



TAXN

Status of manufacturing/production plans

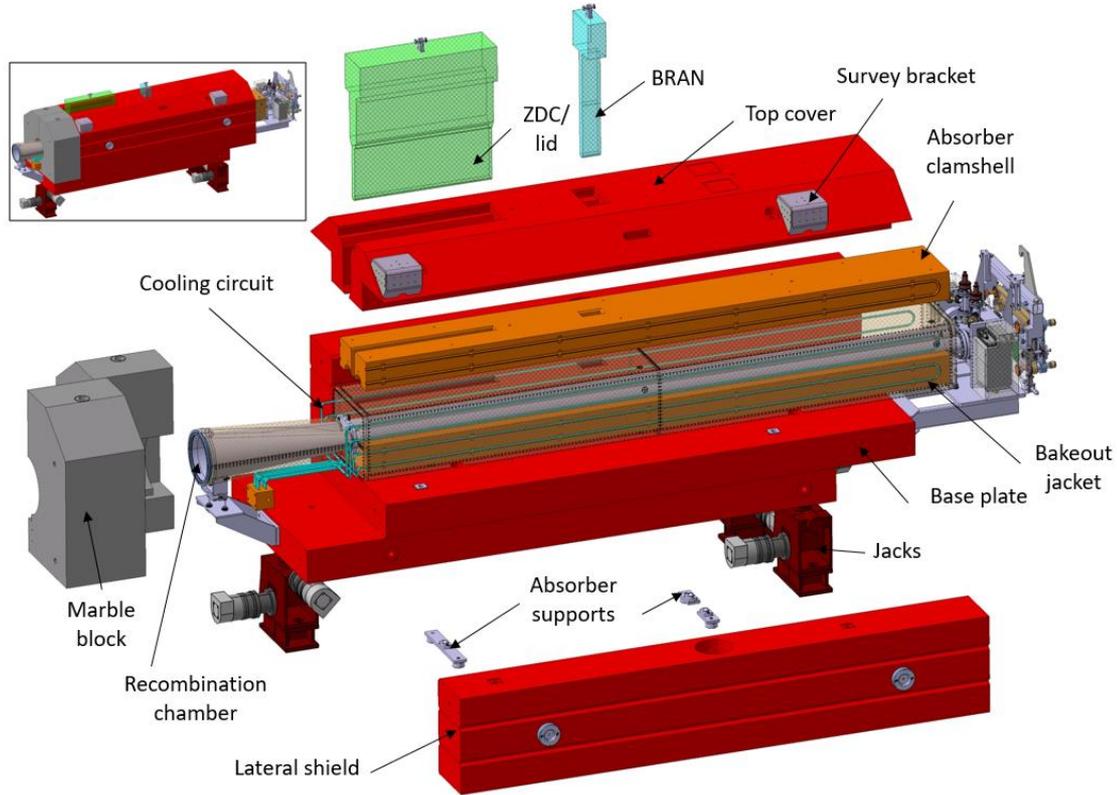
F. Sanchez Galan, on behalf of WP8

Special thanks to P. Santos Diaz, J. Hansen, H. Garcia Gavela, J. Ranya,
N. Mournet, O. Boettcher, J. Sestak

