

THE CMS MUON CONSTITUTION

“ E pluribus Unum”

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¹ Paragraphs of Annexes are referenced between square brackets in the text

² The election and appointment rules in Annex 5 are based on CMS practice and its Constitution.

THE MUON CONSTITUTION

The “CMS Muon Group” is the group of CMS Institutions that are committed to building, operating, and maintaining the Muon Detector of the CMS experiment at CERN. The Muon Group is lead by a Muon System Manager (Muon SM) and is coordinated through a number of Boards. The operation of the detector is handled through internal MU Subsystems and MU Offices. MU Subsystems are groups of Institutions committed to specific parts of the detector. MU Offices are coordination bodies for areas that extend across the different MU Subsystems.

The highest institutional organisation of the Muon Group is the Muon Institution Board (MUIB) [Annex 1]. Each collaborating Institution is represented in the MUIB by one person who is designated by the Institution. Every important decision or plan of the Muon Group, and any issue believed to require a collective discussion, action or approval, must be submitted to the MUIB for consideration. The Chairperson of the MUIB is elected by the MUIB members [Annex 5.1] with a renewable two-year mandate. The full list of responsibilities of the MUIB is in [Annex 1.6].

Here, and in the following Annexes, the decision of what constitutes sufficient “importance”, “urgency”, or “relevance” will be made by the Chair of the MUIB in consultation with the Muon System Manager.

The Muon Group is led by a Muon System Manager who is the Chair of a Management Board [Annex 2] composed by Project Managers of the MU Subsystems and by one Coordinator of each Office; the Deputy SM, the MUIB Chair and Deputies are ex-officio³ members of the MUMB. The Muon SM is appointed by the CMS Spokesperson in consultation with the MUIB [Annex 5.2] for a term of two years and is a member of the CMS Executive and Management Boards. The term is renewable. The Muon Management Board is responsible for directing the operation of the Detector and

³ Ex-officio means they are **not counted for consensus, although** they can take part in meetings and are included in the mailing list

for preparing short and long-term plans for submission to and approval by the MUIB.

MU Subsystems [Annex 3] have internal Management structures and Boards in which the participating Institutions are represented (the latter are generically referred to as Subsystem Institution Boards in the following). The list of responsibilities of a MU Subsystem IB is in [Annex 3.1]. Each MU Subsystem is led by a Project Manager appointed by the Muon SM in consultation with the MU Subsystem Institution Boards [Annex 5.3]. The mandate is for two years and is renewable. The MU Subsystem organisation must be approved by the MUIB [Annex 3.1].

An Office [Annex 4] groups together Subsystem Task Leaders [Annex 3.2] with similar responsibilities in the different MU Subsystems to improve Coordination and/or to fulfil common tasks. Each MU Office is led by a Coordinator, appointed by the Muon SM and the Office members, and approved by the MUIB [Annex 5.6]; high-level CMS Managers in similar areas should also be consulted. The Coordinator of the MU Resources Manager Office has the role of Muon Resources Manager in the CMS Finance Board and is nominated in consultation with the CMS Resources Manager. The internal organisation of an Office is subject to the approval of the **MUIB** after consultation with the MUMB.

All the Boards of the MU Subsystems and of the MU Offices will make decisions by consensus⁴ of the eligible members. In case consensus is not reached, the issue is moved to a higher level. The only exception is the MUIB, which in the case of a lack of consensus, will make the decision by a vote [Annex 1.5]. A CMS general rule foresees that relevant decisions should be submitted for endorsement to the CMS Collaboration Board.

Subsystems, Offices, and other kinds of groups or sub-organisations, permanent or temporary, can be established by the Muon Group as needed following the procedure described in [Annex 3.1].

To ensure proper communication and coherent action among the different levels of the Muon organisation,

⁴ Here and in the following “consensus” means “without a formal vote”, it is clear that a majority agrees with the proposal, the minority accepts it and nobody asks for a vote.

- the members of the MUMB are ex-officio members of the MUIB,
- the Muon SM and MUIB Chair are ex-officio members of all the MU Subsystem Boards,
- the Chairs of each Muon Subsystem Institution Boards are ex-officio members of the MUIB.

Ex-officio members are not counted for consensus and are not eligible to vote.

The following Annexes describe in detail the membership, mandate, responsibilities, and decision procedures of the Muon Group and all its Boards and Offices, and the procedures for election, selection, and appointments of the persons responsible for the different functions. The document follows the spirit of the Constitution of the CMS Collaboration.

This document can be updated, improved, or amended at any time by the MUIB. It will be also adapted when necessary to comply with changes to the CMS Constitution.

