

East Hall under construction - 1962

East Area Renovation – CSR#3 EA Deliverables and Configuration Management

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ENGINEERING
DEPARTMENT



EN-EA Group Deliverables for EAR

The EN-EA group deliverables for the East Area Renovation project are mainly:

- Mixed and primary areas shielding
- Dump primary area
- Gas supply system to experimental areas
- False floor bldg. 251
- Cabling (patch panels connections between exp. areas and control rooms)
- Magnet supports
- Beamline equipment with supports: Collimators, XCET, TCX, Converters
- 4 control rooms for experimental areas
- Vacuum system of all beamlines

In addition the group is providing also project wide supports:

- Mechanical integration
- Physics optics with beach files
- Configuration management (layout database, ...)

Equipment Readiness Reviews

Equipment readiness reviews for the EA deliverables:

7 May 2019 - First Equipment readiness review <https://indico.cern.ch/event/816919/>

5 July 2019 <https://indico.cern.ch/event/830225/>

20 September 2019 <https://indico.cern.ch/event/841949/>

11 November 2019 <https://indico.cern.ch/event/860674/>

GOALS:

- Follow the status of the EN-EA deliverables
- Identify opens points and critical aspects
- Monitor eventual delay proposing alternative solutions
- Verify advancements according to the project planning

PARTICIPANTS:

- EN-EA responsables for East Area Project and beamline equipment
- Project Safety Officer
- Project Leader
- Experts of specific fields when required

Production Readiness Reviews

GOALS: Checkpoint before big commitments in industry or with CERN services!

- Validation of drawings before launching the production
- Comparison between physics files, integration and layout before providing alignment files to survey group
- ...

Equipment readiness reviews done in the past for EA deliverables:

- 02-08-2019 - Review F61 and F62 lines magnets supports
- 26-09-2019 - Technical meeting Collimators
- 01-08-2019 - BLM position verification with OP
- 27-06-2019 - Technical and safety review # 1 <https://indico.cern.ch/event/830680/>
- 31-07-2019 - Review Beatch files and positioning F61, F62, F63, F6D and T08 lines - EDMS 2059467
- 5-11-2019 - XCET production readiness review with main workshop and HSE - EDMS 2270959

MAIN readiness reviews needed in the future:

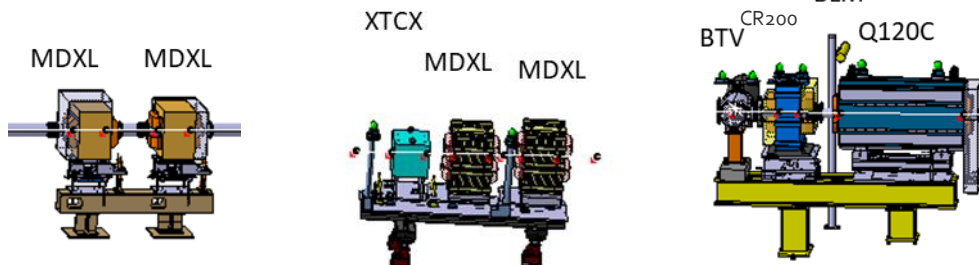
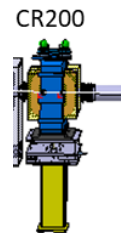
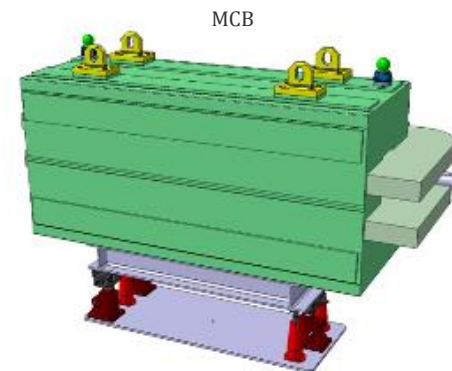
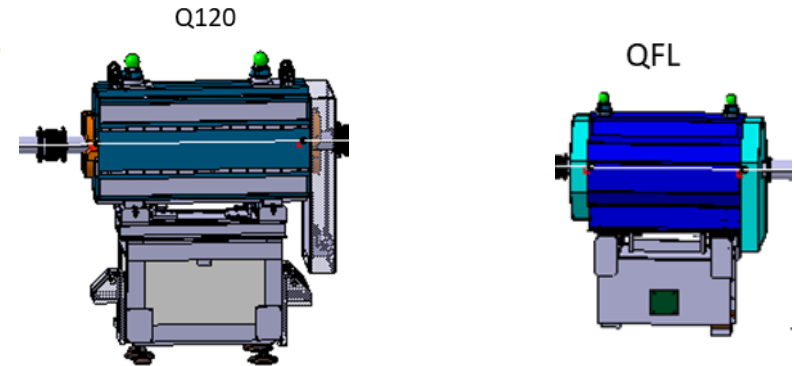
- Beatch files T09, T10, T11 lines verification
- Magnets supports readiness for T08, T09, T10, T11 lines
- Vacuum needs and drawings for T08 T09 T10 and T11 lines
- East Area commissioning planning with OP