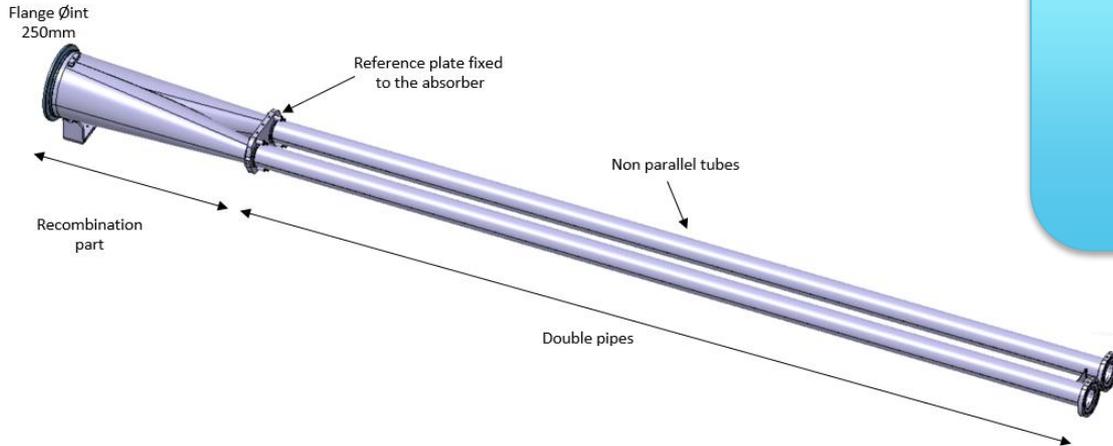


HL-LHC Collaboration meeting, Uppsala 20-09-2022

TAXN



Y-chamber Cu coating



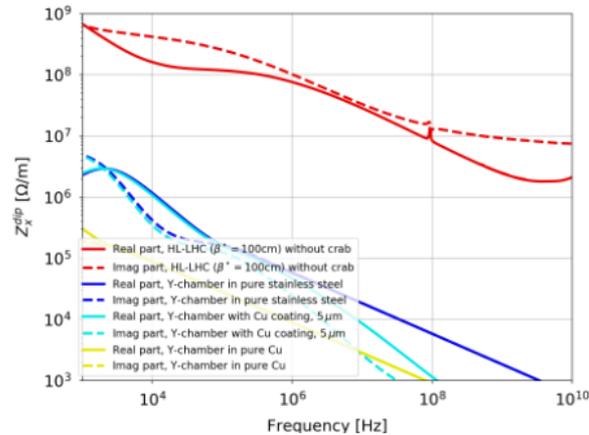
The Impedance Working Group was asked to evaluate the impact on transverse beam stability of removing the copper coating

203rd HiLumi WP2 Meeting
<https://indico.cern.ch/event/1179002/>

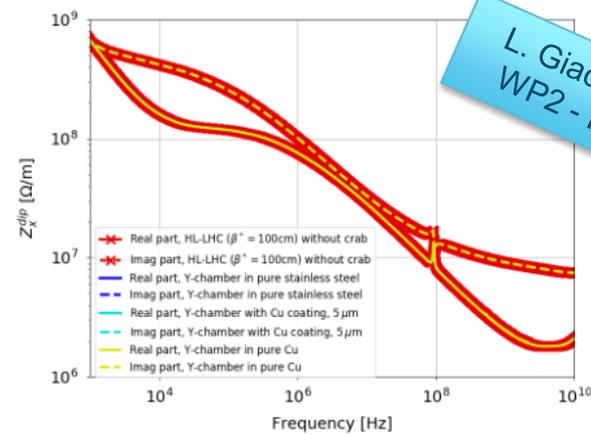
The copper coating of the Y-chambers is not of fundamental importance and they can be realized in bulk stainless steel.

Impedance of the Y-Chambers (already presented by B. Salvant on 18/05/2021)

Impedance of a Y-chamber vs total impedance:



Total impedance with vs without Y-chambers:



With all the materials, the impedance of the chambers is very small comparing to the total impedance (also when weighted by the beta functions).

The copper coating of the Y-chambers is not of fundamental importance and they can be realized in bulk stainless steel.

New baseline, SS Y-chamber, NEG coated. DMR to be released after Uppsala

Y-chamber manufacturing

Cu (DO-33344): unsuccessful price inquiry (no offers)

SS (DO-33343): successful price inquiry (2 offers, one within budget)
(Supply of two stainless steel recombination chambers for the HL-LHC Target Neutral Absorber) <https://cds.cern.ch/record/2807454>

Technical exchanges between TE-VSC and potential suppliers shown that the companies could not guarantee the required tolerances.