Issues not foreseen or not described in this document should be submitted for consideration and modification to the MUIB through its Chair. The decisions will be recorded and considered as a precedent in case of future similar cases. If relevant, they will be included in this document. The responsibility to keep the document up-to-date lies with the MUIB Chair. An updated version of this document, addenda, and modifications are kept in the office of the CMS Resources Manager.

ANNEX 1. The Muon Institution Board

1.1 Definition

The Muon Institution Board (MUIB) is the highest decision-making body in the Muon Detector Project of CMS. It must approve all important decisions of the Muon Detector Project; The MUIB elects its Chairperson. Each Institution participating in the Muon Group will nominate one representative to the MUIB⁵ regardless of the number of MU Subsystems to which it is committed. The MUIB can define the conditions required for an Institution to qualify as a Voting Member of the MUIB. The members of the Muon Management Board and the Chairs of the Subsystem Institution Boards are ex-officio members of the MUIB [Annex 3.2]⁶. The CMS Spokesperson, the Chairperson of the CMS Collaboration Board, and the CMS Resources Manager are invited to attend by the MUIB Chair. The outgoing MUIB Chair is ex-officio member of the MUIB.

1.2 Institution representatives

The Institution representatives in the MUIB are responsible for the diffusion and collection of information to and from their Institutions. They must also inform the MUIB Chair and the Muon SM of any change in the Institution representation, composition, or commitment in the Muon Group or in CMS.

1.3 The Muon Institution Board Chair

The Chairperson of the MUIB is elected by its members to manage the operations of the MUIB [Annex 5.1]. She/he will propose one or two Deputies in consultation with and to be endorsed by the MUIB. Chairperson and Deputies are responsible for the minutes. MUIB Chair and Deputies are ex-officio members of the MUIB. The term of the office of the Chairperson is two years. The Chairperson can stand for re-election to

⁵ An Institution might be a member of several Muon Subsystems in which it may be represented by different persons, but only one member of the Institution will be its representative in the MUIB.

⁶ If a Subsystem has no formal Institution Board its Institution Representatives should nominate a person who will represent them as an ex-officio member of the MUIB.

successive-terms. The terms of the Deputies are concurrent with the MUIB Chairperson term.

The MUIB Chair is responsible for bringing to the MUIB any issue believed to require a collective discussion, decision or approval. The responsibilities of the MUIB are summarised in [Annex 1.6].

The Chairperson and Deputy Chairperson of the MUIB are ex-officio members of the Muon Management Board and of all the Boards of the Muon Group and its Subsystems⁷. Since 2014 they are ex-officio members of the CMS Collaboration Board.

The Chairperson may appoint one or more Advisory Groups on specific issues after informing the MUIB; **their members are ex-officio members of the MUIB.**

The Chairs of the Muon Subsystem Institution Boards are ex-officio members of the MUIB.

1.4 Meetings

Meetings of the MUIB are restricted to the members and ex-officio members as well as to persons invited by the MUIB Chair. They will be held not less frequently than the CMS General meetings (including Physics or other specialised meetings). Extraordinary sessions can be convened on the initiative of the Chairperson, on the request of the Muon SM, or of any Institution. However, the decision to convene an extraordinary meeting rests with the Chairperson.

Any member of the Muon Group can address the MUIB Chair or propose to the Chair to submit any matter of interest to the MUIB.

Delegation to meetings and attendance via video conference, in person or via a proxy, is allowed and encouraged on all issues to allow any discussion and any decision to be taken in the presence of the largest possible number of members and eligible voters.

1.5 Decision process

Any issue of importance should be submitted to the MUIB for decision with

⁷ This implies they can take part in meetings as nonvoting members and are included in the mailing lists of all the Boards of the Muon Group.

adequate time for consideration and consultation. The decision regarding what constitutes sufficient “importance” will be made by the Chairperson in consultation with the Muon SM.

Decisions should be taken by consensus of the eligible voters attending the meeting in person, via a delegate or by videoconference. In the absence of a consensus the issue will be decided by a simple majority vote of the eligible voters present. The vote is public unless two or more of the members ask for a secret vote or when persons are involved by name. In the presence of a secret ballot members in Videoconference will vote by sending an e-mail to the MUIB Chair and Deputies. Supporters of losing causes may appeal a decision to the CMS Spokesperson or to the CMS Collaboration Board.

