of the final report and distribute the draft to committee members for comment. NIST and 3M have volunteered to supply some measurement data on standard materials to verify the effect of tightening the tolerances. The TC plans to meet at Warsaw in 1999.

TC2-40 Characterizing the Performance of Illuminance and Luminance Meters

Chair: R. Rattunde (Germany) **AD:** Goodman

ML: Bastie (France), Czibula (Germany), Dezsi (Hungary), Goodman (UK), Khandelwal (India), Khanh (Germany), Mahidharia (India), Moore (UK), Ohno (USA), Pietrzykowski (Poland), Saito (Japan), Sauter (Germany)

TR: Convert the present CIE Technical Report No. 69 into an ISO/IEC standard. Prepare a combined CIE/ISO standard describing the definitions of quantities influencing the performance of illuminance and luminance meters, as well as defining measurement procedures for the individual error quantities.

ST: Report given by the chairman. The TC had a successful meeting on May 18th with 35 participants. Discussed the second draft which was circulated in March. There were active discussions with many comments from the attendees. The TC added some new members. The chairman requested the attendees to send further comments on the draft within a few months. The third draft will be prepared for discussion at Warsaw Session.

TC2-41 Industrial Photometry in Developing Countries

Chair: B. Bhattacharya (India) **AD:** Goodman

ML: Chanchanchop (Thailand), Goodman (Great Britain), Moscati (Brazil), Ohno (USA), Sastri (India), Sauter (Germany), Ye (China)

TR: To prepare a Technical Report giving guidance on recommended practices for photometric measurement (including sphere photometry and goniophotometry), taking account of the special requirements of industrial laboratories in developing countries.

ST: No report received from the chairman this time. This TC was established in 1995. If no progress is made by 1999 D2 meeting, this TC may be closed.

TC2-42 The Colorimetry of Visual Displays

Chair: A. Hanson (Great Britain) **AD:** Goodman

ML: Andor (Hungary), Berns (USA), Dalton (Great Britain), Fairchild (USA), Ikeda (Japan), Hardis (USA), Leone (USA), Luo (Great Britain), Maelfeyt (Belgium), MacDonald (Great Britain), McFadden (Canada), Munger (Canada), Reid (Great Britain), Schanda (Austria), Stokes (USA), Sakata (Japan), Stienstra (Netherlands), Ohno (USA), Vienot (France)

TR: To produce a Technical Report summarizing recommended practice for the measurement of the colorimetric and spectroradiometric properties of visual displays.

ST: An outline of the structure of the proposed report was discussed a the Expert Symposium on Color Standards for Imaging Technology in Scottsdale in Nov. 1997. The chairman is also taking care to coordinate the work of this TC with activities in the IEC.

TC2-43 Determination of measurement uncertainties in photometry.

Chair: G. Sauter (Germany) **AD:** Goodman

ML: Bastie (France), Corrons (Spain), Goodman (Great Britain), Köhler (BIPM), Moore (Great Britain), Ohno (USA)

TR: To prepare a CIE recommendation as basis for the determination of measurement uncertainties valid for selected quantities used in photometry.

ST: The report was given by the chairman. The TC met for the first time on May 18th in Boulder with about 35 participants. The first draft, distributed in April, was discussed. The word "selected" was added in the TR to make it more accurate. There were active discussions on the structure of the document. There were suggestions for the document to start with a part with more plain descriptions for photometry practitioners, followed by the rigorous mathematical procedures as given in the current draft. Based on the discussions, the next draft will be prepared for the second meeting in Warsaw. (The minutes of the TC meeting was distributed by e-mail on June 25, 1998)

TC2-44 Vocabulary Matters

Chair: J. Moore (UK) **AD:** Vandermeersch

ML: Billmeyer (USA), Burghout (Netherlands), Ionescu (Romania), Johnson (USA), Kohler (BIPM), Morren (Bergium), Nishi (Japan), Ohno (USA), Poppe (Hungary), Sauter (Germany), Schanda (Hungary), Woo (Canada)

TR: To provide liaison between Div.2 and TC 7-06 "Lighting Terminology" and support the preparation of the new edition of the Lighting Vocabulary in the field of light and colour measurements.

ST: The report from the chairman was read by Secretary. Work has only just started in this TC. A letter is being sent to members asking them to give their views on changes that they would like to see made to existing definitions in the International Lighting Vocabulary and on new terms that should be introduced. The new ILV will certainly incorporate the new definitions agreed by Division 2 which appear in the CIE Collection on Photometry and Radiometry, Publication CIE 114-1994. These include precise new definitions for distribution temperature and ratio temperature as well as the terminology relating to non-selective detectors. It is still not clear what central policy TC 7-06 will recommend concerning the number and scope of the new definitions to be adopted, but, for the present, I am suggesting that perhaps Division 2 should follow the policy already adopted by

Division 1, keeping changes to existing definitions to a minimum and limiting the introduction of new terms to those that are regarded as essential. The definitions of terminology contained in the various Division 2 Technical Reports, both those now published and those still in preparation, will be examined to determine which of the terms listed are appropriate for inclusion in the ILV.

Follow-up issues

(1) TC2-10 (Photometry and Goniophotometry of Luminaires) was closed in 1997, but the Director reported that small changes were made on the published document CIE 121, according to the decision made at the last D2 meeting. "luminaires" has been changed to "lamps and luminaires" in the title and abstract.

(2) TC2-22 (Luminous Flux of High-Pressure Sodium Lamps) was closed in 1997, but documentary material is to be compiled into a report by the Editor and it is to be published in the next CIE Collection. The material is at the hand of the Editor.

(3) The Director mentioned that Associate Director, Vandermeersch, is now involved in European standardizing activities and is getting too busy for his CIE work, which is affecting the D2 work on luminaire photometry. It is urgent for Division to find a good leader in this area. Recommendations are welcome. Request was made to Rennilson to look into Div.4 and to Goodman to contact Lou Bedocs in UK.

6.2. Reporters

R2-05 Visual Gloss (J. Taylor, Great Britain) **AD:** Goodman

ST: AD reported. The status is still as last year i.e., a TC is not yet appropriate. Work is underway in several countries on the measurement of 'appearance' and a watching brief is being kept to see whether the situation changes. The reporter is to get information from NIST and ASTM subcommittee on appearance: E12-14.

R2-06 Standardization of Measuring Geometry for the Colorimetry of Metallic Coatings (C. McCamy, USA) **AD:** Johnson

ST : McCamy reported. There is continuing work on the standardization of methods of observing and measuring the colors of metallic and pearlescent materials, in the American Society for Testing and Materials (ASTM). The working group assigned that task has been made Subcommittee E12.12, Metallic and Pearlescent Colors, of Committee E12, Color and Appearance. Much of the work has been on refining concepts and terminology. Current work is directed toward standardization of methods of observing and measuring the colors of these materials. Multi-angle spectrophotometry is used internationally for this purpose, most notably in the automotive industry. McCamy has reported the development of the concepts, terminology, and methods of observation and measurement of the colors of these materials in two publications. The appearance at a distance of a few meters was treated in "Observation and measurement of the appearance of metallic materials. Part I.

Macro Appearance", *Color Res. Appl.,21,* 292-304 (1996). "Part II. Micro Appearance", treating the appearance at reading distance, has been accepted by the same journal. The most notable finding reported in this latest paper is the importance of binocular vision in the perception of the appearance of metallic materials. These materials may present different colors and different patterns of glitter to the two eyes, giving rise to perceptions of binocular luster and binocular glitter. The reportership will continue. No need for a TC at this moment.

R2-09 Absolute Cryogenic Radiometers (A. Parr, USA) **AD:** Johnson

ST: Report given by Parr. Many national labs now use cryogenic radiometers. In the U.S., they are used also by commercial sector for space applications. There is a need for a guide on utilization of these devices. The reporter is starting to think about a new TC. A longer report will be prepared for Warsaw with a proposed TR and an outline of the document. Köhler supported Parr's report, referring to the number of the cryogenic radiometers (total ~30 now) in the world, and mentioned that the TR must be carefully made to include characterizations of sources and other instrumentation as well as radiometer itself. The reporter will circulate further ideas for a new TC in next a few months.

R2-17 Aviation Photometry (Y. Ohno, USA) **AD:** Goodman

ML: Bhagat (USA), Hengstberger (South Africa), Verdier (France)

ST: Ohno reported. The document ARP5029 (Measurement Procedures for Strobe Anticollision lights) is being published from SAE (Society for Automotive Engineers). NIST started providing calibration services for flash photometers, as the FAA(Federal Aviation Administration)'s regulation came into effect. During these activities, a need for a CIE document for photometry of flashing light (no only for anticollision lights but in general) was confirmed. The existing document CIE105 (Spectroradiometry of pulsed optical radiation sources–1993) does not address photometry terms and derivation of photometric quantities for flashing light measurement. Thus, a new TC should be formed for this subject. Visual perception issues are also addressed (e.g., the validity of Blondel & Rey Equation in various conditions and for different types of sources) by the SAE and aviation community, which should be brought to Div. 1. The reporter has also established a contact with ICAO (International Civil Aviation Organization). This reporter will be kept for another year to continue discussion with ICAO on other subjects in aviation photometry.

R2-18 OIML Matters (G. Sauter, Germany) **AD:** Hengstberger

ST: No report this time. Hold this reportership till next year.

R2-21 Use of detectors as absolute transfer standards for spectroradiometry (N. Fox, Great Britain) **AD:** Goodman

ST: New techniques are being investigated at NPL and elsewhere, but are not yet sufficiently well-developed to warrant establishment of a TC. The situation will continue to be monitored.

R2-22 Implementation of Photometric Units (R. Köhler, BIPM) **AD:** Vandermeersch

ST: Kohler reported. This reporter was established last year to study the need for a

document to guide future implementation of photometric units for non-V(λ) functions. This was proposed by Moore in Durban, but Div. 2 did not decide to establish a TC then. The reportership is continued for the time being to watch the situation, contacting Div. 1 also.

6.3. Liaison report

CCPR (Köhler)

Köhler reported with a short presentation, overviewing the organization and activities of CCPR (Comité Consultatif de Photométrie et Radiométrie) and BIPM (Bureau International des Poids et Mesures), and then introducing the concept of the CCPR Key Comparisons. The equivalence of national standards is becoming essential for traceability requirements (to national labs) made in ISO Guide 25 and other quality systems. Pressures come from trade agreements such as Transatlantic Agenda/MRA and EC-US Agreement on Trade. Reduction of technical barriers in trade necessitates mutual acceptance of test methods. For example, there is an effort between Euromet and NIST to develop a publicly available data base, which will contain the results of international intercomparisons. The results of the past international intercomparisons of photometric units, including the illuminance intercomparison just finished last year, were also overviewed.

ISO/TC6 (J. Zwinkels)

This is a very active committee. A plenary session of ISO/TC6 was held in Cape Town, S.A., Nov. 1997. The main issues discussed in WG3 (Optical Properties of Paper, Pulp and Board) were: comparison between NRC and PTB, new authorized laboratories, liaison with ISO/TC 130, indoor whiteness and ISO-brightness, gloss measurement at 75° and 20° and instruments for d/0° and d/8°. Several ISO draft standards were received for review and comments were given to CIE CB. These documents were: FDIS 2471 (Paper and board - determination of opacity (paper backing), FDIS 9416 (Paper - determination of light scattering and absorption coefficient (using Kubelka-Munk theory), and ISO/DIS 11475 (Paper and Board - CIE whiteness, D65/10°. Comments included addition of CIE and ISO/CIE standards as normative references and changes to definitions to conform with ILV.

ICO (F. Hengstberger)

This reportership is closed.

IMEKO (J. Schanda)

This reportership is closed.

IEC TC100 /PT61966 -Colour Measurement and Management in Multimedia System (Y. Ohno)

Report given by Ohno. He met with H. Ikeda, the chairman of TC100/PT61966, last November at the Color Imaging Conference in Scottsdale. Later, the liaison between CIE D2 and TC100/PT61966 was officially established. This is a very active committee with full use of e-mails and website. The PT (project team) has about 50 members. The PT published a

liaison report in January, which was distributed by D2 Circular Jan/22/98. The PT is developing (or plans to develop) 11 documents related to color management and color measurement. Some of the documents are planned to be ISO/IEC/CIE joint standards. Among them, four draft documents (for CRT, LCD, Digital camera, and Default RGB space) were posted on the website (http://www.map.chiba-u.ac.jp/IEC/100/PT61966) for comments by April 30. This was informed to CIE D2 mailing list by D2 Circular Mar/19/98 with a request to review these documents. Many poor descriptions of photometric and radiometric terms and measurement procedures were found in these documents. Schanda, Ohno, and Hanson (TC2-42 chair) sent comprehensive comments on these documents. There was a PT61966 meeting on May 14-15 in Derby, England, where they discussed these four draft documents. None of us from CIE could attend it, but Hanson's staff (Chris Wall) attended this meeting and gave a liaison report on CIE D2 on our behalf. Many of our comments were adopted.

JTAG2 – ISO/IEC Joint Technical Advisory Group 2 (A. Robertson)

The report from Robertson was received by Secretary. There was a JTAG2 meeting in Geneva in January 13-14, 1998. The key parts of the January JTAG2 minutes are the resolutions supporting the CIE's current initiative in the field of imaging technology, and the formation of an ad hoc coordinating committee of which Robertson is a coordinator. Active discussions by the ad hoc committee members took place on e-mail for the last several months. According to the discussions, the most likely development is a new Division although there is some support for starting things under the umbrella of Division 1. (Further report on the new CIE Division is given in Section 12.)

7. Close of TCs and other functions

Technical Committees: TC2-33, TC2-34
Reportership: none closed.
Liaison: ICO and IMEKO

8. New TCs

Per discussion during the TC2-34 report (See 6. Progress report of Technical Committees), Div. 2 agreed to establish the following two TCs related to LED measurements. The reason for two TCs proposed was to publish, as soon as possible, the luminous intensity part of CIE 127 as CIE/ISO standards without waiting for many other issues to be discussed for revision of CIE 127.

(1) Title: Measurement of LEDs - Revision of CIE 127

Chair: K. Muray (USA)

TR: Revise CIE Pub. 127 to include improved definitions of quantities and methods of measurement for total flux and partial flux of LEDs and to reevaluate other parts including spectral and color measurements of LEDs.

Initial ML: Former TC2-34 members, plus, C. Jones, J. Scarangello

(This new TC was approved by the Board in June 1998 as TC2-45.)

(2) Title: CIE/ISO standards on LED intensity measurements

Chair: J. Scarangello (USA)

TR: To prepare a CIE/ISO standard on the measurement of LED intensity measurements based on the CIE Pub. 127.

