

MEBT (Project)

NCFE and Interfaces Meeting
17-18 January 2017 INFN Laboratori Nazionali del Sud

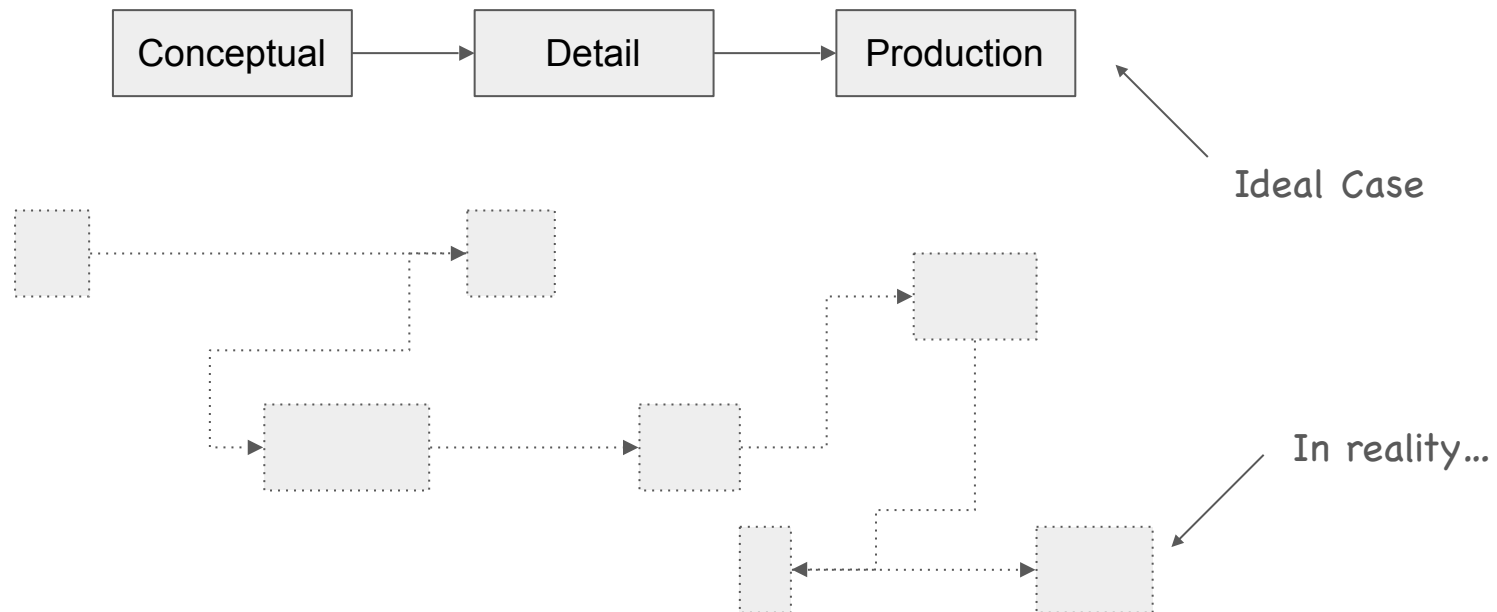


I. Bustinduy, on behalf of ESS-Bilbao Team

Collaboration approach

Common problems, specifications are not ready in time. (Mature enough; not enough) Design team normally takes time from the fabrication team.

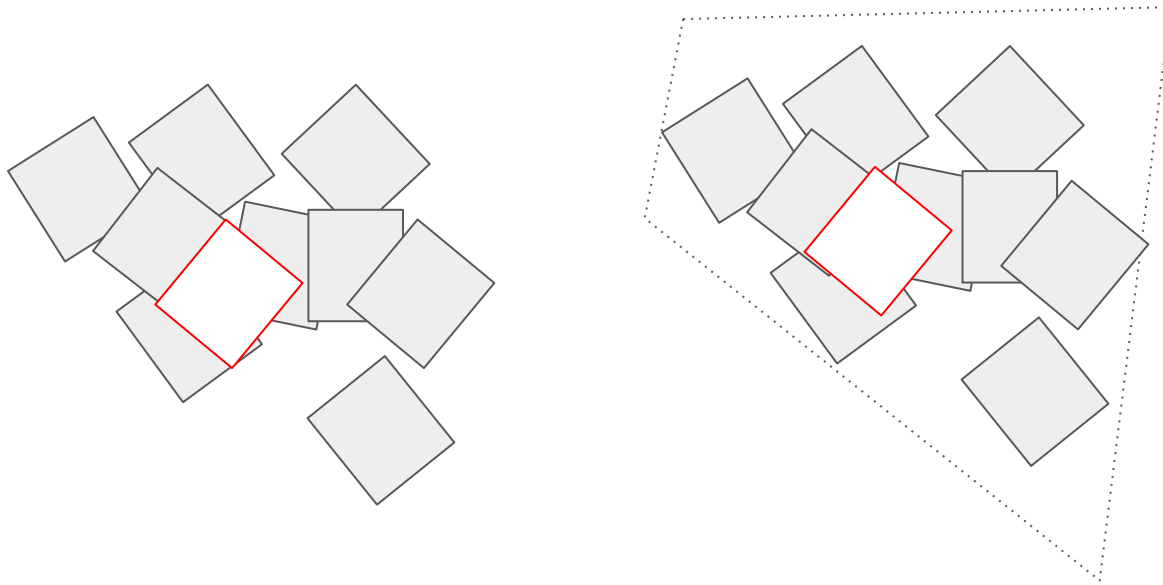
Design stages and detail design stages do not follow a nice cascade plan. And become difficult to follow (Which drives crazy to project managers).



Collaboration approach

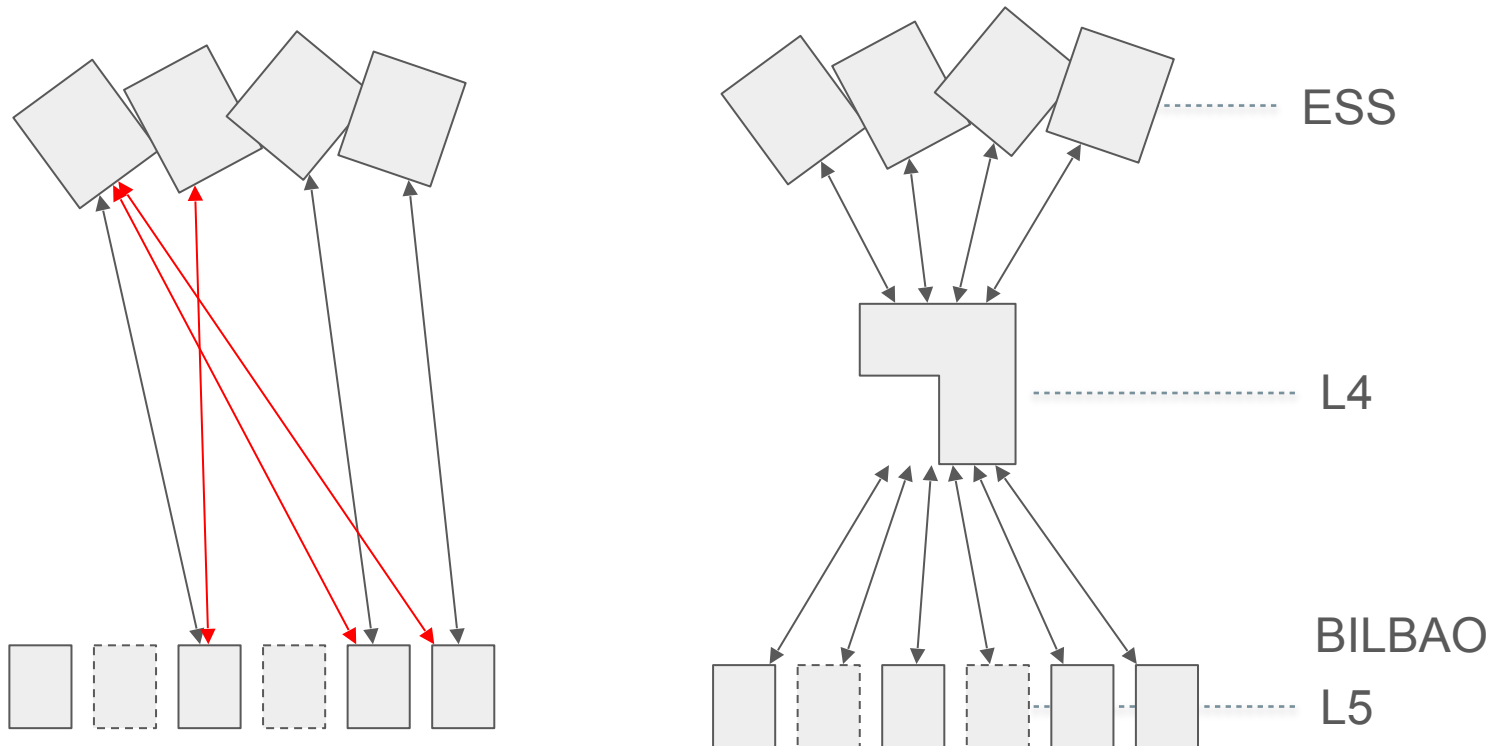
When two requirements collide (happens all the time), there are no agile mechanism to solve conflict. And when they are, partner is the only one who cares about cost and time impact. L4 REQUIREMENTS

Many groups, but no project perspective: how much time it takes, cost?



