F. Tessarotto, E. Oliveri. M. Titov, P. Gasik

WP ENDORSEMENT PROCEDURE

(DRAFT FOR DISCUSSION)

DRD1 Collaboration Meeting, 09-13.12.2024, CERN

MoU annex 7 – current status

- Current nine WPs established at the time of the DRD1 proposal endorsement
- Annexes on WPs are updated

Annex 7 Work Packages

7.1 Establishment and conditions applicable to Work Packages, Annual Scientific and Financial Endorsement

A Work Package (WP) is established either as part of the initial DRD1 proposal or subsequently proposed to the Scientific Coordination Board (SCB) for endorsement and to the Collaboration Board (CB) for approval of its establishment. Once established, a Work Package will go through yearly scientific and resource approvals, following the procedure in Annex 7.2 and 7.3.

Institutes wishing to participate in a Work Package must be members of the DRD1 collaboration. Being involved in at least one task and one deliverable of the chosen WP is strongly recommended for membership. Each case will be individually evaluated and approved by the relevant WP Leaders.

Any institute is entitled to withdraw from a Work Package and terminate its obligations under the respective Work Package Annex by providing written notice of not less than six months to the Work Packages Coordinator, the relevant Work Package Leaders, the Spokespersons, the Collaboration Board Chair and Deputy and, if applicable, its Funding Agency/Agencies.

Upon the establishment of the Work Package, the Work Packages Coordinator (4.1.15) will nominate, in agreement with the Management Board (MB), an internal Referee. The Referee should be one of the members of the MB. The nomination must be endorsed by the SCB and the MB.

Work Package (WP) Leaders will present the scientific status of the Work Package for scientific endorsement once per year in a dedicated SCB+MB meeting, following the criteria detailed in Annex 7.2. Minutes of the meeting will serve as official reference.

After obtaining scientific endorsement, WP Leaders will present the resource status of the Work Package for resource approval once per year in dedicated RB+MB meetings and to relevant Work Package Funding Agencies (WP-FA), following the criteria detailed in Annex 7.3. Minutes of the meeting will serve as official reference.

The CB will be informed once per year about the annual endorsements from the SCB and RCB for the active Work Packages and will give final endorsement. Minutes of the meeting will serve as official reference.

7.2 Scientific Endorsement

During the SCB meeting dedicated to WP internal scientific endorsement, the WP leaders will present an overview of the WP proposal. The SCB session will be open, and all member of the Collaboration will be invited. This presentation should encompass:

- Alignment with relevant ECFA themes, referencing the ECFA Detector R&D Roadmap document.
- Progress in the scientific program and its objectives.
- A detailed list of milestones and expected deliverables.
- Collaboration and interaction with Working Groups (WGs), other Work Packages, and other DRDs.
- A resource table provided for informational purposes only, not for approval.

2024: MoU Annex 7 – Work Packages

DRD1 Gaseous Detector Technologies

Task ID	Task	Performance Goal	ECFA DRD Theme
T1	New RPC structures	Achieve RPCs and TGC with a high-rate capability (ranging from 10kHz/cm2 to 1MHz/cm2) and/or improved timing resolution (reaching sub-ns to ps levels) using new resistive materials and fine structure.	
T2	New Resistive MPGD Structures	Development of large area resistive MPGD capable of efficient and stable operation under conditions of high rates (D… w/medium rates (D2.2)	
T3	New Front-end electronics	Fr… up to 0.1-1 GHz; High density channel; Radiation hardness; time resolution (< 10 ps); local zero suppression; higher FE gain amplification	1.1, 1.3
T4	Optimization of scalable multichannel readout systems	Development of novel Scalable Readout Systems for Gaseous Detectors. Development of new FPGA-based readout system t… electronics	
T5	Eco-friendly gases	Reduce the GHG… new ecological ga… of the current gas…	
T6	Manufacturing	Constructing and… producing high-… resistive MPGD … rates with industr…	
T7	Longevity on large detector areas	Ensure operation … with optimal an… integrated charges…	
T8	New detector structures	Develop new … exploiting new ide… new frontiers in g…	