EA Deliverables Summary Status

		Status	Foreseen Delivery	Urgency	Critical Points
Magnet supports	54 supports	F61 F62 Ready for installation	Installation for b.352 Dec2019 - b.157 Apr2020	High	Support plug-in Drawings folders secondary lines
Vacuum system	all East Area lines except F6D and F63	F61 and F62 under construction	Installation for b.352 Apr2020- b.157 Jun2020	High	Magnets for chamber installation Drawings folder secondary lines
Collimators	3 collimator 2-blocks 4 collimators 4-blocks	Maintenance on 4-blocks started Production of one new 2-blocks started with AP	Installation Jul2020	Normal	Re-assembling of 4 blocks collimator
XCET	4 XCET (2 on T09 and 2 on T10)	Production started	Installation May2020	Normal	HSE certification
Shielding	Dump primary area, shielding, shielding roof	Offers request	Installation for b.352 Dec2020 b.157 Mar2020	High	Leak tightness roof primary area
False floor b.251	/	Ventilation and cooling system installation, cable tray installation	Complete installation May2020	1.5 months delay on schedule	Delay for structure installation
Equipment	XBPF vessel, XTCX with support, XCON	Fabrication and offers started	b.352 Feb2020 – b.157 May2020	According to schedule	
Gas supply system	Gas supply for experimental area	Offer for building gas system received Predesign for tube supports done	Oct 2020	According to schedule	
Control Rooms	4 control room for experimental areas	Technical specification on going	Installation Jul2020	According to schedule	

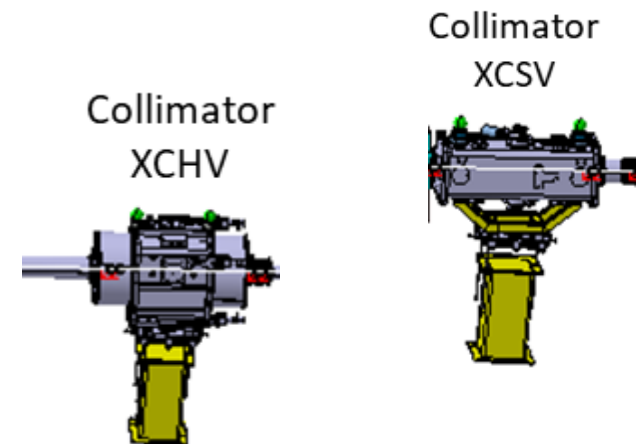
Magnets Supports

- 3D design + 2D drawings **COMPLETED** for primary lines
ON GOING for other lines
- **Plug-in support: priority!**
- 54 supports fabrication in EA workshop: **ON GOING**
 - 12 metal base recovered (small modifications for angles)
 - 18 concrete base recovered + production of interface frame
 - 8 Universal supports (for 2: small modifications) in stock?
 - 13 Adjusting system support (plug-in and non)
 - 3 supports multiple components (plug-in and non)
- **PRODUCTION READINESS**
- Primary lines supports : **ready for installation**