Important issues should be decided by consensus in presence of a minimal attendance of 50% of the eligible voters. Should the attendance be below 50% or consensus not reached, the issue will be discussed and moved for consensus or vote to the next MUIB meeting, where the minimal fraction of attendance is reduced from 50 to 40%. If no conclusion is reached in the second meeting the issue is moved to the CMS MB and CB.

Among the important issues are the performance of the Managers and management teams and the amendments to the Constitution.

A two thirds majority of the present eligible voters is required in case of a vote on matters dealing with the performance of the Project Managers and their Management teams (see last bullet of Annex 1.6).

Constitution revisions should be approved by consensus.

The designated representative of each institution has the responsibility for communicating the presence of a delegate to the MUIB Chair and Deputies (via e-mail or in writing) before the date of the meeting. The delegate may attend via videoconference.

1.6 MUIB responsibilities

The MUIB responsibilities include the following items:

- Approval of the plans that are proposed by the Muon Management Board, and monitoring progresses.

- Assessment of the costs and of the sources of funding that are proposed by Muon Resource Manager Office Coordinator on behalf of and in agreement with the Muon Management Board.
- Monitor that the MUMB plans ensure a balanced and appropriate sharing of the load for maintenance and operation of the detector among the individuals and the Institutions, taking into account the available human and financial resources.
- Consideration and approval of the membership of Institutions willing to participate in the Muon Group that are proposed by the Muon Management Board.
- Contribution to the nomination of the Muon SM, in consultation with the CMS Spokesperson[ANNEX 5.3]
- Endorsement of the appointments of the Subsystem Project Managers and Office Coordinators by the Muon SM [ANNEX 5.6]
- Approval of the creation and organisation of a Muon Subsystem or Office.
- Nomination of a Muon Editorial Board and a Muon Conference Committee. Their Chairpersons are ex-officio members of the MUIB. In 2016 these two boards were unified in a Muon Conference and Publication Board (MCPB).
- Monitoring of the performance of the Muon System Manager and Subsystem Project Managers and their management teams. If shortcomings are found, the MUIB can recommend to the CMS Spokesperson or the Muon SM that a substitution should be made in the management team.

ANNEX 2. The Muon Management Board and the Muon System Manager

2.1 Definition and membership

The Muon Management Board is an executive body and is the highest Management Organisation of the Muon Group. It is directed and chaired by the Muon SM and is composed of the Subsystem Project Managers [Annex 3.2] and of the Office Coordinators [Annex 4]; the Deputy SM, MUIB Chair and Deputies are ex-officio

members. The outgoing Muon SM is ex-officio member of the MUMB.

Following the CMS Constitution the Muon SM is appointed by the CMS Spokesperson in consultation with the MUIB [Annex 5.2] with a term of two years that is renewable. The Muon SM is a member of the CMS Executive and Management Boards.

The Muon SM in consultation with the Muon Management Board and the CMS Spokesperson should propose to the MUIB a Deputy, who will be a member of the CMS EB and MB. The term of Deputy is concurrent with that of the Muon SM. The appointments of the Muon SM and Deputy must be endorsed by the CMS Management Board and approved by the Collaboration Board. The Muon SM and/or Deputy should guarantee a continuous presence at CERN.

2.2 Mandate

The Muon Management Board is responsible for the operation, maintenance, and upgrade of the Detector, and is expected to define plans, strategies, and policies to be recommended to the MUIB for consideration and approval. The Muon Management Board has the responsibility to see that the Muon Group maintains a tight connection with the CMS Boards, Coordination Tasks and Committees, and for considering the participation of new Institutions in the Muon Group. The Muon Management Board has the mandate to resolve controversies within or between the various Muon Subsystems and Offices.

2.3 Decisions

Decisions in the Muon Management Board should be taken by consensus whenever possible. In a case where such a consensus cannot be reached, the Muon SM shall propose a compromise to the Muon Management Board. Should such a compromise not be accepted by consensus, the Muon SM can choose between making the decision, which, as for all important matters, will be forwarded to the MUIB for consideration and approval or moving the issue for decision to the MUIB. The MUIB Chair, as an ex-officio member of the Muon Management Board, can bring before the MUIB for information, consideration, or action any matter discussed in the Muon Management

Board.

2.4 Meetings

The Muon Management Board meets regularly, typically every two weeks. The Agenda is announced by the Muon SM to the Muon Management Board members and posted in Indico in advance of the meeting. Should urgent matters arise, additional meetings may be called by the Muon SM or advised by the MUIB Chairperson. Any member of the Muon Management Board who is unable to attend a meeting should name a delegate.