Initial ML:

Former TC2-34 members, plus, C. Jones, A. Bouman (Netherlands), D. Ellis (USA), K. Bando (Japan).

(This new TC was approved by the Board in June 1998 as TC2-46.)

G. Xu presented the need for the standardization in characterizing UV radiometers, and proposed a new technical committee. Div.2 agreed to establish this TC.

(3) Title: Characterization and Calibration Methods of UV Radiometers

Chair: Gan Xu (Singapore)

TR: Prepare a CIE recommendation on methods of characterization and calibration of broad-band UV radiometers in the spectral ranges of UVA and UVB for industrial applications.

Initial ML:

F. Hengstberger (South Africa), F. Wilkinson (Australia), R. Lambe (UK), G. Sauter (Germany), R.Rattunde (Germany), B. Saunders (USA), J. Pietrzykowski (Poland), A. Corrons (Spain)

(This new TC was approved by the Board in June 1998 as TC2-47.)

G. Eppeldauer presented a proposal for the following TC. The main point of his proposal was that there have been many new detector technologies developed for the last fifteen years, and the CIE 64 needs to be updated. A need for cooperation with the above new TC (3) on UV radiometers was noted.

(4) Title: Spectral responsivity measurement of detectors, radiometers, and photometers.

Chair: G. Eppeldauer

TR: To rewrite the technical report CIE 64 (1984) "Determination of the spectral responsivity of optical radiation detectors" to update device and measurement technology, and include the spectral irradiance responsivity measurement for radiometers and photometers from UV to near IR.

Initial ML:

J. Palmer (USA), G. Sauter (Germany), R. Kohler (BIPM), R. Rattunde (Germany), J. Pietrzykowski (Poland), A. Corrons (Spain), G. Dezsi (Hungary), J. Gardner (Australia), Xu-Gan (Singapore), P. Boivin (Canada), L. Larsen (Denmark), B. Bauman (USA), T. Larason (USA)

(This new TC was approved by the Board in June 1998 as TC2-48.)

Y. Ohno proposed the following new TC based on the report given for R2-17 Aviation Photometry (See 6.2. Reporters). Div. 2 agreed to establish this TC.

(5) Title: Photometry of Flashing Light

Chair: Y. Ohno

TR: Produce a technical report for photometric measurements of flashing light, including derivation of the photometric quantities applied to flashing light, measurement of light sources, and calibration of photometers for flashing light.

Initial ML:

J. Arens (USA), R. Austin (USA), D. Couzin (USA), D. Ellis (USA), F. Hengstberger (South Africa), H. Kondo (Japan), R. Rattunde (Germany), G. Sauter (Germany), P. Webb (USA)

(This new TC was approved by the Board in June 98 as TC2-49.)

9. List of candidates for Division Director (1999 - 2003)

The Secretary received the following written nominations for the next Division 2 Director, listed in the order of receiving the letters.

Teresa Goodman (Great Britain)

Georg Sauter (Germany)

Norbert Johnson (USA)

Further nominations from the attendees were requested, but there was no further nomination. Based on this listing, there will be postal voting by the country members within a few months.

10. Future meetings:

Division 2 meetings

1999 CIE Div. 2 will meet in conjunction with the CIE 24th Session, Warsaw, Poland, starting 23rd of June. Plan a joint meeting with Div. 1. June 24-26 will be technical sessions, and June 28-30 for Div./TC meetings.

Div. 2 also agreed to propose a Joint Workshop with Div. 1 in Warsaw on Measurement of Flashing Light. This workshop may be scheduled during June 24th-26th.

2000 open. CORM-Rochester and NPL are suggested.

2001 Possibly with CORM in Gaithersburg-NIST 100th Anniversary.

2002 open.

2003 J. Rennilson has a proposal to invite CIE Quadrennial Session for San Diego. (Last Session in the U.S. was 1967 Washington DC.)

Other related meetings

1998 International Symposium and Workshop on Measurement of Optical Radiation Hazards,

at NIST, Gaithersburg, Maryland, USA, 1-3 September 1998. (Co-sponsored by USACHPPM, NIST, CIE D6, and ICNIRP)

1999 NEWRAD in Madrid, Spain.

2001 NEWRAD at NIST, Gaithersburg, Maryland USA.

AIC in Rochester in the last week of June.

2003 NEWRAD in Sydney, Australia.

11. General

1) Liaison with D6 TCs.

At the last D2 meeting, there was a request from D6 Director to establish liaison with TC 6-34 (Photobiological lamp safety standard) and TC 6-45 (Measurement of optical radiation hazard in work place). AD Goodman to follow up on this issue.

2) NEW CIE Division

The Director reported. As reported in the Circular Jan/22/98, the discussions at the CIE Expert Symposium on Color Standards on Imaging Technology in Scottsdale, USA, Nov. 1997, lead to the recommendation of a new Division in CIE in the area of imaging technology. ISO/IEC JTAG2 also supported this proposal and recommended formation of an ad hoc coordinating committee. Active discussions by the ad hoc committee members, that included CIE BA members and ISO and IEC committee chairs, took place on e-mail for the last several months. Robertson is the coordinator of the ad-hoc committee. Below is further report from Robertson, which the Secretary reported on his behalf.

According to the discussions by the ad hoc committee, the most likely development is a new Division although there is some support for starting things under the umbrella of Division 1. Three key aspects that should be brought to D2's attention are:

1. Liaison with existing work (especially in D1 and D2) will be very important to avoid duplication and to enable experts to attend all relevant meetings without travelling to many different places at many different times. Many of us are already forced to choose between D1 and D2 and if there is a three-way choice each year, the situation will be worse.
2. It is hoped that much of the new work can be done by e-mail, reducing the slowness that inevitably comes from waiting for a physical meeting before taking any action.
3. The CIE Board of Administration is expected to make a decision on starting the new work at its meeting on June 22-24 this year.

Some opinions from attendees were addressed to oppose the formation of a new Division. Further opinions on this issue should be sent to D2 Director who will attend the BA meeting. Div.2, however, does not foresee much problems in terms of Division activities because we now have only one or two TCs that are directly related to color imaging and that may have to move to the new Division if formed. Div. 1 will be seriously affected.

3) **Omega-naught issue**

There has been a common problem in several photometry TCs, discussed over the past a few years, regarding how to express the equation for the relationship between luminous intensity and illuminance (the inverse square law). A simple equation $I=E\,d^2$ appears to leave inconsistency of units; i.e., [lm/sr] equals [lm]. To solve this problem, some members are suggesting to use Ω_0 as in, $I=E\,d^2/\Omega_0$, but others oppose that [sr] is a dimensionless unit and it need not be worried about. Schanda is invited to attend the CCU (Comité Consultatif de Unit) meeting on 8-9, September, 1998, and he suggests asking for an advice from CCU to resolve this issue. Div.2 agreed to send an official request to CCT on this issue. (This action has been approved by CIEBA at the June 98 Board meeting.)

4) **Recognition by CEN**

The Director reported that the Central Bureau had a meeting with CEN for CEN to recognize CIE Standards, and some progress has been made. There will be a movement from CEN. Discussion will continue on.

12. Adjournment

The Division 2 meeting was adjourned at 5 pm.

Division 2 Technical Committees

Technical Committee	AD	Chair	
TC2-04 Secondary standard sources	G	John R.	Moore
TC2-14 Measurement of Reflectance and Transmittance, Including Turbid Media	J	Pietro	Polato
TC2-16 Characterization of the performance of tristimulus colorimeters	G	Maria Luisa	Rastello
TC2-17 Recommendation for integrated irradiance and spectral distribution of simulated solar radiation	G	Dieter	Kockott
TC2-19 Measurement of the Spectral Coefficient of Retroreflection	J	Norbert	Johnson
TC2-23 Photometry of Street-Lighting Luminaires	V	Guy	Vandermeersch
TC2-24 Users guide for the selection of illuminance and luminance meters	G	K.	Ganesha
TC2-25 Calibration Methods and Photoluminescent Standard for Total Radiance Factor Measurement	J	Joanne C.	Zwinkels
TC2-28 Methods of characterizing spectrophotometers	G	John F.	Verrill
TC2-29 Measurement of detector linearity	G	Teresa M.	Goodman
TC2-30 Array radiometry	J		
TC2-32 Measuring Retroreflectance of Wet Horizontal Road Markings	J	Neil A.	Hodson
TC2-35 CIE Standard for V(λ) and V'(λ)	J	Klaus D.	Mielenz
TC2-36 Retroreflection: Definition and Measurement (Revision of CIE Publication 54, Liaison with CEN/226)	J	Justin	Rennilson
TC2-37 Photometry Using Detectors as Transfer Standards	J	Yoshi	Ohno
TC2-39 Geometric Tolerances for Colorimetry	J	Danny C.	Rich
TC2-40 Characterizing the Performance of Illuminance and Luminance Meters	G	Reiner	Rattunde
TC2-41 Industrial Photometry in Developing Countries	G	Basudev	Bhattacharya
TC2-42 The Colorimetry of Visual Displays	G	Andrew R.	Hanson
TC2-43 Determination of measurement uncertainties in photometry	G	Georg	Sauter
TC2-44 Vocabulary Matters	V	John R.	Moore
TC2-45 Measurement of LEDs - Revision of CIE 127		Kathleen	Muray
TC2-46 CIE/ISO standards on LED intensity measurements		John	Scarangello
TC2-47 Characterization and Calibration Methods of UV Radiometers		Gan	Xu
TC2-48 Spectral responsivity measurement of detectors, radiometers, and photometers		George	Eppeldauer
TC2-49 Photometry of Flashing Light		Yoshi	Ohno

Technical Committees producing ISO/CIE standards
TC2-35 CIE Standard for V(λ) and V'(λ)
TC2-36 Retroreflection: Definition and Measurement (Revision of CIE Publication 54, Liaison with CEN/226)
TC2-40 Characterizing the Performance of Illuminance and Luminance Meters
TC2-46 CIE/ISO standards on LED intensity measurements

Division 2 Reporters

Reporter Title	AD	Reporter
R2-05 Visual Gloss	G	Julie Taylor
R2-06 Standardization of Measuring Geometry for the Colorimetry of Metallic Coatings	J	Calvin S. McCamy
R2-09 Absolute Cryogenic Radiometers	J	Albert C. Parr
R2-17 Aviation Photometry	G	Yoshi Ohno
R2-18 OIML Matters	H	Georg Sauter
R2-21 Use of detectors as absolute transfer standards for spectroradiometry	G	Nigel P. Fox
R2-22 Implementation of SI Photometric Units	V	Rainer Köhler

Division 2 Liaisons

Organization	Liaison Officer
CCPR - Consultative Committee of Photometry and Radiometry	Rainer Köhler
IEC TC 34: Lamps and rel. equipm.	G. Vandermeersch
IEC TC100/PT61966 Audio, Video and Multimedia Systems and Equipment	Yoshi Ohno
IEC/ISO JTAG2: Joint Technical Advisory Group 2	Alan Robertson
ISO TC6 Paper, board & pulps	Joanne Zwinkels
ISO TC160/SC2/WG 2:Glass in buildings, Light & energy trans.	Jack Hsia
ISO TC 180/SC 1: Solar energy/Climate - Measurement and data	Dieter Kockott
OIML Optical Pyrometers	Albert C. Parr
OIML Lum.& illum.meters	Albert C. Parr

CIE Division 2 Mailing List

Revised: August 14, 1998

NOTE: This list consists of two parts:
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(2) TC chairpersons and associates

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CIE DIVISION 3 ACTIVITY REPORT

Submitted by I. Pasini, Canadian Delegate to Division 3
for CNC/CIE Annual Meeting, Ottawa, November 6th, 1998

The summary of the meeting is attached to this cover letter.
Division 3 met at the NRC/IRC Montreal Road Campus in Ottawa. The meeting was well attended, thanks to the favourable site and timing coinciding with a series of events taking place around and about the same time in Ottawa. These events were:

- CIE Symposium on Lighting Quality, hosted by NRC and organized by Dr. Jennifer Veitch, NRC/IRC

- International Daylighting '98, hosted by the Canadian Federal Government and organized by NRCan, NRC and Public Works Government Services Canada.

The highlights of Division 3 meeting were:

1. Notice that all divisional communications will from now on be based on the new internet site: *http://ciediv3.entpe.fr* . This site will contain several sections, each one dedicated to promoting a specific divisional subject. It will also permit members to communicate and exchange TC information.

2. The Division 3 Board will have several new faces at the next quadrennial meeting in Warsaw - new Director Marc Fontoynont of ENTPE, Lyon, France, new Associate Director for Daylighting, Dominique Dumortier of ENTPE, Lyon, France, new Division Secretary Geoffry Cook of University of Reading, UK; Sueko Kanaya will remain the Associate Director for Artificial Lighting.

3. Division 3 will meet in Warsaw from Monday afternoon to Tuesday afternoon on June 28, 1999. The TC meetings will take place during the conference but no specifics are available at this time. A series of half-day workshops (6) are planned by Division 3 - details yet to come.

4. List of new publications (see attached)

Division 3 had a good mid-term meeting in Ottawa with the major achievement of beginning new work in the area of lighting quality, as a result of ideas and discussions held at the Lighting Quality Symposium. Work in this area is currently carried out at NRC/IRC by Dr Jennifer Veitch and Dr Guy Newsham and is also part of a similar project undertaken by IESNA in which NRC/IRC is playing a major role.

CNC/CIE has submitted 3 papers for the 24th Session of the CIE in Warsaw 1999.
One paper was submitted by Dr. Jennifer Veitch and Dr. Guy Newsham (NRC/IRC), one by Dr. Dale Tiller, Dr. Guy Newsham & Roger Marchand (NRC/IRC) and one by Claude Demers, Laval University.

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Central Bureau: Kegelgasse 27 - A-1030 Wien - Austria

Division 3: Interior Environment and Design

Notes of the meeting held on May 8, 1998, in Ottawa, Canada.