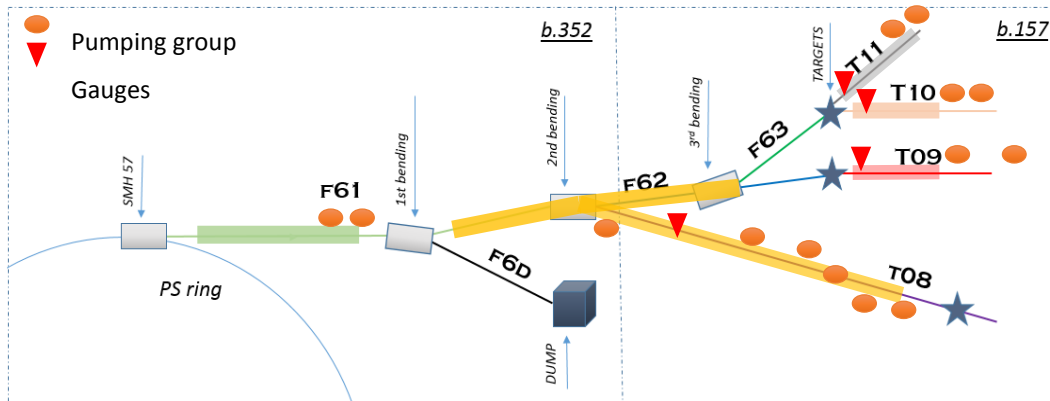


EA Equipment

- **4 Cerenkov counters:** body and support in stock, production of chambers and windows: 3D and 2D drawing finalized. Part production on going. HSE certification on going
→ **PLANNING:** assembly Feb 2020, Pressure test Mar 2020, installation May 2020.
- **1 TXC fixed collimator:** 3D+2D model done, production on going..
- **3 Collimators 2 blocks:** 2 on stock, 1 to be produced in external companies: order on going with main workshop
- **4 Collimators 4 blocks:** one collimator dismantled with update of procedure, re-assemble on going
- **3 Converters:** 3D model done, technical specification on going for production in EN-EA
- **4 XBPF (beam profile monitors):** vessel ordered
- **Supports:** on stock
- **Universal tables:** 10 ordered



Vacuum System



Vacuum system divided in 5 sectors:

- Sector 1: from BTV in F61 until 1st bending, in green
- Sector 2: from 1st bending to 3rd bending in F62 and to IRRAD in To8, in yellow
- Sector 3: To9 line, in red
- Sector 4: T10 line, in pink
- Sector 5: T11 line, in grey

- **F61 + F62 PRODUCTION** in EN-EA workshop: ON GOING, missing magnet chambers of magnets still not available
- **F63 – F6D** → no vacuum
- **To8, To9, T10, T11** → integration model on going, order for vacuum tubes done
- **Cabinets for pumping group control** : 12 cabinet production in EN-EA-AS on going, prototype done and validate, reception end Nov 2019

Configuration Management for EAR

Thanks to the help and following the examples of the colleagues from EN-ACE-CL, EN-EA is also implementing a configuration management approach to the East Area beamlines:

GOAL: Provides a clear and coherent picture of the status of a **BEAMLINE at a given point in time!**

- **Hardware Baseline:** Product Breakdown Structure in EDMS of all beamlines
- **Layout Database:** Sequence of functional positions = space management
Integration and Installation Drawings
- **Naming:** verify and registering all EA names on Naming Portal

Hardware Baseline



[...]