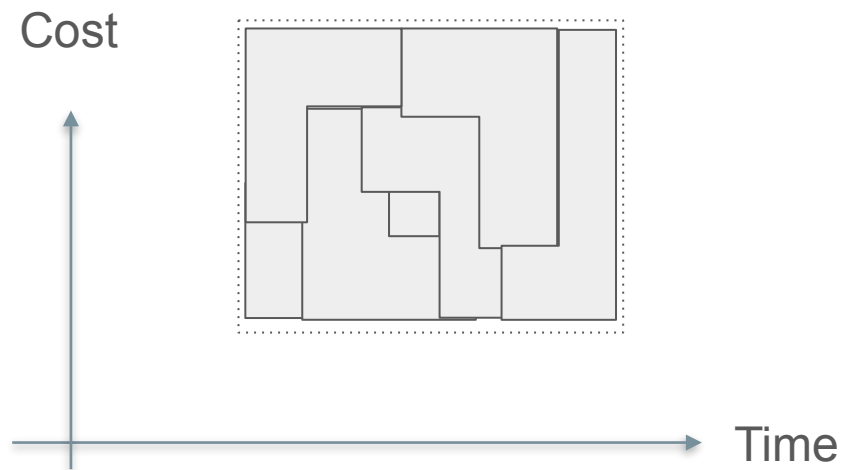
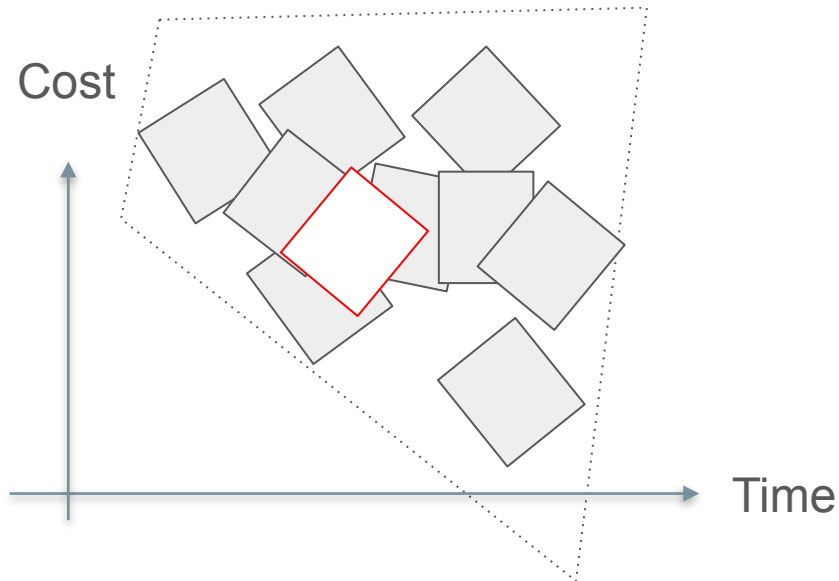
Collaboration requirements

End user (ESS) should always express their wishes, even if some are out of budget, or not coherent with rest of groups. But, it should be responsibility of in kind partner in charge of the integration to decide the coherent solution that fits with schedule and cost.

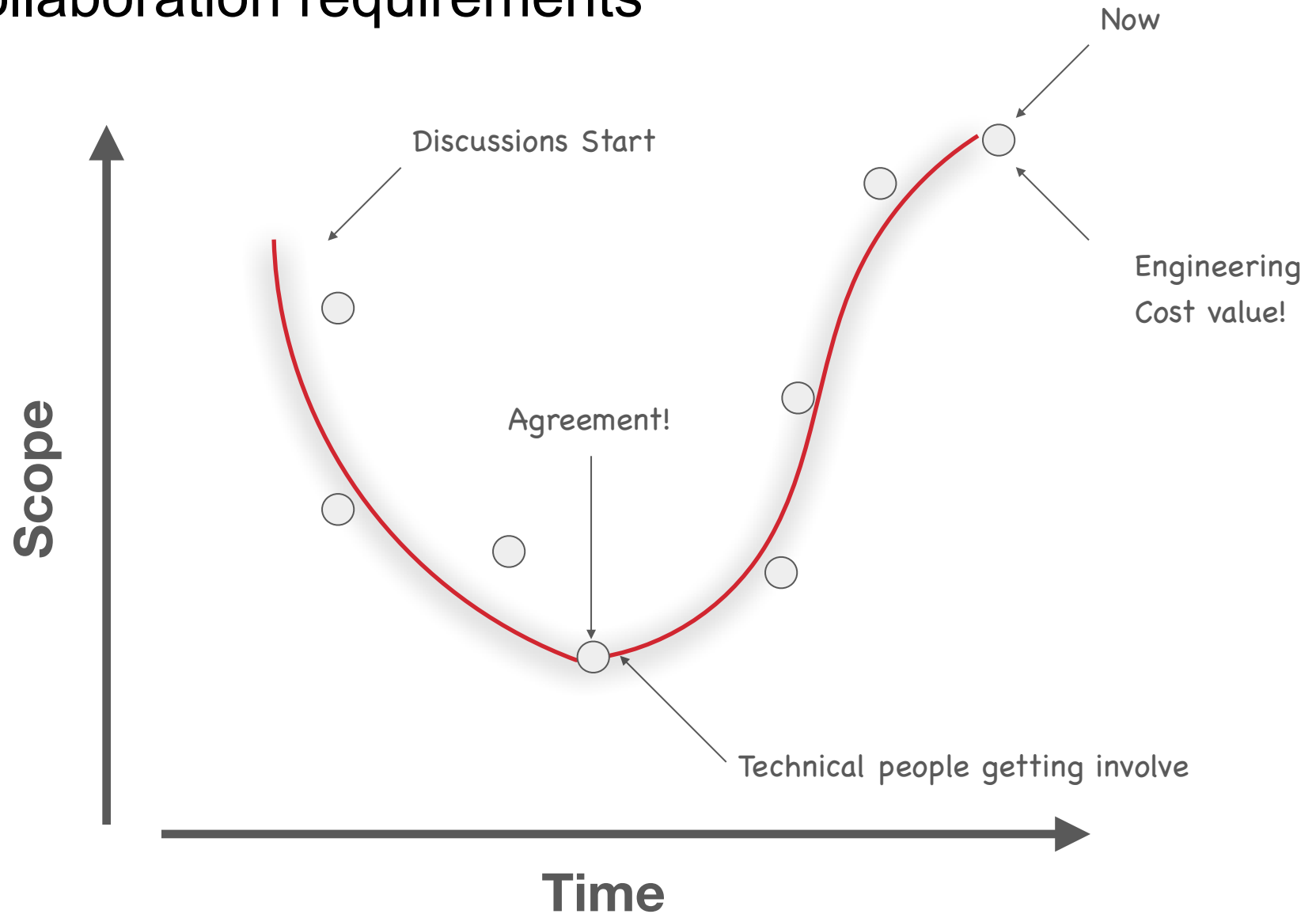


Collaboration requirements

In order to ensure the functionality and quality of each system a set of L4 shall be agreed, those L4 shall cover the functionality without overlapping or blank spaces in a coherent way.



Collaboration requirements



Technical drawing of the front view of a large industrial machine, showing various components, dimensions, and part numbers.

