HERMES

High Energy Rapid Modular Ensemble of Satellites

Schedule model philosophy & activity planning

Yuri evangelista – INAF-IAPS

In the last months we successfully completed:

- HERMES-TP delta-PDR (Nov 18, 2019)
- HERMES-SP 12 month review (Dec 16, 2019)

Using standard phase definition (e.g. ECSS-M-ST-10C), HERMES (both TP and SP) is in Phase-C
"Phase-C scopes are driven by the model philosophy selected for the project, as well as the verification approach adopted."

- Completion of the detailed design definition of the system at all levels in the customer-supplier chain.
- Production, development testing and pre-qualification of selected critical elements and components.
- Production and development testing of engineering models, as required by the selected model philosophy and verification approach.
- Completion of assembly, integration and test planning for the system and its constituent parts.
- Detailed definition of internal and external interfaces.
- Issue of preliminary user manual.
- Update of the risk assessment.

Next milestone is the P/L CDR, at present foreseen for Jun 22, 2020

"The critical design review (CDR) is held at the end of phase C. The outcome of this review is used to judge the readiness of the project to move into phase D (i.e. qualification & production)"

Main review objectives:

- Assess the qualification and validation status of the critical processes and their readiness for deployment for phase D.
- Confirm compatibility with external interfaces.
- Release the final design.
- Release assembly, integration and test planning.
- Release flight hardware/software manufacturing, assembly and testing.
- Release of user manual.

Now, coming back at Phase C definition: *"Phase-C scopes are driven by the model philosophy selected for the project, as well as the verification approach adopted."*

Demonstration Model (DM) - #1
Subsystem level tests (DA + PCB mock-ups)
Qualification levels

Protoflight Model (PFM) - #1
Satellite level tests (PL + SVM)
Protoflight levels

Flight Models (FM) - #5
Satellite level tests (PL + SVM)
Acceptance

Now, coming back at Phase C definition: *"Phase-C scopes are driven by the model philosophy selected for the project, as well as the verification approach adopted."*

Demonstration Model (DM) - #1
Subsystem level tests (DA + PCB mock-ups)
Qualification levels

