ECR/Documents for Information and Approval

Giulia Romagnoli and Natalya Kahn for BE-EA, 2024-02-13

EA Documents - Agile Board - CERN Central Jira

LIST OF DOCUMENTS for Info

FOR INFORMATION EATM

Summary	Reporter	EA Projects	EDMS number	EDMS Status
Risk Assessment for the Individual System Tests of AD Horn Power Supply During YETS	Gregor Grawer	AD	3018473 - AD-THOR-SR-0001	Engineering check
Consolidation of the AD Electron Cooler	Adriana Rossi	AD	3014585 - AD-LNT-WD-0001	Engineering check
Replacement of AD Horn Sandwich Line PXTHOR_001 and PXTHOR_002	Edouard Grenier-Boley	AD	3024760 - AD-THOR-PRD-0007	Engineering check
Replacement of AD Target Sub-Assembly PXTARH_060 and PXTARAD003	Edouard Grenier-Boley	AD	3024759 - AD-TARAD-PRD-0002	Engineering check
Engineering Specification of the New AD Electron Cooler Magnet System	Luke von Freeden	AD	3014577 – AD-LNT-ES-0002	Engineering check
NEPTUNE Converter Family for North Area and SPS Consolidation	Jerome Savary	North Area, NACONS	3018519 - SPSX-R-ES-0004	Engineering check
Mandate of the NA-CONS Project Safety Officer	Filipa Duque Carvalho	North Area, NACONS	2458825 - SPSX-PM-MG-0002	Engineering check
North Area Beam Instrumentation Consolidation Type: NA-CONS Groups: BE-BI & EN-EA	Jocelyn Tan	North Area, NACONS	2206350 - SPSX-B-WD-0003	Under Approval
Consolidation of the North Area Vacuum Controls NA-CONS TE-VSC	Abel Gutierrez	North Area, NACONS	2716599 - SPSX-V-WD-0002	Released
North Area Telecom and Network Infrastructure	Mohssen Souayah	North Area, NACONS	2732643 - SPSX-CC-WD-0001	Released

LIST OF DOCUMENTS for Info

FOR INFORMATION EATM				
Summary	**Reporter**	**EA Projects**	**EDMS number**	**EDMS Status**
New Parabolic Mirror Design for the XCET Detector	Jan Buesa Orgaz	Equipment	2851423	**Released**
Electron Intensity in the H8 Beamline	Maarten Van Dijk	North Area	3020139 - SPSX-O-RPT-0002	**Engineering check**

LIST OF DOC for FUTURE APPROVAL

ECR INFO/FUTURE APPROVAL EATM				
Summary	**Reporter**	**EA Projects**	**EDMS number**	**EDMS Status**
NA-CONS Fire Safety and Access WP 5.1.3 Fire-Resistant Partition	Adem Kaymak	North Area – NACONS	3010259 - SPSX-SF-EC-0006	**Engineering check**
Consolidated XCRHV Installation in TT82 YETS 23/24	Jan Buesa Orgaz	North Area - NACONS	2961759 - SPSX-TC-EC-0001	**Engineering check**
Space Reservation Request - North Area Surface Fire Detection Racks	Michael Jeckel	North Area - NACONS	3018433 - SPSX-SF-EC-0007	**Engineering check**
Shielding Improvement for the High Intensity Hadron Operation of M2	Dipanwita Banerjee	North Area	2868386 - SPSX-J-EC-0002	**Engineering check**
BA80 Fire Detection Equipment	Florian Andre Deperraz	North Area – NACONS	2997829 - SPSX-SF-EC-0005	**Under Approval**
User Requirements for XTAX Absorbers in North Area Beamlines	Miguel Lino Diogo Dos Santos	NACONS, Equipment	2747997 - SPSX-T-ES-0003	**Under Approval**
Replacement of Big Vertical Collimator XCBV on M2 Beamline in TT84	Giulia Romagnoli	North Area - NACONS	2976670 - SPSX-TC-EC-0002	**Under Approval**
Installation of XCET Detectors in Neutrino Platform NP02 and NP04	Giulia Romagnoli	North Area	2811758 - SPSX-X-EC-0001	**Under Approval**