Dimensions (mm):

- Overall width: 285
- Overall height: 200
- Section 1: 200
- Section 2: 182.5
- Section 3: 950
- Section 4: 200
- Section 5: 485
- Section 6: 420
- Section 7: 200
- Section 8: 485

Part Numbers:

- MEET-QD-BMD-Q-001V
- MEET-QD-BMD-C-001V
- MEET-QD-PRI-W5-001
- MEET-QD-BMD-Q-002H
- MEET-QD-BMD-C-002H
- MEET-QD-PRI-BPW-001
- MEET-QD-BMD-Q-003V
- MEET-QD-BMD-C-003H
- MEET-QD-BMD-C-003V
- MEET-QD-PRI-BPW-002
- MEET-QD-B-Q-001
- MEET-QD-BMD-Q-004H
- MEET-QD-BMD-C-004H
- MEET-QD-BMD-C-004V
- MEET-QD-PRI-NP-M-001H
- MEET-QD-PRI-NP-M-001V
- MEET-QD-PRI-W5-002
- MEET-QD-PRI-W5-003
- MEET-QD-PRI-W5-004
- MEET-QD-PRI-W5-005
- MEET-QD-BMD-Q-005H
- MEET-QD-BMD-C-005H
- MEET-QD-PRI-BPW-003
- MEET-QD-BMD-Q-006H
- MEET-QD-BMD-C-006H
- MEET-QD-PRI-BPW-004
- MEET-QD-PRI-BPW-005
- MEET-QD-BMD-Q-007H
- MEET-QD-BMD-C-007H
- MEET-QD-PRI-BPW-006
- MEET-QD-BMD-Q-008H
- MEET-QD-BMD-C-008H
- MEET-QD-PRI-BPW-007
- MEET-QD-BMD-Q-009H
- MEET-QD-BMD-C-009H
- MEET-QD-PRI-BPW-008
- MEET-QD-B-Q-002
- MEET-QD-BMD-Q-010H
- MEET-QD-BMD-C-010H
- MEET-QD-BMD-C-010V
- MEET-QD-PRI-BPW-009
- MEET-QD-B-Q-003
- MEET-QD-BMD-Q-011H
- MEET-QD-BMD-C-011H
- MEET-QD-BMD-C-011V
- MEET-QD-PRI-BPW-010

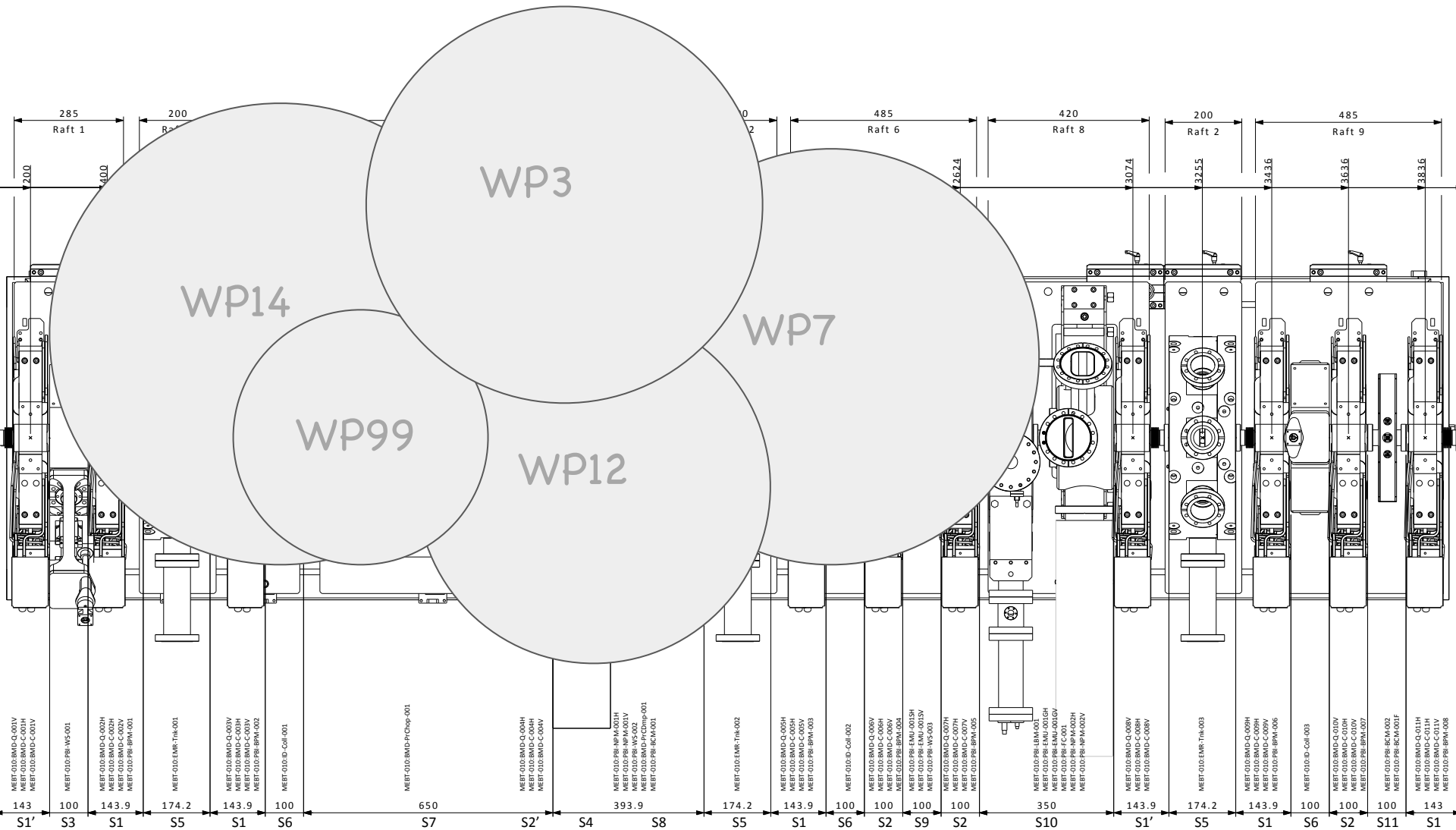
Section Labels:

- S1'
- S3
- S1
- S5
- S1
- S6
- S7
- S2'
- S4
- S8
- S5
- S1
- S6
- S2
- S9
- S2
- S10
- S1'
- S5
- S1
- S6
- S2
- S11
- S1

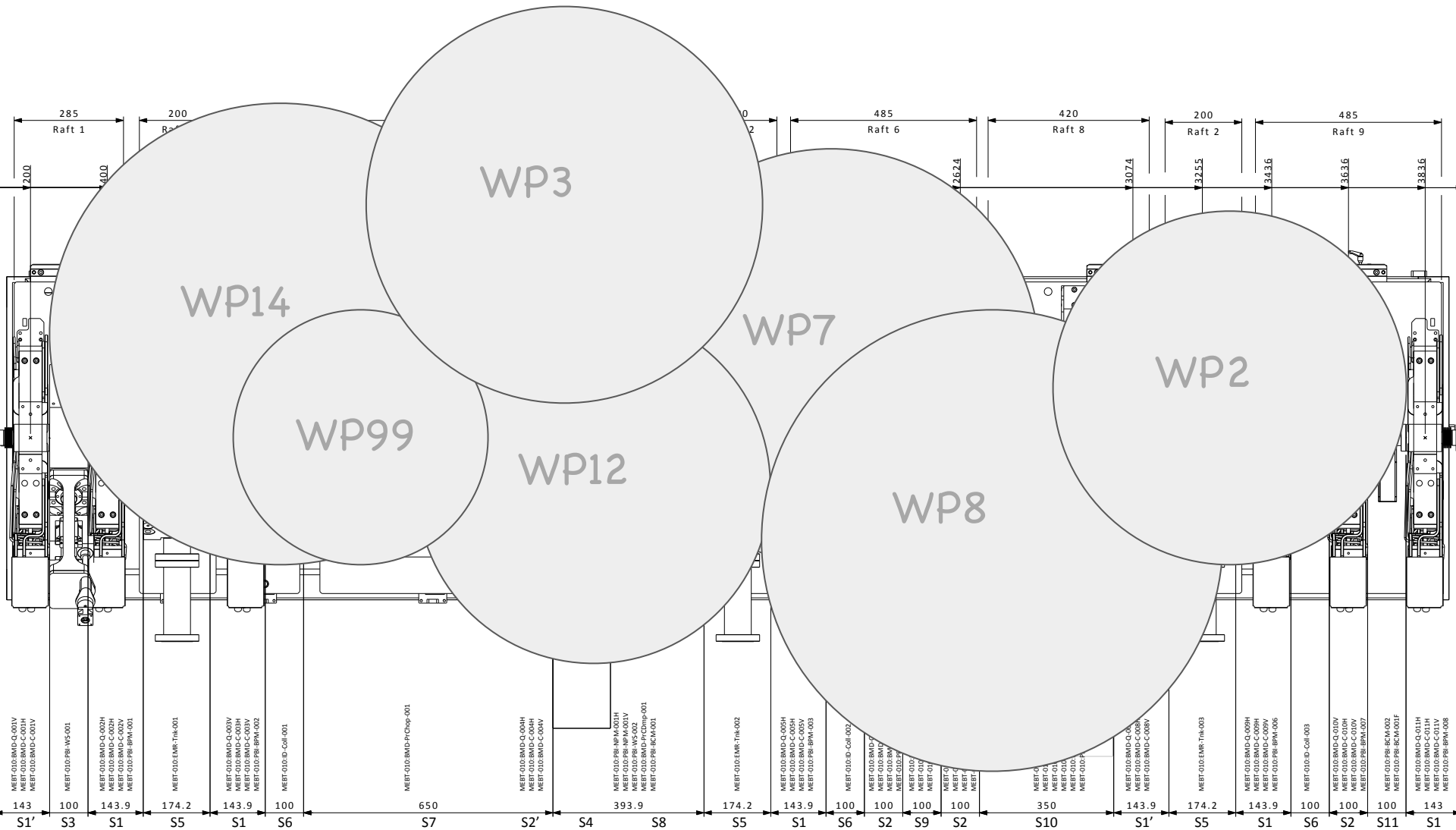
Other Dimensions:

- 143
- 100
- 143.9
- 174.2
- 143.9
- 100
- 650
- 393.9
- 174.2
- 143.9
- 100
- 100
- 100
- 100
- 350
- 143.9
- 174.2
- 143.9
- 100
- 100
- 100
- 143

Technical drawing of the aft section of the ship's hull, showing the aft hull structure, aft hull plating, and aft hull stiffeners. The drawing includes a plan view of the hull structure and a side view of the hull plating. The plan view shows the aft hull structure with various stiffeners and plating. The side view shows the aft hull plating with various stiffeners and plating. The drawing includes dimensions and labels for various components.