MME will manufacture 5 units:

1st unit- Q2 2023

2 to 5th unit- Q3-2024

TE-VSC NEG-coating

Collaborations & in-kind contributions – status

BINP collaboration ruled out, but WP8 is still open to in-kind contributions (manufacturing and resources) for:

- TAXN Cu absorbers & ancillaries (piping, instrumentation, alignment supports, absorber supports)
- TAXN cover, TAXN plug.

Jacks manufacture will follow magnets delivery schedule *(thanks to J. Perez Espinos!)*

Bake-out jackets drawings being revised (VSC), order ready (2023 ?)

Deadline for stablishing a clear, final roadmap is Q1 2023

TAXN Schedule

28 - In work schedule 28th June 2022

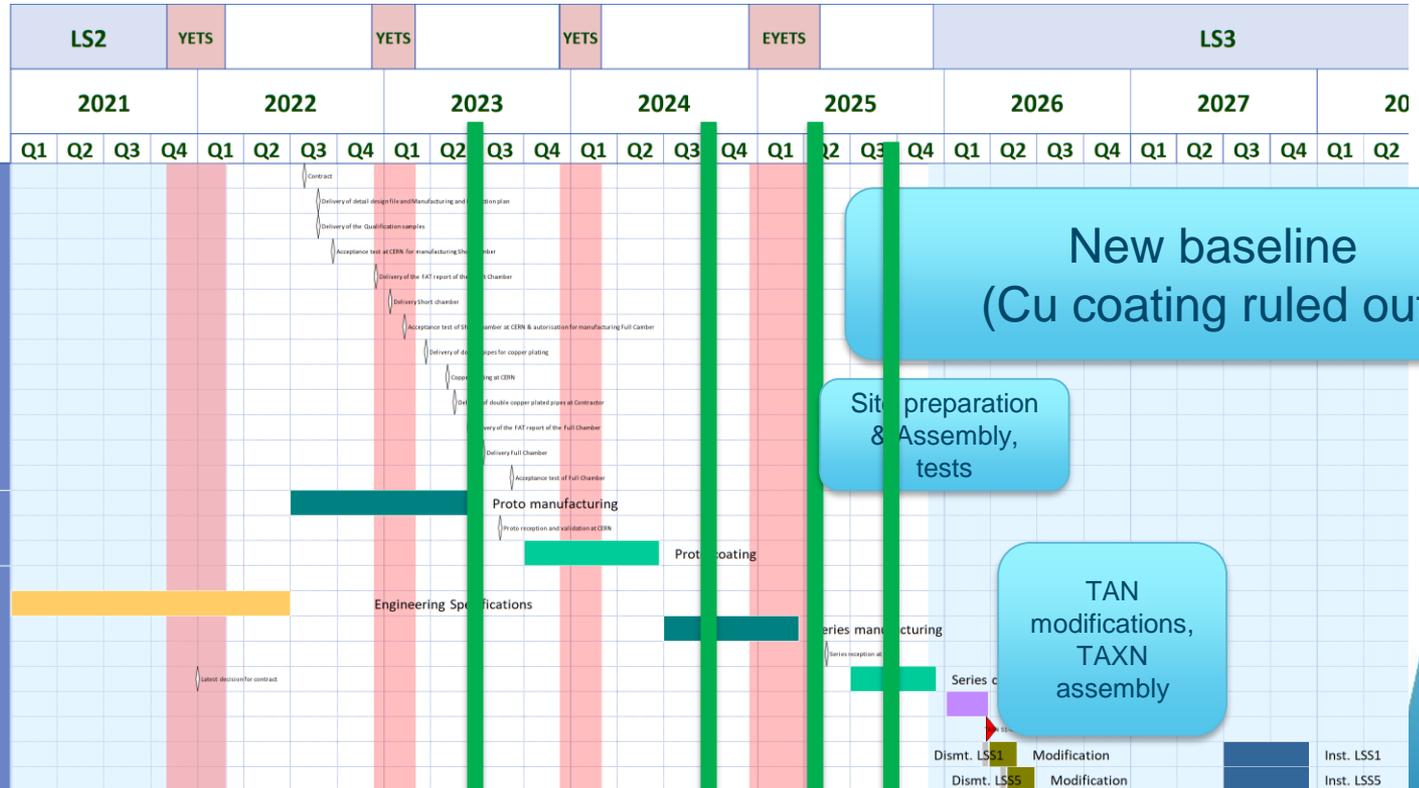
Target Absorbers for Insertion Region Neutrals [TAXN]