LIST OF DOC for FUTURE APPROVAL

ECR INFO/FUTURE APPROVAL EATM				
Summary	**Reporter**	**EA Projects**	**EDMS number**	**EDMS Status**
Installation of a Radiation-Hard Profile Monitor in TT81	Inaki Ortega Ruiz	North Area	3001893 - SPSX-B-EC-0005	Engineering check
Installation Water Cherenkov Test Experiment in T09 beamline During YETS 23-24	Dipanwita Banerjee	EA	2960989 - PSZ-J-EC-0003	Engineering check
High-Intensity Beam to IRRAD/CHARM	Federico Ravotti	EA	3024761 - PSZ-L-EC-0002	Engineering check

LIST OF MISSING ECRS for YETS 23/24

MISSING ECRS			
Summary	**Reporter**	**EA Projects**	**EDMS number**
NP Platform Installation on H4	Filippo Resnati	North Area	Coming soon…
Installation Tuyauterie BA81-TT81/Installation Baie SDI - Detection Incendie	Michael Dole	North Area – NACONS	Coming soon…

LIST OF DOCs for APPROVAL

ECR APPROVAL EATM				
Summary	**Reporter**	**EA Projects**	**EDMS number**	**EDMS Status**
HiRadMat Primary Vacuum Manifold	Anthony Harrison	HiRadMat	2958976 - HRM-V-EC-0003	**Under Approval**
User Requirement for the XCRVH Micro-Collimator in H8 Line in North Area	Bastien Rae	North Area, Equipment	2718575 - SPSX-TC-ES-0003	**Under Approval**
User Requirements for XCED Detectors in North Area Beamlines	Anna Baratto Roldan	North Area, NACONS, Equipment	2813075 - SPSX-X-ES-0004	**Under Approval**
Installation of New Test Beam Experimental Area at AD/ELENA	Maud Wehrle	AD, ELENA	2975107 - AD-LJ-EC-0026	**Under Approval**

ECR for Approval

HRM-V-EC-0003
Version **0.2**

By Anthony Harrison

HiRadMat Primary Vacuum Manifold

This ECR explains the modifications to the primary vacuum systems of HiRadMat, the new installation for TT66 and stand-alone beam instrumentation.

There is currently no dedicated primary pumping line installed within the HiRadMat facility experimental area. Temporary ad-hoc installations have been used.

A new primary pumping system must be installed due to the partitioning of TT66 vacuum systems. This can be expanded to include the needs of the HiRadMat experimental area, which will improve the area's flexibility and capabilities.

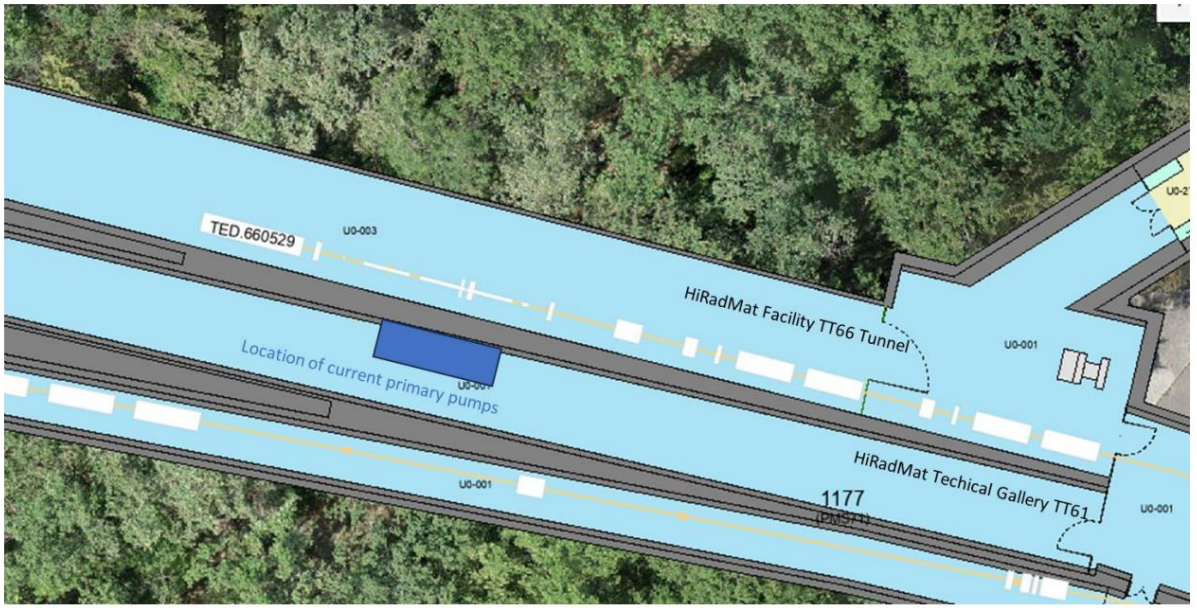

Figure 2: Location of current primary pumps in the technical gallery TT61.