East Area Renovation Project

Project management

Presentations

East Area Renovation HARDWARE BASELINE

Magnets

Power Converters

Beam instrumentation

Beam intercepting devices

Vacuum system

Networks

Controls

Electrical Systems

Cooling and Ventilation

Handling

Civil Engineering

Radiation Protection

Machine Interlocks

Alarms

Personnel Protection System

Survey

Operation

Safety

Shielding

Collimation

Gaz

Exp. Areas & Layout change

Dismantling

Layout and database

Mechanical Supports

Budget

Schedule

<https://edms.cern.ch/project/CERN-0000171687>

Hardware Baseline

- [-]
- East Area Renovation Project
 - Project management
 - Presentations
 - East Area Renovation HARDWARE BASELINE**
 - Magnets
 - Power Converters
 - Beam instrumentation
 - Beam intercepting devices
 - Vacuum system
 - Networks
 - Controls
 - Electrical Systems
 - Cooling and Ventilation
 - Handling
 - Civil Engineering
 - Radiation Protection
 - Machine Interlocks
 - Alarms
 - Personnel Protection System
 - Survey
 - Operation
 - Safety
 - Shielding
 - Collimation
 - Gaz
 - Exp. Areas & Layout change
 - Dismantling
 - Layout and database
 - Mechanical Supports
 - Budget
 - Schedule

<https://edms.cern.ch/project/CERN-0000171687>

Drawing folder

2261166 v.0.1 | PSZ-H-DF-0002 v.0.1 In Work Sensitive
MAGNET QFL PLUG IN by VINCENT CLERC

- Mechanical Supports
 - Magnets Supports
 - DRAWINGS
 - MAGNET QFL PLUG IN
 - PSZHMQA0013 (v.0) WEDGE JACK STAND QFS
 - PSZHMQA0006 (v.0) FRAME QFL SET
 - LHCHCMAB0327 (v.0) PLANIMETRIC ADJUSTMENT MECHANISM -
 - LHCHCMAB0326 (v.0) PLANIMETRIC ADJUSTMENT MECHANISM -
 - PSZHMQA0005 (v.0) LOWER FRAME QFL
 - PS_TDIL_0285 (v.0) ASSEMBLY FOOT WITH BALL PS DUMP
 - PS_TDIL_0286 (v.0) BALL SUPPORT (before machining PS_TDIL_(
 - PSZHMQA0004 (v.0) QFL SUPPORT BASE PLATE
 - LHCHCMAB0328 (v.0) PLANIMETRIC ADJUSTMENT MECHANISM -
 - PSZHMQA0006 (v.0) CENTRING PIN PLANIMETRIC TABLE
 - PSZHMQA0012 (v.0) PLATE SYSTEME ALIGNEMENT PLUG IN
 - PSZHMQA0003 (v.0) UPPER FRAME QFL SET
 - PSZHMQA0007 (v.0) UPPER FRAME QFL
 - PS_TDIL_0288 (v.0) BALL SUPPORT IN V PS DUMP
 - PSZHMQA0018 (v.0) CLAVETTE 3061081 12_8_32
 - PSZHMQA0009 (v.0) FIXATION PLATE FUNNEL
 - PSZHMQA0010 (v.0) FIXATION PLATE V_BALL
 - PSZHMQA0014 (v.0) RONDELLE Ø60
 - PSZHMQA0009 (v.0) SYSTEME ALIGNEMENT QFL
 - PSZHMQA0008 (v.0) QFL ROD OF ADJUSTMENT
 - PSZHMQA0010 (v.0) PALPEUR QFL
 - PSZHMQA0002 (v.0) MAGNET SET QFL PLUG IN
 - 2244146 (v.1) ENTONNOIR SYSTEME ALIGNEMENT 8088.6010.1
 - 2244159 (v.1) APPUI VERIN 8088.5863.4
 - 2244498 (v.1) PIED DE CENTRAGE 8088_6009_2

Layout Database

- PS East Hall Complex
 - F61 Transfer Line
 - F61.MQNCL007
 - F61.HMQAD007
 - F61.BLM008
 - F61.BTV012
 - F61.MCXCE013
 - F61.MQNEL014
 - F61.HLMAC014
 - F61.MCXCE015
 - F61.HMCAD015
 - F61.TBS016
 - F61.TBS017
 - F61.TBS018
 - F61.TBS019
 - F61.TBS020
 - F61.MQNEF021
 - F61.HMQAN021
 - F61.BCTF022
 - F61.HBCTF022
 - F61.BCGAA023
 - F61.XSEC0.23
 - F61.MBXHD025
 - F61.HMBAD025
 - F61.BLM027
 - F61.BCGAA023
 - F61.XSEC0.23
 - F61.MQNEG030
 - F61.BLM027
 - F61.HMQAH030
 - F61.MQNEG030
 - F61.MBXHD033
 - F61.BLM035
 - F62 Transfer Line
 - F63 Transfer Line