ANNEX 3. The Muon Subsystems and the Subsystem Project Managers

3.1 Definition

A Subsystem is a group of Muon Institutions committed to a specific part of the muon system. The establishment of a Subsystem should be submitted, after consultation with the Muon MB, to the MUIB. The MUIB will consider the proposal and approve it only after a careful and positive review. Members of a Subsystem are the Institutions committed to it that fulfil the obligations foreseen in the approval of the project. The Muon SM and the MUIB Chair are ex-officio members of its Boards.

Presently the active Subsystems are CSC, DT, RPC, and GEM.

The Subsystem Institution Board is responsible for

- Assist the Muon SM in the nomination of the Muon Subsystem Project Manager [Annex3.2] and monitor her/his performance
- Consideration of the plans that are proposed by the Muon Subsystem Project Manager.
- Assessment of the sources of funding
- Promote and assist fund raising
- Assist the Subsystem PM in the nomination of the Subsystem Task Leaders [Annex 3.2]

- Consideration of the membership **request** of new Institutions willing to participate in the Subsystem. **The request is then submitted to the MUIB for approval.**
- Maintain the subsystem author list

The Chairs of each Muon Subsystem Institution Boards are ex-officio members of the MUIB.

3.2 Organisation, management structures, and appointments

A Muon Subsystem is directed by a Subsystem Project Manager who is responsible for all matters related to its scope, activity, and operation. The Muon Subsystem Project Manager is appointed by the Muon SM in consultation with the Subsystem Institution Board. The nomination must be approved by the Muon Institution Board [Annex 5.3]. The CMS Spokesperson, CMS Management Board and Collaboration Board are informed.

The Muon Subsystem Project Manager will be assisted by a Subsystem Board that includes the persons in charge of the relevant activities (Subsystem Task Leaders). It could include a DPG Convener, Technical Coordinator, and Resources Manager and others as necessary. The Subsystem Task Leaders are appointed by the Muon Subsystem Project Manager in consultation with the Subsystem Institution Board and with the Muon SM. The MUIB and CMS Management Board are informed. The Subsystem Boards will include the Chair of the Subsystem Institutions Board as an ex-officio member.

3.3 Decisions

Decisions in a Subsystem are taken whenever possible by consensus. If consensus is not reached, the Subsystem Project Manager will bring the issue before the Muon Management Board and eventually before the MUIB for decision⁸. The Chair of the Subsystem IB⁹ can bring any matter discussed in the Subsystem Board before the MUIB for information, consideration, or action.

⁸ This implies that no important decision can be taken within a subsystem in absence of consensus.

⁹ Or the representative of the Subsystem Institutions: see **footnote 7** of Annex 1.

ANNEX 4. Muon Offices and the Office Coordinators

An Office groups together the Subsystem Task Leaders [Annex 3.2] appointed as responsible for the same task or area of activity in the different Subsystems. An Office is created by the Muon Group as necessary or desirable. The establishment of an Office should be approved by the MUIB.

The mandate of Offices is **to carry out tasks and solve issues of Office pertinence and** to promote synergy, enhance overall efficiency, and provide mutual help among the different Muon Subsystems.

Existing Offices are the Resource Manager Office, the Technical Coordination Office, the DPG Office and an Upgrade Coordination Office. The TCO, DPGO, UCO each have an additional member - chosen by the CMS alignment community in consultation with the SM - for coordinating the muon alignment work.

Each MU Office is led by a Coordinator, appointed by the Muon SM and **the Office members and** approved by the MUIB [Annex 5.6]. In the case in which a related coordinating area exists in CMS, the person responsible should also be consulted. The term of the coordinators is two years and renewable; **an Office can exceptionally propose a shorter term.**

The coordinator of the Muon Resources Manager Office will be the Muon Resources Manager in the CMS Finance Board. The Muon Resources Manager will inform the Office and the MUMB of any matter discussed in the CMS Finance Board.

The Office Coordinators are responsible for the contacts and collaboration with the corresponding or connected areas of CMS and—for making, within their mandate, suggestions and proposals to the Muon Management Board. The Coordinators call and chair regular meetings of the Office members. On issues that require urgent decisions or need a quick reaction, a special Office meeting is called to deal with the issue, in which the SM, DSM and Subsystem PMs are invited.

ANNEX 5. Rules for Elections and Appointments

The election and appointment rules in Annex 5 are based on CMS practice and its Constitution.

5.1 Election of the MUIB Chair

The election takes place during a regular MUIB meeting held during a general CMS Week (including Physics or Upgrades Week).