ATLAS / CMS [TAXN] 2 units/point

Prototype

Series

Y-Chamber (1st unit)



New baseline (Cu coating ruled out)

Site preparation & Assembly, tests

TAN modifications, TAXN assembly

1st Y-chamber, PRR & absorbers contract

Y-chamber absorbers delivery

Manufacturing installation review



New infrastructures/ facilities requested

TAN to TAXN conversion requested in **SX6**. (prepare logistics, transport, RP) (~150 sqm)

RP preliminary considerations (EDMS 264932)

EDMS # 2649832 v. 1.0 - VALID

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3.5 Preliminary consideration on the worksite layout

The simulations reported in Section 3.2 did not consider any specific location, since the final worksite location is currently unknown. However, based on the results in the sections above, some preliminary considerations on the worksite layout can be made. The simulations in Section 3.2 considered a generic area of 90 m^2 ³. The worksite shall have three different areas to reduce workers exposure, as illustrated in Figure 20:

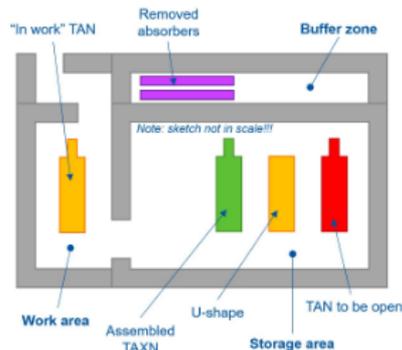


Figure 20: Possible worksite layout, based on the results presented in this note (for illustration purposes only, sketch not in scale).

- A *working area* where one TAN will be in-work at a time.
- A *buffer zone* to store activated and not reused components, including removed absorbers. This area is assumed to be accessible by the crane.
- A *storage area* where to place TANs to be disassembled and/or already upgraded TAXN.

Safety aspects

- System safety Assessment TAXN (C. Gaignant) created, under revision to be released in October




EDMS NO. XXX	REV. 0.2	VALIDITY DRAFT
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REFERENCE: [OTHER REFERENCES]

LAUNCH SAFETY AGREEMENT

SYSTEM SAFETY ASSESSMENT

WP8: TAXN

Abstract

This document contains the description and location of the TAXN, to be installed during LS3.

It details the main hazards and the risk control measures implemented for a safe installation, commissioning and operation of the TAXN.

TRACEABILITY

Prepared by: N.Grada, P.Santos Diaz, J.Hansen	Date: 2021-01-28
Verified by: T.Otto, C.Gaignant, J.Gascon, A.Infantino, G.Bregliozzi, C.Garion, H.Garcia Gavela, P.Fessia, <u>Kurt Weiss</u> , <u>Andreas Herby</u> , <u>Marc Tavlet</u> , <u>Louis Pereira</u>	Date: 2021-MM-DD
Approved by: O.Bruning, <u>M.Zerlauth</u> , H.Burkhardt, F.Sanchez Galan, Y.Loertscher, V.Vincent, <u>M.Brigger</u> , <u>P.Chappuis</u>	Date: 2021-MM-DD

Distribution: N. Surname (DEP/GRP) (In alphabetical order) can also include reference to committees