ECR for Approval

HiRadMat Primary Vacuum Manifold

HRM-V-EC-0003
Version **0.2**

By Anthony Harrison

Three new primary lines will be installed on the side of the TT66 tunnel.

- Line 1 (pink), monitored and controlled pumping manifold with three ports dedicated to installed experimental equipment.
- Line 2 (red and green), monitored and controlled pumping manifold with three ports dedicated to beam instrumentation and a separately controlled manifold dedicated to the vacuum sector 6602.
- Line 3 (brown), monitored and controlled pumping manifold with one port dedicated to the beam dump (TED.660529).

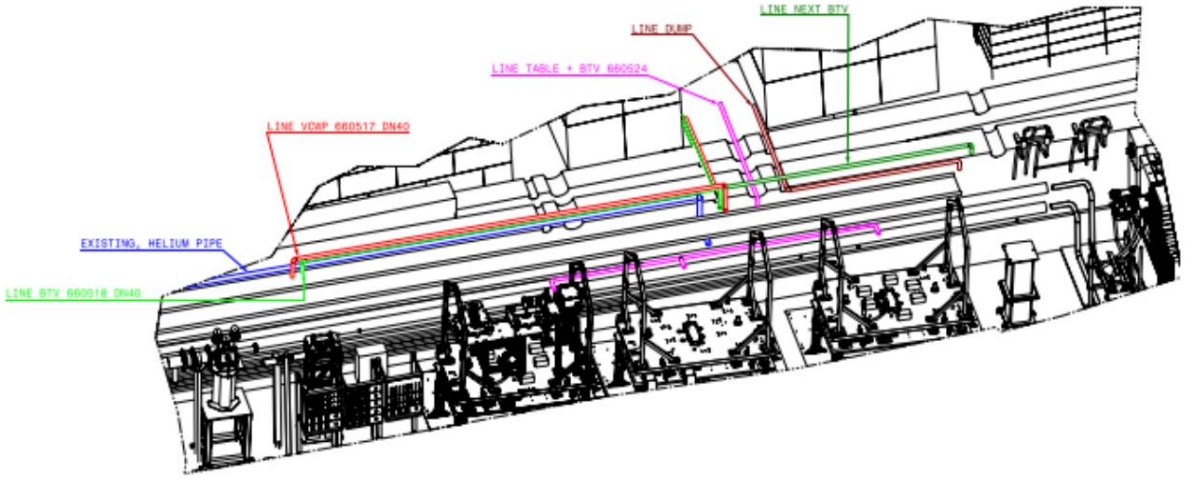

Figure 3: Layout of Primary vacuum lines (extracted from SPSXMUSR0523).

Responsibilities:

- The purchasing and installation costs will be shared between TE-VSC, BE-EA and SY-STI.
- BE-EA will provide integration studies and design support.
- BE-CEM will develop, install and maintain the PLC-based control system to read out the pressure value from the Pirani gauges and to control the electropneumatic valves.
- TE-VSC will perform the tunnel installation and commissioning.
- The primary pumps will be maintained by BE-EA.
- The gauges and control electropneumatic valves will be maintained by TE-VSC.

ECR for Approval

HRM-V-EC-0003
Version **0.2**

By Anthony Harrison

HiRadMat Primary Vacuum Manifold

✔ **Accepted** by **MATHESON Eloise** (BE-CEM)
Fine with me

▬ **Seen** by **BANNISTER William Thomas** (EN-CV)
Seen

✔ **Accepted** by **BOISSEAUX-BOURGEOIS Philippe** (BE-EA)
ok.

✔ **Accepted** by **SOLIERI Nicola** (SY-STI)
Thanks to Anthony and the VSC colleagues for the excellent work.
Please add the dump (SPTED__004-CR000001 / Position TED.660529) in impacted systems in paragraph 4.1

✔ **Accepted** by **FERREIRA SOMOZA Jose Antonio** (TE-VSC)

Seeking approval from EATM

ECR for Approval

SPSX-TC-ES-0003
Version **0.5**

By Bastien Rae

User Requirement for the XCRVH Micro-Collimator in H8 Line in North Area

This document summarizes the needs of the users and the physics requirements for the micro-collimator situated on the H8 beamline in the North Area.

Figure 1 – Image of the XCRHV in the H8 beamline.