Protoflight Model (PFM) - #1
Satellite level tests (PL + SVM)
Protoflight levels

Flight Model (FM) - #5
Satellite level tests (PL + SVM)
Acceptance

HERMES SCHEDULE

DESIGN AND PROCUREMENT

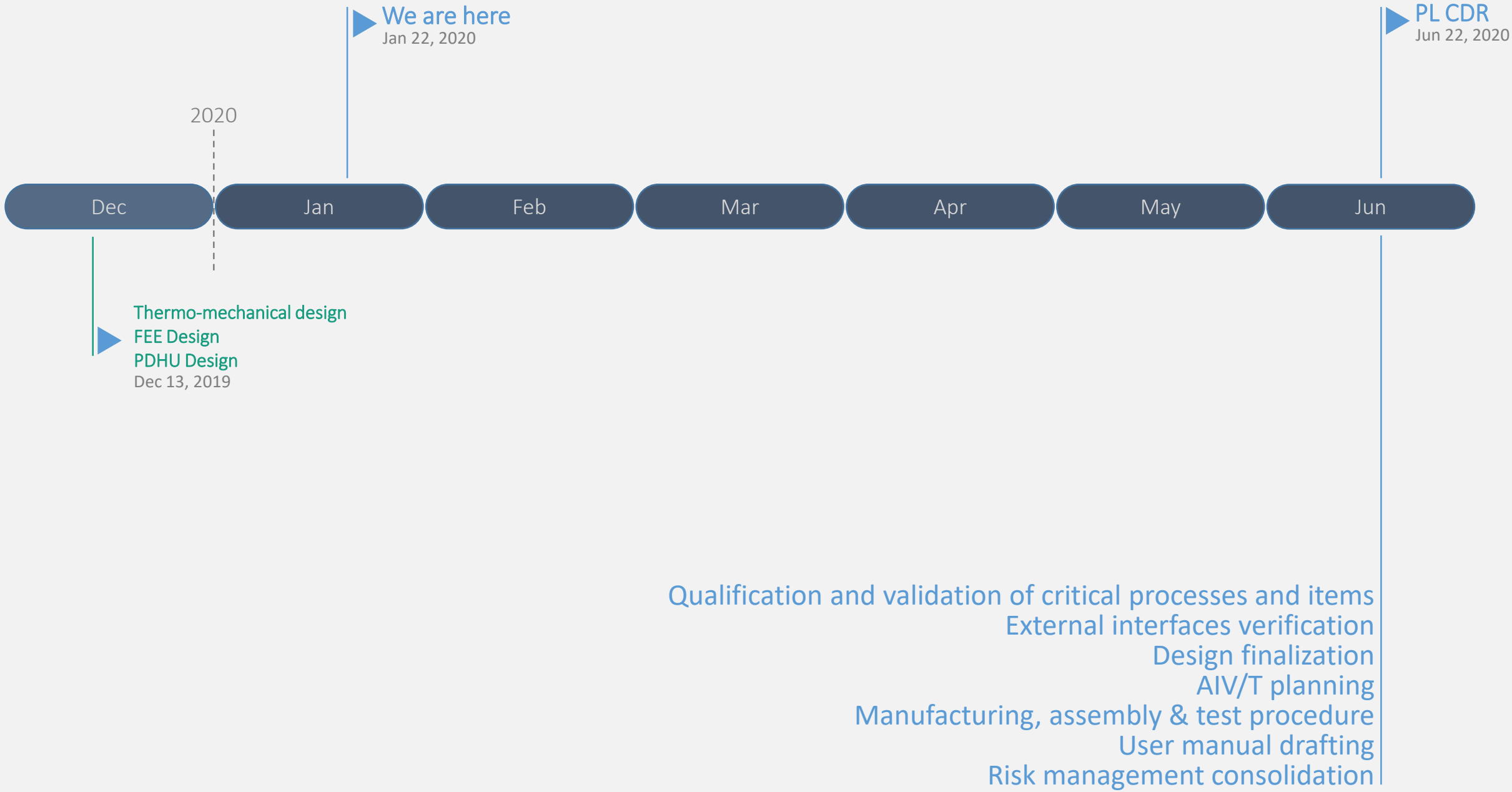
HERMES
High Energy Rapid Modular Ensemble of Satellites

Qualification and validation of critical processes and items
External interfaces verification
Design finalization
AIV/T planning
Manufacturing, assembly & test procedure
User manual drafting
Risk management consolidation