[illegible]

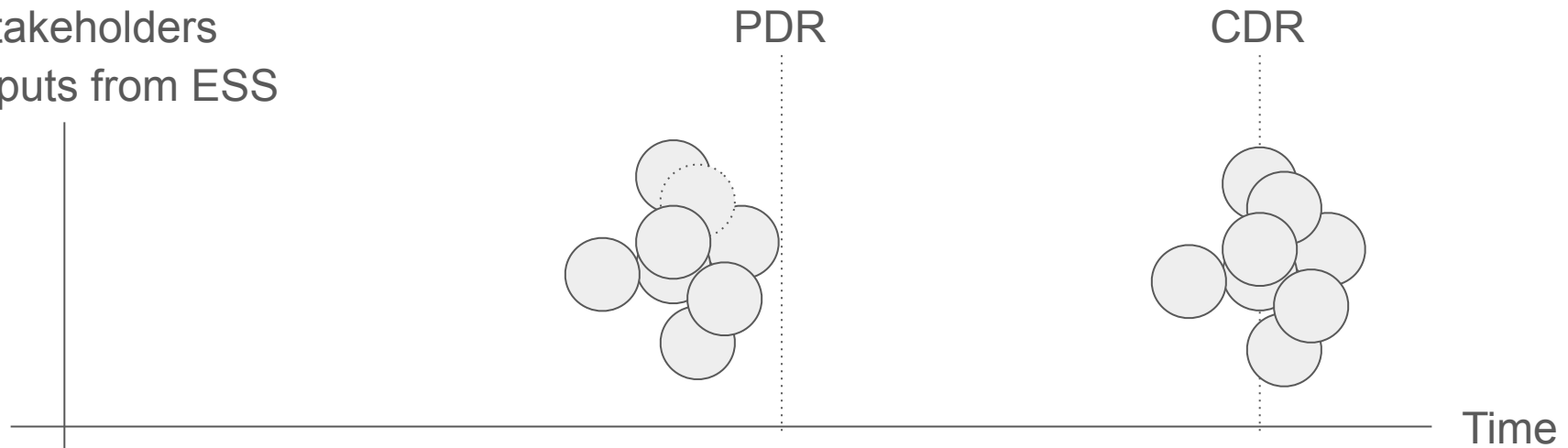


Reviews: some facts

The experience so far is that reviews are used to gather all the problems and leave the PARTNER deal with them:

- Some of the stakeholders are inexistent until the review ceremony.
- Some of the requirements come after the Review!
- Delivery date & Cost stays the same.