The micro-collimator (XCRHV) was developed for use in the North Area H8 beamline. Used in 'microbeam' mode, the collimator attenuates a beam of particles to allow only a small number to pass.
There are currently two micro-collimators: one installed in H8 beamline and one spare.

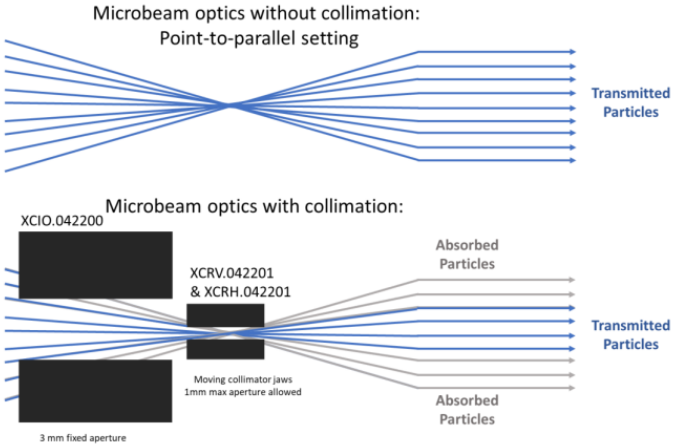

Figure 2 – Representation of the 'microbeam' optics.

ECR for Approval

SPSX-TC-ES-0003
Version **0.5**

User Requirement for the XCRVH Micro-Collimator in H8 Line in North Area

By Bastien Rae

The collimator is critical for operation of microbeams on the H8 beamline, and so consolidation is necessary. The spare XCRHV is due to be exchanged with the installed one during YETS 2023-24.
Precise alignment of the micro-collimator is essential but the current alignment mechanisms are not user-friendly, nor is there an accurate optical reference point to carry out fiducialisation. A redesign of the alignment system would be beneficial, perhaps one encompassing both the XCIO and XCRHV.

Table 1 – User Requirements for XCRHV.

Parameter	Requirement	Comment
Jaw material	Tungsten	Satisfactory performance for the physics purpose of the element for all current use
Jaw dimensions	30 × 30 mm	Square cross-section for each jaw
Jaw length	450 mm	Length of an individual jaw
Jaws movement range	±15 mm (max)	+/- refers to the positioning of the left/right or upper/lower jaw respect to the chamber centre. Requirement must be met for beam tuning purposes and checks
Jaws aperture	0.2 mm (min) 1 mm (max)	The LOKN system is set with a max aperture of 1 mm but in the future, it can change to higher values always inside the range of movement
Mechanical control precision	Better than 0.1 mm absolute, reproducible adjustment	Due to the very small aperture required for microbeam optics, collimator movement needs to be very precise
Alignment table adjustment range	±6 mm (min)	Minimum adjustment range in y (horizontal) and z (vertical) axes. Required for allowing collimator to follow beamline trajectory
Vacuum	10^{-3} mbar	Primary vacuum currently present vacuum in H8 beamline

ECR for Approval

SPSX-TC-ES-0003
Version **0.5**

By Bastien Rae

User Requirement for the XCRVH Micro-Collimator in H8 Line in North Area

✔ **Accepted** by **ROMAGNOLI Giulia** (BE-EA) Created on
Final version with all points verified. Ready to be released.

✔ **Accepted** by **BOISSEAUX-BOURGEOIS Philippe** (BE-EA) Created on
ok

✔ **Accepted** by **FOLCH Ramon** (BE-EA) Created on

Seen by **KADI Yacine** (BE-EA) Created on
OK for NA-CONS

✔ **Accepted** by **BARATTO ROLDAN Anna** (BE-EA) Created on
Paragraph 1.2 : "Primary beams to H8 can only be sent once the XCRHV and the XCIO are both inserted", this is true only with primary proton beams. With ions it is possible to send the beam to H8 without the XCIO being inserted.

Table 1 : Is the limitation in the maximum jaw aperture true also for ion beams?

Seeking approval from EATM

ECR for Approval

SPSX-X-ES-0004
Version **1.1**

By Anna Baratto Roldan

User Requirements for XCED Detectors in North Area Beamlines

This document summarizes the user needs and the physics requirements for the CEDAR detectors (XCED) in the North Area.

Several XCEDs are currently in use in the North Area. The following types exist:

- XCED N1 , filled with helium and comprising adapted optics;
- XCED W2 , filled with nitrogen;
- XCED H, filled with hydrogen.