Tasks

Country	Collaborating Institution	Town	Institution Code	Contact
Belgium	Vrije Universiteit Brussel	Brussel	BE-VUB	M. Tytgat
China	University of Science and Technology of China	Hefei	CN-USTC	J. Liu
China	Chinese University of Hong Kong	Hong Kong	CN-CUHK	Y. Tu
China	Hong Kong University	Hong Kong	CN-HKU	Y. Tu
China	Hong Kong University of Science and Technology	Hong Kong	CN-HKUST	Y. Tu
France	Institute of research into the fundamental laws of the Universe, CEA, Université Paris-Saclay	Gif-sur-Yvette	FR-IRFU-CEA	M. Vandenbroucke
Germany	Ludwig-Maximilians-University of …	Munich	…MU	O. Biebel
Germany	Max-Planck-I… Physics, Munic…	…	…PP	O. Kortner
Hungary	HUN-REN Wi… Centre for Physics	…apest	HU-HUN-REN	D. Varga
Israel	Weizmann Institute of Science	Rehovot	IL-WIS	S. Bressler
Italy	INFN Sezione di Bari, University and Politecnico of Bari	Bari	IT-INFN.BA	A. Pastore
Italy	INFN Sezione di Bologna	Bologna	IT-INFN.BO	P. Giacomelli
Italy	INFN Sezione di Ferrara	Ferrara	IT-INFN.FE	G. Cibinetto, R. Farinelli
Italy	INFN Laboratori Nazionali di Frascati	Frascati	IT-INFN.LNF	G. Bencivenni, M. Poli Lener, D. Piccolo, A. Paoloni
Italy	INFN Sezione di Napoli, University of Napoli	Napoli	IT-INFN.NA	M. Della Pietra
Italy	INFN Sezione di Roma Tor Vergata, University of Roma Tor Vergata	Roma	IT-INFN.RM2	P. Camarri
Italy	INFN Sezione di Roma Tre	Roma	IT-INFN.RM3	M. Iodice
Italy	INFN Sezione di Torino, University of Torino	Torino	IT-INFN.TO	M. Greco

Institutes

7.4.1.4 Start And End Date, Deliverables and Time Scale

The Work Package starts on start_date and ends on end_date.

The deliverables, time scales and contributing institutions are indicated in the table below.

Number	Title	Description	Start date	End date	Institutions
D1.1	Large area RPC and MPGD prototypes	Design, construction, and test of RPC and MPGD-based prototypes [T1, T2] with advanced solutions for extensive surface coverage [T6], optimized for medium-high flow rates (range tens kHz/cm2 – few MHz/cm2), precise tracking (100 µm) and timing (few ns). This includes considerations for the compatibility of eco-friendly gases. [T5, T7]	0	36M	BE-VUB, CN-USTC, CN-CUHK, CN-HKU, CN-HKUST, FR-IRFU-CEA, DE-LMU, DE-MPP, HU-HUN-REN, IL-WIS, IT-INFN.BA, IT-INFN.BO, IT-INFN.FE, IT-INFN.LNF, IT-INFN.NA, IT-INFN.RM2, IT-INFN.RM3, JP-KOBE-U, RO-UNSTPB, RO-IFIN-HH, RS-IOFH-BG, CH-CERN, CH-UNIGE, TR-ISTINYE, UK-PHY-CAM, e+e-US Cluster
M1.1.1	Review of Detector Prototypes	Examining the status and future prospects of innovative resistive materials, novel structures, and challenges in hybridizing Resistive Plate Chambers (RPC) and Micro-Pattern Gas Detectors (MPGD). This evaluation includes compiling of a comprehensive report highlighting comparative performance, along with the respective advantages and disadvantages of available	0	12M	

Deliverables / Milestones

	Deliverable						Total		
	D1.1			D1.n					
…ution	Material / kCHF	Physicists : FTE months	Engineers and technicians: FTE months	Material / kCHF	Physicists: FTE months	Engineers and technicians: FTE months	Material / kCHF	Physicists: FTE months	Engineers and technicians: FTE months
…ding Agencies									
Funding Agencies									
Contributions from other sources									
Total other …ces									
Total (Major Funding Agencies plus other sources)									

