

CERN Computer Aided Engineering Committee (CAEC): What it is, What it does ...

1st CAD Forum

Alessandro Bertarelli (EN-MME)

8 November 2023

Outline

- **CAEC Mandate, Composition**
- **CAEC Sub-Working Groups**
- **Main Ongoing Activities**
- **Updates from GrACQ**

CAEC Mandate I

- **CAEC** steers the activities concerning **tools, processes, methodologies** and **support** for **computer-aided mechanical engineering** and related fields at CERN
- It requests and controls the **budget** covering the **purchase** and **maintenance** of CAE-related **standardized software**
- **CAEC reports** to the **EN** and **IT** Departments, as they provide relevant support for personnel and financial resources. It further reports to CERN Extended Directorate as need be
- **CAEC Chair** is **appointed by EN DH** in **concertation** with **IT DH**

Available at <https://caec.web.cern.ch/content/mandate> and

EDMS <https://edms.cern.ch/ui/file/1001439/8/EN-DI-2022-016-CAEC-Mandate-2022-12-06.pdf>

CAEC Mandate II

- **Computer Aided Engineering Areas covered by CAEC**
 - Mechanical computer aided design and engineering
 - Multiphysics finite element analysis
 - Electromagnetic field calculation programs
 - Engineering data management systems (EDMS, PDM and PLM platforms)
 - Engineering digital thread of equipment and the related tools for its lifetime
- It defines **official CAE tools**
- It supervises the **implementation of rules, standards, methods** for such tools, and **related documents and processes**. It provides guidelines to institutes collaborating with CERN
- It **coordinates the deployment of CAE tools** and their new **versions** at CERN
- It gives advice on CAE-related platforms and operating systems. It **cooperates** in the **procurement** of CAE-related software