D. Dumortier, A. Slater, May 18, 1998

Anthony Slater	BRE, Garston, UK	Director
Sueko Kanaya	Matsushita Electronics Corporation	Associate Director
Dominique Dumortier	ENTPE, Lyon, France	Secretary
Odd Arnesen	IGP/Unit, Trondheim, Norway	Norway Rep.
David Carter	University of Liverpool, UK	Chair. TC 3.31
Geoffrey Cook	University of Reading, UK	UK Rep.
Marc Fontoynont	ENTPE, Lyon, France	France Rep.
Warren Julian	University of Sidney, Australia	CIE VPP
Richard Kittler	Slovak Academy of Science, Bratislava	Slovakia Rep.
Yasuko Koga	Kyushu University, Fukuoka, Japan	TCs 3.15 and 3.25
Heinrich Kramer	Lichtdesign, Köln, Germany	Chair. TC 3.20, 3.22
Hans Allan Löfberg	KTH-BMG, Gävle, Sweden	CIE VPT
Richard Mitanchey	ENTPE, Lyon, France	Chair. TC 3.33
Hiroshi Nakamura	Kochi Womens University, Japan	Japan Rep.
Ivan Pasini	PWGSC, Ottawa, Canada	Canada Rep.
Geoffrey Roy	Murdoch University, Australia	TC 3.33
Simon Simos	Simos Lighting Consultants	Switzerland Rep.
Dale Tiller	National Research Council, Canada	Chair. TCs 3.16, 3.26
Radosteva Topalova	University of Waterloo, Canada	G. Irvine
Lorne Whitehead	University of British Columbia, Canada	Chair. TC 3.30

Next division 3 meeting will happen in Warsaw, Poland, just after the CIE quadrennial conference. The meeting should begin in the afternoon of Monday June 27, 1999 and last until the afternoon of Tuesday June 28.

EXECUTIVE SUMMARY

1. Check out the division 3 web server. Its address is http://ciediv3.entpe.fr. It has been developed by the division secretary: dominique.dumortier @entpe.fr. It is still under development, so it is open for comments and suggestions.

2. Among other things, the web server will contain minutes of past meetings, invitation, agenda and travel information for future meetings. **This is the last time that the minutes are sent via regular mail.** If you do not have access to e-mail

and to the Internet, we urge you to do so, Internet connections are getting cheaper and cheaper. The invitation to the next meeting will be sent via e-mail and all related information will be posted on the web site.

3. If you have not done it yet, send the address update form. Let the secretary know about someone who is not receiving information from Division 3. The complete division roster will soon be made available on the web server in the section called «members». You will then be able to check if you are in the roster and if your coordinates are the right ones. If this is not the case, send an e-mail to the web master (for now the division secretary) who will modify them.

4. Following discussions in Ottawa, the board of division 3 will change significantly after the CIE meeting in Warsaw: (1) Marc Fontoynont from the National Engineering School of State Public Works (ENTPE), in Lyon, France, will be the new division director, (2) Dominique Dumortier from ENTPE, in Lyon, France, will be the new associate director for daylighting, (3) Geoffrey Cook from the University of Reading, in the UK, will be the new division secretary; (4) Sueko Kanaya will stay as the associate director for artificial lighting.

5. About 5 TCs have planned to finalise their report and submit it for the Warsaw meeting. These are TC 3.16 (Psychological aspects of lighting), TC 3.20 (Lighting and architecture), TC 3.22 (Museum lighting and protection against radiation damage), TC 3.26 (Development of a protocol for post occupancy evaluation of lighting) and TC 3.30 (Hollow light guides). **It is reminded to the chairmen, that TCs which have been inactive for one or two years will definitely be closed at the Warsaw meeting.**

6. TC 3.25 has a new chairman: D. Dumortier who succeeds H. Nakamura.

7. Reportership 3.06 has a new reporter: R. Topolova, who succeeds G. Irvine.

8. TC 3.24 and TC 3.28 are now disbanded because of prolonged inactivity.

NOTES OF THE MEETING

1. Opening of the meeting. A. Slater opens the meeting at 9:05, on Friday May 8. He thanks Jennifer Veitch of the National Research Council of Canada, who has organised the division and the TC meetings. He also thanks the Canadian National Committee who have sponsored the resfreshments. Then, he asks everyone around the table to present himself.

2. Approval of the agenda. A. Slater presents the agenda which has been modified to allow Dale Tiller (TC 3.16 and 3.26) and Lorne Whitehead (TC 3.30) to present the work of their TCs in the first part of the morning. A presentation of the division 3 web server is also added to the agenda. These changes are approved by all the participants.

3. Apologies of absence. K.R. Ackerman, C. Belcher, B. Collins, E. Einhorn, J. Ejhed, D. Gall, R. Henderson, D. Kendrick, R. Lintermans, K. Matsuura, M. Navvab, E. Ne'eman, N. Ruck, T. Rutten, S. Takahashi, P. Tregenza, Y. Uetani and H. Willey.

4. Minutes of the last meeting. A. Slater asks for comments on the minutes of the last meeting. There are no comments from the participants of the meeting. D. Dumortier, the division secretary indicates that the minutes of the Durban meeting and this meeting, will be downloadable directly from the web site of division 3.

5. Division membership. A. Slater welcomes those attending division 3 meeting for the first time.

6. Division director report. A. Slater reports that since the Durban meeting, last September, the main activity has been the organisation of the Warsaw meeting. Regarding the activities of the division 3, 75 abstracts have been received. Selection of papers, for presentations and posters, will be made at the Division Directors meeting and CIE board meeting in Vienna, in June.

7. Division 3 web server. D. Dumortier presents the division 3 web server. Its address is: http://ciediv3.entpe.fr. At the Durban meeting, he had asked C. Hermann to organise a division secretary meeting in order to co-ordinate secretary activities, particularly the development of the division web servers. This meeting happened in October 1997. The content of the server is based on the discussions at this meeting. It contains 8 sections: «what we are», «news», «wanted», «meetings», «activities», «members», «publications» and «links».

The «what we are» section describes the objectives of the division 3 and its strategy. The «news» section gives information on upcoming events, new publications...The «wanted» section lists various subjects which are of interest to the division, but which have been left without TCs or reporterships. The «meetings» section, as its name implies, contains detailed information of upcoming meetings, and minutes of past meetings. The «activities» section contains a summary of all current TCs and reporterships of the division. By clicking on the TC number or on the reportership number, you access a page containing a full description of the TC or the reportership: date it started, date it is supposed to end, list of members, summary of activities... If you need a complete activity report, this is the page that you will need to print. The «members» section contains information on all division members: names, addresses, fax, phone, e-mail...If you know someone who is not receiving news from the division, check if he is on this page and if the information we have is right, if not ask for modifications. The «publications» section, as its name implies, contains all the products from division 3. The «Links» section contains liaisons, projects and links to other web sites, all in relation with the activities of our division.

Since the server has been developed just before the Ottawa meeting, some of these sections are not complete. If you would like to provide information to help us in making the server better, feel free to do it. D. Dumortier will be in charge of the server until the Warsaw meeting, send him all the necessary information. **TC chairmen and reporters are also invited to check the information contained in the «activity» section.**

We remind you that there is a discussion list on lighting. You can subscribe to this list by sending an e-mail at lighting-request@garnet.nist.gov. The only word contained in your e-mail should be «subscribe».

M. Fontoynont suggests that the address of all CIE division web servers be formatted the same way and appear as subdirectories of the CIE main site. D. Dumortier says that he will talk to C.Hermann about this matter, he will also ask her to set up a link to the division 3 server, on the CIE main page and to indicate the server address on the CIE news. Finally, he says that the members will be warned as often as possible of the major modifications made to the server.

8. Technical committee reports. All TC chairmen and reporters who have not done it yet are requested to send their activity report as soon as possible. **All TC chairmen and reporters are requested to check the information found on the web server.** Some of this information might be erroneous or incomplete, so please send modifications to dominique.dumortier@entpe.fr.

Even though, D. Tiller and L. Whitehead were first at presenting the progress of their TCs during the meeting, the activity report below follows TCs numerical order.

TC 3.01: Glare for small and large sources. H. Einhorn has indicated that the TC has prepared a draft report which has been sent out to TC members. Members have been requested to comment on the report before April 28, 1998. So far only a minority has replied. Once modified (if necessary), this report could then be sent to C. Hermann for ballot around the board and the division.

TC 3.11: Daylighting Calculation methods. No report was received from the chairman M. Navvab. If no significant progress is announced by the chairman, before the Warsaw meeting, the division will have to find a new chairman, or the TC will have to be closed.

TC 3.12: Daylight and solar radiation data for building performance. No report has been received from the chairman S. Hayman. If no news is received from the chairman, before the Warsaw meeting, the TC will be closed.

TC 3.15: Sky luminance models. The chairman has indicated that he has received several documents from the TC members. R. Kittler has produced a paper called «Modelling daylight conditions under a new set of standard skies» written in collaboration with R. Perez. D. Kendrick made comments on Kittler's paper and on the calibration of IDMP measurements. An informal meeting was held in the afternoon of October 9, 1997, for discussion on the concepts behind the sky luminance models presented by R. Kittler and by N. Igawa who presented a report called «Sky luminance distribution between two CIE standard skies».

A. Slater indicates that the clear and overcast skies have now become CIE/ISO standards. He adds that the TC should finally reach an agreement on new models for intermediate conditions and prepare a draft for the Warsaw meeting.

TC 3.16: Psychological aspects of lighting. D. Tiller, the TC chairman is now finally editing the document which had been approved at the New Delhi meeting. This document (about 40 pages) should be ready for balloting by June. D. Tiller asks whether the CIE would agree that this report become available directly on the Internet. W. Julian indicates that the CIE has still no intention to distribute publications via

the Internet. This TC will be closed at the next Warsaw meeting, however the division may pursue an update of this work through a reportership.

TC 3.19: Scale model photometry for interior lighting. There has been no report from the chairman M. Navvab. If no activity is shown before the Warsaw meeting, the TC will be closed.

TC 3.20: Lighting and architecture. H. Kramer indicates that he has finalised a first draft of the publication which contains an additional chapter on light quality. He has brought it to the meeting. He says that this publication will be quite different from all other CIE publications, since it really takes into account the architect point of view on lighting. The final publication should be ready by the Warsaw meeting. Since the publication is planned to include more than a hundred colour pictures, H. Kramer should contact the vice-president of publications. To reduce the cost, a CD-ROM could be used to publish the document with full color pictures.

TC 3.21: CIE/ISO Interior lighting standards. A TC meeting was organised at the University of Lancaster, on April 8, 1998. 6 members took part to this meeting, together with a new member nominated by TC 159/SC5 Ergonomics. The committee was informed that the ISO TC 159/SC5 had also completed an inquiry on the 3rd draft, in 1997. The results reported in October 1997 was: 11 in favour, 2 against and 1 abstention. The TC then reviewed the structure and the details of the draft. The position now is that a fourth draft is in preparation and expected to be available in July 1998 for balloting in the TC/Division and Board. The draft will also be sent to ISO for a parallel balloting by members.

W. Julian indicates that an ISO/CIE standard must be suitable to the economy of all countries, therefore defining a range of values rather than a fixed value would be more appropriate. H.A. Löfberg stresses the fact that this is an important matter to the CIE.

TC 3.22: Museum lighting and protection against radiation damage. The TC will meet after the division 3 meeting on May 14 and 15. The final drafts of all sections of the guide will be reviewed during the meeting. Later the drafts will be edited by the editor P. Gabriel, into one complete document. This draft will then be circulated to all TC members for final comments. It is planned that the final draft of the guide will be submitted to the central bureau before the CIE session in Warsaw.

TC 3.24: Energy aspects of lighting. There has been no report from the chairman. A. Slater says that if L. Zonneveldt (the TC chairman) does not provide a report of significant activity before the end of June, the TC will be definitely closed. Because this is a subject which is of interest to the division, it will be posted into the «wanted» section of the division web server. If you are interested in this subject, if you have some spare time to lead a technical committee, let us know about it.

TC 3.25: Coordination and development of the International Daylight Measurement Programme and its data. The TC met the day before the division meeting. The chairman H. Nakamura who recently retired from the University of Kyushu, expressed the wish to quit from the chairpersonship. He proposed D. Dumortier as the new chairman. D. Dumortier agreed. Y. Koga stays as the TC secretary.

These changes are approved by all the participants to the division meeting. D. Dumortier will have to contact C. Hermann to complete the procedure obtaining CIE board approval.

The IDMP network is still expanding: four new stations have been created in India and two others are supposed to be in the work. One may also be created in Thailand. Two Swedish stations have ceased operation in March 1998. The stations in Sidney, in Lisbon, and in Freiburg have resumed operation. During the meeting, D. Dumortier presented the results of the questionnaire which was sent to all members in March. The purpose of this questionnaire was (1) to strengthen the TC web server by updating and improving the information presented on it, (2) to draw a complete summary of IDMP activities since its inception in 1991. A total of 28 questionnaires have been received. This amounts to a 80% return rate. A complete report summarising the results will be sent to all those who answered the questionnaire. As a result from the questionnaire, the TC has defined two major actions for the coming year: a new calibration plan and a data exchange programme (based on voluntary contribution) which will lead to the production of a CD-ROM of IDMP data.

TC 3.26: Development of a protocol for post occupancy evaluation of lighting. D. Tiller, the chairman indicates that the objective of this TC was to describe methods for questionnaire surveys in buildings. A draft of the report has now been produced. This draft will be circulated within the TC in the coming months. Its final version may be ready for the Warsaw meeting.

TC 3.28: Standard on calculation of utilization factors. Since there has been no report from the chairman. This TC is closed and this subject will be moved to the «wanted» list.

TC 3.30: Hollow light guides. L. Whitehead, the TC chairman, describes the TC activities. A CIE publication is in the work. It will include recommendations on photometric measurement procedure and 5 of the 20 case studies which had been planned previously. The draft should be circulated within the TC at the end of the summer. A. Slater asks whether the 15 case studies which have not been included could be part of another publication. L. Whitehead indicates that unfortunately, most of these case studies are incomplete. Then he concludes in saying that there could be two future actions for the TC: (1) improve the efficiency of light guides, (2) characterise the daylighting performance of light guides.

TC 3.31: Electric lighting for real spaces. D. Carter, the chairman, presents the activities of the TC. Work has now moved forward to a point where the structure of the final report and the content is being developed. Initially, this work is being carried out by the chairman before circulation to all members. The TC expects to produce a final report for the year 2000. A. Slater suggests that the work of this TC could be of interest to the new TC 3.33, and that D. Carter should become at least one of its corresponding member.

TC 3.32: Validation of algorithms for daylighting outdoors. There has been no report from the TC chairman: M. Navvab. A. Slater urges M. Navvab to show that some work has been done or to propose a new chairman.

TC 3.33: Test cases for assessment of accuracy of lighting computer software. This TC had his first meeting the day before the division meeting. The chairman R. Mitanchey describes the objective of the TC: create test cases which can be used as benchmarks against which software developers could assess their products. The TC will focus on electric lighting first. R Mitanchey indicates that the TC has now more than 10 members. Many are part of the IEA task 21: «Daylight in building», noticeably subtask 21C, which is the software validation subtask. One of the first activities of the TC has been to review the literature on the subject.
M. Fontoynont stresses the fact that the TC could easily result in a lot of work, therefore the TC should make sure that its action items can be fulfilled within a year. W. Julian thinks that the work of the IEA Task 21 should not be lost. CIE could insure the perennity of the work performed within the IEA. Therefore, some IEA task reports could become joint publications CIE/IEA.