Resources

Resources and List of FA's to be complemented only after DRD1 MoU signature & WP endorsement process

Scientific endorsement in the MoU Annex 7

- Alignment with relevant ECFA themes, referencing the ECFA Detector R&D Roadmap document.
- Progress in the scientific program and its objectives.
- A detailed list of milestones and expected deliverables.
- Collaboration and interaction with Working Groups (WGs), other Work Packages, and other DRDs.
- A resource table provided for informational purposes only, not for approval.

Baseline for the procedure

Resource endorsement in the MoU Annex 7

- During the RCB meeting dedicated to WP internal resource approval, the WP Leaders will present the WP resources. MB will be invited. All relevant WP Funding Agencies (WP-FA) listed in the Work Package Annexes (6.4.x) will be invited. The presentations will focus specifically on resource requirements and allocation.
- To facilitate informed discussion, **all relevant information for the presentation will be provided to the relevant WP-FA and RCB members at least one month in advance of the meeting**, with the best effort.
- Before the RCB meeting, WP Leaders are responsible, irrespective of the nature of the feedback received, for organizing the timely collection and presentation of confirmations from the WP-FA to ensure that the proposed resource table accurately reflects their allocated funding and support.
- The method by which the proposed resource table will be acknowledged is left to each WP-FA, with the unique requirement that the acknowledgement is clear and unambiguous.

Baseline for the procedure

WP ENDORSEMENT

WP endorsement procedure drafting timeline

- ✓ Drafting by the committee
- ✓ The draft circulated within SCB on 15.11.2024
  - Zoom slot to explain the details of the draft will be available
- ✓ Discussion in the SCB on 22.11.2024
  - WP Leaders are encouraged to get feedback from the WP Institutes (WP-FAs) and discuss
- ✓ Discussion in the MB on 29.11.2024
  - Draft with additional comments from SCB; expected endorsement from the MB
- □ DRD1 Collaboration Meeting, WP session on Monday 09.12.2024 - procedure presentation.
  - Open discussion within the Collaboration
- □ Presented to CB on 12.12.2024
  - Expected endorsement from the CB

Key aspects of the procedure

- **Define a clear time flow**
- **Avoid duplicating work**. Clear list or required documentation without overlapping or duplication.

  Proposed list of documents needed for the endorsement:

  1. MoU Annex 7 (updated with all tables)
  2. Work Package Executive Summary for Internal DRD1 Scientific and Resource Endorsement
  3. WP Leader Presentations for SCB
  4. WP Leader Presentations for RCB

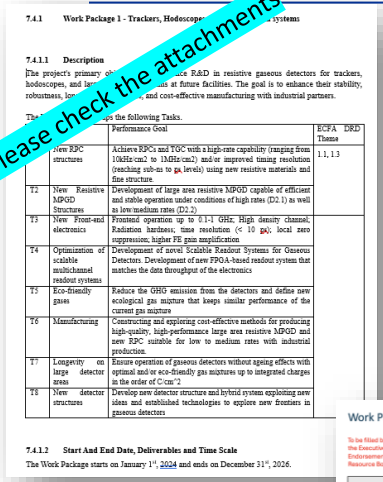
- **Simplify the collection of the required information** for the endorsement process. Using common templates – see documents attached.

WP Internal Referee

- From MoU Annex 7: *Upon the establishment of the Work Package, the Work Packages Coordinator (4.1.15) will nominate, in agreement with the Management Board (MB), an internal Referee. The Referee should be one of the members of the MB. The nomination must be endorsed by the SCB and the MB.* Comments:
  - Internal referee from the institute which does not participate in the WP
  - Being a member of the MB assures that the person is up to date with DRD1 and WP activities
  - Nominated MB members may ask an expert from outside MB for support
- Referee(s) **work together** with WPLs (see also next slides). (S)he is not a single person to decide on the endorsement, but preparing the background for discussion in the SCB
- The goal of the procedure is an endorsement. We don't judge the quality of work.
  - Research line compatible with ECFA, synergies within collab and other DRDs, etc. Status of Milestones and Deliverables.
- The referee is preparing a report, following the template
  - Findings, comments, and recommendations
  - The report helps in the Scientific Endorsement, it serves as a baseline for minutes.