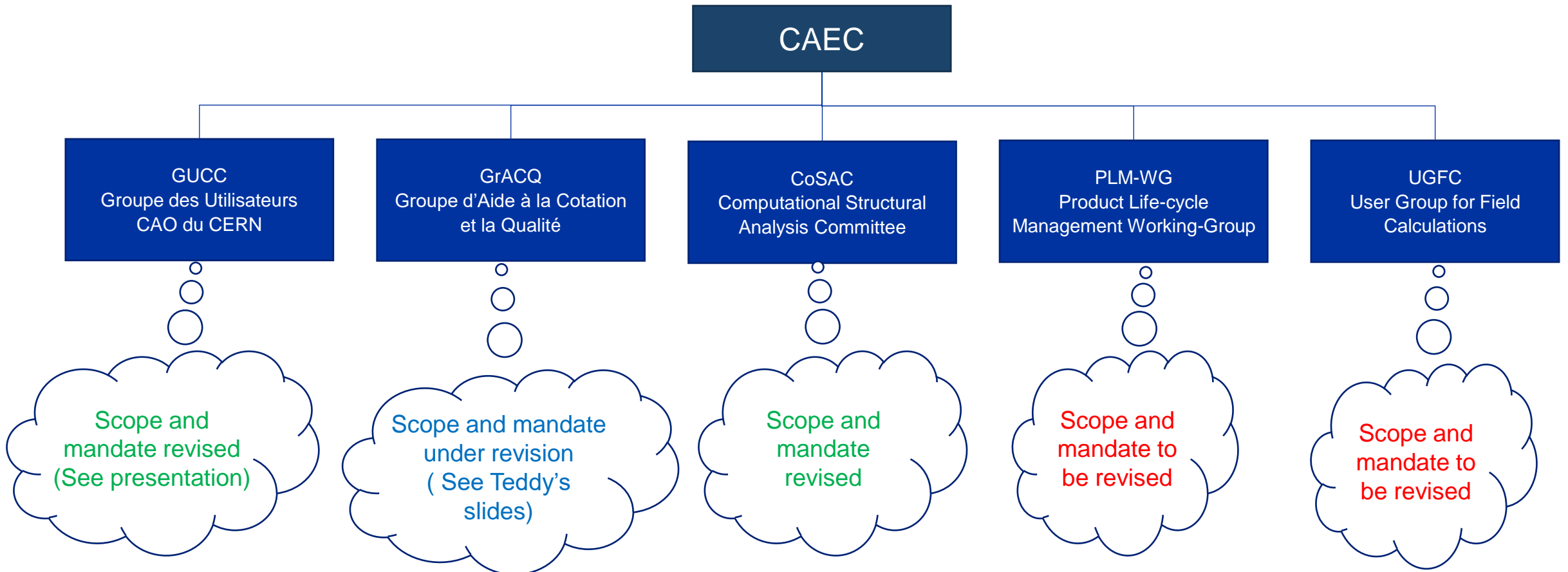
CAEC Composition and Working Mode

- Composed of ~ 20 representatives of CERN stakeholders concerned with CAE, i.e. **Design Offices, CAD support, Users, IT dept, chairs of sub WG.**
- CAEC convenes ~ once per month
- Agenda and minutes available on Indico <https://indico.cern.ch/category/6395/>

Name	Department / Group	CERN Function CAEC Function / Representation in CAEC
Stéphane Bally	EP / CMX	Integration engineer in CMS experiment Chairman of PLM-WG. GUCC Steering
Thomas Baron	IT / CA	Leader of IT-CA Groupware and Engineering Services section Representing IT department
Ludovic Barthelemy	SCE / SAM	Responsible of SCE/SAM/TB design team Representing SCE department
Alessandro Bertarelli	EN / MME	Deputy leader of EN Mechanical and Materials Engineering group Chairman of CAEC / Representing EN department and EN/MME group
Robin Betemps	EN / MME	Senior designer in EN / MME group Representing GrACQ (Groupe d'Aide à la Cotation et à la Qualité)
Teddy Capelli	EN / MME	Senior designer in EN / MME group Chairman of GrACQ (Groupe d'Aide à la Cotation et à la Qualité)
Federico Carra	EN / MME	Member of EN/MME Engineering Design & Simulation section Representing EN/MME group
Andrea Catinaccio	EP / DT	Deputy leader of EP Detector Technology group Representing EP department and EP/DT engineering office
Julie Coupard	EN / ACE	Leader of EN/ACE Integration section Representing EN/ACE group. GUCC Steering
Jurgen De Jonghe	EN / IM	Deputy leader of EN Information Management group Representing EN department and EN/IM group
Mario Di Castro	BE / CEM	Leader of BE-CEM Mechatronics, Robotics & Operation section Representing BE department
Délio Duarte Ramos	TE / MSC	Project engineer in TE Magnets, Superconductors & Cryostats group Representing TE department
Line Everaerts	IT / CDA	CAE services staff in IT Collaborative Applications group Secretary of CAEC / Representing IT CAE services team
Per-Olof Friman	EN / IM	Member of EN Information Management group Representing CAD-support team. GUCC Steering
Cédric Garion	TE / VSC	Project engineer in TE Vacuum, Surfaces & Coatings group Representing TE department (alternate to Delio Duarte Ramos)
Alexej Grudiev	SY / RF	Member of SY Radio-frequency group. Chairman of UGFC (User Group on Field Calculations) / Representing SY department
Tatiana Klioutchnikova	EP / ADO	Integration engineer in Atlas experiment Representing EP / Atlas design office
Antti Onnela	EP / DT	Project engineer and Section leader in EP Detector Technologies group. Representing EP department and EP/DT group
Marc Timmins	EN / MME	Senior designer in EN / MME group GUCC Steering