9. Reporters reports.

R 3-02: Stage and studio lighting. Mr Ackerman, the reporter, is preparing Showlight 2001, he is inviting offers of venues preferably in Western Europe.

R 3-06: Accidents and lighting. In a letter that he wrote to the division director, G. Irvine indicates that the report written by Prof. H. Ruschenschmidt and colleagues concerning industrial accidents and lighting has been translated from the German by Prof. Gubler and Prof. Topalova of the University of Waterloo. The complete report has been posted on the Internet at http://www.irvine-engineering.com and sent to about 20 CIE members. G. Irvine regrets that no link has been established from the CIE web site, to the page where the report has been posted. A. Slater says that there will be a link on the division 3 web server, in the «publications» section. In his letter, G. Irvine proposes that the reporter responsibility be assigned to Prof. Dr. Radosteva Topalova who has been associated with the Canadian CIE and is working with the IESNA Industrial Lighting Committee on the Lighting Handbook revision. All participants agree to the change of reporter. A. Slater thanks G. Irvine for his work.

R 3-10: Maintenance of indoor lighting. The reporter L. Bedocs has not sent any progress report.

R 3-13: Lighting vocabulary. Once again, there has been no significant progress made on the revision of the lighting vocabulary. Therefore, C. Belcher, the reporter, is invited to send to the division secretary, the list of terms that include words that he feel are poorly defined or whose definitions he does not understand or question. This list should include old definitions and new ones. The secretary will send the list for comments to all division members.

R 3-14: Lighting quality. This reportership has led to the organisation of the CIE symposium on lighting quality starting the day after the division meeting. No doubt that the symposium will result in new ideas for technical committees on lighting quality.

R 3-15: Lighting standards. S. Simos, the reporter, indicates that he has received information from 15 countries. He is ready to start another call for information to increase this number. He will first need to receive an updated list of CIE delegates from the secretary.

10. Liaisons. M. Fontoynont reports on the Satellight European research programme, the objective of which is to create a database of solar radiation and daylight for Europe, on the basis of the Meteosat satellite images. The database will be available through the Internet via a web server. The server is currently being developed at ENTPE. It will open officially on January 1, 1999, at http://satellight.entpe.fr.

11. Discussion on the change of director(s). A. Slater (division director) and P. Tregenza (associate director for daylighting) have announced their intention to quit their position on the occasion of the next CIE conference, in Warsaw. Following the call for nominations in the invitation to the Ottawa meeting, the Japan and South African committees have recommended Sueko Kanaya as new director for the division. However, S. Kanaya has expressed the wish to stay as associate director for electric lighting. On the other side, discussions with the CIE board and other delegates have led to the recommendation of M. Fontoynont as division director and D. Dumortier as associate director for daylighting. M. Fontoynont and D. Dumortier agree. Geoffrey Cook from the University of Reading, UK, proposes to be the new division secretary. These changes will take effect at the Warsaw meeting. M. Fontoynont thanks A. Slater for his remarkable work. A. Slater thanks P. Tregenza for his excellent work as associate director for daylighting.

W. Julian and H.A. Löfberg indicate that in the future, the division should be more careful in creating technical committees which may become quickly unproductive. They recommend to start with a reportership and then move to a TC.

12. Review of division 3 publications and future work. As a result of discussions during the last division meeting, in Durban, South Africa, A. Slater suggests to create a reportership on «Lighting in developing countries». Rob Henderson, from South Africa, has agreed to be reporter. This would be R 3-16. It is approved by the participants to the meeting.

A. Slater mentions that there is also some work to do on new guides for interior lighting, since TC 3.21 provides standards but no guidance to set up the standards.

A. Slater also indicates that new ideas for TCs or reporterships will undoubtedly arise from the CIE symposium on lighting quality which will begin the next day. M. Fontoynont asks whether it would be possible to create a new TC before the next meeting in Warsaw. A. Slater says that this would be possible. I. Pasini thinks that one first thing to do about lighting quality would be to demonstrate that lighting quality is important. H. Kramer thinks that proving the effectiveness of lighting quality will take forever.

A. Slater asks whether there are publications in the division 3 which are out of date. H.A. Löfberg answers that there are indeed some publications which would need to be modified, two of them dated before 1978, noticeably one focusing on the calculation of utilisation factors. R. Topalova agrees to report on this subject by comparing the three methods of calculation: the CIE, the Cavity and the British methods. This reportership is R 3-17.

H. Kramer indicates that he would like to see the division work more on the difference in quality between natural and artificial light.

13. Next meeting. The next meeting will happen in Warsaw at the same time as the CIE quadrennial conference. The conference will happen on Thursday June 24, Friday June 25 and Saturday June 26. The division 3 meeting is tentatively scheduled from Monday June 28, in the afternoon, to Tuesday June 29. The TC meetings could take place either during the conference, on Sunday June 27, or on the morning of Monday June 28. The division meeting is planned to last longer than a day to allow small presentations by TCs or reporters.

Finally, the Warsaw conference provides some space for six half-day workshops, 3 in parallel, during two afternoons. W. Julian suggests to organise a workshop on «progress in software» which would be directly related to the work of TC 3.33. H. Kramer suggests to organise a workshop on «lighting and architecture». A. Slater suggests that a workshop on «lighting in developing countries» be organised. The conference programme needs to be ready by June. Each workshop could begin with a small number of presentations to start the discussion.

14. Closure of the meeting. A. Slater thanks all the participants to the meeting, J. Veitch and I. Pasini for having organised the meeting. Then, he adjourns the meeting.

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PRESS RELEASE

April 1998

CIE Standard

S 005/E-1998

CIE Standard Illuminants for Colorimetry

This CIE Standard specifies two illuminants for use in colorimetry:

a) CIE standard illuminant A

This is intended to represent typical, domestic, tungsten-filament lighting. Its relative spectral power distribution is that of a Planckian radiator at a temperature of approximately 2 856 K. CIE standard illuminant A should be used in all applications of colorimetry involving the use of incandescent lighting, unless there are specific reasons for using a different illuminant.

The standard recommends laboratory realizations of the CIE standard illuminant A.

b) CIE standard illuminant D65

This is intended to represent average daylight and has a correlated colour temperature of approximately 6 500 K. CIE standard illuminant D65 should be used in all colorimetric calculations requiring representative daylight, unless there are specific reasons for using a different illuminant. Variations in the relative spectral power distribution of daylight are known to occur, particularly in the ultraviolet spectral region, as a function of season, time of day, and geographic location. However, CIE standard illuminant D65 should be used pending the availability of additional information on these variations.

Values for the relative spectral power distribution of CIE standard illuminants A and D65 are given in Table 1 of this International Standard, with an accuracy of six significant digits. Values are given at 1 nm intervals from 300 nm to 830 nm.

A French and a German translation (CIE S 005/F and CIE S 005/G) are also available.

This document is available in Canada for $77.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

October 1997

Measurement of LEDs

CIE 127-1997

ISBN 3 900 734 84 4

There are significant differences between LEDs and other light sources which made it necessary for the CIE to introduce a new quantity for their characterisation with precisely defined measurement conditions. The new quantity has been given the name "Averaged LED Intensity". It can be used to provide meaningful and reproducible data for many of the different types of LEDs now on the market.

The evaluation of the luminous flux must be carried out with caution, utilising specially constructed integrating spheres. Best results will be obtained if luminous intensity and luminous flux are measured by a comparison method and every laboratory should have available a standard, temperature controlled and calibrated LED with the same spectral and spatial power distribution as the test LEDs to allow measurements to be made on this basis.

Spectroradiometric measurements can be performed using the same technique as for other light sources with careful alignment along the optical axis.

The publication contains 27 pages. It is written in English, with a short summary in French and German, and is readily available at the CIE National Committees or at the CIE Central Bureau in Vienna.

This document is available in Canada for $90.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

December 1997

Proceedings of the CIE Symposium 1997 on

Standard methods for specifying and measuring LED characteristics

CIE x013-1997 **ISBN 3 900 734 85 2**

Currently there is considerable effort within the LED industry and the community who use LEDs to standardise on LED characterisation and measurement. CIE TC 2-34 *LED Measurements* completed its report on the subject (published as CIE 127-1997 *Measurement of LEDs*). The CIE 1997 Workshop and Symposium, held on 22-25 October 1997 at the CIE Central Bureau, Vienna, Austria, introduced the CIE recommendations on LED measurements and dealt with the underlying radiometric, photometric and colorimetric measurements. Health aspects of LED radiation were also discussed.

The goals of the meeting were:

to introduce the recommended CIE method for characterising LEDs, to share information on the technical content and status of projects involving the characterisation of LEDs, to identify areas where existing/proposed industrial methods are divergent and to initiate discussion towards resolution, to identify areas requiring new technology or knowledge and to recommend needed activities of CIE and industry to provide the necessary solutions.

Papers were read on the following subjects:

- New LED technologies
- Industrial measurements
- Safety issues of LEDs and other light sources, eye hazards
- LED lighting products, the use of LEDs in modern lighting applications
- Measuring new LED products, laboratory and industrial measurements
- LED measuring devices.

The Proceedings contain the text of the 12 papers read as well as a report on the roundtable discussions.

The publication contains 85 pages, and is readily available from the CIE National Committees or from the Central Bureau of the CIE in Vienna.

This document is available in Canada for $147.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

April 1998

CIE Guide to the Lighting for Open-Cast Mines

CIE 128-1998 **ISBN 3 900 734 860**

Open-cast mines cover a large area and continually change their shape as mining proceeds. Effective illumination is required to achieve production and safe operation of various machinery at different work areas.

Mobile mining machinery is equipped with luminaires powered by on board generators. Movable lighting towers are used in the mine faces for general lighting. Deep, compact pits and permanent facilities such as stockpiles, conveyors and processing plant, can be lit from fixed lighting arrangements.

Illuminance levels are provided for each work area to meet the visibility requirements of equipment operators and other workers.

Luminaires must have a high degree of protection against ingress of dust and moisture due to the atmosphere prevalent in open-cast mines. Luminaire design and installation must facilitate ease of maintenance. Strict adherence to agreed-upon maintenance schedules is important for prevention of undue loss of light with time and to avoid capital investment in higher initial lighting levels thus saving energy.

Lighting quality parameters like average illuminance, uniformity and glare limitation have been described. Further guidance can be obtained from existing CIE publications. Requirements for areas typical of open-cast mines have been given.

The report contains 30 pages. It is written in English with a short summary in French and German, and is readily available at the CIE National Committees or from the Central Bureau of the CIE in Vienna.

This document is available in Canada for $90.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

March 1998

Guide for lighting exterior work areas

CIE 129-1998

ISBN 3 900 734 87 9

The present document updates and replaces Publication CIE 68-1986 "Guide to the lighting of exterior working areas".

The values published are based on illuminance concept. Further to the average maintained illuminance and minimum to average ratio, the minimum to maximum ratio was introduced. Glare is limited by Glare Rating (GR), The values are "maintained" and determined to achieve efficient working conditions, safe movement and traffic and safety/security of people and property. Work areas are divided into twelve sections and listed in the Application Tables.

Attention is focused on design values. Other topics, as colour quality, maintenance, environmental aspects, design and measurement are only mentioned in this paper, detailed recommendations or standards are to be sought for in relevant CIE and ISO publications.

The publication is written in English, with a short summary in French and German. It contains 20 pages and is readily available from the CIE National Committees or the Central Bureau of the CIE in Vienna.

This document is available in Canada for $77.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

June 1998

The CIE 1997 Interim Colour Appearance Model (Simple Version), CIECAM97s

CIE 131-1998

ISBN 3 900 734 89 5

TC1-34, Testing Colour Appearance Models, was established to test various models for the prediction of the colour appearance of object colours. Later, TC1-34's terms of reference were extended to include the recommendation of a single colour appearance model to be used until a demonstrably better model could be formulated. The committee decided to formulate a single model with a simple version for many practical applications and a comprehensive version for a wide range of viewing conditions and phenomena. TC1-34 will continue its work testing this and other models. This report summarizes the formulation of the simple version of the CIE Interim Colour Appearance Model, CIECAM97s. The extension of this model to a comprehensive version, CIECAM97c, will be formulated and published in the future.

The publication contains 18 pages. It is readily available from the CIE National Committees or the Central Bureau of the CIE in Vienna.

This document is available in Canada for $77.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

July 1998

CIE Standard

S 006/E-1998

Road Traffic Light - 200 mm Roundel Signals Photometric Properties

National and international standards for road traffic signal lights usually specify requir ements for the luminous intensity of the lights to ensure that the signals will be visible in adequate time for an approaching driver to safely and efficiently respond to the signal on roads where speeds are low.

The official guidance of the CIE for traffic signal luminous intensity (CIE 79-1988: *A Guide for the Design of Road Traffic Lights*) has been widely followed as providing sound direction for standard development. This guidance was based on a comprehensive review of the subject published as a CIE Technical Report (CIE 48-1980: *Light Signals for Road Traffic Control*).

The CIE undertook a major review of its recommendations in the period 1989 to 1994 (see CIE 107-1994: *Review of the official recommendations of the CIE for the colours of signal lights* and CIE DS004.2-1996: *Colours of light signals*) and this Standard is based on that review. Technical Committee 4-29 (Standard on Road Traffic Lights) of Division 4 of the CIE (Lighting and Signalling for Transport) was responsible for the review and the drafting of this Standard. This Standard deals with the colour, luminous intensity and luminous intensity distribution for 200 mm road traffic signals. The serious problem of sun phantom, which can affect the correct recognition of the light, is included in the Standard.

It should be noted that this Standard considers only a few of the topics covered in CIE 79-1988. These are the topics for which supporting research and practical experience were strong enough to support standardisation. For topics not covered in this Standard, such as guidance concerning higher speed roadways and traffic lights using symbols, the user is advised to follow the guidance provided in CIE 79-1988.

This Standard has been approved by the CIE and replaces the recommendations made on 200 mm roundel signals in CIE Publication 79-1988.

A French and a German translation (CIE S006/F-1998 and CIE S006/G-1998) will be available shortly.

This document is available in Canada for $58.00 from the CNC/CIE. Orders should be addressed to:

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PRESS RELEASE

June 1998

Proceedings of the CIE Expert Symposium '97 on Colour Standards for Imaging Technology

21-22 November 1997,
at the Radisson Resort, Scottsdale, Arizona, USA

CIE x014-1998 **ISBN 3 900 734 90 9**

This Symposium was the third in a series of meetings of colour experts to discuss colour standards for imaging technology and the second to be organized by the CIE. It was a follow-up to the very successful Symposium on the same topic held in Vienna, Austria in 1996. The purpose was again to inform users of imaging technology on new standard methods and to provide international standard-writing organisations with the necessary feedback from the community of imaging technologies on their requirements and needs. The Symposium began with a joint session with the IS&T/SID Fifth Color Imaging Conference and ended with a discussion in which conclusions and action plans were formulated.The goals of the Symposium were:

- to share information on the technical content and status of projects involving the characterisation or definition of the colour of images,
- to review progress on various issues identified as priorities during the 1996 Symposium,
- to identify areas requiring new technology or knowledge and to recommend needed activities of CIE, industry and other standards groups to provide the necessary solutions.

