

2025 Meeting of Section III of the Consultative Committee for Ionizing Radiation

Neutron Metrology

International Atomic Energy Agency, Vienna, Austria

9-11 July 2025

Minutes

1. Welcome statements given by Andreas Zimbal (CCRI(III) chair), JT Janssen (CCRI President), Vincent Gressier (CCRI Executive Secretary) and Neil Roberts (CCRI(III) vice-chair).
2. Rapporteur – John Paul Archambault (NRC)
3. Agenda approved
4. Workshop on high energy neutrons (7-8 July 2025, IAEA)
 - There was optimism about the meeting, including the high level of science presented and the clear need for neutron metrology in this area. The CCRI(III) is tasked with maintaining the momentum of the workshop and keeping the different communities engaged.
 - **Recommendations to CCRI:**
 - i. Write a letter of intent (LOI) regarding a comparison for measurements in high energy neutron fields to be sent to possible facilities. The LOI would get support from the CIPM and the BIPM.
 - ii. Form a Task Group with potential participants to organize and determine parameters for a comparison for high energy neutrons. The type of comparison (key, supplementary, pilot study) has to be defined by the Task Group.
 - Members of the Task Group:

Institute	Name	Email
ASNR	Nelson Magalotti (Chair)	nelson.magalotti@asnr.fr
PTB	Andreas Zimbal (as CCRI(III) chair)	andreas.zimbal@ptb.de
BIPM	Vincent Gressier (as CCRI Executive Secretary)	vincent.gressier@bipm.org
TLabs	Zina Ndabeni	nb.ndlovu@ilabs.nrf.ac.za
PTB	Mirco Dietz	mirco.dietz@ptb.de
NIST	Shannon Hoogerheide	shannon.hoogerheide@nist.gov
CIAE	Tingyu Jiao	xiumusue@sina.com
NMIJ	Tetsuro Matsumoto	t-matsumoto@aist.go.jp
NPL	Neil Roberts	neil.roberts@npl.co.uk
UCT	Andrew Buffler	andy.buffler@uct.ac.za

- Task Group Goals:
 - Prepare LOI and Terms of Reference by end of 2025
 - Protocol ready before the next online CCRI(III) meeting (2026) and measurements starting before next onsite CCRI(III) meeting (2027)
 - Plan and perform measurements. Aim: results should be ready by CCRI(III) 2029 meeting
 - Proposal: Perform measurements at two facilities, 3 different energies but with one energy in common at both facilities
5. CIPM Update:
- new strategy published including ‘horizontal activities’: digital forums, climate and environment, quantum technologies
 - there is an effort to bring more countries into the metre convention (new observer status for users which are not members of the CIPM-MRA)
 - a new director of the BIPM (Annette Koo) will arrive at the BIPM this September and start as director in January 2026
6. Reports from the NMIs:
- CIAE, SCK, CIEMAT, CMI, LNE-ASNR, KRISS, NIST, NMIJ, NMISA, NPL, NIM
7. Status of ongoing and planned comparisons
- CCRI(III).S1-H*(10): all participants completed measurements and submitted results, results are now draft B
 - CCRI(III).S2-Hp(10): 17 participants
 - **A reminder to all labs which have completed measurements to send in their results**
 - **A reminder for remaining labs to send in their availability for scheduling**
 - CCRI(III).K12:
 - Participants are reminded to respond to emails regarding comparisons or risk missing the comparisons
 - CCRI(III).K8: a review was provided summarizing the updated procedures for the analysis
 - **NIM/CMI needs to update the protocol with new procedures and get approval from the participants**
8. Strategy for comparisons:
- Period of validity for comparisons starts after the last lab completed its measurements
 - For CCRI(III), the period of validity is 10 years (15 years for exceptions)
 - **Recommendation to CCRI:** emission rate comparisons for radionuclide neutron sources of one type using the manganese bath will validate the lab’s capabilities for all radionuclide source types. Therefore, CCRI(III).K9.Cf will validate capabilities until 2031.
 - **Recommendation to CCRI:** extend the validity of K11 to 2027 (15 years). Since both K11 and K10 are calibrations in multiple mono-energetic neutron fields, the validity of K11 covers K10

9. Comparison for High Energy Neutrons – see section 4.

10. RMO Comparisons

- APMP plans a comparison for determination of emission rate and fluence of radionuclide source by a transfer instrument (SP9 detector in polyethylene moderators)
 - CCRI(III) recommends that this comparison only supports fluence measurements
- STUK is currently performing a bilateral comparison with NPL for fluence measurements and $H^*(10)$, $H_p(10)$ measurements via transfer instruments

11. N/A

12. Reports from CCRI Working Groups (WG):

- Communication WG:
 - ~2100 people currently on the distribution list
 - 12 CCRI webinars in 2024/2025
 - 8 CCRI newsletter editions
 - Labs are encouraged to submit general interest stories to the newsletter
- Sources WG:
 - Report is scheduled for completion in time for CCRI meeting in November (draft has been circulated since Oct. 2024)
 - **CCRI(III) members are encouraged to communicate planned dates for renewal of Cf-252 neutron sources to coordinate possible purchases**
- Digitalization WG:
 - **Reminder: questionnaire was sent to CCRI members and the deadline for responding is August 15, 2025**

13. Reports from Liaisons

- IAEA
 - New ion beam/neutron facility is planned and may need support from CCRI (in-kind, support letters, out-reach, etc.)
 - Requests for updates to IAEA database content can be sent to Valentina Semkova (v.semkova@iaea.org)

14. Reports from RMOs:

- AFRIMETS, EURAMET, GULFMET, SIM

15. Reports from NMIs:

- SMU, ENEA, PTB, LNHB, iThemba, BARC

16. Strategy for future developments

CCRI Strategy contains neutrons in several places, which reflects also the activities of the CCRI(III) members

- Climate Change (eg. SoMMet)
- BNCT
 - There is a proposal to create a Task Group, possibly led by NMIJ.
 - Possible participants: NPL, STUK, CIAE, KRISS, FANR, NIM, NMIJ
- Radiation Protection (eg. Secondary neutrons from proton therapy)
- Next generation reactors (SMR, fusion)

- Advanced manufacturing (materials analysis)
- Nuclear forensics

17. Membership to CCRI(III)

- There is a growing interest of NMIs presently not members to join CCRI(III). This is seen as very positive, but it means more caution has to be taken when planning comparison exercises.
- **Decision of CCRI(III): Future comparisons for derived quantities (dose) which are not listed in the actual service categories have to be performed as RMO supplementary comparisons**
- Rules to join CCRI(III) derived from document CIPM-D-01 presented by BIPM
- **Conclusion: Calibrating neutron devices with traceability from a calibrated transfer instrument is not sufficient evidence to join CCRI(III), as voted by CCRI(III)**
 - STUK, PSI, KACST, UAE – all labs are quite advanced in neutron measurements but do not meet the above requirements for joining CCRI(III), as voted by current members of the section. All labs are encouraged to continue progress and to attend the next meeting of the section as guests.

18. Next Meeting

- There is a plan to have an on-line meeting in spring/early summer of 2026
- Default location of 2027 meeting is BIPM. If another lab would like to host the meeting, it must be decided one year in advance, i.e. latest during the on-line meeting 2026. Proposals for alternative locations can be communicated to the executive secretary.