Physics Name – Expert Name (chosen by physicists)
EDMS 2271129

Functional Position (slot name)




The screenshot displays the 'MACHINE hierarchy' on the left, listing various components under 'F61 Transfer Line'. The main panel shows details for 'F61.MQNCL007', a 'Quadrupole magnet, type Q74', with an 'Expert Name' of 'F61.QFN01'. The 'Dimensions' are listed as width 0.74m, height 0.41m, and depth 0.225m. The 'Machines' field is highlighted in purple and contains the text 'F61 (F61 TRANSFER LINE, F61 Transfer Line)'. Below this, a 'Distances' table is shown with columns for Distance type, Dime, From, To point, Strea, S [m], U [m], V [m], Valid, Valid, and Act.

Distance type	Dime	From	To point	Strea	S [m]	U [m]	V [m]	Valid	Valid	Act
DISTANCE CUMULATED	52943...	F61 STAF	F61.MQNCL007 START	UPST...	6.45	0	0	LS2	ENDL...	
DISTANCE CUMULATED	52943...	F61 STAF	F61.MQNCL007 MIDDLE	MIDST...	6.82	0	0	LS2	ENDL...	
DISTANCE CUMULATED	52943...	F61 STAF	F61.MQNCL007 END	DOWN...	7.19	0	0	LS2	ENDL...	
DISTANCE CUMULATED	52943...	F61 STAF	F61.MQNCL007 MIDDLE OPTIC		6.82	0	0	LS2	ENDL...	

Layout Database

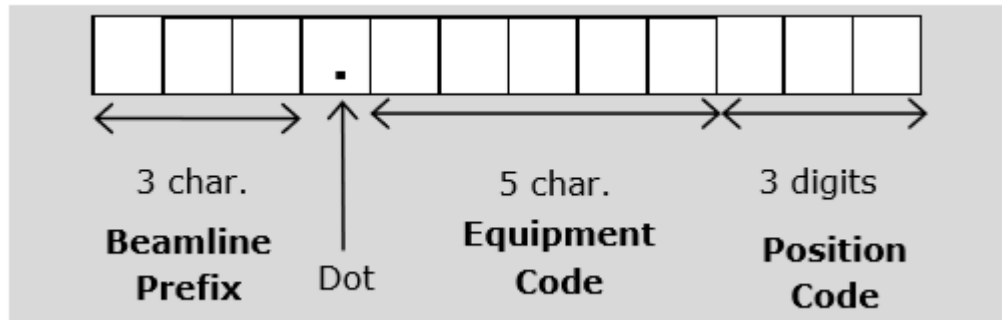
<https://layout.cern.ch/search>

	Functional Positions	Relative Positioning	EDMS ITEMS	Drawings and Dimensions	Magnets Data for MADX
F61	Finished	On-going	On-going	On-going	To be done
F62	Finished	On-going	On-going	On-going	To be done
F63	Finished	On-going	On-going	On-going	To be done
F6D	Finished	On-going	On-going	On-going	To be done
To8	On-going	On-going	On-going	On-going	To be done
To9	To be done	To be done	To be done	To be done	To be done
T10	To be done	To be done	To be done	To be done	To be done
T11	To be done	To be done	To be done	To be done	To be done

-  Finished
-  On-going
-  To be done

Naming

- Naming Portal <https://naming.cern.ch/naming/ui/codes/PS/PX>
- East Area Naming Convention <https://edms.cern.ch/document/1723747/1.3>