Rev. No.	Date	Description of Changes (major changes only, minor changes in EDMS)
0.1	2021-01-29	First draft
0.2	2021-03-12	Contributions from P.Santos Diaz and J.Hansen




EDMS NO. XXX	REV. 0.2	VALIDITY DRAFT
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REFERENCE: [OTHER REFERENCES]

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Template EDMS NO. 136370 v 3.6

		<p>calculation note can be found in [8].</p> <p>Technical:</p> <ul style="list-style-type: none"> Tests at 15bars done by the supplier or at CERN are foreseen for validation Inlet circuit valve is closed while outlet is opened during bakeout to allow safe evacuation of warm water and avoid temperature/pressure build-up. <p>Are the pipes CE marked?</p>	<p>Public Safety Dis:</p> <p>Operations condition under FED conformity, Under Investigation.</p> <p>Closeable Gaps:</p> <p>Are they?</p> <p>Closeable Gaps:</p> <p>OK</p> <p>The information is relevant with "Order or overpressure" in the table above. Please only send of them. Tagged to track the data here, and remove the other line.</p>
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		<p>Any pressure relief valve in the circuit? Relief valve set pressure? Hydraulic pressure test at 1.42*P₁?</p> <p>Pressure-relief devices 5.2.2.4</p> <p>Relief-valve-checked</p> <p>Lifting and handling equipment 5.3.4</p> <p>Handling of the TAXN subassemblies in the LHC tunnel.</p> <p>Design: EN-HE detector's handling study can be found in [2].</p> <p>TAXN assembly and transport to their final location.</p> <p>Design:</p> <p>Fluid under pressure 5.3.01</p> <p>c.f. "under over pressure"</p> <p>Electrical Hazards 5.7</p> <p>Electrical material 5.14.2.1.2</p> <p>Electrical racks installed in the underground galleries.</p>	<p>Public Safety Dis:</p> <p>Are they the same under pressure as in the TLD & TDS when no pressure relief valves were represented in their safety assessment document.</p> <p>Closeable Gaps:</p> <p>Link tests to be performed before operations and results to be attached.</p> <p>Closeable Gaps:</p> <p>Is the "Pressure relief device" can be deleted.</p> <p>Public Safety Dis:</p> <p>Under study by EN-HE and VHS. An EDMS document with the detailed procedure and handling steps will be created.</p>
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(My) Conclusions

Plan B started. Descoping of Cu plating eliminates extra-cost for the Y-chamber allow contingency in schedule and opens the floor to potential savings.
Manufacturing in MME gives flexibility and assures the required tolerances.

WP8 new schedule without BINP is feasible and leaves some time for new collaborations.
Still to be included in production plan.

Space allocation (LS3 and preparation) to be granted before Q2 2023.



*Thank to WP12, TE-VSC, MME for the
support!!!*

*And thanks to all WP8 members, partners
and contributing WP's and groups*





Spare slides

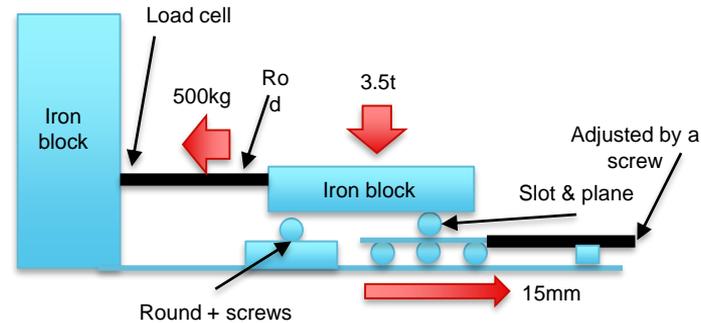
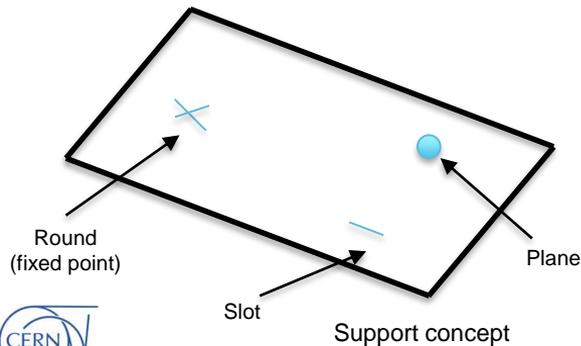