HERMES SCHEDULE

DESIGN AND PROCUREMENT

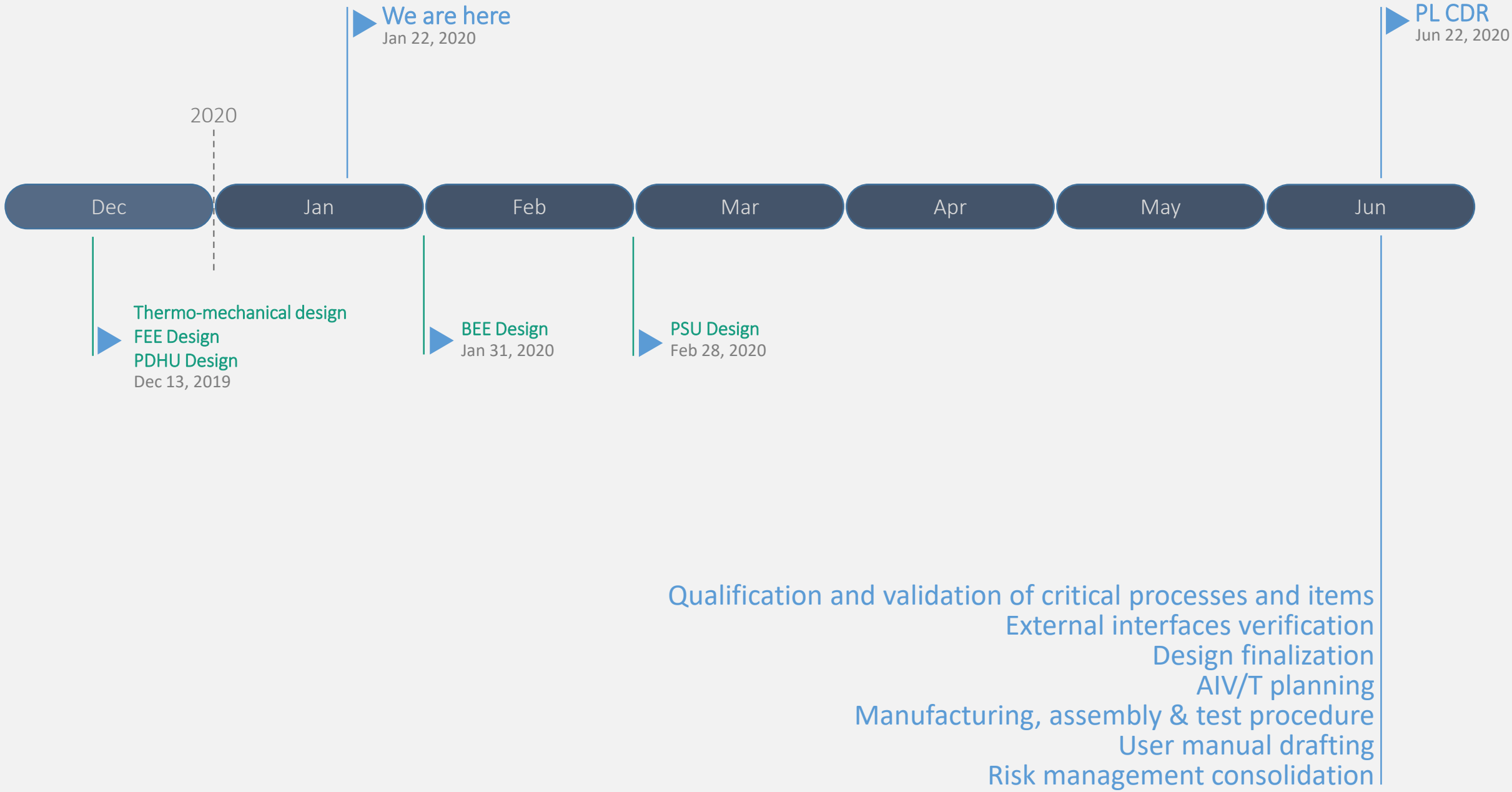
HERMES
High Energy Rapid Modular Ensemble of Satellites



HERMES SCHEDULE

DESIGN AND PROCUREMENT

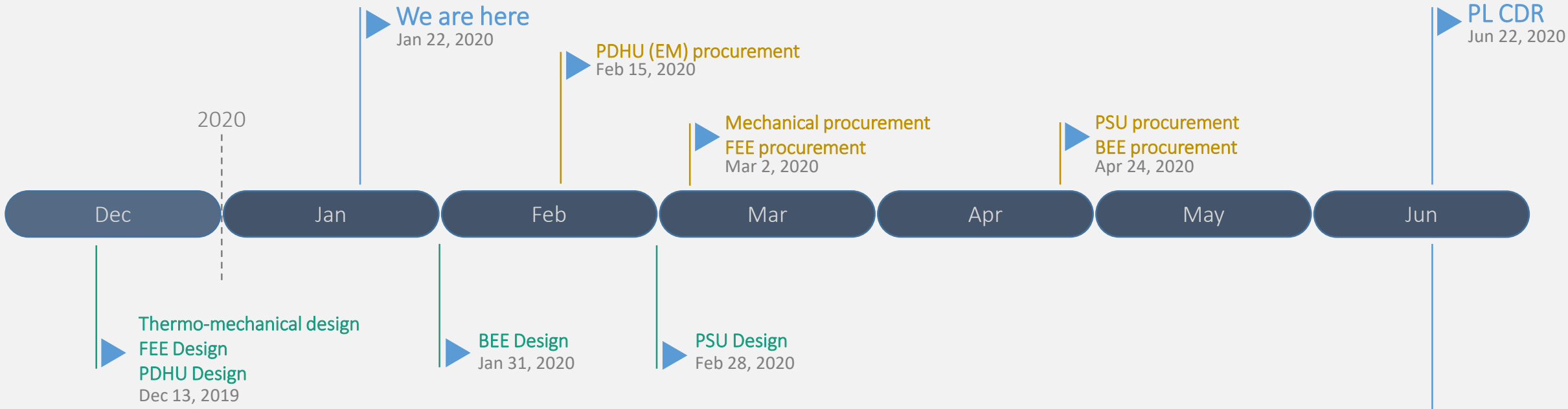
HERMES
High Energy Rapid Modular Ensemble of Satellites