- Quality Website
<https://quality.web.cern.ch/conventions>

Quality
Quality Management Support for the Accelerators & Technology Sector

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Conventions

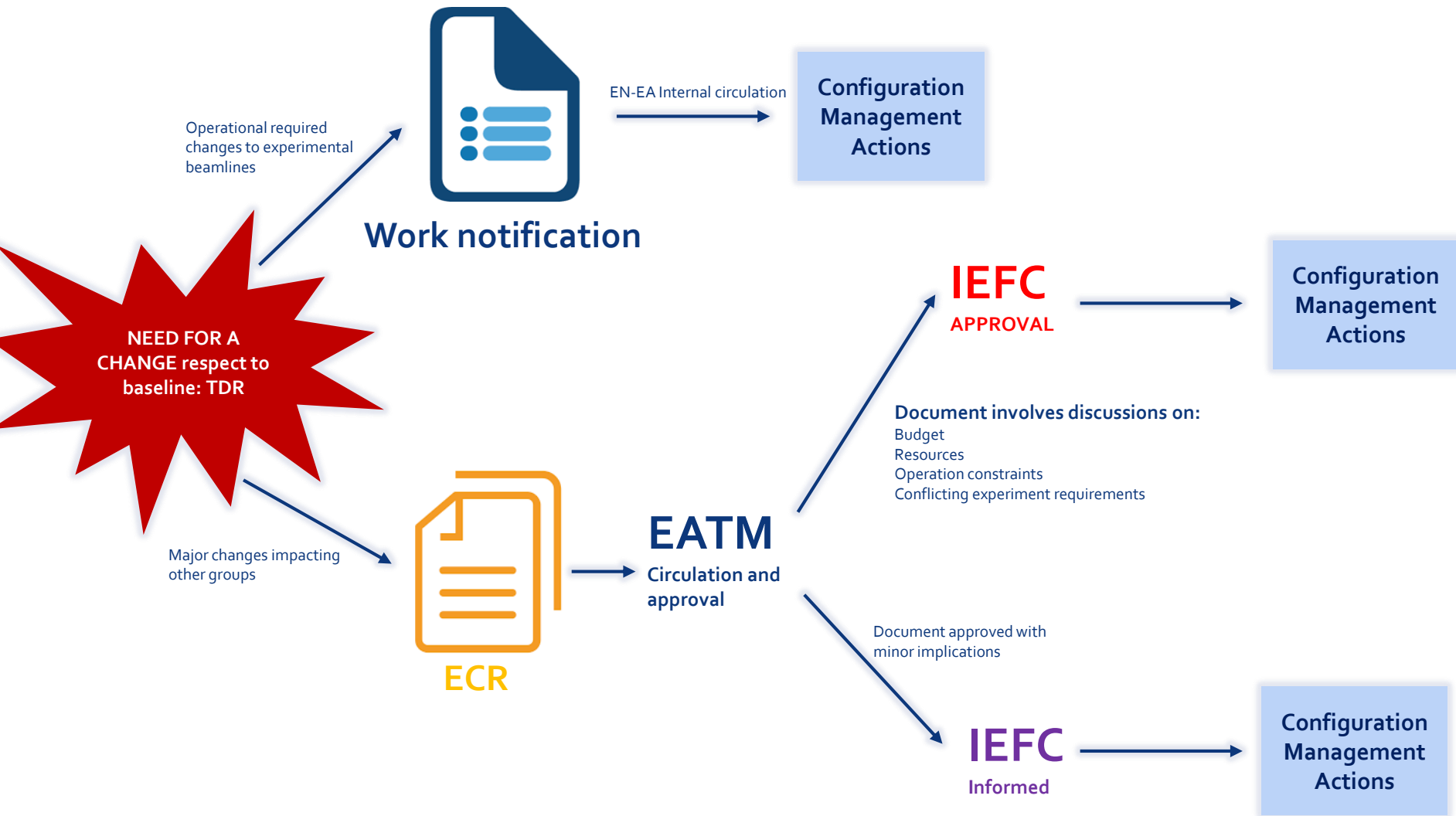
- [Applicable Standards at CERN](#) (Quality website)
- [Naming Conventions](#) (Quality website)
- [Project Codes and Naming Conventions](#) (Quality website)
- [List of PS Machine Systems Codes](#) (Quality website)