We began with a Session in which members of various CIE Technical Committees preparing standards for colour in imaging technology reported on progress and issues in their work. There were also reports from other organisations working in this field. Following this first Session, there were four separate, non-overlapping Sessions which dealt with the following sub-topics:

- Metrology of displays
- Viewing conditions
- RGB colour space
- Colour appearance models (in this Session the CIE 1997 Interim Colour Appearance Model (Simple Version), CIECAM97s, and the underlying scientific research were introduced).

Ample time was included for open discussion. The final Session was an open Session (general discussion and formulatation of some action plans for the future).

The Proceedings contain on 140 pages the text of the papers read as well as reports on the roundtable discussions.

This document is available in Canada for $185.00 from the CNC/CIE. Orders should be addressed to:

Dr. A.R. Robertson
Institute for National Measurement Standards
National Research Council of Canada
Montreal Road
Ottawa, Ontario, Canada
K1A 0R6

Tel: (613) 993-9347
Fax: (613) 952-1394
E-mail: alan.robertson@nrc.ca

Payment must be made in advance, payable to "Canadian National Committee of CIE".

CIE DS 007.4/E
4th draft for NC vote
official version

Draft Standard

CIE TC 6-40
NC voting begins on
1998-05-11
NC voting ends on
1998-08-11

Erythema Reference Action Spectrum and Standard Erythema Dose

Référènce spectre d'action erithémale et dose erithémale normalisée

Erythemale Referenzwirkungsfunktion und standardisierte Erythemdosis

DRAFT

This document is a draft circulated to National Committees for approval.
It may not be referred to as a CIE Standard until accepted by CIE Board of Administration.

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CIE Central Bureau, Vienna
Kegelgasse 27, A-1030 Vienna, Austria

DS 007.4/E

UDC: 612.014.481
614.898

Descriptor: Optical radiaton effects on humans
Protection of the skin

© CIE, 1998

CIE

Draft Standard

CIE DS 004.4/E

4th draft for NC vote

official version

CIE TC 4-14
NC voting begins on
1998-07-06
NC voting ends on
1998-10-15

Colours of Light Signals

Couleurs des signaux lumineux

Farben von Signallichtern

DRAFT

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CIE Central Bureau, Vienna
Kegelgasse 27, A-1030 Vienna, Austria

DS 004.4/E

UDC: 535.625
628.975
656.54

Descriptor: Coloured light signals
Signal lighting
Traffic signals

© CIE, 1998

Dr. W. Adrian
University of Waterloo

30 October 1998

Report on the Activities of CIE Division 4 "Lighting and Signaling for Transport" in 1997/98

The annual meeting of Division 4 was held in Bath, UK from 22-27 October this year from which I have just returned. There were important TC meetings of the CIE. The event was fraught with serious concern about the future of the CIE. It was openly argued that the CIE has no future in its present form and need support by those who benefit from its work. One of the most important topics were confirmed again relating to the inefficiency of the TC's and the time needed to prepare a document that could serve as a basis for the ISO/CIE Standard. In contrast, the European standardization body CEN is much faster due to the fact that committees are given a constrictive deadline that has to be met.

Basically the reported activities of the Technical Committees in 96/97 are the same, but progress has been made in several which should be reported here.

TC4-15 Lighting of Roads for Motor and Pedestrians. It seems that,after rather lengthy discussions,the final version and verified calculation of Threshold Increments TI due to glare are in sight. In the L_{seq} calculation, however, age was neglected so far,and the chairman was not prepared to consider this factor, as it would increase TI. Compared with TI following for a 25 year old observer a 70 year old would have approximately twice the value of TI. The chairman R. Simons seems to be protective to the industry while P. Hautala, Finland, sees it as a challenge to Luminaire manufacturers to improve on their products. After all the final draft report has been nearly finished.

TC 4-36 Tunnel Lighting Quality Criteria. The title is misleading as the committee has to revise Document 80 and 88. Personal, commercial and national interests burden the work. In addition it has been felt,that the chairman has some difficulties with leading and directing the committee as he is manufacturer for tunnel lighting equipment. The director of Division 4 is informed about that conflict of interest. He supported a meeting of Mr. Stark, Adrian, Lutkevich and Schreuder which was held in Ann Arbor, MI, mid November '97. The physiologically based method to obtain the adaptation level of the entering driver should replace the preliminarily chosen approximation using L_{20} because of the inaccuracies occurring. This result has been ignored in the latest draft written by Schreuder. New investigations on 3 tunnels in Belgium by Rombouts, University of Bruxelles, have shown over a period of 6 months the predictable difference between L_{20} (average luminance in a 20° cone, which

was used to describe the adaptation level) and L_{seq}, the physiologically correct measure. As no solution (due to commercial interests) is in sight, Mr. J.M. Dijon of Belgium will write the draft and USA, France and Canada will provide their input.

TC 4-36 Visibility Design for Roadway Lighting. This committee met in conjunction with TC 4-33 (discomfort glare). A master plan how to proceed with research had been presented and was well received. However no one knew how to finance the research. The present draft contains the visibility model, that allows to calculate the threshold contrast as a function of background luminance, target size, observation time, contrast polarity (negative or positive) and the age of the observer. It is intended to use the visibility level VL to express the lighting quality.

TC 4-33 Discomfort Glare in Street Lighting

The 4th meeting of TC 4-33 was held on 24 October in Bath, UK. A few members and an unexpected large number of interested guests attended the 3 hour meeting. The chairman reported on the Research that has been done in very recent time, and the written results and graphs were distributed at the meeting. The known formulation (DeBoer et al, Adrian, Bennett and the CIE) were mathematically compared and came out to be very close. The USA is inclined to use the CBE by Bennett, which can be amalgamated with the GCM (glare control Mark) of the CIE, that is based on DeBoer and Adrian. The GCM Scale is associated to defined sensations reflected as subjective glare ratings. CBE was obtained for a constant glare sensation and leads only to a number that increases with glare but does not allow to judge the glare sensation. For that reason a mathematical connection between CIE and Bennett has been provided that showed, that the run back of the light intensity distribution (characterized by I_{80}/I_{88}) and spacing between the luminaires are strong parameters. A final algorithm was developed taking all these parameters into account. Glare can be accordingly calculated by CBE and express it on the basis of a sensation as given by a 1-9 scale. Those using the CIE formula may do so and arrive at the same glare sensation. The last part of the research results will be sent to the members with the request to perform a few calculations to verify the system and elicits their comments.

The chairman announced, now in his 3rd year of retirement, that he will step down as chairman for mainly financial reasons. As the future chairman Prof. Schmid-Clausen, T.U. – Darmstad) was nominated. He is also expected to compare the results with his own experiments.

TC 4-14 Specification of Color Boundaries for Signal Lights. Work was terminated. Committee closed.

TC 4-18 Conspicuity of traffic signs and signals in complex background. The chairman H. Jenkins, Australia, named the report near final.

New TC's

TC 4-31 Color vision standards for Transport. Chairman B.L. Cole held the first meeting. This is an important topic as it has to deal with deficient colour vision. About 8% of the male population are colour deficient, mainly deuteranomalous or protanomalous (red-green deficiencies).

TC 4-40 Requirements for retroreflective traffic signs. J. Rennilson is in the chair. They had a good start, and Jay is an expert in that field.

It should be also mentioned that some TC's are without a chairman, others are inactive which indicates that proper initiatives are absent.

Werner Adrian

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

Canadian National Committee Comité National Canadien

CIE DIVISION 5 :

EXTERIOR AND OTHER LIGHTING APPLICATIONS

REPORT toCNC/CIE, 43rd ANNUAL MEETING
November 6, 1998

Jacques Roberge
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A meeting of CIE Division 5 took place in Barcelona on June 5 1998, preceeded on Jun0e 4 by TC 5.11 and TC5.14 meetings, and on June 3 by a workshop on Division 5 related topics, listed in **appendix 1**.

The proceedings started on a sad note, with an obituary being read by the Dividion Director, on our Division Secretary of many years, Robert Hargroves who had passed away a few weeks before the meeting. Bob was a very active person in the division, and , as you will see from the minutes of the meetings, the re-assignment of his tasks was effected as follows : Nigel Pollard (GB) was elected interim Secretary until the end of the Quadrennium, and Gerrit van den Beld (NL) took over responsability for TC 5-11 and reporting duties for R 5-07, Review of CIE 83 publication.

- **Workshop** : since some topics overlap in scope with Div 3 and Div 4, I have prepared copies of the presentations for our members of those divisions. Other interested members can peruse those and request specific additionnal copies from myself.

- **Technical committee meetings** :

- **TC 5-11** : Although I am not a member of TC 5.11, I attended the morning half of the whole day meeting on **« Practical design guidelines for sports lighting installations for CTV «** . There was a large attendance of interested people, in addition to committee members, and lively discussion took place with many positive suggestions being made and it seemed to me that significant progress was being made. Having been away to TC 5-14, of which I am a member, I am not aware of how far they progressed by the end of the day.

- **TC 5-14** : **« Maintenance of outdoor lighting systems « :** Draft 5 was reviewed but the work could not be completed because of missing up-to-date light maintenance data on a number of important light sources. A tentative meeting to complete the work was planned for October 98 in Bath, England, at the time of the Division 4 meeting. Unfortunately this was cancelled, but some progress may have been made as some informal get-together was to be attempted on the subject. Unfortunately the minutes of both activities are not available at this time. I expect the Chairman to make every effort to complete the work by Warsaw as planned.

-1997 Division 5 Annual Report : The report was only received in May and is attached as **appendix 2.** Some data is updated in the next document.

-Minutes of Division 5 meeting,Barcelona, June 5 1998 : A draft document, the only one available as of last week, is attached as **Appendix 3** . It contains the most accurate and recent summary of the present situation, when supplemented with the specific comments offered above on TC 5.11 and TC 5.14.

A-1

AGENDA

C.I.E. Division 5 Workshop
BARCELONA, SPAIN
3th June 1998

Doc. #

15.00 Opening and welcome

15.20 (1) **Wout van Bommel:**
Maintenance factors, definitions of service, maintained illuminance: the C.I.E. statement defined and C.I.E. explained
Discussion

16.00 (4) **Luciano Di Fraia:**
Optimisation of maintenance schedules
Discussion

16.40 (3) **Dan Moroldo:**
Maintenance of the quality of electric energy by means of quality parameters
Discussion

17.20 **Break**

17.40 (5) **Ramon San Martín Carlos Sierra Eduardo Manzano:** (ARGENTINA) 1991 → 1998
Research and study relating to operation of exterior lighting installations
Discussion

18.20 (2) **Nigel Pollard:**
Energy efficiency and energy utilisation
Discussion

19.00 **Close of the workshop**

1997 ANNUAL REPORT CIE DIVISION 5

Director: Dr. József Horváth

98-04

1. GENERAL

The terms of reference of Division 5 are: "To study procedures and prepare guides for the lighting for exterior working areas, security lighting, floodlighting, pedestrian and other urban areas without motorised traffic, areas for sports (indoor and outdoor facilities) and recreation and for mine lighting".
On the basis of that Division 5 deals with:
Open cast mine lighting;
Exterior security lighting;
Sports lighting;
Lighting for offshore structures;
Restriction of obtrusive light;
Tolerances in lighting;
Maintenance of outdoor lighting systems;

The officers of Division 5 for the quadrennium 1995/1999 are:

Division Director:	Dr. J. Horváth (H)
Division Secretary:	R.A. Hargroves (GB)
Division Editor:	P.K. Bandyopadhyay (India)
Liaison officer:	A. Stockmar (D)

The present Technical Committee structure is:

TC 5-03	Open-cast mine lighting Chairman: P.K. Bandyopadhyay (India)
TC 5-08	Lighting for off-shore gas and oil structures Chairman: H.H. Björset (Norway)
TC 5-09	Illuminance levels for sports events Chairman: T.M. Lemons (USA)
TC 5-10	Exterior security lighting Chairman: P.C. Joye (Switzerland)
TC 5-11	Practical design guidelines for sports lighting installations for CTV Chairman: R.A. Hargroves (Great Britain)

DISBANDED

TC 5-12	Obtrusive light Chairman: A. Fisher (Australia)
TC 5-13	CIE/ISO Standard for the lighting of exterior working areas Chairman: J. Horváth (Hungary)
TC 5-14	Maintenance of outdoor lighting systems Chairman: N. Pollard (Great Britain)
TC 5-15	Tolerances in lighting design Chairman: A. Fisher (Australia)

Reporting topics are:

R 5-03	Lighting for HDTV (R. Livingstone)
R 5-05	Semicylindrical Illuminance (P. Rombauts)
R 5-06	Exterior Security Lighting (P. Schwarcz)
R 5-07	Review of C.I.E. 83 (R.A. Hargroves)

2. MEETINGS

In 1997, Division 5 had a Meeting in Eindhoven (Netherlands) in conjunction with Luxeuropa Congress. We had also T.C. meetings (T.C. 5-08., 5-11., 5-14.) the day before this Division Meeting in the same venue.
T.C. 5-14 had a Meeting in Durban (South Africa) in September 1997.

3. PROGRESS OF TECHNICAL WORK

TC 5-03 OPEN-CAST MINE LIGHTING
(P.K. Bandyopadhyay)

The last draft was reduced by shortening the description of mining technology, as the Division Meeting asked. The report is ready and the voting procedure is finished. The report is now under edition by C.I.E. Secretariat.

TC 5-08 LIGHTING FOR OFF-SHORE GAS AND OIL STRUCTURES
(H.H. Björset)

The work is continuing trying to achieve the first daft of report. ICAO (International Civil Aviation Organisation) is touched also of this subject. More investigations and studies are needed.

TC 5-09 ILLUMINANCE LEVELS FOR SPORT EVENTS
(T.M. Lemons)

A delay in the work was agreed in Newark (1994) pending the finalising CEN Report. The latest drafts of CEN Report were available. Our Division Meeting in Eindhoven established that there are no contradictions between these two drafts of publications. In according to the Division Meeting's decision the Director asked the T.C. Chairman to finalise the report. A discussion began about using the definition of "maintained illuminance".
The Division should try to clear up the problem during the next Meeting.