HERMES SCHEDULE

DESIGN AND PROCUREMENT

HERMES
High Energy Rapid Modular Ensemble of Satellites

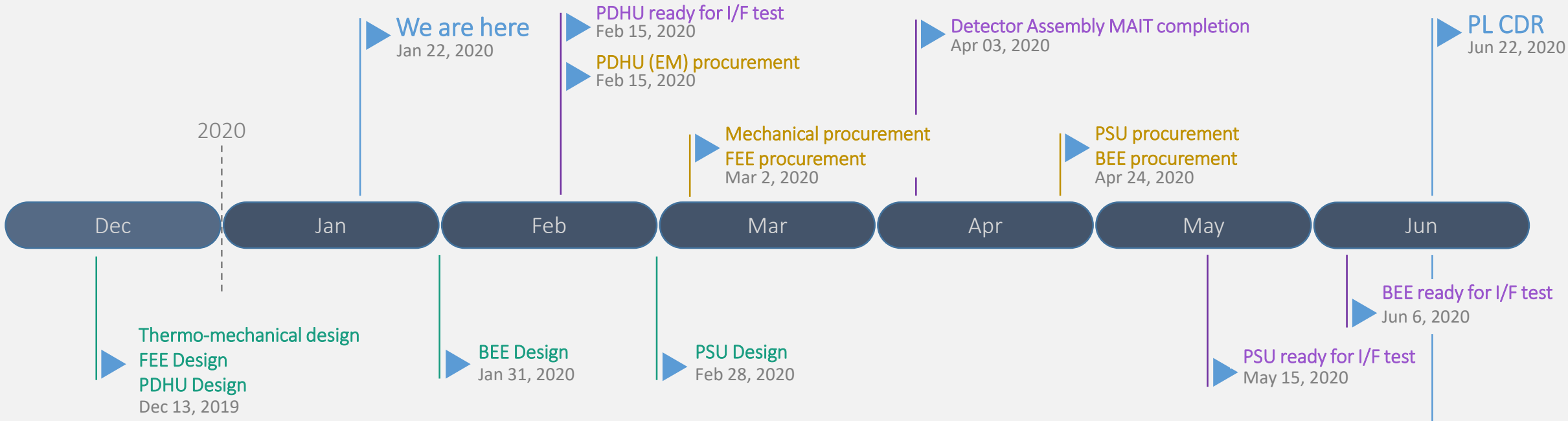


Qualification and validation of critical processes and items
External interfaces verification
Design finalization
AIV/T planning
Manufacturing, assembly & test procedure
User manual drafting
Risk management consolidation