Documents and Beatch Files

- **Beatch Files:** F61, F62, F63, F6D, To8 **READY**.
Secondary beam lines: position of equipment check in progress.
Discussion with Survey Team for alignment files.
- **Documents:**
 - ECR F61 Line 2038214 <https://edms.cern.ch/document/2038214/1.0>
 - Access Specification EA1 990209 – New Version **Under Approval**
<https://edms.cern.ch/document/990209/5.1>
 - Access Specification IRRAD: 990210 – New Version **Under Approval**
<https://edms.cern.ch/document/990210/5.1>
 - TDR: Technical Design Report <https://edms.cern.ch/document/2224589/0.2>

RELEASED

Handling Changes → Baseline TDR



Thank you!



Configuration Management Actions

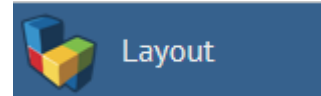
NEED FOR
A CHANGE



Configuration
Management
Actions

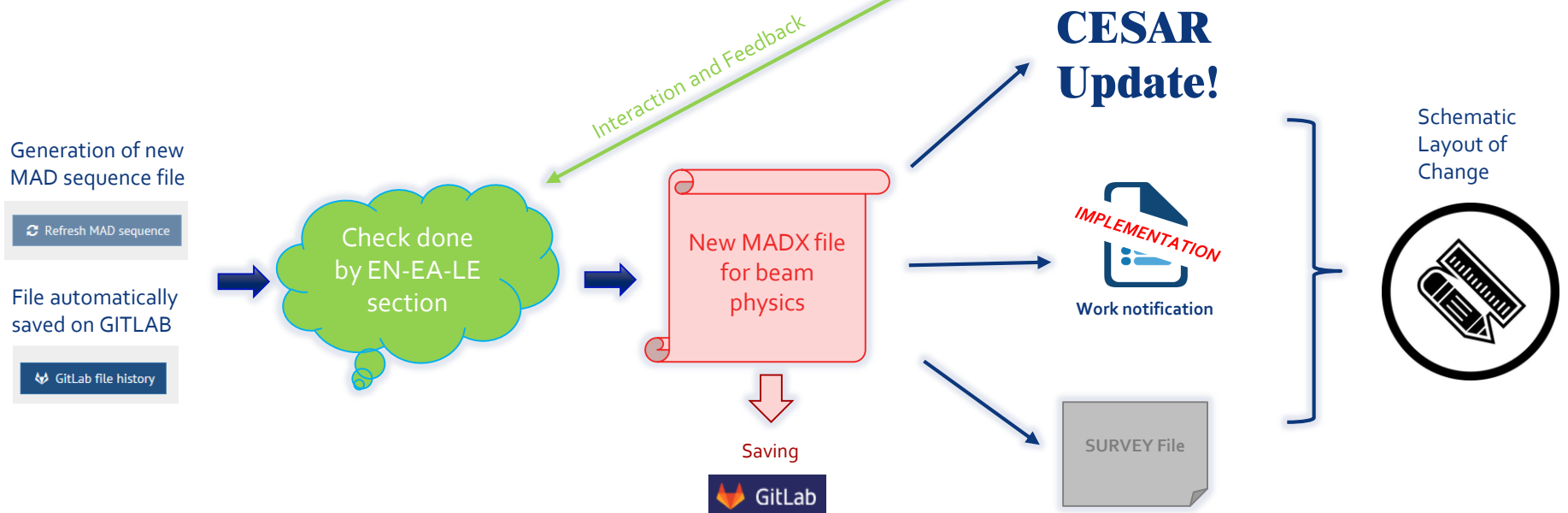
- Update of Hardware Baseline Documents/Drawings
- Registering possible new names on Naming Portal
- **Update of LAYOUT DATABASE functional position**
- (Creation of NEW MAD sequence file)

Refresh MAD sequence



Creating a Work Notification or a ECR has a BIG impact!

Workflow of Configuration Management



Schematic Layout of Change



Possible automatic generation from layout database data under study