TC 5-10 EXTERIOR SECURITY LIGHTING
(P.C. Joye)

Considering that there has been no progress on this committee since 1993., the Division disbanded this Committee. A new T.C. Reporter was charged to investigate this matter.

TC 5-11 PRACTICAL DESIGN GUIDELINES FOR SPORTS LIGHTING INSTALLATIONS FOR COLOUR TELEVISION
(R.A. Hargroves)

The guide being prepared by this TC will give practical advise on the realisation of the recommendations for sports lighting for colour television and filming laid down in CIE Publication No 83. The practical guidance here will reflect the best of modern lighting design worldwide. The main body of the guide will be devoted to sections

covering many individual sports where there may be colour television or film coverage under artificial lighting. The final draft was circulated to the Committee for voting. A discussion arose about using the standard terminology of "maintained illuminance". Further consultations are expected.

TC 5-12 OBTRUSIVE LIGHT
(A. Fisher)

The terms of reference of this committee are: " To study the effects of obtrusive light from exterior lighting to residents and traffic; and to prepare a Technical Report that gives measure(s) to describe the effect(s), restricting values for these measures, and measuring methods; excluding the problem for astronomers." (For the latter problem CIE Division 4 has established a Technical Committee). Only a few comments have been received for such an important report. This report requires careful study, but the values need checking against current design.
The Chairman will finalise the report and it will be sent out for National Board Ballot. A longer periods for returning the vote will be given, to enable checking of values to be carried out.

TC 5-13 CIE/ISO STANDARD FOR THE LIGHTING OF EXTERIOR WORKING AREAS
(J. Horváth)

Originally this Committee was formed to prepare a C.I.E/ISO Standard. All the voting procedure was finished with a majority acceptance. But CEN is dealing with the same subject also, that is why an adjustment with CEN is proposed before becoming a standard.
As a consequence this text will be edited like a Technical Report C.I.E. Publication No. 129-1998 under title:
"Guide for Lighting Exterior Work Areas".

TC 5-14 MAINTENANCE OF OUTDOOR LIGHTING SYSTEMS
(N. Pollard)

This committee is producing a Technical Report describing the parameters influencing the depreciation process and the procedure for estimating the maintenance factor for outdoor lighting systems. The 3rd draft report includes maintenance of columns, luminaries maintenance factors and definitions of pollution categories.
The Technical Committee had a Meeting in Eindhoven, and on other one in Durban (South Africa) during 1997.
The publication is in advanced stage, the 4th draft is available yet, the next draft will be applicable to vote.

TC 5-15 TOLERANCES IN LIGHTING DESIGN AND MEASUREMENT
(A. Fisher)

This committee was found in 1994.
There has been little input from committee members so far, so that a 1st Draft could no be prepared.
A workshop was held in Delhi and the objectives and report contents were endorsed. However, the complexity of the subject was stressed and the need to restrict the scope of the work, so a short time targets can be achieved. The Chairman gave public undertaking to produce a draft report. After the Division Meeting the Director of the Division asked the Chairman for information by post. No more action is since the Eindhoven Meeting.

R 5-03 THE LIGHTING FOR SPORTS EVENTS FOR HIGH DEFINITION TELEVISION
(J. Livingstone) Van den Berg

The aim is to study whether a Technical Report can be produced as an annex to CIE Publication 83-1989 (Guide for the lighting of sports events for colour television and film systems). J. Livingstone (GB) produced a report that was discussed at the November 1995 New Delhi Session and the report had been circulated to all members. In summary, it appears unlikely that a new HDTV channel would come into service before 2000. Some change in lighting levels may be

necessary as a result of reduced depth of field, and also possibly changes in camera and lens sensitivities, but it will not be any dramatic effect on lighting requirements. This reporting topic was continued, discussed in the Eindhoven Meeting and finished.

R 5-05 SEMICYLINDRICAL ILLUMINANCE
(P. Rombauts)

The Reporter presented his first approach of this topic giving an outlook of use of semi-cylindrical illuminance concept at the occasion of Division Meeting. The Division asked the Reporter to continue this work and a final Report should be useful to be published in C.I.E. collection.

R 5-06 EXTERIOR SECURITY LIGHTING
(P. Schwarcz)

The subject of disbanded TC 5-10. "Exterior Security Lighting" was given to a Reporter, during the Eindhoven Division Meeting.
The goals of this reporting work to analyse available literature standards, guides and recommendations and the necessity of an eventual T.C.

R 5-07 REVIEW OF C.I.E. 83
(R.A. Hargroves)

The new reporting topic was established to ascertain worldwide opinion on the need to update C.I.E. 83 (Guide for the lighting of sports events for colour television and film systems. 1989). The work just began now.

4. LIAISON MATTERS

CEN Liaison is very desirable: Mr. A Stockmar (D) was appointed as Liaison Officer.

The Liaison officer informed the Division about the work of different CEN Committees, namely WG2: Lighting of Work places, WG4: Lighting Application-Sports Lighting.

5. ACKNOWLEDGEMENT

Without the time, energy and especially the enthusiasm of many volunteers the work of Division 5 would never have progressed.

Thanks for everybody.

Dr. József Horváth, Budapest, April 7, 1998.

CIE DIVISION 5

A-3

Minutes of the Division Meeting
Held on Friday 5th June 1998
at the
Universitat Politecnica de Catalunya
Departamant de Projectes d'Enginyeria

Present:	Bandypoadhyay, Pranah	(Editor)	(m)	India
	van den Beld, Gerrit			Netherlands
	van Bommel, Wout J M	(VP)	(m)	Netherlands
	Coatham, David			UK
	Di Fraia, Luciano		(m)	Italy
	Horvath, Jozsef	(Division Director)	(m)	Hungary
	Jerleke, Jan-Erik		(m)	Sweden
	Lain, Steven			UK
	Lasinski, Marek		(m)	Poland
	Lecocq, Jacques		(m)	France
	Lemons, Tom	(Chair, TC 5-09)	(m)	USA
	Morold, Dan		(m)	Romania
	Major, Gyula			Hungary
	Manzano, Edwardo		(m)	Argentina
	Otudesfad, Jan			Norway
	Pollard, Nigel	(Chair, TC 5-14)	(m)	UK
	Roberge, Jacques		(m)	Canada
	Rombauts, Patrick	(Reporter, R 5-05)		Belgium
	San Martin, Ramon		(m)	Spain
	Schwarcz, Peter			Hungary
	Scott, Alistair			UK
	Sozen, Mujgan		(m)	Turkey
	Stockmar, Axel		(dv)	Germany

Note: (m) = Division 5 member
(dv) = Delegated vote

Apologies were received from:

Boos, G.V.	Russia	
Bjorset, H.H	Norway	
Culley, D.H.	South Africa	
Fisher, A.J.	Australia	
Joye, P.C.	Suisse	
Kawakami, K	Japan	
Philippot, M	Belgium	Retired
Vassilev, N	Bulgaria	
Weis, B.	Germany	(Delegated vote to A. Stockmar)

With the retirement of Mr Philippot, a special thanks was given for his work for the Division ever since it was first set up in 1983 and for his work before that on various TC's.

Changes in Membership

Mr Kohji KAWAKAMI (Japan) - to take over from Mr Hiroshi Yoshida.

Divisional Secretary

Mr Nigel Pollard (UK) - to take over as Division Secretary until the end of the current Quadrennium, ie June 1999.

Delegates introduced themselves to the meeting.

2. MINUTES OF LAST MEETING : EINDHOVEN, MAY 1997.

Minutes accepted. Any matters arising were covered in the agenda.

3. DIVISION DIRECTORS' REPORT

This had been circulated before the meeting. The Director summarised the report.

Under the Technical Committee structure, it was proposed Gerritt van den Beld take over the Chair of TC 5.11 following the death of Bob Hargroves.

This was voted on and agreed unanimously.

Under the Reporter structure, it was proposed Gerritt van den Beld take over the Reporting of R 5.07 following the death of Bob Hargroves.
This was voted on and agreed unanimously.

The Director added that two Guides had since been published and were now available from the Central Bureau, they were:

Publication **No. 128: Guide to the Lighting for Open-Cast Mines.**
and
Publication **No. 129: Guide for Lighting exterior work areas.**

Finally, mention was made of the previous day's "Workshop" on Division 5 topics that included presentations as follows:

* **Maintenance factors, definitions of service and maintained illuminance: The C.I.E. statement defined and explained.** *Ir. Wout van Bommel*

* **Maintenance of the Quality of Electric Energy by means of quality parameters** *Dr. Eng. Dan Moroldo*

* **Optimization of maintenance schedules** *Prof. Luciano Di Fraia*

* **Energy efficiency and energy utilization** *Nigel E. Pollard*

The event was regarded a great success, and both presenters and those who joined in the discussion, were again thanked for their contributions.

The report was accepted unanimously.

4. EDITOR'S REPORT

The Editor submitted the following Report:

1. The following. drafts have been edited.

- Guide to the Lighting for Open-cast mines (TC5-09).
  This has since been published as CIE 128-1998.

- CIE/ISO Standard for the Lighting of Exterior Work Areas (TC5-13).
  This has since been published as CIE 129-1998.

- Draft 5 of Practical Design Guidelines for the Lighting of Sports Events

for Colour Television and Filming. (TC5-1 1). Comments sent in July 1997.

Draft 6 for TC ballot was received in November 1997. Most of the editorial comments on Draft 5 have been taken into account in this draft. Comments not incorporated, probably through oversight, will be repeated, once the result of TC ballot and any comments from TC members are known.

2. TC 7-06 "Terminology""
As decided in the Division 5 meeting at EINDHOVEN held in May 1997 all papers concerning "Terminology" have been sent to the DD and the Secretary of the Division 5, Mr. J.Lecocq,
in September 1997. Comments from them are awaited.

It was noted that a number of members had not seen the list of CIE Terminology and it was therefore agreed that all Chairs and the ILE (UK) should be sent copies for comments.

P. Bandyopadhyay

Review of Division 5 Publications

Mr Lemons was concerned that TC 5.09 was only concerned with lighting levels and Mr Lecocq called for Guidance on method of attainment.

After some discussion, the idea of Messrs. van de Bede and van Bommel that a TC should be set up to decide on a new "family" of reports that would cover, lighting levels, methods of attainment and methods of measurement.
(see new work - item 8)

It was agreed that with the publication of Pub. 129-1988, Pub.68 (1986) should be withdrawn.

Remaining reports - no revision.

5. TECHNICAL COMMITTEE REPORTS

TC 5-03 "Open-cast Mine Lighting" (P K Bandyopadhyay)

The Chairman thanked the committee for all their hard work that had now led to the publication of the Guide as CIE Pub.128-1998.

Mr Lemons was concerned however that the USA vote, against, had not been given due recognition. Their concerns were that while levels and uniformity's had been given, areas were not specified. There were also conflicts in Table 8.1 with

regard to mine faces.

The Chairman would investigate these concerns and the CB would be asked to comment on how this negative vote had not been followed up earlier.

P. Bandyopadhyay

TC 5-08 "Lighting of Off-shore Gas and Oil Structures" (H-H Bjorset)

The report as reproduced in Appendix 1 was read by Mr Otudesfad on behalf of Mr Bjorset.

The DD was concerned that little work had been done in this committee since May 1997 and asked that there be a detailed draft available by the Warsaw meeting in June 1999. H-H Bjorset

TC 5-09 "Illuminance Levels for Sports Events" (T.M Lemons)

The Chairman stated the the 1991 illuminance data collected from 12 countries could now be out of date, and that he proposed to update it. CEN work should by now have brought the European countries together and was well documented. He was particularly interested therefore to hear from non CEN countries and would contact Divisional members accordingly. He would have a draft Report ready for Warsaw. T.Lemons

TC 5-11 "Practical Design Guidelines for Sports Lighting Installations for Television and Filming" (G van Den Beld)

Draft 6 had been sent out for voting the results of which were: 7 for, 1 against (USA) and 2 abstentions (Italy and Japan). The new chairman had held a meeting in Barcelona which had clarified matters together with some editorial comments. A revised draft would be produced. G van Den Beld

TC 5-12 "Obtrusive Light" (A J Fisher)

Dr A Fisher's report is attached as Appendix 2.

Mr Pollard, on behalf of Dr Fisher had held a TC meeting in Barcelona which had discussed in detail the 3rd Draft. Comments of the meeting and a 4th and hopeful final Draft would be put together by Messrs Pollard and Fisher. A further meeting was planned together with Division 4 in October 1998 in Bath, UK if required. N. Pollard
A. Fisher

TC 5-13 "CIE / ISO Standard for the Lighting of Exterior Working Areas" (J Horvath)

The Chairman thanked the Committee for all their hard work and presented those present with a copy of the newly published report.

Mr Lemons questioned why it was not a "Standard" and Mr Stockmar said that he too was disappointed that it had not be published as such.

The meeting agreed that it should be put forward as a ISO Standard and asked that the DD bring up the suggestion at the CIE Board Meeting in July.

If it did progress that way, Mr Di Fria asked that the "grids" be better defined as in line with his paper given in 1998 at *Lux Europa*. J Horvath

TC 5-14 "Maintenance of Outdoor Lighting Systems" (N E Pollard)

A meeting had been held in Barcelona to discuss the 4th Draft. This had now been agreed and all that was required was the lamp lumen and life data that was being put together by the major lamp manufacturers for CEN. Hopefully this would be available before the end of 1998. N. Pollard
A. Stockmar

TC 5-15 "Tolerances in Lighting Design" (A J Fisher)

Dr Fisher's letter (Appendix 2) was read by Mr Major. The draft Australian Standard was welcomed and a new group of TC members offered to Dr Fisher to take matters forward for the CIE. Those offering assistance being: D. Coatham (UK), L. Di Fraia (Italy), J. Lecocq (France) and J. Roberge (Canada).
The DD would write to Dr Fisher asking him to contact the above directly with copies of the Australian Draft. J Horvath

6. REPORTERS' REPORTS

R 5-05 "Semi-cylindrical Illuminance" (P Rombauts)

A Report of around 50 pages would be ready by November 1998 P. Rombauts

R 5-06 "Exterior Security Lighting" (P Schwarez)

A Report is attached as Appendix 3.

Mr van Bommel welcomed the Report and thought it a good one but highlighted the fact that it crossed CIE Divisions. Section 4.1 (Public Lighting) was clearly Division 4, while 4.2 and 4.3 (Business, Commercial and Industrial) were our own Division. It was agreed that CIE would probably not be welcome in section 4.4 (High security/Military) aspects.