HERMES SCHEDULE

FUNCTIONAL/PERFORMANCE TESTS

HERMES
High Energy Rapid Modular Ensemble of Satellites

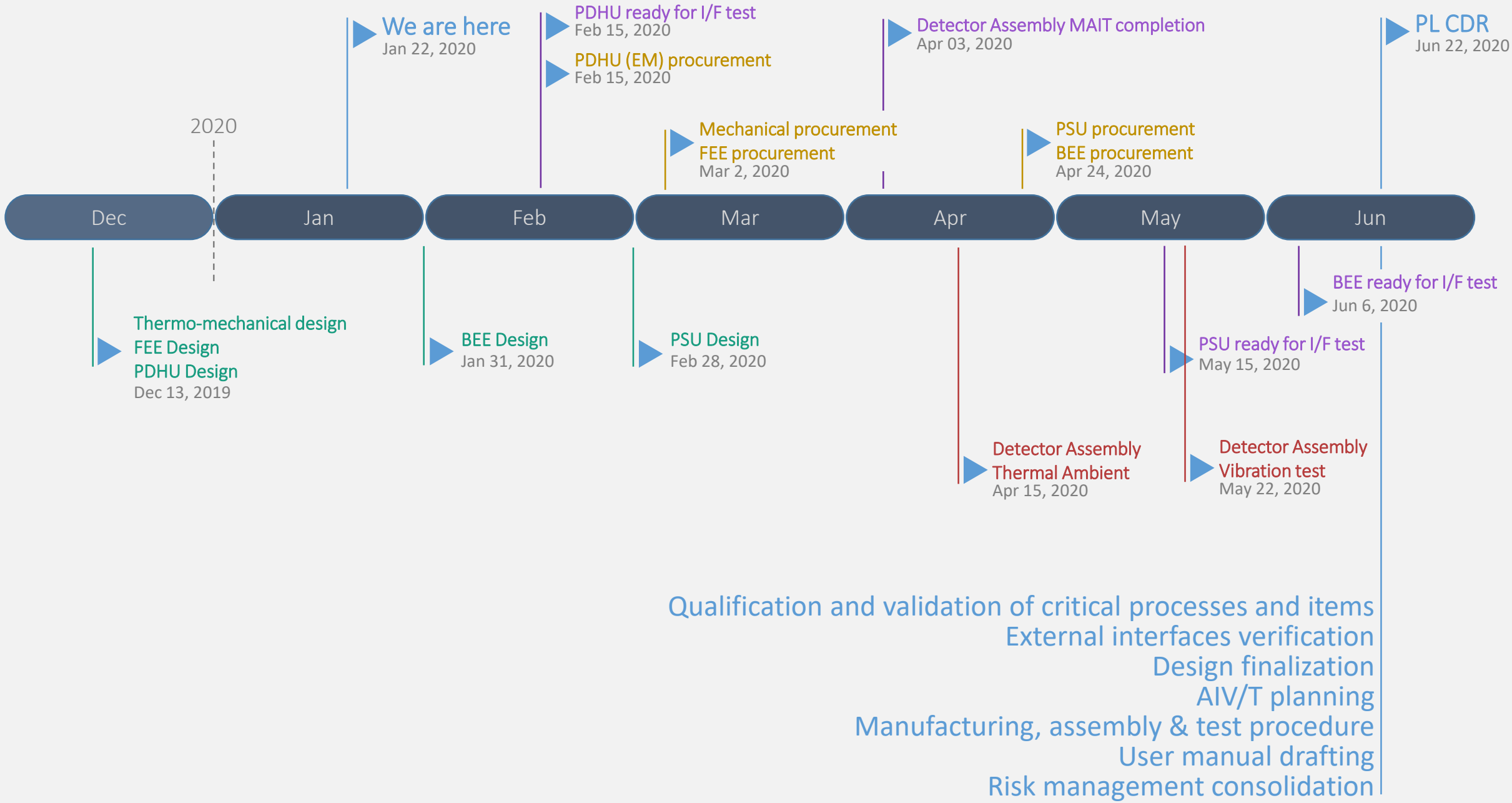


Qualification and validation of critical processes and items
External interfaces verification
Design finalization
AIV/T planning
Manufacturing, assembly & test procedure
User manual drafting
Risk management consolidation