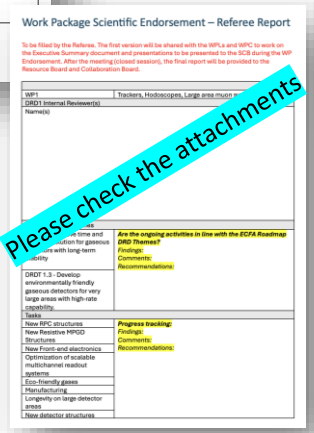
- SCB and MB shall establish the list of referees by the end of 2024, after the procedure gets approved.

Endorsement: Required Documentation



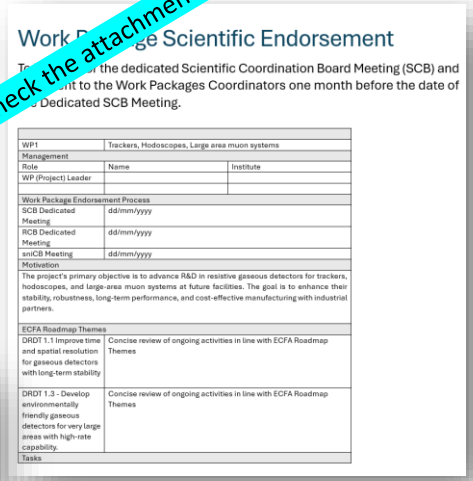
Please check the attachments

Updated version of **MoU Annex 7**



Please check the attachments

Referee report, following the WP Executive Summary document layout. Findings, Comments , and Recommendations for each part



Please check the attachments

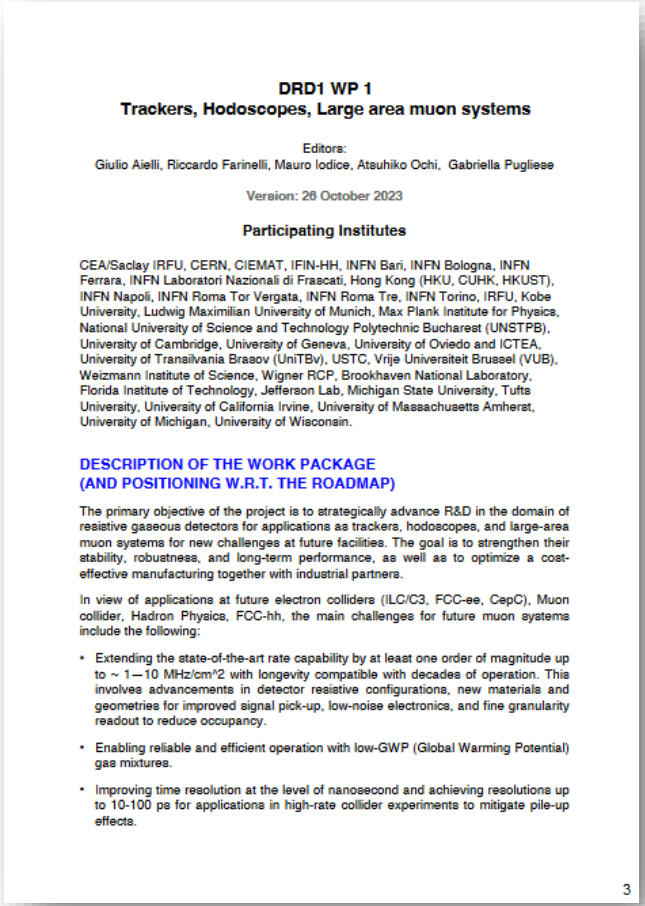
WP Executive Summary
A concise review of the status of the WP activities.