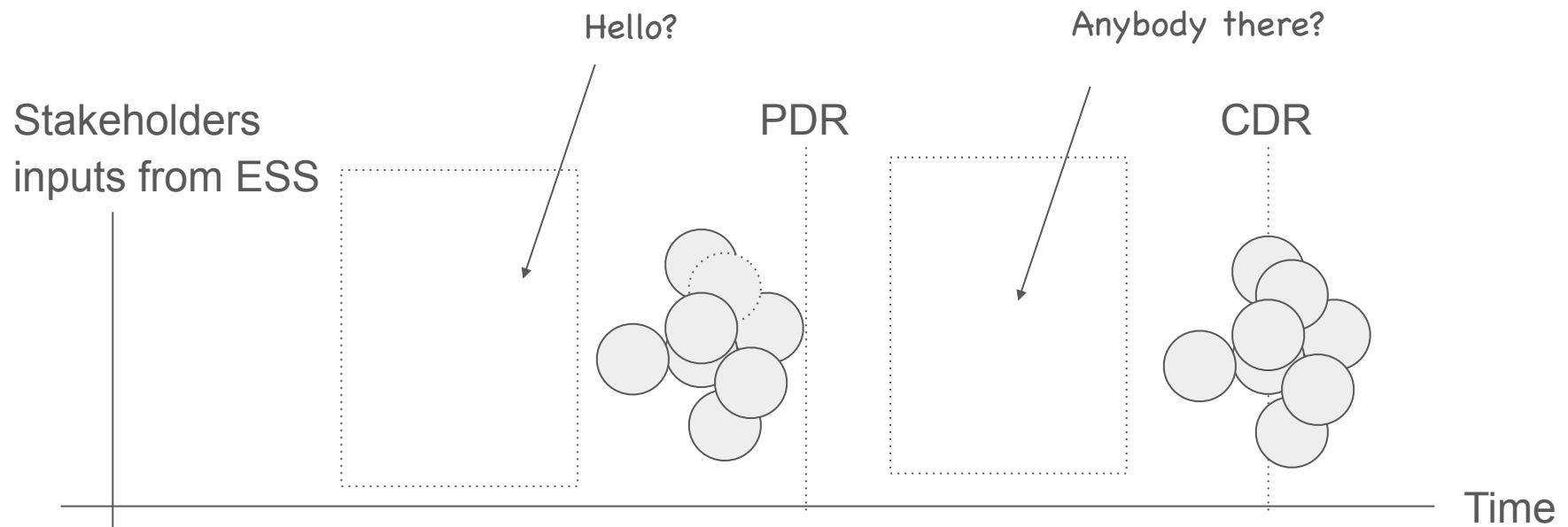
Stakeholders
inputs from ESS



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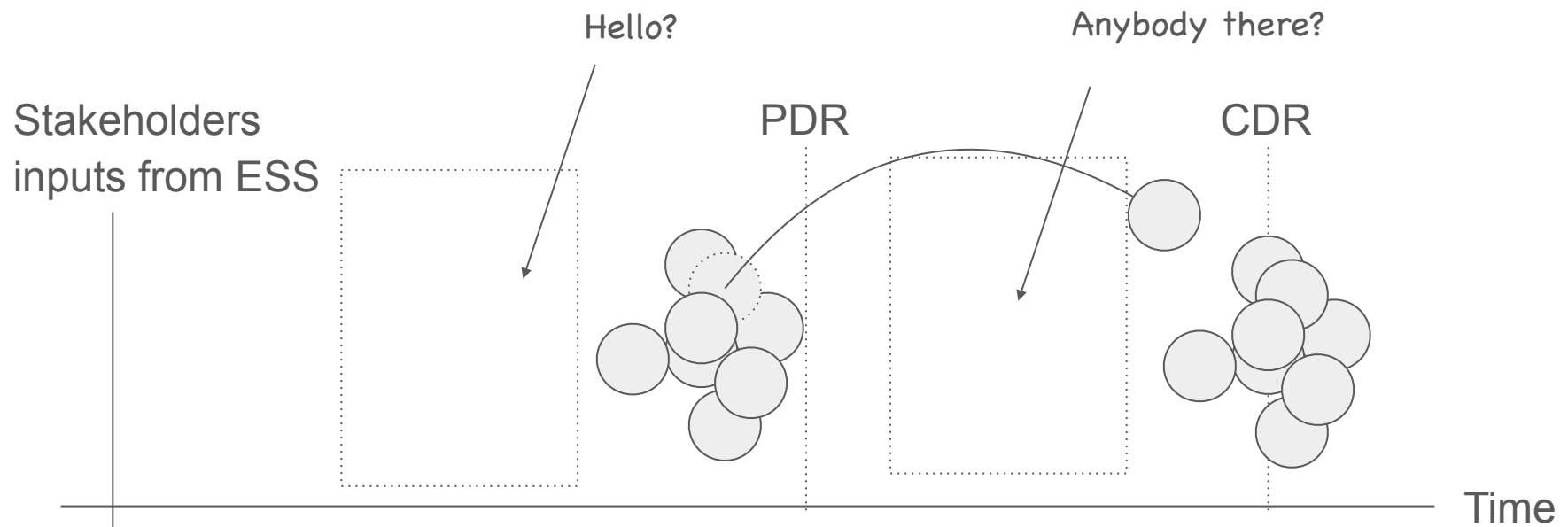
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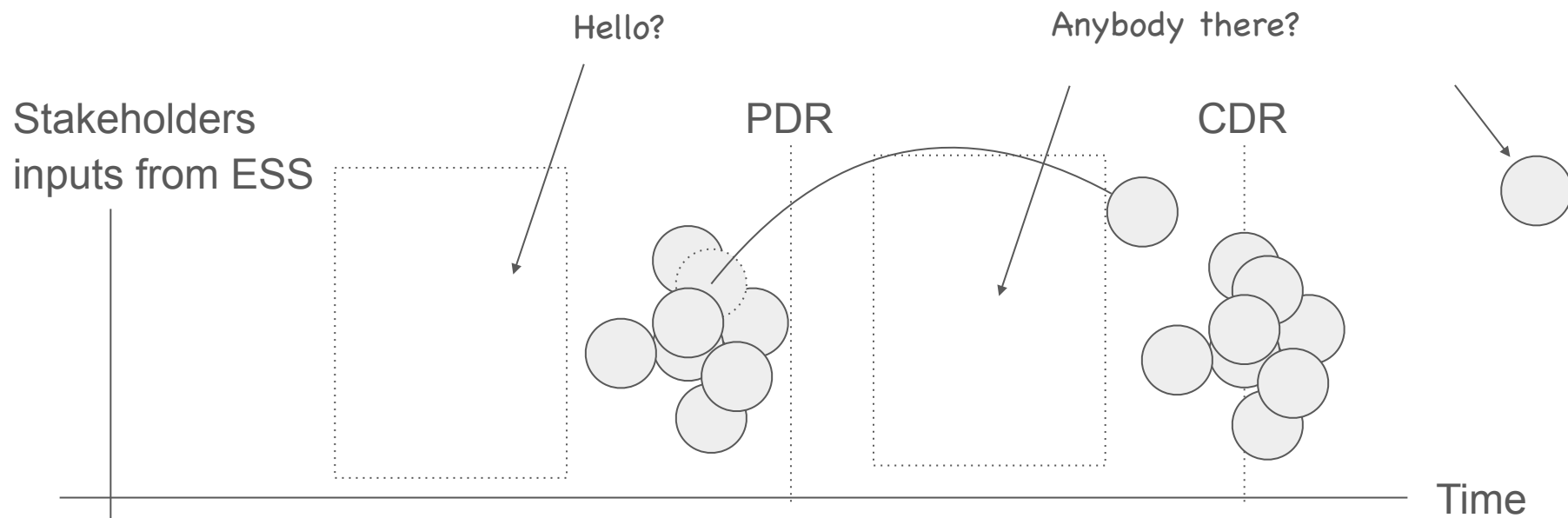
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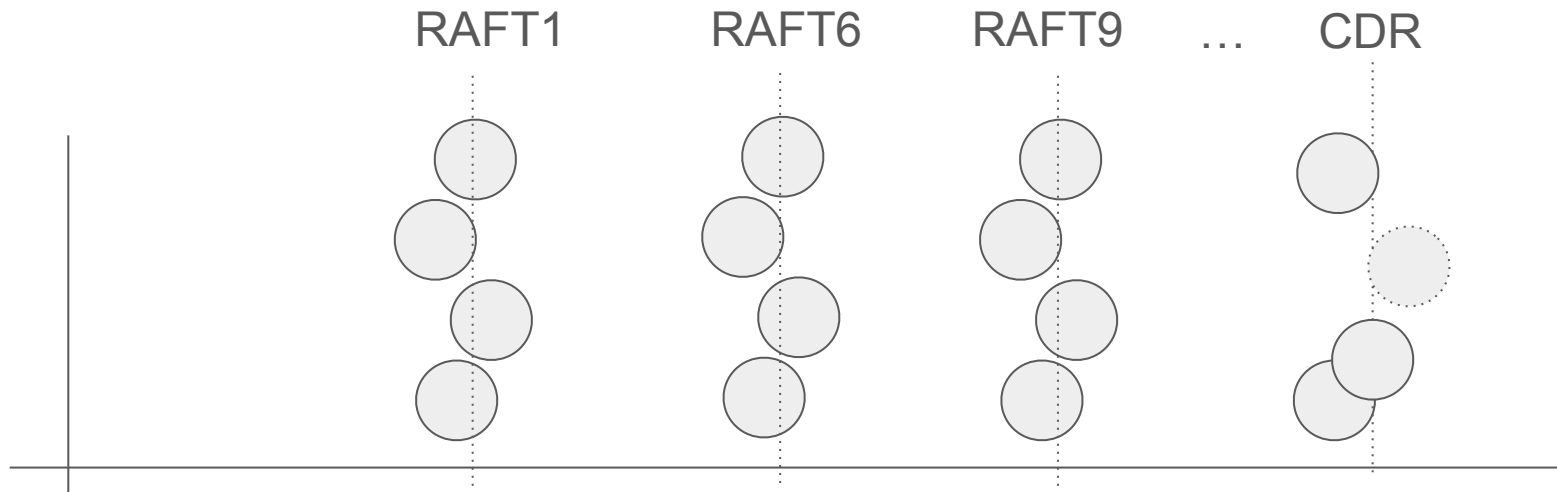
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Reviews: a methodology for MECH. INTEGRATION

For the **MECHANICAL INTEGRATION**, The methodology we propose is that reviews should be done RAFT by RAFT all relevant STAKEHOLDERS should be in the loop:

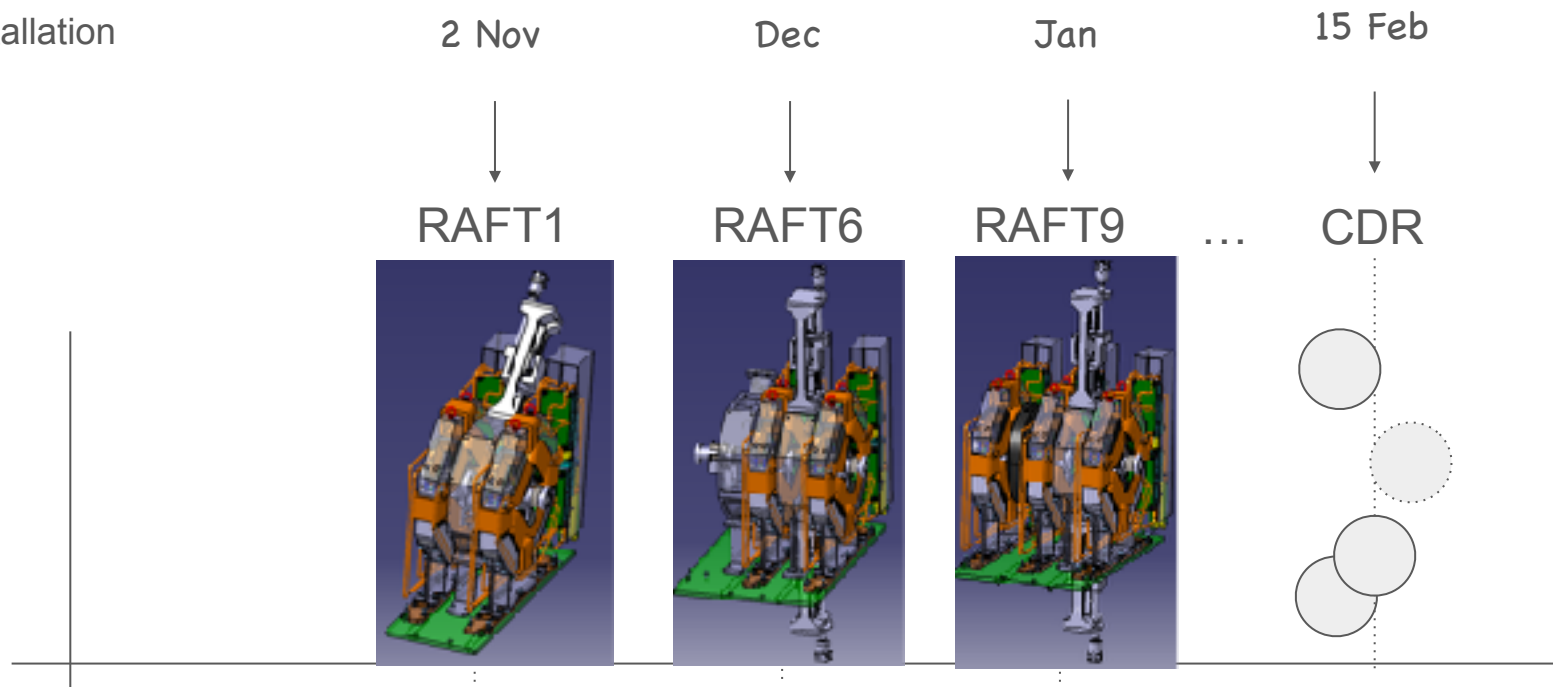
- Alignment.
- Beam Instrumentation
- Warm Linac
- Installation