HERMES SCHEDULE

PRE-QUALIFICATION

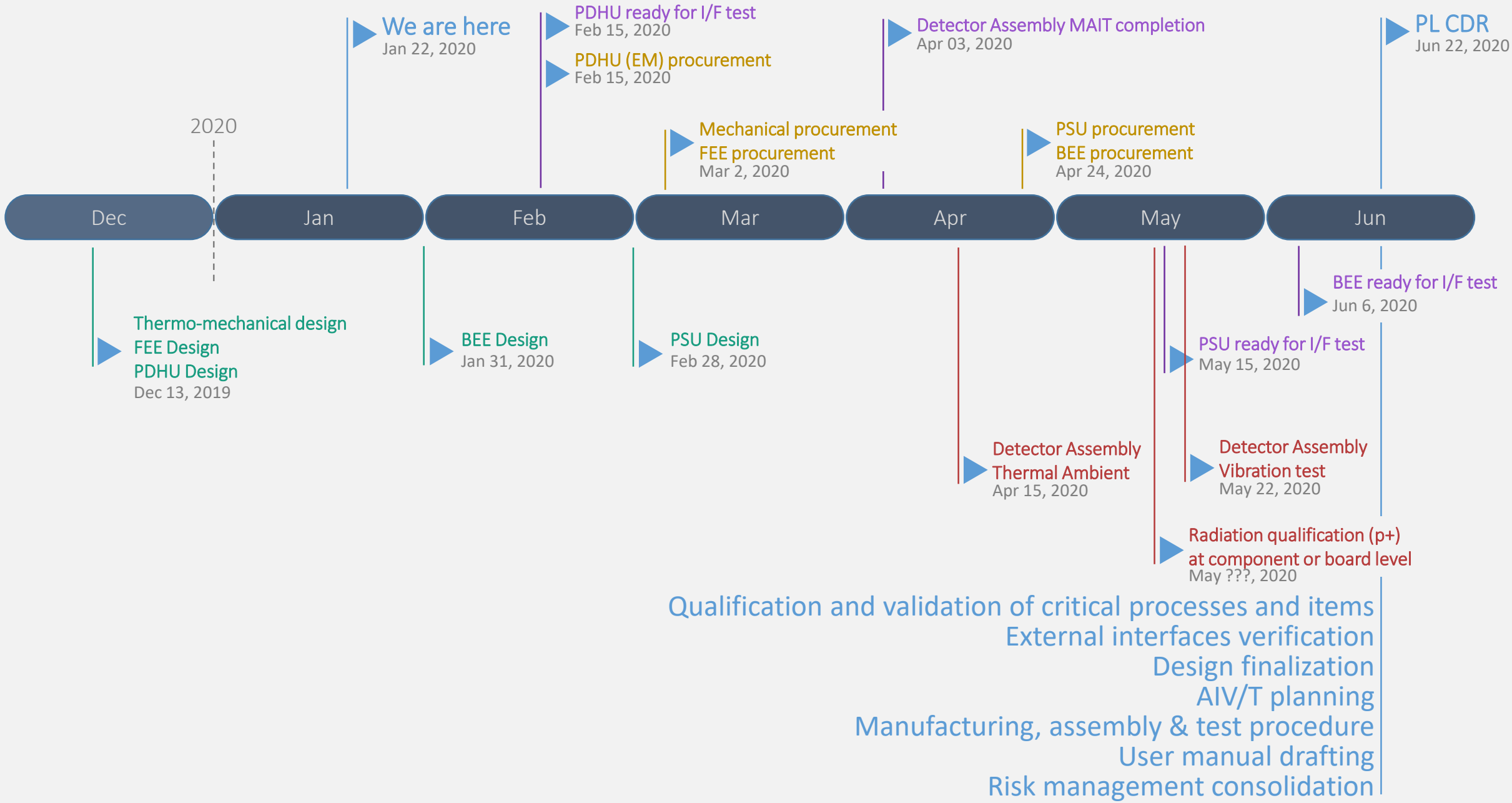
HERMES
High Energy Rapid Modular Ensemble of Satellites



HERMES SCHEDULE

PRE-QUALIFICATION

HERMES
High Energy Rapid Modular Ensemble of Satellites



10:10 → 11:30	**Detector assembly (FEE, SDD, ASIC, Crystals)** **Speakers**: Mauro Fiorini (INAF IASF Milano), Dr Evgeny Demenev (FBK), Irina Rashevskaya (TIFPA), Massimo Gandola (PoliMI), Riccardo Campana (INAF - OAS)	1h 20m	Aula Multimediale
11:30 → 11:50	**Break**	20m	Sala Riunioni
11:50 → 12:10	**BEE (design, firmware and protocols, timing, breadboard test results)** **Speaker**: Giovanni La Rosa (INAF - IASF Palermo)	20m	Aula Multimediale
12:10 → 12:30	**PSU (design, breadboard test results)** ¶ **Speaker**: Giuseppe Sottile (INAF - IASF Palermo)	20m	Aula Multimediale
12:30 → 12:50	**PDHU (design iOBC & DB, firmware/sw, breadboard test results)** **Speaker**: Alejandro Guzman (Universität Tübingen - IAAT)	20m	Aula Multimediale
12:50 → 14:20	**Lunch**	1h 30m	Bar Mensa (UniUD)
14:20 → 14:40	**Mechanical design** **Speaker**: Raffaele Piazzolla (INAF - IAPS Roma)	20m	Aula Multimediale
14:40 → 15:00	**Thermal design** **Speaker**: Gianluca Morgante (INAF - OAS)	20m	Aula Multimediale

15:00 → 15:20 **PDHU -> sBUS** 20m Aula Multimediale

Speaker: Alejandro Guzman (Universität Tübingen - IAAT)