(It will include a section – not for endorsement – presenting long-term plans and additional requests for funds)

20’ minutes presentation for the Scientific Coordination Board (reflecting the review)

10’ minutes presentation for the Resource Coordination Board

Additional Documentation – Detailed Proposals



DRD1 WP 1
Trackers, Hodoscopes, Large area muon systems

Editors:
Giulio Aielli, Riccardo Farinelli, Mauro Iodice, Atsuhiko Ochi, Gabriella Pugliese

Version: 26 October 2023

Participating Institutes

CEA/Saclay IRFU, CERN, CIEMAT, IFIN-HH, INFN Bari, INFN Bologna, INFN Ferrara, INFN Laboratori Nazionali di Frascati, Hong Kong (HKU, CUHK, HKUST), INFN Napoli, INFN Roma Tor Vergata, INFN Roma Tre, INFN Torino, IRFU, Kobe University, Ludwig Maximilian University of Munich, Max Plank Institute for Physics, National University of Science and Technology Polytechnic Bucharest (UNSTPB), University of Cambridge, University of Geneva, University of Oviedo and ICTEA, University of Transilvania Brasov (UniTBv), USTC, Vrije Universiteit Brussel (VUB), Weizmann Institute of Science, Wigner RCP, Brookhaven National Laboratory, Florida Institute of Technology, Jefferson Lab, Michigan State University, Tufts University, University of California Irvine, University of Massachusetts Amherst, University of Michigan, University of Wisconsin.

DESCRIPTION OF THE WORK PACKAGE (AND POSITIONING W.R.T. THE ROADMAP)

The primary objective of the project is to strategically advance R&D in the domain of resistive gaseous detectors for applications as trackers, hodoscopes, and large-area muon systems for new challenges at future facilities. The goal is to strengthen their stability, robustness, and long-term performance, as well as to optimize a cost-effective manufacturing together with industrial partners.

In view of applications at future electron colliders (ILC/C3, FCC-ee, CepC), Muon collider, Hadron Physics, FCC-hh, the main challenges for future muon systems include the following:

- Extending the state-of-the-art rate capability by at least one order of magnitude up to ~ 1—10 MHz/cm^2 with longevity compatible with decades of operation. This involves advancements in detector resistive configurations, new materials and geometries for improved signal pick-up, low-noise electronics, and fine granularity readout to reduce occupancy.
- Enabling reliable and efficient operation with low-GWP (Global Warming Potential) gas mixtures.
- Improving time resolution at the level of nanosecond and achieving resolutions up to 10-100 ps for applications in high-rate collider experiments to mitigate pile-up effects.

3

Detailed Description of Work Package Activities as Required by the WP-FA for Participating Institutes

Not required for internal DRD1 endorsement.

Each Work Package is strongly encouraged to prepare (and keep it updated) a detailed document describing its activities, in line with the DRD1 proposal submission.

This document should support the funding request with a more detailed description of the planned activities. It will not be reviewed by the DRDC and will not be part of the WP Endorsement but can be used by all institutes in discussions with their corresponding funding agencies.

GENERAL TIMELINE

Latest time		-5 week		-3 week	-2 week	-1 week	CB Date
SCIENTIFIC ENDORSEMENT	Requirement	• Updated Annex 7 with all tables • WP Executive Summary		• Updated WP Executive Summary • Referee report • Annex 7	• All documents and presentations ready • Summary of WP-FA acknowledgements • 1h Dedicated SCB/MB Meeting for the WP Scientific Review		• Scientific endorsement • Financial endorsement • Recommendations to CB
	Action	• All documents sent to Work Packages Coordinator, Resource Coordinator and the WP Internal Referee • Referee report is prepared within 2 week time period. • The Referee works together with WPLs to "improve" the **WP Executive Summary**.		• Documents sent to SCB and MB by WPs Coordinator	**1) Open session (30')** - WPL or WPPL present with all WP members present. Open to all collaboration. **2) Closed session (30')** - Internal referee presents their report; SCB and MB members may ask questions. WPLs, WPPLs and WP-Members present		**Final WP Endorsement**
	Outcome		• WPs Coordinator and Resources Coordinator receive the referee report and updated WP Executive Summary	• Any major concerns identified by the respective board members shall be communicated before the dedicated SCB meeting	• Scientific endorsement (Final referee report and SCB minutes)		
RESOURCES ENDORSEMENT	Requirement	• Updated Annex 7 with all tables		• 75% of acknowledgements expected (otherwise, needs to be discussed in the SCB endorsement)		• Scientific approval • 30' Dedicated RCB/MB Meeting 30' per WP project	
	Action	• The annex is distributed to relevant WP-FA and requests for acknowledgement in 2 weeks		• Summary of WP-FA acknowledgements of existing Resources are sent to SCB, RCB and MB		**1) Closed session (30')** - WPL presents a summary of SCB approval,resource tables and a list of acknowledgements (100% expected)	
	Outcome					• Financial endorsement	