Reminder

- OBJECTIVES:
 1. Reproduce bakeout cycle dilatation of the 3.2t absorber.
 2. Tests movement reproducibility.
 3. Check defects on the spheres contacts during the movement under operation conditions.
- Real scenarios:
 1. 500kg vacuum forces.
 2. 300kg vacuum forces plus absorber dilatation (13mm and 1mm longitudinal and radial displacement, respectively).

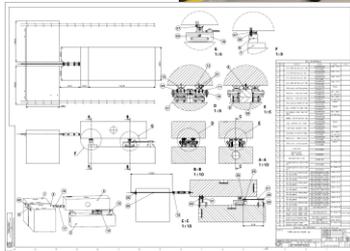
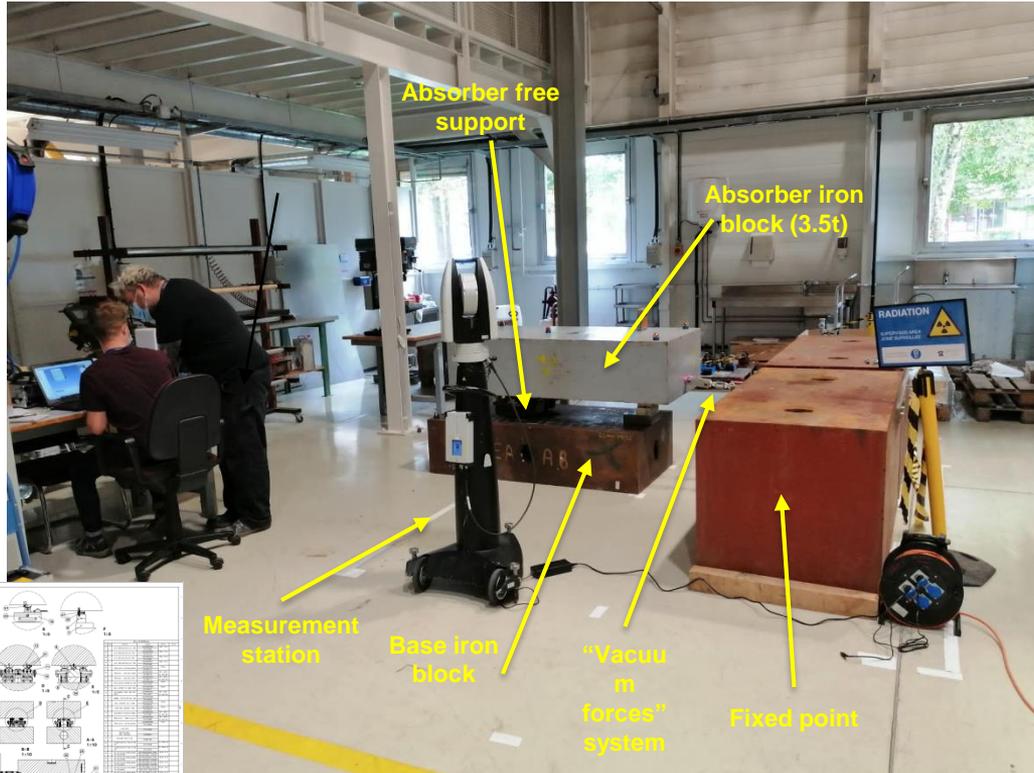


867 R-H78



Preliminary test sketch

Set up [I]



LHCTAXNP0023

Set up [II]