The normal Threshold Cherenkov Counters (XCETs) are limited at high intensities, therefore, the XCEDs are more desirable for fixed-target experiments and for test beam users who would like to tag or veto individual particle species.

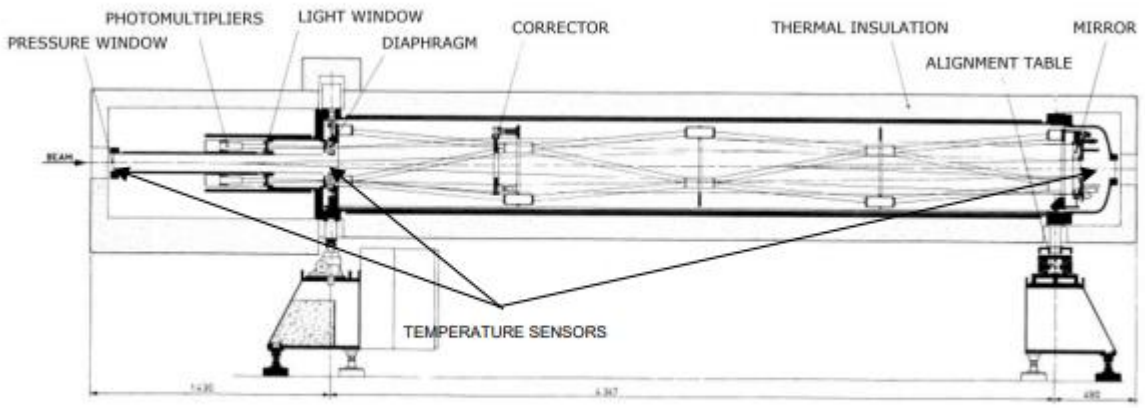

Figure 3 – General mechanical drawing of an XCED [2]

The consolidation of the XCED detectors aims to standardise all North Area XCED detectors.
Thermal insulation and pressure control systems must be improved to meet user requirements and to achieve the required precision in particle identification.
Procurement of new XCEDs is necessary to ensure there are sufficient spares, given that the interest in XCEDs detectors is increasing.

ECR for Approval

SPSX-X-ES-0004
Version **1.1**

By Anna Baratto Roldan

User Requirements for XCED Detectors in North Area Beamlines

Parameter	Requirement	Comment
Gas Types	CEDAR-N – He CEDAR-W – N2 CEDAR-H – H2	Three gases needed for the three different CEDAR types.
Max Operating Pressure	CEDAR-N - 15 bar(a) CEDAR-W – 5 bar(a) CEDAR-H – 5 bar(a)	The pressures are quoted in absolute values.
Length	CEDAR-N – 6.2 m CEDAR-W – 6.2 m CEDAR-H – 6.2 m	Other lengths could in principle be studied if justified.
p_{min}/m	CEDAR-N – 55.9 CEDAR-W – 11.3 CEDAR-H – 42.6	Theoretically, lowest momenta (p_{min}) at which the counters can be set to detect particles of mass m. However, at these low momenta efficiency is very low (see Fig. 3 in [2]).
Beam Window Material	< 1% X_0	Beam Window Material and thickness should be limited to reduce multiple scattering of the beam
Diaphragm Opening	0 mm to 20 mm	The current range of movement is satisfactory.
Diaphragm Opening Accuracy	0.01 mm	Necessary precision for satisfactory control of the opening and particle tagging (as in [2]).
Vertical/Radial Alignment Tolerance	0.5 mm	Precision satisfactory.
Longitudinal Alignment Tolerance	0.5 mm	Precision satisfactory.
Angular Alignment Tolerance	0.1 mrad	Precision satisfactory.
Alignment Scan	yes	The possibility of performing alignment scans must be included
Range of Alignment table	-4.3 mm to +4.3 mm	Alignment table movement range.
Accuracy of Alignment Table.	0.01 mm	Needed precision to align the table and maximize 6/7/8 fold co-incidences.
Angular Resolution of Alignment Table	2.3 µrad	Current precision satisfactory for all CEDARs.
ΔP	± 1 mbar	Needed precision on pressure for all CEDARs.
ΔT	CEDAR-W - < 0.3 K CEDAR-N - <0.1 K CEDAR-H - < 0.5 K	Needed stability of temperature along the CEDAR as temperature gradients cause inhomogeneity of the refractive index [2].
Six-fold Efficiency	6-fold efficiency > 99% for tagging a particle.	The CEDARs should have a 6-fold efficiency > 99% efficiency to tag a particle species.
Pressure Scan	Yes	The possibility of performing pressure scans must be included.
Minimum Emptying Speed	1 mbar per 5s	Emptying speed should be adjustable according to the need. When a gas outlet is made, there is a uniform decrease in temperature followed by an equilibrium reached with a time constant of 15 s. For a pressure scan with a step size of 3 mbar, 1 mbar accuracy would be reached only if one waits for 15 s before each measurement. For other coarse adjustments of the pressure, higher emptying speeds should be available, to be able to empty the device within 30 minutes.
Filling Speed	>4 mbar/s	Pressure is always scanned down so the filling speed should be higher than the emptying speed for initial filling.
Safety Aspects	Pressure Vessel	For a pressurized vessel, the following CERN rules apply: - SR-M - Mechanical equipment [5] - GSI-M-2 - Standard pressure equipment [6] - SSI-M-2-1 - Pressure vessels [7] In accordance with the CERN rules, the following European directive applies Directive 2014/68/EU. The harmonized standard concerning the pressurized vessel is EN13445.