A copy of the Report would be sent to Kate Painter, the new Div 4 Reporter for "Lighting and Crime". N. Pollard

R 5-07 "Review of CIE 83" (G van Den Beld)

Any data collected by the late Bob Hargroves would be obtained from his secretary and sent to the new Reporter. N. Pollard

7. LIAISON OFFICERS' REPORTS

The DD Reported on a joint meeting between CIE, CEN and ISO at the ISO Central Secretariat in November 1997.
A memo. of the meeting is attached as Appendix 4.

A Stockmar reported on liaison with CEN TC 169, WG4: Lighting Application - Sports Lighting, and stated that they had formally adopted the levels of CIE 83 into their latest document A figure of 0.8 was used to at "minimum maintained" illuminance levels". It was hoped the document would be published by the end of 1998.

8. WORK PROGRAMME

i) TC's dissolved - TC 5-03: Open Cast Mine Lighting.

ii) New TC's:

TC 5-xx **Exterior Security Lighting of Private Properties (Chair: Peter Schwarez)**

Terms of reference:

Guide gives recommendations of lighting designed primarily to improve security of homes, industrial, commercial properties and working area. It can serve as an additional guide to existing ones of exterior lighting. It excludes security aspects of public lighting (to avoid parallel work with Division 4 covering the same topic) and lighting of high security areas (military, nuclear areas, prisons), which topic is complex enough to have its own guide.

Members: A. Scott (UK) P Schwartz

plus.....

TC 5-xx **Standardisation Format for Sports Guide (Chair: Tom Lemons)**

Terms of reference:

To prepare a report that establishes a format for sports lighting reports to use to prepare revisions of Publications 42,45,57,58,and 62.

T. Lemons

Members: G. van Den Beld (Netherlands),
J. Roberge (Canada)
P. Schwarcz.(Hungary)

TC 5-xx **Practical Design Guidelines for the Lighting of Exterior Work Areas (Chair: P. Bandyopadhyay)**

Terms of reference: To produce an "applications" guide for exterior work areas that compliments Pub. 129-1998, by updating where necessary the relevant portions of the withdrawn CIE Publication 68.

Members: R. Beckford? (USA),
D. Coatham (UK)
M. Lasinski (Poland)
P. Schwarcz.(Hungary)

?

iii) Reporting Topics : Changes / Additions

R 5-xx	City Beautification:	M.S. Sozens (Turkey) APPROVED	
R 5-xx	Emergency Lighting: (To investigate common committee with Division 3)	Prof. Dr. B. Weis (Germany)	
R 5-xx	Glare in indoor sports:	K. Kawakami (Japan) to be asked?	DD

9. CIE-ISO/IEC STANDARDS

DD to take forward Pub. 129 as a suggested ISO Standard DD

10. DATE AND VENUE OF NEXT MEETING

The next Division 5 meeting would be held in Warsaw, during the CIE Quadrennial Meeting 24 - 30 June 1999.

Note was made of the possible mid term meeting in 2001 in Vancouver, Canada.

11. ANY OTHER BUSINESS

None.

12. CLOSE OF MEETING

The Director thanked Roma San Martin and his local Committee for their hospitality in providing all the facilities for the Workshop, Division and TC meetings.

indian society of lighting engineers

Office of the President
Tel No. 4932511(Direct)
4930311
Fax No. 4950304/4950498

1998.07.23

CIRCULAR:

To CIE Division 5 members and TC Chairmen

Sub: CIE TC 7-06 Terminology

All of you were aware of the above TC, in which all the Divisions and some other experts are members. I have received several documents from the Chairperson of this TC giving some terminologies and definitions.

It was decided in the last Division 5 meeting in Barcelona that extracts from these documents relevant for Division 5 be circulated to you inviting your comments. Accordingly, I have prepared the enclosed extracts.

Kindly let me have your comments at an early date for further action within the Division 5 before passing them on to TC7-06.

I have already advised Ms. Christine Hermann to keep a meeting of TC7-06 in the schedule of meetings at Warsaw in June 1999.

Thanking you and with kind regards,

Yours sincerely,

Pranab K. Bandyopadhyay
Editor, CIE Division 5

Encl: as above

New proposals for inclusion: in the International Lighting Vocabulary

Divisions 3 and 5 have identified a need for clarification of various terms used in CIE reports which are currently being drafted. With the approval of the Board of Administration the following definitions are recommended. Any comments covering the following should be sent to TC 7-06 care of the Central Bureau.

500-01.0 *Average illuminance (over a surface), E_{av}:*

Illuminance averaged over the specified surface.

Note 1:
In practice, this may be approximated by an average of the illuminance at a representative number of points on the surface. (The number and positions of these points should be specified in the relevant application guide.)

Note 2:
The specification must include a clear indication of the type of illuminance at the points of the surface, i.e. horizontal, vertical, spherical, cylindrical or semi-cylindrical.

500-02.0 *Average luminance (of a surface), L_{av}:*

Luminance averaged over the specified surface.

Note:
In practice, this may be approximated by an average of the luminance of a representative number of points of the surface. (The number and positions of these points should be specified in the relevant application guide.)

500-02.1115 **Average luminance of the road surface $\bar{L}$**

This is the minimum value to be maintained throughout the life of the installation. It is dependent on the light distribution of the luminaires, the luminous flux of the lamps, the geometry of the installation, and on the reflection properties of the road surface. Higher levels are acceptable when they can be economically justified.

The calculation and measurement of the average luminance of the road surface should be carried out in accordance with CIE 30.2-1982.

Calculated values should take account of luminaire and lamp maintenance factors. Luminaire maintenance factors vary according to the intervals between cleaning, the amount of atmospheric pollution and the quality of the sealing of the lamp housing of the luminaire. Their values may be established by field measurements. Lamp flux maintenance factors vary according to lamp type and power. Values are usually available from lamp manufacturers.

500-03.0 *Maintained average illuminance (over a surface), E_{avm}:*

Value below which the average illuminance on the specified surface is not allowed to fall. It is the average illuminance on the specified surface at the time maintenance must be carried out.

Note:
The Division Directors Meeting decided to use throughout all CIE Divisions from now on as basis for lighting level specifications:
"The minimum value during use of the installation of the average illuminance over a number of (specified) points on the field, street or working place". This value will be called the "maintained average illuminance value".
Also on this subject the Spring issue of the Division 5 Activity Report gave more details.

(CL from DD5 to D5 92-07-24)

500-04.0 *Maintained average luminance (of a surface), L_{avm}:*

Value below which the average luminance of the specified surface is not allowed to fall. It is the average luminance on the specified surface at the time maintenance must be carried out.

500-05.0 *Initial average illuminance (over a surface), E_{avi}:*

Average illuminance on the specified surface when the installation is new.

Note:
The initial average illuminance is obtained from the specific maintained value by dividing the latter value with the maintenance factor at the time maintenance must be carried out.

500-06.0 *Initial average luminance (of a surface), L_{avi}:*

Average luminance of the specified surface when the installation is new.

Note:
The initial average luminance is obtained from the specified maintained value by dividing the latter value with the maintenance factor at the time maintenance must be carried out.

Above proposals were published in CIE 103-1993.
(also sent to Div. 3)

Note taken from Publ. CIE 92-1992:

Average and Maintained Lighting Values
As there is some confusion regarding usage of the above terms the following explanations of the usage in this document are given:
Average is the mean value of a number of calculated or measured points in an installation.
Maintained values are the values used in the calculation based on
(a) the lamp lumen depreciation at the planned time of replacement, plus
(b) the luminaire dirt depreciation.

The lamp lumen depreciation factor can be obtained from any lamp manufacturer which will give details of the light output of the lamp from original switch-on until some point in time usually beyond any economical replacement time. This factor may, with some types of lamps, vary according to its burning position. A designer will select a specific time to replace lamps according to the mortality and lumen depreciation rate and the relevant costs of labour and material. The light output of the lamps at that time should be used in all calculations.
The luminaire dirt depreciation factor will depend on the locality and atmosphere of the urban area in which the equipment is to be installed plus the frequency of cleaning which will be carried out during the life of the equipment. Individual measurements on site can give guidance to designers.

New terms defined in CIE publications:

500-07.1034 THROW is defined by the angle of elevation of the centre of the lantern beam. This is determined from the isocandela diagram, as shown in Fig. 7, by evaluating the γ-angles of the 90% I_{max} contour in the principal vertical plan Throw is the average of these two angles (59° in Fig. 7).

(also sent to Div. 2, 3 and 4).

500-08.1034 SPREAD is defined by the most distant longitudinal roadway line on the road sid of the lantern which intercepts the lantern beam. This is determined from the isocandela diagram, as shown in Fig. 7, by drawing the longitudinal roadway lin which is tangential to the 90% I_{max} contour on the road side of the lantern. Spread is the γ-angle of this tangent in the C = 90° plane (36° in Fig. 7). Although longitudinal roadway lines are used to define the equivalent of spread in American Standards for classifying lanterns, the ASA system uses the 50% I_{max} contour.

(also sent to Div. 2, 3 and 4.)

500-09.1034 CONTROL is defined by SLI, the specific lantern index, which consists of those parameters in the glare control mark of an installation which are characteristic of the lantern used. As explained in Publication CIE No. 31 (TC-4.6) 1976, "Glare and uniformity in road lighting installations", the formula is SLI = $13.84 - 3.31 \log I_{80} + 1.3 (\log I_{80}/I_{88})^{\frac{1}{2}} - 0.08 \log I_{80}/I_{88} + 1.29 \log F$, and applies only within certain limits. It must be emphasised that SLI is in no sense a replacement for glare control mark, G. An installation of lanterns with a low value of SLI on high columns may have a better G than an installation of lanterns with a high value of SLI at normal mounting height.

(also sent to Div. 2, 3 and 4)

500-11.1068 Isolated remote strips

These are some distance from buildings or storage yards etc., and may be defined as a strip of property both inside and outside a perimeter barrier or fence. Typically, illumination of such strips should cover a width of 25 metres, of which at least 5 metres is outside and 20 metres is inside the perimeter.

500-12.1068 Close-in strips

These are strips of property along a perimeter which are in close proximity to buildings or storage yards, and which may or may not be enclosed by a fence. Illumination of such areas should include at least 5 metres outside the defined perimeter and the area within the building walls or storage yards.

500-13.1068 Waterfront strips

These include docks, quays, and the water alongside them. Illumination of the security area should extend outwards for a distance of 12 to 15 metres on the waterside, and inwards for a distance of 20 metres, or to dock buildings within that distance.

500-14.1068 Storage zones

These are areas where materials or equipment are stored or where cars or trucks are parked.

500-15.1068 Entrance zones

These areas include entrance gates and the adjacent areas where people, goods and documents are checked.

500-16.1068 Traffic zones

These consist of walkways and roads through the area from the entrances to buildings and storage areas.

CIE DIVISION 6, Photobiology and Photochemistry
Report to the Canadian National Committee
October, 1998

Delegate: Jennifer A. Veitch, Ph.D.
National Research Council of Canada
Institute for Research in Construction
M-24, 1500 Montreal Road
Ottawa, ON K1A 0R6
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1. D6 Director

The term of Division Director Dr. David Sliney will conclude at the Warsaw Session. This is his second term as DD6, and under CIE rules he is ineligible for a third term. However, there has been no other nomination for his position. He was re-nominated during the 1998 annual meeting of the division and there is widespread support for his holding the position. However, it appears possible that the CIE Board of Administration will appoint someone if no other candidates emerge, because of the two-term rule.

2. Division 6 Annual Meeting Highlights

The Division 6 meeting was held in Gaithersburg, Maryland, August 31, 1998. A summary of TC activities is appended, and I can provide a complete copy of the D6 minutes to anyone who requests them.

CIE Standard S007/E-1998,"Erythema Reference Action Spectrum and Standard Erythema Dose" has been published, as CNC members have seen in the recent press release.

TC reports that were in the editing stage at the 1997 annual meeting are still in process, with several chairs reporting that work is expected to be complete in time for the Warsaw session.

Two new technical committees were proposed:
TC6-49, "Infrared Cataract", chaired by Myron L. Wolbarsht
TC 6-50, "Photodegradation of Pharmaceuticals", chaired by Joseph Piechocki.
CNC members who wish to propose Canadian members for these TCs are asked to contact me for more information.

3. Canadian Membership on D6 TCs

It is impossible to determine if there is Canadian membership on D6 technical committees, as the division records of committee membership are not centralised (and are largely out of date). What is known is:

The Canadian member of TC 6-47, " Photobiological Lamp Safety Standards" (Tim Richardson), has been dropped from the committee by its Chair, Dr. Rolf Bergman, after not responding to requests for participation.

Dr. Jennifer Veitch has taken the Chair of TC 6-11, "Systemic effects of optical radiation on humans", at the request of its previous chair, Dr. George Brainard. A draft report is expected before Christmas, and it is hoped that the work will be completed before the Warsaw session.

4. Other Division 6 Activities in 1998

Division 6, along with five other national and international organisations, sponsored an International Symposium on Measurements of Optical Radiation Hazards, Sept. 1-3. The event was attended by 150 participants from 14 countries, and focused on three topics; action spectra, guidelines and standards, and measurement. There will be of a proceedings volume forthcoming, including papers presented and discussions.

ANNEX 2

TC Update, as of 21 September 1998

No.	Chair	Title	Status
6-01	Sandor Ferenczi	Actinic Effects on Man	Completed, published as MFKI report.
6-02	Alistair McKinlay	Reference UV-Erythema Action Spectrum	Completed, published in CIE Journal 6/1, 1987. Re-published in CIE 106-1993.
6-03	Bernhard Steck	Photo-kerato-conjunctivitis	Completed, published in CIE Journal 5/1, 1986.
6-04	Charles C.E. Meulemans	Selected Photobiological Information	Closed at Durban 1997 meeting; data available.
6-05	G.S. Sarytchev	Actinic Effects on Plants	Completed, published in CIE Journal 6/2, 1987.
6-06	Kohtaro Kohmoto	UV Actinic Sources of Relevance To Illuminating Engineering	Closed in 1991, no publication.
6-07	G.S. Sarytchev	Recommendation of the Methods of Measurement of Optical Radiation In Terms of Its Effects on the Corresponding Receivers	Transferred to Division 2, TC 2-31. No publication.
6-08	Dieter Kockott	Guidelines for Obtaining Action Spectra	Reported at Gaithersburg 1998 and faxes to D6 chair that draft has been sent out and will be edited based on editorial comments received.
6-09	Bernard Muel	Malignant Melanoma and Fluorescent Lighting	Completed, published in CIE Journal 7/1, 1988.
6-10	Maxim Mutzhas	Photobiological Effects on Human Skin	Completed, published as Annex 2 to Board Report 0302. Also published in CIE Technical Collection 1993 as 103/3.
6-11	George C. Brainard	Systemic Neuroendocrine Effects of Optical Radiation on the Human	Chair reported at Gaithersburg 1998 that his database on the subject now includes over 1200 references. Will use report given at New Delhi as a guide to create a more manageable document. Chair may change.
6-12	Jean-Pierre Cesarini	Phototesting of Skin Application for Sun Protection (UV-B)	Completed, published in CIE 90-1991.
6-13	G.S. Sarytchev	Lighting Aspects of Large-Scale Plant Growing in Completely Protected Environments ("Dark Rooms")	Closed for inactivity; work assumed by TC 6-42.