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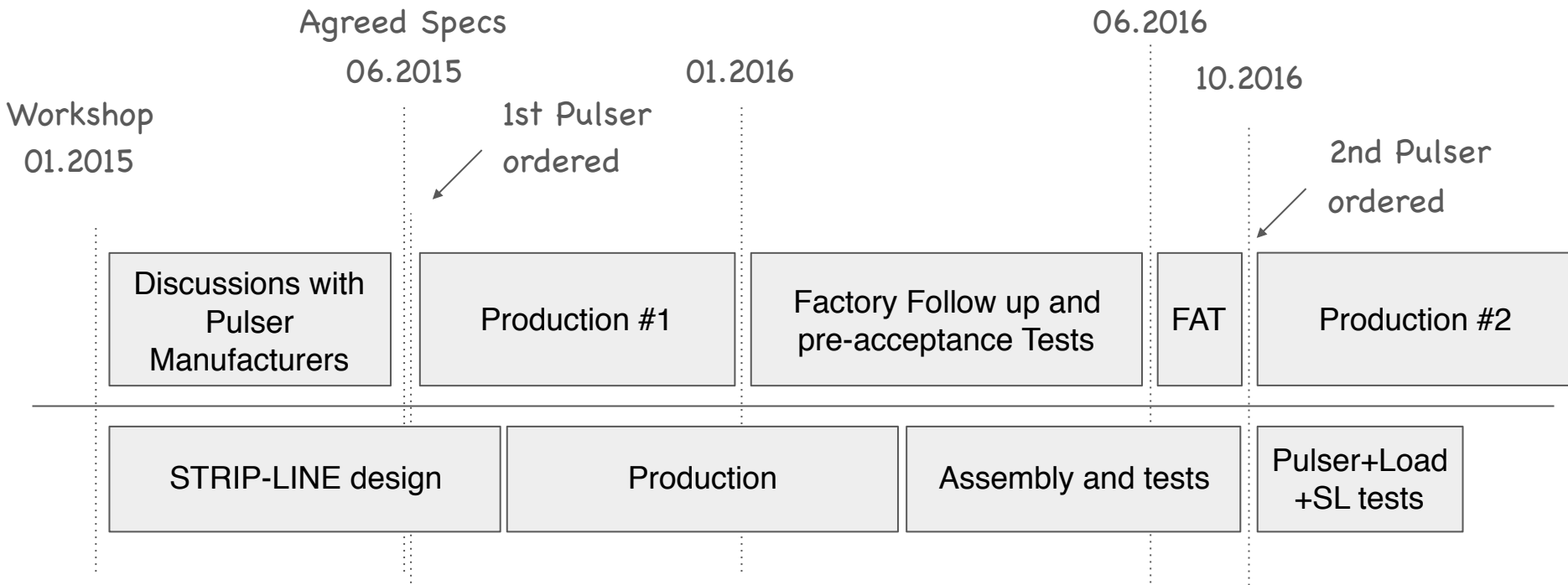


Interfaces: Fast Chopper

A **big challenge** was **anticipated** as a TEAM.

Actions were taken accordingly: Workshop organised inviting: Fritz Caspers (CERN), Alexander Aleksandrov (ORNL) and Michael Clarke-Gaythe (STFC). <https://indico.esss.lu.se/event/285/>

- In this workshop available resources and required specs both were taken into account.
- Only a couple manufacturers were identified as capable of producing such a pulser !
- Strip-line and pulser were launched as proof of principle soon because specs were agreed soon.



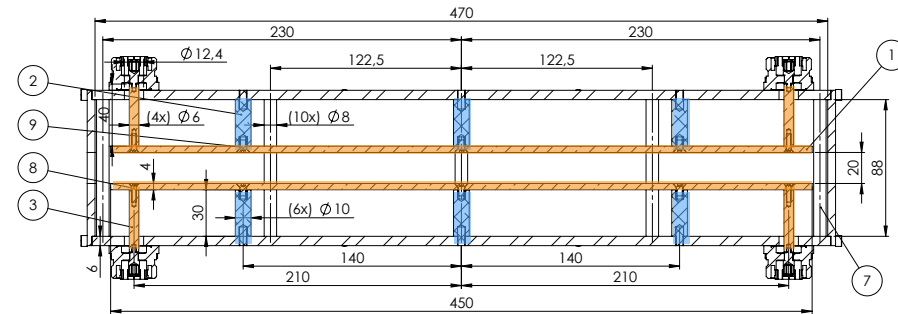
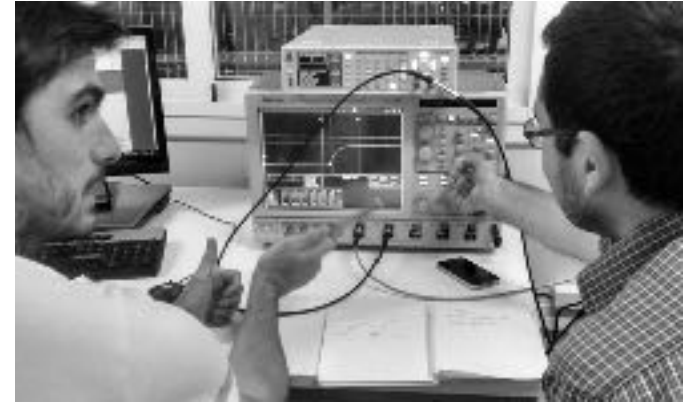
Interfaces: Fast Chopper

Regular Pulser In-factory acceptance tests. Including effects of employed load, jitter, cable length, etc. Overall, **performance was promising**.

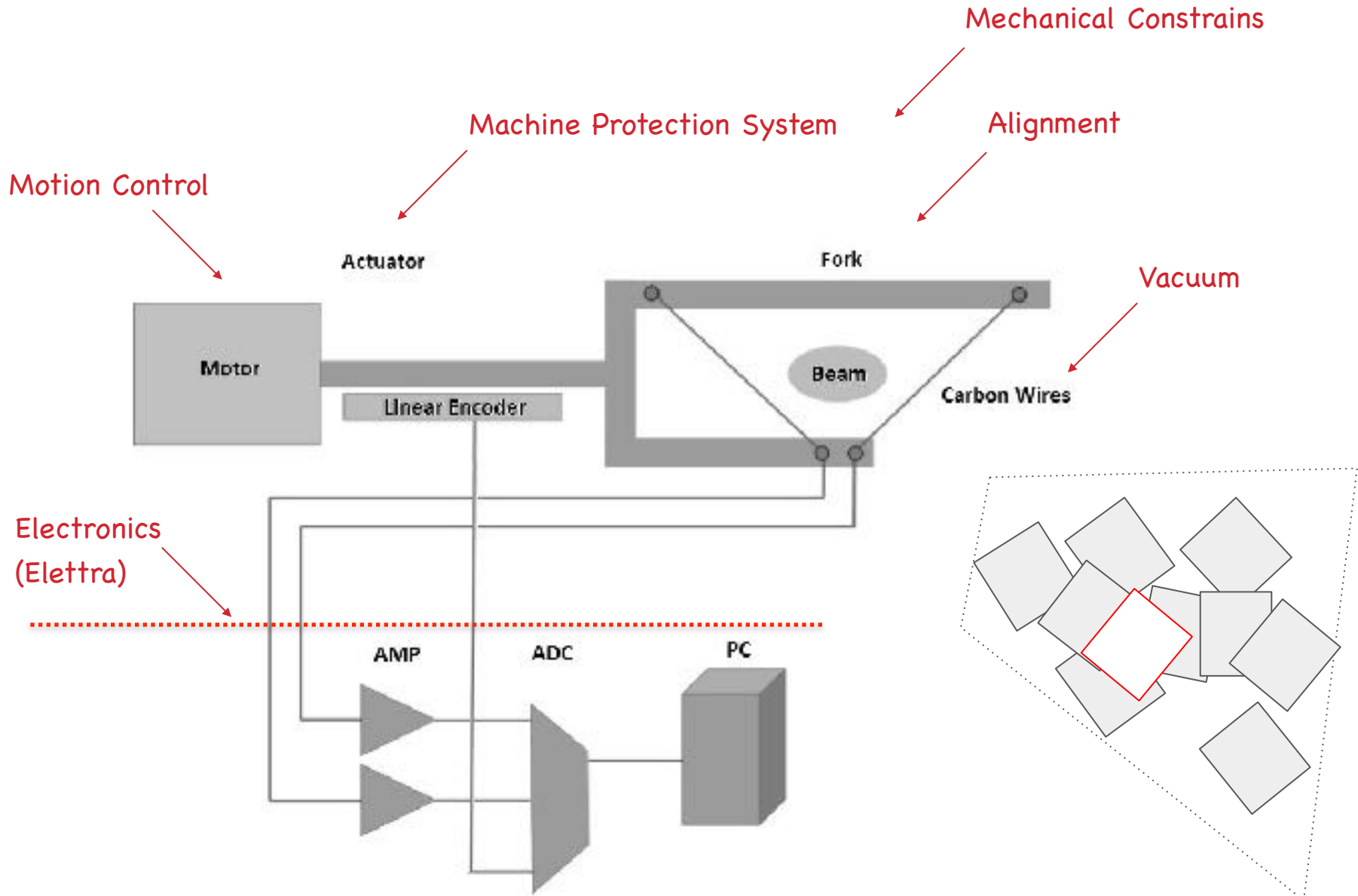
Chopper Strip-line: Components delivered to ESS-Bilbao, acceptance tests performed. Low voltage RF measurements performed: Rise time and fall time contribution of the SLC, the jitter between positive and negative cells, reflection and insertion parameters and flat top amplitude loss **meet the requirements with margins**.