CAEC sub-Working Groups

- CAEC revising scope, mandate and composition of its sub-working groups



CAEC Recent Activities

- **Revision of sub-Working Groups**
- Change in usage policies concerning **Autodesk** products, related to increase in license costs and change in policies (named licenses) (**Autodesk Task Force**)
 - Memorandum on Rules and recommendations on use of CAD systems at CERN
<https://edms.cern.ch/document/2257134/1.3>
 - BricsCAD replaced Autocad for 2D dwg-format drawings
 - Inventor: use of Inventor is not authorized apart from very specific applications to be discussed case by case. Very limited number of licences. Use CatiaV5 instead
 - REVIT: Authorisation to use needs to be requested, accompanied with a justification and approval by the user's hierarchy

CAEC Ongoing Activities: PLM Readiness

- A PLM Production Readiness Review (PRR), called by CAEC, was held on 13 October '23 <https://indico.cern.ch/event/1327729/>
- CAEC established in early 2023 dedicated **PLM PRR Panel**: EN (J. Coupard, M. Timmins, J-Ph. Tock, D. Widegren), EP (Ch. Bault, A. Onnela (Chair), R. Vuillermet), IT (Th. Baron), TE (A. Milanese)
- PRR Objectives:
 - **Main objective**: Go through key areas in the PLM deployment (**Phases 2 and 3**), **assess the production readiness** of the related solutions and resources (software, support, user training, etc.)
 - **Additional objective**: **Share information** about **timeline** and **impacts** of the PLM deployment on the CAD-PLM tool & data users and on the tool support
- PRR Panel to **submit report** with **findings** and **recommendations** to CAEC (end November '23)
- Based on PRR Panel feedback, CAEC to give green light (conditional or not) to PLM deployment

PLM Context and Schedule

PLM rolled out in 3 main phases:

- **1st phase: Replacing CDD for non-CATIA-SmarTeam. In production since 2022.**
 - AutoCAD in summer 2022 followed by Inventor, REVIT and now BricsCAD since August 2023.
 - All non-SmarTeam CDD drawings now migrated to PLM.
- **2nd phase: CATIA-SmarTeam-CDD → CATIA-SmarTeam-PLM (*)**
 - Stop CDD.
- **3rd phase: CATIA-SmarTeam-PLM → CATIA-PLM (*)**
 - Stop SmarTeam.

(*) Scheduled for 2023 – 2024.

- **Windows 10 end-of-life: October 2025.**
Move to Windows 11 before that.
- **Problem: SmarTeam in use at CERN is not compatible with Windows 11.**
Problem: SmarTeam is reaching its end of support by Dassault Systèmes.
Upgrading CERN's SmarTeam for Windows 11 is not foreseen.
- **Solution: Move away from SmarTeam before October 2025.**
→ Target: Complete PLM Deployment (Phases 2 and 3) within 2023-2024

PLM Team's presentation

- **Well-structured good reference for further use**
- **Possibility for further reading: The slide set contains 30 additional pages “Functionalities Overview” not shown during the PRR**