6-14	Kohtaro Kohmoto	The Blue Light Photochemical Retinal Hazard	Final stage of editing, S. DiDomenico. Chair has added terms of reference and member list, and has proposed revising standards for eye protectors-specs.
6-15	Nils Svendenius	A Computerized Approach to Reflection, Transmission, and Absorption Characteristics of the Human Eye	Recommended change of chair
6-16	Rikard Küller	Psychobiological Effects of Lighting	Chair has composed overviews of the various effects, and a draft has been forwarded to members of the TC.
6-17	Lucia R. Ronchi	Spatial and Temporal Variability of Radiation Exposure and Human Behavior	Recommended at Durban, 1997 to close. Other publication by Ronchi.
6-18	A. F. McKinlay	Evaluation of Potential Optical Hazards Associated with "Desk Top" Quartz Halogen Lamps	Completed, published in CIE 103-1993.
6-19	J. Barth	Personal Dosimetry of UV Radiation	Completed, published in CIE 98-1992.
6-20	Jean-Pierre Cesarini	Phototoxicity in Domestic and Industral Environments	A complete file of phototoxic and photoallergic compounds has been completed. They have been classified in 3 categories corresponding to: high frequency, and low frequency. Meeting is scheduled during 1994, after publication of the results of the European Community Commission.
6-21	David H. Sliney	Cataractogenesis by Low-Level Exposure to Ambient Ultraviolet Radiation	Sliney has finished this report, will be submitted for ballot.
6-22	T. W. Tibbetts	Terminology and Units for Characterizing Photosynthetically Active Radiation for Plants	Completed, published in CIE Technical Collection 106 as 106/8.
6-23	Donald T. Krizek	Develop Generalized Action Spectra for Plant Responses to Wavebands from 280 to 1100 nm	Work in progress; sent repeated e-mails to D. Krizek but no reply.
6-24	Jean-Pierre Cesarini	Sunscreen and UVA	LORP POC: S. DiDomenico. Document has been written but TC is delayed because there is no "official " method for the

			measurement of sunscreen. May be written as a "current status" report.
6-25	Steve Wengraitis	The Conventional Solar Day Weighted by UV Action Spectra	New data recommended for TC at MORH Symposium; chair will contact J. Frederick for info.
6-26	Jean-Pierre Cesarini	Standardization of the Terms UVA-1 and UVA-2	Completed.
6-27	A. F. McKinlay	Standardization of the Erythema Action Spectrum	Completed, combined with 6-40 as "Erythema Reference Action Spectrum and Standard Erythema Dose".
6-28	Jean-Pierre Cesarini	Standardization of Sunscreen Testing: Method of UV-A Sunscreen Testing	Group may correspond with similar TC 2-17. Much controversy exists over whether solar simulators are a good representation of real sunlight. Awaiting TC 6-24 report.
6-29	Peter Gies	UV Protective Index for Clothing	Report expected in late 1998, early 1999..
6-30	C. F. Wong	Dosimetry of UVR Exposure – UV Protection of the Eye	Completed. Final paper sent to CIE CB/Dr. Janos Makai in June 1998
6-31	Jean-Pierre Cesarini	Immediate Pigment Darkening	Work in progress, awaiting TC 6-24 report.
6-32	P. Donald Forbes	Action Spectrum for Photocarcinogenesis	Completed. Draft has been finalized and accepted, will be sent to CIE CB.
6-33	E. C. de Fabo	Photoimmunological Effects Mediated Through the Skin	Latest copy sent to Helga Tuschl by S. Wengraitis for immunolgy editing. Rec'd by D6 in 9/98.
6-34	P. Donald Forbes	Testing Protocols for Photocarcinogenesis Safety Testing	Final stage of editing, group met at Gaithersburg 1998 meeting. LORP POC: S. Wengraitis
6-35	Richard L.Vincent	Present State of UV Disinfection	Draft final report presented at 1998 Gaithersburg meeting. New references and comments will be incorporated. Should be completed by Warsaw 1999 meeting.
6-36	Natasha van Tonder	UV Protective Materials Used in Shading	Results of initial studies were reported at the Gaithersburg meeting. Hope to finish studies within the next year.
6-37	David H. Sliney	Light and Retinal Disease	Final stage of editing, S. DiDomenico. More needed animal data was recently provided. Group met at Gaithersburg 1998 meeting.

6-38	David H. Sliney	Photobiological Safety Standards for Lamps	Completed, sent to CIE CB. Group recommended that ICNIRP limits be used (similar to ACGIH).
6-39	Kohtaro Kohmoto	UV Radiation in Lighted Environments	Investigations have been completed and include more than 50 lamps. Need to establish guidelines for lamps.
6-40	Brian Diffey	Erythema Reference Action Spectrum and Standard Erythema Dose Unit	Completed, submitted for balloting.
6-41	Elizabeth C. Weatherhead	A Standardized UV Index	Final stage of editing,, edited copy sent to chair in July 1998 S. Wengraitis.
6-42	T. W. Tibbetts	Lighting Aspects for Plant Growth in Controlled Environments	New chair needed; Siekmann likely.
6-43	Dr. Jain	UV Water Disinfection	Jain and Vincent are forming the committee. Next meeting in Warsaw.
6-44	Myron L. Wolbarsht	Illuminators for Treatment of Infact Hyperbilirubinemia	Chair reported at Gaithersburg 1998 the need for manufacturers to make illuminators with constant output during useful life. Also has developed a meter to measure amount of bilirubin in the patient.
6-45	Alex Ryer	Optical Radiation Hazard Measurements in the Work Space	Chair and new recruits met a Gaithersburg 1998 and composed a first draft for the document.
6-46	Ed Nardell	Standardized Action Spectrum for UV Disinfection	Group met at Gaithersburg 1998, will gather data, then write first draft.
6-47	Rolf Bergman	Photobiological Lamp Safety Standard	First draft standard is under review.
6-48	Janusz Beer	Typical Minimal Erythema Doses	New TC
6-49	Myron Wolbarsht	Infrared Cataract	New TC
6-50	Joseph Piechocki	Photodegradation of Pharmaceuticals	New TC

November 4, 1998

CIE - CNC
ANNUAL REPORT - DIVISION 7 - GENERAL ASPECTS OF LIGHTING

Terms of Reference: To study and evaluate activities in terminology, education, economics of lighting and to provide information on the development of light sources.

Division Director :	Dr.-Ing. Michael Seidl	Germany
Editor of the division:	Mr. John T. Grundy	South Africa
Division Secretary:	vacant	
Canadian Representative:	Robert White c/o Duschenes & Fish Architectes Suite 404 1425 René-Lévesque West Montreal, QC H3G 1T7 Tel: (514) 879-1708 Fax: (514) 861-6219 Email: dfsarch@total.net	

1. General Comments:

There has been little activity and almost no correspondence during the year. Dr. Seidl has advocated, with little discussion, that because of the inactivity of the Division it should be disbanded at the next meeting in Warsaw and the activities of the two TCs be handled by the Central Bureau. A ballot to this effect is currently out for voting and is due December 11, 1998.

It is apparent that this Division has no direction or mission and that any issues that could fall into this grab-bag category could be handled by other divisions.

2. TC 7-06 Lighting Terminology - Chair: Christine Hermann (Austria)

Ms. Hermann has established a data base at the central bureau. All Divisions are encouraged to respond to her request for new terms to be incorporated in the CIE vocabulary. The work of the TC will be done by the Central Bureau in the event of the end of Division 7.

3. TC 7-08 Lighting Research Overview - Chair: R. Vincent (USA)

The purpose is to determine if a global data base of current lighting research can be compiled and to determine lighting research needs. I have had no information from Mr. Vincent on his work in the past year. There is a compilation of recent Canadian research efforts available from Dr. Veitch that will be sent to Mr. Vincent for his compilation.

4. Reportership on Energy and Environmental Aspects of Lighting - Division Reporter: P. Bleasby (USA)

Mr. Bleasby's report titled: " Environmental Impact of Lighting", focused primarily on the lessons learned in North America and Europe has been published.

Technical Committees:

No.	Chairman	Title
7-06	Christine Hermann	Lighting Terminology
7-08	Richard L. Vincent	Lighting Research Overview

TCs working on standards

No.	TC Title
7-06	TC Lighting Terminology

Reports:

Reporter	Title
Peter A. Bleasby	Environmental Impact of Lighting
P.K. Bandyopadhyay	Light and Radiation Sources

Liaisons

Organisation	Liaison Officer
IEC/TC1: Terminology	Christine Hermann
IEC/TC25: Quantities	Christine Hermann
IEC/TC34: Lamps & rel.equipm.	R. Rattunde
ISO/TC12: Quantities & Units	Christine Hermann

CIE Division 7 Publications

No.	Title	Year	ISBN
10	Slides for lighting education (withdrawn)	1963	
17.4	International lighting vocabulary, 4th ed. (Joint publication IEC/CIE)	1987	3 900 734 070
77	Electric light sources: State of the art - 1987	1988	3 900 734 135
96	Electric light sources state of the art - 1991	1992	3 900 734 33X
99	Lighting education (1983-1989)	1992	3 900 734 364

Report to CNC/CIE on Division 8 (Image Technology), November 1998

A.R. Robertson

The CIE Board of Administration has recommended the formation of a new Division to deal with CIE work in image technology. The recommendation arises out of discussions at the CIE Symposium on Color Standards for Image Technology held in Scottsdale, Arizona, U.S.A. in November 1997 and extensive subsequent discussions by e-mail. The recommendation has been approved by the National Committees in a letter ballot.

The Terms of Reference of the new Division are:

> To study procedures and prepare guides and standards for the optical, visual and metrological aspects of the communication, processing, and reproduction of images, using all types of analogue and digital imaging devices, storage media and imaging media.

In the discussions leading to the formation of the Division there was significant debate on whether these problems should be dealt with in a new CIE Division or as part of Division 1 The consensus was strongly in favour of forming a new Division and of possibly transferring some activities from Divisions 1 and 2. However, to alleviate the concern that forming a new Division might further fragment activities and make it difficult or impossible for some experts to take part, it was strongly recommended that the new Division work very closely with Division 1 and Division 2. In particular, it is hoped that physical meetings of the new Division will take place in conjunction with those of Division 1. This was implemented by having a preliminary meeting of Division 8 in conjunction with the Division 1 meeting in Baltimore, Maryland, U.S.A. in September.

The first Director of the Division will be Todd Newman of the U.S.A. David McDowell (U.S.A.), Michael Pointer (GBR) and Michael Stokes (U.S.A.) will be Associate Directors.

The following is a list of some suggested topics for the Division:

Chromatic adaptation transforms for imaging technologies.
Gamut mapping.
Colour difference evaluation in imaging applications.
The RGB default colour space .
Colour inconsistency index.
Viewing conditions .
Visual and ergonomic characterisation of different media (CRT, LCD etc.).
Spectral databases for surface colors (human skin, plants...).
Evaluation of colour filters used in camera and scanners.
Effect of ambient light on colour appearance of softcopy images.
Measurement geometries correlating with typical viewing conditions for images.
Viewing conditions for matching hard copy and softcopy images.
Colour and luminance homogeneity evaluation.
Calibration accuracy required based on observer metamerism and spectral differences between different media.
Resolve industry feedback on CIECAM97s.
Standard contrast sensitivity functions for luminance and chrominance signals and spatial/temporal responses.

In setting up Technical Committees it will be important to cooperate closely with other standards committees to avoid duplication and to ensure that all the desirable work is done by the most qualified experts and without undue delay. For example, IEC/TC100/PT61966 has agreed in principle to restructure various parts of its standard to move certain generic aspects related to

colour science to Part 1, which is yet to be written. It will be imperative for the new Division to work closely with the IEC group to take full advantage of the expertise available to the CIE and eventually to publish the results as a joint CIE/IEC document.

Based on expectations voiced at the Scottsdale meeting, much of the work of the new CIE Division is expected to result in standards that can be easily referenced by other activities. Thus many of the TCs in the new Division should be designated as standards committees and use ISO procedures. This would be the fastest way to be sure that the output meets the needs of the users. The message is loud and clear that the standards and industrial community needs colour related standards that are unambiguous and can be easily referenced.

An important aspect of the new Division's work will be liaison with other standards bodies working in the field. The CIE must avoid rivalry and duplication and make sure that all the necessary topics are covered. IEC/ISO JTAG2 will have an important role in this as its only responsibility is to provide liaison and co-ordination of international technical standards committees whose work involves imagery. The terms of reference of JTAG2 are broader than the optical, visual and metrological aspects proposed for the CIE. It is therefore recommended that the new Division should set up a small group to ensure good liaison with other related standards groups, including JTAG2. Unlike the TCs, this group should have an indefinite lifetime.

It is worth mentioning that, at its January 1998 meeting, JTAG2 passed the following resolution: "JTAG 2 is pleased and encouraged by the CIE proposal to set up a new division on colour for image technology. JTAG 2 encourages CIE to proceed with the activation of this division as quickly as possible, and to coordinate with those organizations which have colour standards work in progress."

Current stakeholders in image technology are not evenly distributed across national boundaries. Many of the national bodies within the CIE have no major stakeholders in a given industry, and at the same time several of the major stakeholders are multinational corporations. The CIE structure that allows TCs to be composed of experts with no restrictions based on nationality is ideally suited to this situation.

Many of the experts who could best contribute do not have the time or corporate support to travel extensively. Yet it will take frequent conversations within the Technical Committees in order to reach decisions. Therefore, the bulk of the TCs' work should be done by e-mail and other electronic means, with infrequent physical meetings. This approach has worked well both for IEC TC100 and for the International Color Consortium. It allows people to read, think, and respond to discussion at their convenience, yet provides the "face time" that is often essential to making compromises.

The CIE is often criticized for being slow. With an active Chairperson, TC work could be completed much more quickly by electronic communication. However, many of the traditional delays occur even after the TC has completed its report. A much heavier reliance on electronic letter ballots without waiting for Division meetings could speed up this process too.

Division 8 has begun its work by forming five Technical Committees:

TC 8-01: Colour appearance modeling for colour management applications
TC 8-02: Colour difference evaluation in images
TC 8-03: Colour gamut mapping
TC 8-04: Adaptation under mixed illumination conditions
TC 8-05: Communication of colour information