Combined system (pulser and strip-line chopper)

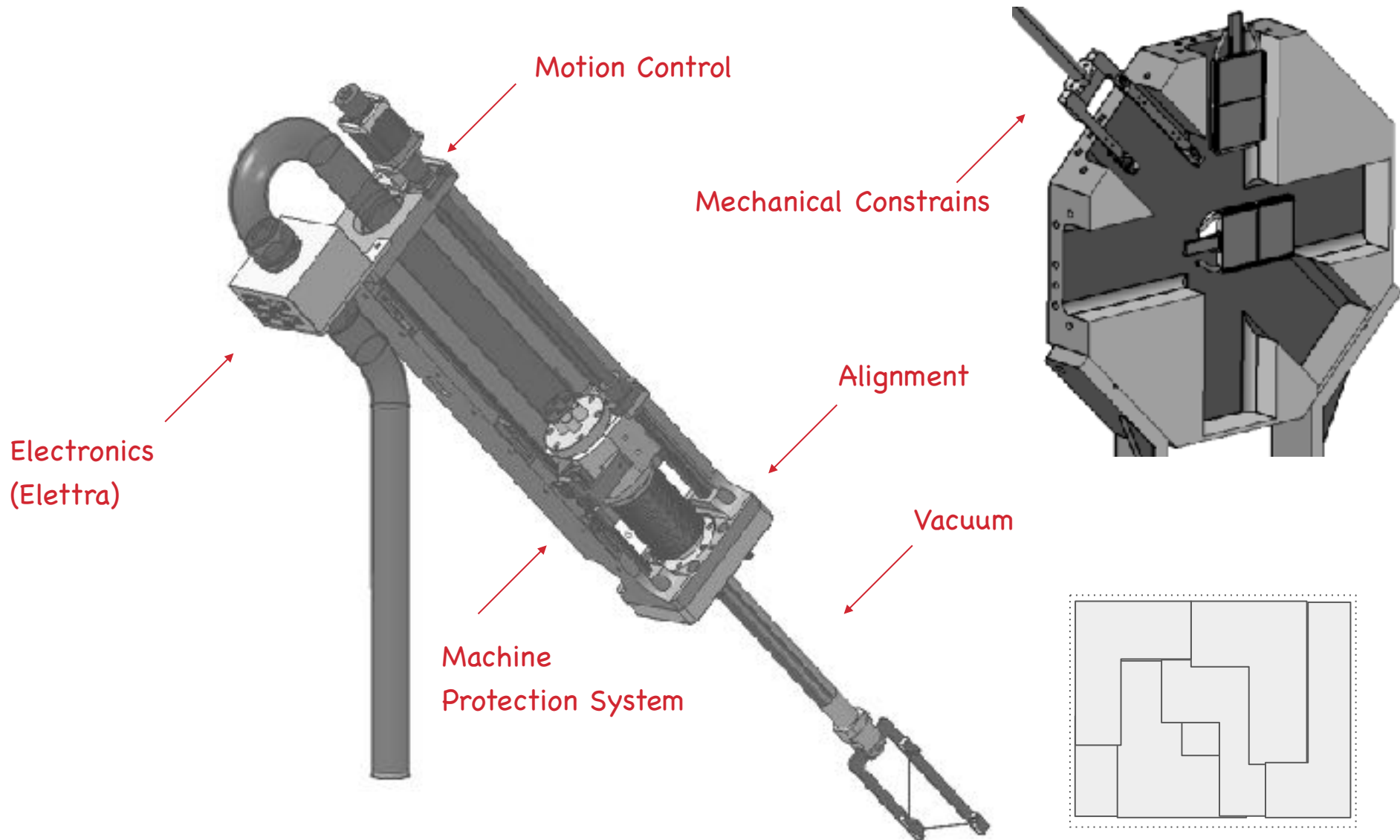
Rise time total (10%-90%): **5.73 ns**
(requirement 10 ns)