WP endorsements

- After establishment and first endorsement, a WP shall undergo an endorsement procedure once per year.
- WP endorsement can be initiated before each CB meeting
- This way, we can accommodate (especially in the initial phase) different levels of preparations of various WPs
- The proposed timeline shows an example where the endorsement documents are sent at the latest five weeks before the corresponding CB meeting.
  - Earlier initialisation of the procedure is encouraged

GENERAL TIMELINE

Latest time		-5 week		-3 week	-2 week	-1 week	CB Date
SCIENTIFIC ENDORSEMENT	Requirement	• Updated Annex 7 with all tables • WP Executive Summary		• Updated WP Executive Summary • Referee report • Annex 7	• All documents and presentations ready • Summary of WP-FA acknowledgements • 1h Dedicated SCB/MB Meeting for the WP Scientific Review		• Scientific endorsement • Financial endorsement • Recommendations to CB
	Action	• All documents sent to Work Packages Coordinator, Resource Coordinator and the WP Internal Referee • Referee report is prepared within 2 week time period. • The Referee works together with WPLs to "improve" the **WP Executive Summary**.		• Documents sent to SCB and MB by WPs Coordinator	**1) Open session (30')** - WPL or WPPL present with all WP members present. Open to all collaboration. **2) Closed session (30')** - Internal referee presents their report; SCB and MB members may ask questions. WPLs, WPPLs and WP-Members present		Final WP Endorsement
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	Outcome					• Financial endorsement	

Example – next CB on 27.02.2025

- For the most advanced WPs, we can prepare the endorsement in the first CB meeting of 2025 already
- Influence of the MoU signing process to be clarified.
- The resulting timeline, based on the discussion before, would consider the following dates as the final deadlines

Latest time		-5 week 23.01.2025		-3 week 06.02.2025	-2 week 13.02.2025	-1 week 20.02.2025	CB Date 27.02.2025
SCIENTIFIC ENDORSEMENT	Requirement	• Updated Annex 7 with all tables • WP Executive Summary		• Updated WP Executive Summary • Referee report • Annex 7	• All documents and presentations ready • Summary of WP-FA acknowledgements • 1h Dedicated SCB/MB Meeting for the WP Scientific Review		• Scientific endorsement • Financial endorsement • Recommendations to CB
	Action	• All documents sent to Work Packages Coordinator, Resource Coordinator and the WP Internal Referee • Referee report is prepared within 2 week time period. • The Referee works together with WPLs to "improve" the **WP Executive Summary**.		• Documents sent to SCB and MB by WPs Coordinator	**1) Open session (30')** - WPL or WPPL present with all WP members present. Open to all collaboration. **2) Closed session (30')** - Internal referee presents their report; SCB and MB members may ask questions. WPLs, WPPLs and WP-Members present		Final WP Endorsement
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RESOURCES ENDORSEMENT	Requirement	• Updated Annex 7 with all tables		• 75% of acknowledgements expected (otherwise, needs to be discussed in the SCB endorsement)		• Scientific approval • 30' Dedicated RCB/MB Meeting 30' per WP project	
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	Outcome					• Financial endorsement	

Latest time		-5 week 23.01.2025		-3 week 06.02.2025	-2 week 13.02.2025	-1 week 20.02.2025	CB Date 27.02.2025
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