The MUIB appoints an Election Committee, which elects a Chair from among its members. The committee establishes the schedule for the various steps towards the vote and the date of the vote, and then calls for nominations through the MUIB members. Any member of the Muon Group can nominate one or more persons. The Chair of the Election Committee will contact the nominees to ascertain their availability and agreement to run. The Election Committee will then submit the list of available nominees to the MUIB for a vote.

The specific voting rules are as follows:

- The candidate who receives at least 50% of all cast votes is elected.
- If no candidate receives this majority, the two candidates with the largest number of votes will participate in a runoff election, which will take place on the same day.
- In the case in which there is a tie for second place, the Election Committee will hold a second vote to determine which of the two tied candidates will go forward to the runoff election. If this second vote is also tied, the tie will be resolved randomly (e.g., by tossing a coin).
- In the case when there are only two candidates in the first round, or in the runoff, if there is a tie, the Election Committee will decide who should be elected, or propose a procedure to break the tie in a timely manner.
- In the case when there are only two candidates in the first round, or in the runoff, the requirement that the winning candidate receives at least 50% of the votes is dropped. However, if blank or spoiled ballots exceed 20% of the votes cast, the matter must be referred to the Election Committee, who may recommend to the MUIB that a new election be organised.
- If there is only one candidate who accepts nomination, the election will proceed and the choice offered will be to vote for or against the one single candidate. The candidate will be declared elected if the “Yes” votes amount to at least 50% of the votes cast. (It should be noted that in this situation, namely where there is only one

candidate on the ballot sheet, an abstention effectively counts as a “No” vote.) If there is a single candidate who fails to receive at least 50% of the votes cast, or if there is no candidate willing to stand, a new election will be scheduled for the following MUIB meeting.

In an exceptional case, the Chairperson of the most recent Election Committee may ask the MUIB to fix a date for a non-regular election. Moreover, such an irregular election must be held at an MUIB meeting and must be announced six weeks in advance.

5.2 Election of the Muon Subsystem IB Chair

The election process is internal to the Subsystem and is expected to follow the rules above [Annex 5.1]. Changes should be submitted to the MUIB for approval.

5.3 Appointment of the Muon System Manager

CMS rules foresee that the appointment of the SM of a CMS Subsystem is made by the Spokesperson in consultation with the relevant Institution Board. The MUIB appoints a small committee that is responsible for establishing a schedule for the different steps of the process and for organising an internal call for nominations through the MUIB members¹⁰.

After checking the availability of the nominees, the committee will submit the list to the MUIB, which will consider the list in consultation with the outgoing Muon PM. The MUIB can approve it or make a motivated request to the Committee for an extension. Once a final list has been endorsed by the MUIB, the MUIB Chair will transmit it to the CMS Spokesperson. The CMS Spokesperson may include other names that will be submitted for consideration to the MUIB. The Muon PM appointment is made by the CMS Spokesperson from the final agreed list of candidates, submitted for endorsement to the MUIB and to the CMS Management Board and then submitted for approval to the CMS Collaboration Board.

The MUIB Chair can decide whether part of this procedure can be undertaken via e-

¹⁰ Exceptionally for the appointment of the first Muon PM the function of the committee has been exercised by the MUIB Chair.

mail.

5.4 Appointment of MU Subsystem Project Managers

A call for candidates is made by the Subsystem Institution Board Chair among the subsystem group members. After checking the availability of the nominees, the list is submitted to the Institution representatives for consideration and approval. Once agreed upon, the list is transmitted to the Muon SM by the Subsystem IB Chair after consultation with the MUIB Chair. The Muon SM appoints the Subsystem Project Manager. The appointment is to be approved by the MUIB. The CMS Spokesperson, CMS Management Board and Collaboration Board are informed. A Subsystem Project Manager can appoint a Deputy, in consultation with the Muon SM; the appointment is to be approved by the MUIB.

5.5 Appointment of Subsystem Task Leaders

A list of candidates is proposed by the Institutions on a call from the Subsystem IB Chair and submitted to the the MU Subsystem Project Manager and to the Muon SM, who are jointly responsible for the appointment. Hi-level CMS Managers in similar areas should also be consulted. The appointment is endorsed by the MU Subsystem Institution Board; the Muon Management Board and the MUIB are informed.

5.6 Nomination of the Coordinator of an Office

The Coordinator of an Office is appointed by the Muon SM and the Office members, and approved by the Muon IB. The Muon SM will consult the high-level CMS responsible persons for the related areas¹¹.

¹¹ This last consultation is particularly relevant in the case of the Resources Office representative, who becomes the unique Muon Resources Manager in the CMS Finance Board.