Interfaces: WS conceptual stage

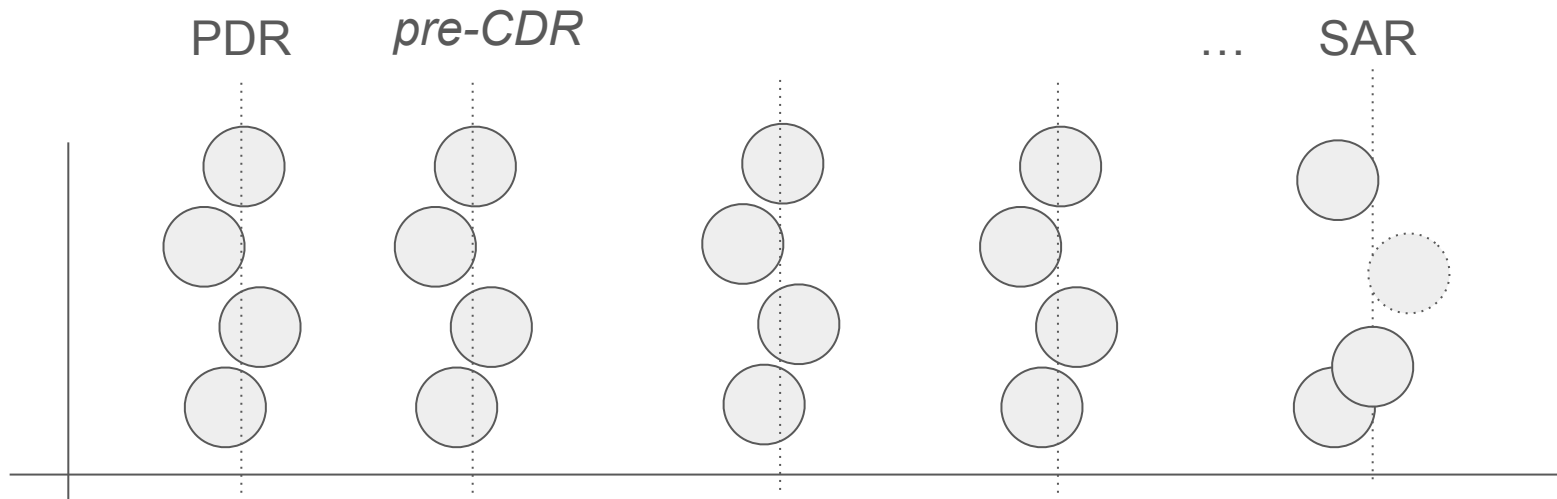


Interfaces: WS detail stage



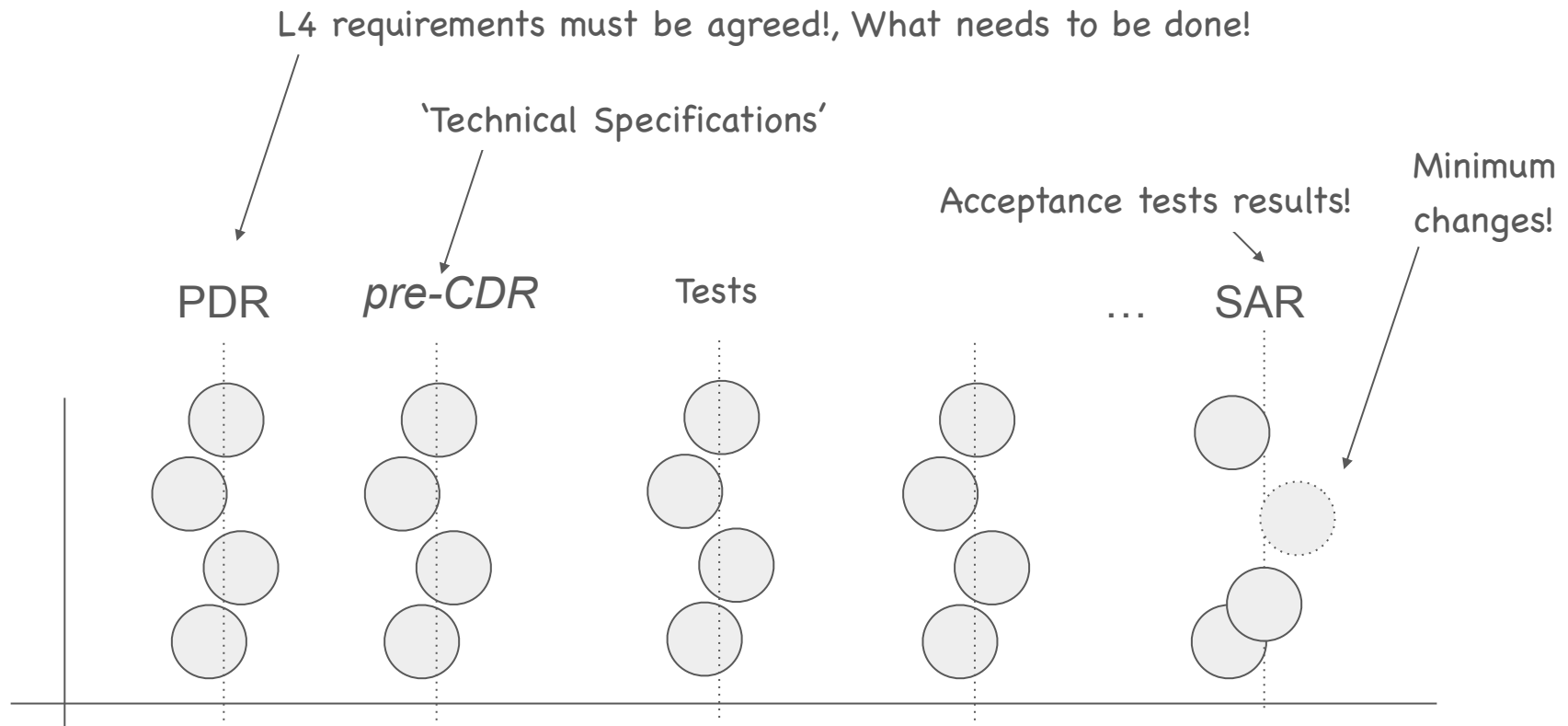
Reviews: a methodology for Other systems...

For the DIAGNOSTICS, the methodology we propose is that reviews should be done **BEFORE** placing contracts and our BLUE-PRINTS: to reduce Cost Time and Risk. Share validation reports. More **transparent** to ESS



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How we do this?

Playing as a **team** requires **practice**.



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Do they know they play in the same team?

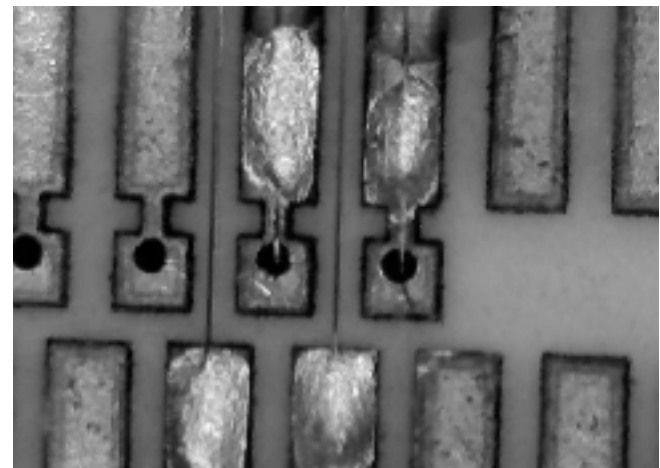
Status

BU The manufacturing process of the first buncher cavity has started and the cavity cover has been roughly machined and heat treatment process has been performed, shortly to be sent. 1st **SSPA will be available in Q1.2018.**

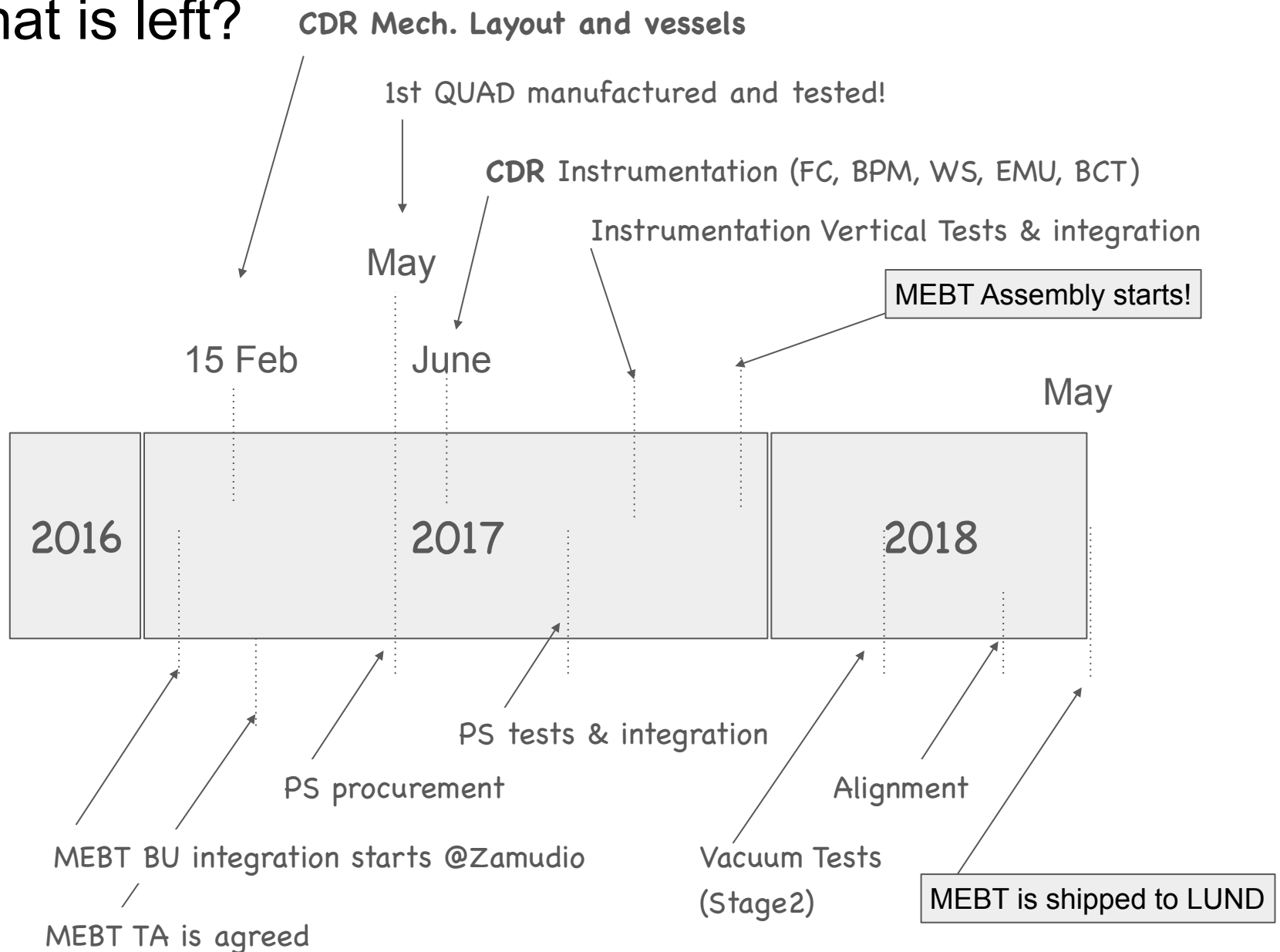
QU Call for tender stage contract to be signed.

PBI, BPM in production, WS, BCT and FC Technical Specs ready. EMU in

Collimators under discussion.



What is left?



Summary

- We got **better requirements**, L4 describe what to do, and L5 describe how it is done.
- Guidelines cannot cover all scenarios. Building up a **Team** is mandatory.
- When ICS interface becomes as part of the *integrated system* we transformed a **problem** into a **solution**.
- The FAST CHOPPER in **good progress** because of a mature team spirit in the people that was involved in the discussions (Fabien*; Matthew*; Ryoichi; Edgar*; Giles; Carlos; Seadat; Ibon).
- QUAD, BUNCHER, SSPA on **tendering** stage! (Soon: PS, vacuum vessels, support, FC and WS).