ECR for Approval

SPSX-X-ES-0004
Version **1.1**

By Anna Baratto Roldan

User Requirements for XCED Detectors in North Area Beamlines

✔ **Accepted** by **LINO DIOGO DOS SANTOS Miguel** (BE-EA)
Thank you very much

⚠ **Accepted with Warning** by **KADI Yacine** (BE-EA)
Thank you for these user requirements. OK with NA-CONS

Page comments

Page 9
Error with references under Safety Aspects

Page 10
reference of the CEDAR consolidation document (EDMS 2742855) should be added in section 2.2.

Error with reference in section 2.3

✔ **Accepted** by **GAUTHERON Fabrice** (Other)
Thanks a lot for the very complete document.
some links to the safety references links are broken (table in page 10) as well as the link in the paragraph 2.3 "schedule and roles"

Seen by **DEEPTI Deepti** (BE-EA)
Seen

Seeking approval from EATM

ECR for Approval

AD-LJ-EC-0026
Version **0.4**

By Maud Wehrle

Installation of New Test Beam Experimental Area at AD/ELENA

This ECR describes the request for the remodelling of the former ATRAP2 experimental area in the AD hall to make it available for a new test beam area.

Figure 1: Location of ATRAP2 experimental area in the AD hall to be converted to TELMAX area.

The existing ATRAP2 experimental area in the AD hall (Building 193) is unused. We propose the creation of a test beamline experimental area to be used both for machine equipment tests and by experiments for new equipment.

If a new experiment expresses interest in this zone at a later stage, it would be very easy to adapt the beamline equipment to meet its needs.

The existing layout of the space needs to be cleaned up and reorganised. Current platforms, stairs and handrails do not meet safety standards and need to be upgraded.

ECR for Approval

AD-LJ-EC-0026
Version **0.4**

By Maud Wehrle

Installation of New Test Beam Experimental Area at AD/ELENA

This ECR describes the request for the remodelling of the former ATRAP2 experimental area in the AD hall to make it available for a new test beam area.

The proposal involves :

- Removing the old ATRAP solenoid magnet;
- Removing the platform surrounding the magnet;
- Changing the LNE03 line layout (e.g. adding a SEM);
- Modifying the shielding layout;
- Replacing the personnel access device with an EIS-access door;
- Equipping the zone with electricity, demineralised water, compressed air, fibre connectivity;
- Adding a new access route to the 193-S3-G22 storage platform with appropriate stairs and handrails.

The document describes:

- Remodelling the space to become more efficient and up to modern standards. This will involve changes to the access route;
- A new optics design in case of horizontal use (should this be needed, a separate ECR will be produced);
- A possible redesign for the vacuum layout;
- New shielding;
- Electrical and cooling water distribution.

ECR for Approval

Installation of New Test Beam Experimental Area at AD/ELENA

AD-LJ-EC-0026
Version **0.4**

By Maud Wehrle

- **Seen** by LEFORT Bertrand (BE-OP)
Really nice document, no comments.

- **Seen** by DUTHEIL Yann (SY-ABT)

- ✔ **Accepted** by GAMBA Davide (BE-ABP)
Thanks!

- **Seen** by AHDIDA Claudia Christina (HSE-RP)
Seen

- ✔ **Accepted** by PONCE Laurette (BE-OP)
OK

Seeking approval from EATM

Thank you!