15:20 → 15:40 **PDHU, BEE & PSU -> sBUS** 20m Aula Multimediale

Speakers: Alejandro Guzman (Universität Tübingen - IAAT), Giovanni La Rosa (INAF - IASF Palermo), Giuseppe Sottile (INAF - IASF Palermo)

15:40 → 16:00 **DM Integration activities and schedule** — 20m — Aula Multimediale

Speaker: Yuri Evangelista (INAF - IAPS)

16:00 → 16:30 **Qualification campaign planning (TVAC, Vibration, Radiation)** — 30m — Aula Multimediale

Speakers: Yuri Evangelista (INAF - IAPS), Dr Raffaele Piazzolla (INAF - IAPS Roma), Filippo Ambrosino (INAF - IAPS), Gianluca Morgante (INAF - OAS), Riccardo Campana (INAF - OAS)

16:30 → 16:50 **Break** — 20m — Sala Riunioni

16:50 → 17:20 **Subsytems test plan** — 30m — Aula Multimediale

Speakers: Fabio Fuschino (INAF - OAS), Giuseppe Sottile (INAF - IASF Palermo), Massimo Gandola (PoliMI), Alejandro Guzman (Universität Tübingen - IAAT), Irina Rashevskaya (TIFPA), Giovanni Della Casa (UniUD - DMIF), Nicola Zampa (INFN - Trieste)

17:20 → 17:40 **P/L full and reduced functional tests (FFT & RFT)** — 20m — Aula Multimediale

Speakers: Fabio Fuschino (INAF - OAS), Giuseppe Sottile (INAF - IASF Palermo), Massimo Gandola (PoliMI), Alejandro Guzman (Universität Tübingen - IAAT), Irina Rashevskaya (TIFPA), Giovanni Della Casa (UniUD - DMIF), Nicola Zampa (INFN - Trieste)

17:40 → 18:10 **Subsytems TE design, procurement and integration** — 30m — Aula Multimediale

Speakers: Riccardo Campana (INAF/OAS), Filippo Ambrosino (INAF - IAPS), Paolo Nogara (INAF - IASF Palermo), Giovanni La Rosa (INAF - OACT), Samuel Pliego (Universität Tübingen - IAAT), Giuseppe Dilillo (INAF - Trieste)

18:10 → 18:30 **EGSE procurement and integration (power, harness, protocols/commanding, data acquisition)** — 20m — Aula Multimediale

Speakers: Riccardo Campana (INAF - OAS), Filippo Ambrosino (INAF - IAPS), Paolo Nogara (INAF - IASF Palermo), Giovanni La Rosa (INAF - IASF Palermo), Samuel Pliego (Universität Tübingen - IAAT), Giuseppe Dilillo (INAF - Trieste)

09:30 → 11:00 **Integration procedure** — 1h 30m — Aula Multimediale

Speakers: Yuri Evangelista (INAF - IAPS), Dr Evgeny Demenev (FBK), Dr Raffaele Piazzolla (INAF - IAPS Roma), Irina Rashevskaya (TIFPA)

11:20 → 11:40	**GAGG irradiation tests @ TIFPA** **Speaker**: Giuseppe Dilillo (INAF - Trieste)	20m	Aula Multimediale
11:40 → 12:00	**Detector breadboard @ UniUd** **Speaker**: Nicola Zampa (INFN - Trieste)	20m	Aula Multimediale
12:00 → 12:20	**Background and radiative environment – report of Bologna and Budapest meetings** **Speakers**: Riccardo Campana (INAF - OAS), Gabor Galgóczi (ELTE - Budapest), Jakub Ripa (ELTE - Budapest)	20m	Aula Multimediale
12:20 → 12:40	**Integration (including PA, cleanliness and contamination control)** **Speaker**: Yuri Evangelista (INAF - IAPS)	20m	Aula Multimediale
12:40 → 13:00	**PFM1 Calibration plan - drafting** **Speakers**: Riccardo Campana (INAF - OAS), Yuri Evangelista (INAF - IAPS), Fabio Fuschino (INAF - OAS)	20m	Aula Multimediale
13:00 → 14:30	**Lunch**	1h 30m	Bar Mensa (UniUD)
14:30 → 14:45	**CAMELOT presentation** **Speaker**: Jakub Ripa (ELTE - Budapest)	15m	Aula Multimediale
14:45 → 16:00	**Discussion and conclusions**	1h 15m	Aula Multimediale