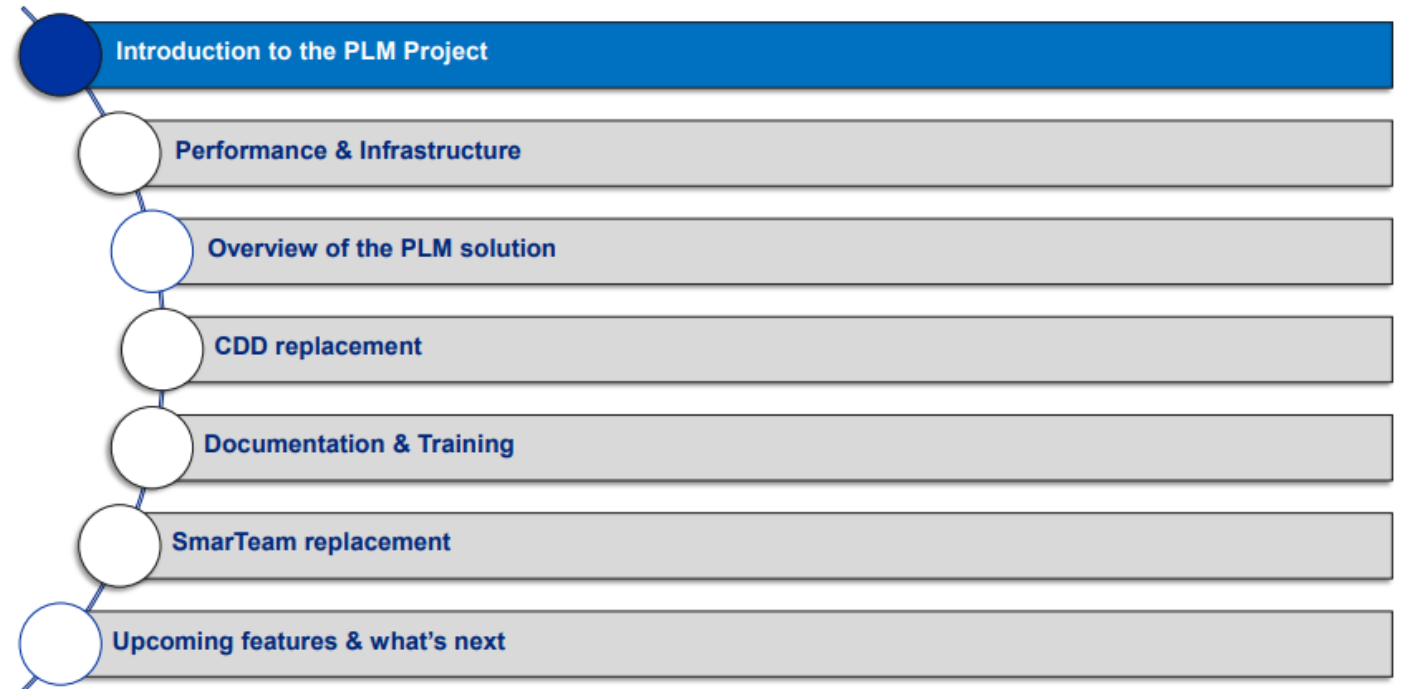
PLM Product Readiness Review

Antoine ANSEL, Lucia CASTRILLON VILAR, Jurgen DE JONGHE, Antoine DUPARAY, Per-Olof FRIMAN, Pablo GARCIA LEDO, Jack Carrick GILLESPIE, Per Gunnar JONSSON, Guennadi KLIOUTCHNIKOV, Kamil Henryk KROL, Benoit LEPOITTEVIN, Pierre-François MARCILLAC, Drew Mitchell MASON-LAURENCE, Yanko Ivanov MIROV, Yoan Marius PAMPHILE, Hugo Louis Joseph PERIER, Claudio SCOERO, Nathan Olivier SOUFFLET, Beata SWIATLOWSKA, Jorge Antonio VELASQUEZ BELMONTE

PLM Product Readiness Review – EN-IM-PLM

2023-10-13

EDMS: 2963004



CAEC and PLM: What's next?

- Proposed two-phase approach (first CDD to PLM, then the full CATIA-PLM) is endorsed
- **CDD to PLM (deployment planned Spring '24)**
 - User tests before deployment
 - Check that essential functionalities are satisfactorily covered, e.g.:
 - Guided listing with explanation of equipment (CDD) codes
 - Creation and management of equipment codes (e.g. link from naming portal)
 - Batch printing and pdf creation
 - Drawing folders
 - Catalogues
 - Tests and validations currently being organized. Important to involve all stakeholders and cover relevant use cases

CAEC and PLM: What's next?

- **Catia to PLM**

- PLM Project currently working on resolving Catia-ARAS connector issues
- Deployment plan not yet available
- PLM PRR Day #2 to be organised on the CATIA-PLM, when system allows thorough real-world user testing
- PLM project analyses alternative plans, in case Catia-ARAS connector issues are not resolved