

Status of ISOLDE (Frontends) Shutdown Works

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ISCC meeting 19th March 2019

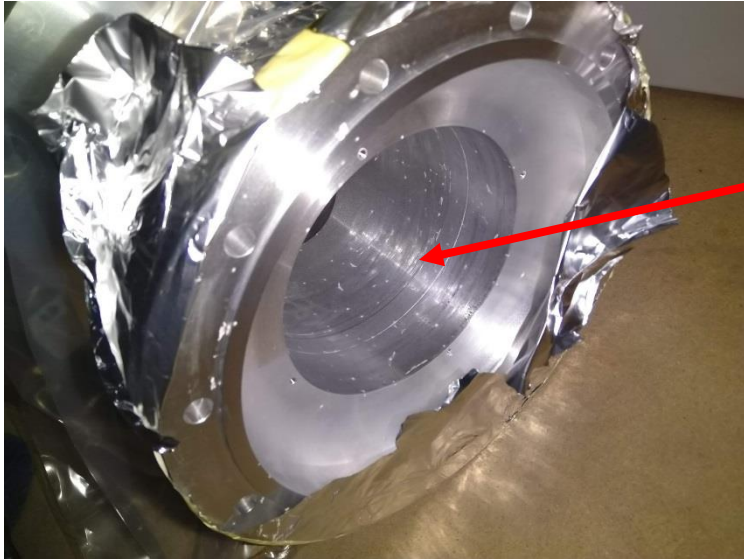
Outline

- Production of new Frontends
 - Status
 - Modifications
- Removal of old Frontends
 - Status
- The first time we replace 2 Frontends AND beam diagnostic chambers

Delays

- NEW2 (Pakistan)
 - Delivery of first order – not to specifications and poor surface finishing
 - Repeat order – specs met but poor packaging – damaged parts corrected at CERN
- Cleaning
 - CERN cleaning service accidentally left in ultrasound baths too long/used wrong frequency/intensity/poor cleaning. Resulted in corrosion of chambers that had to be rectified.
- New extraction electrode design
- A lot of minor rectifications

Some examples

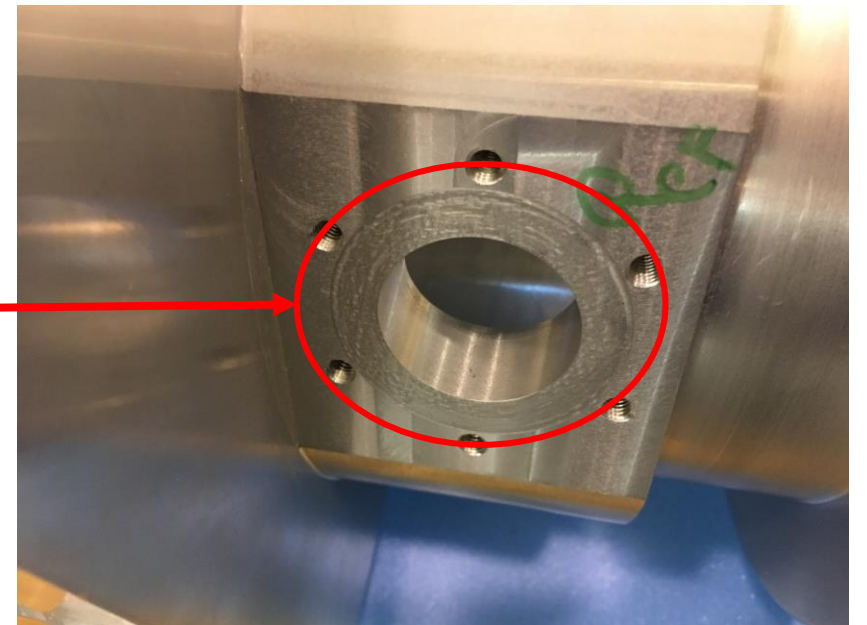


Pitting after
ultrasound cleaning

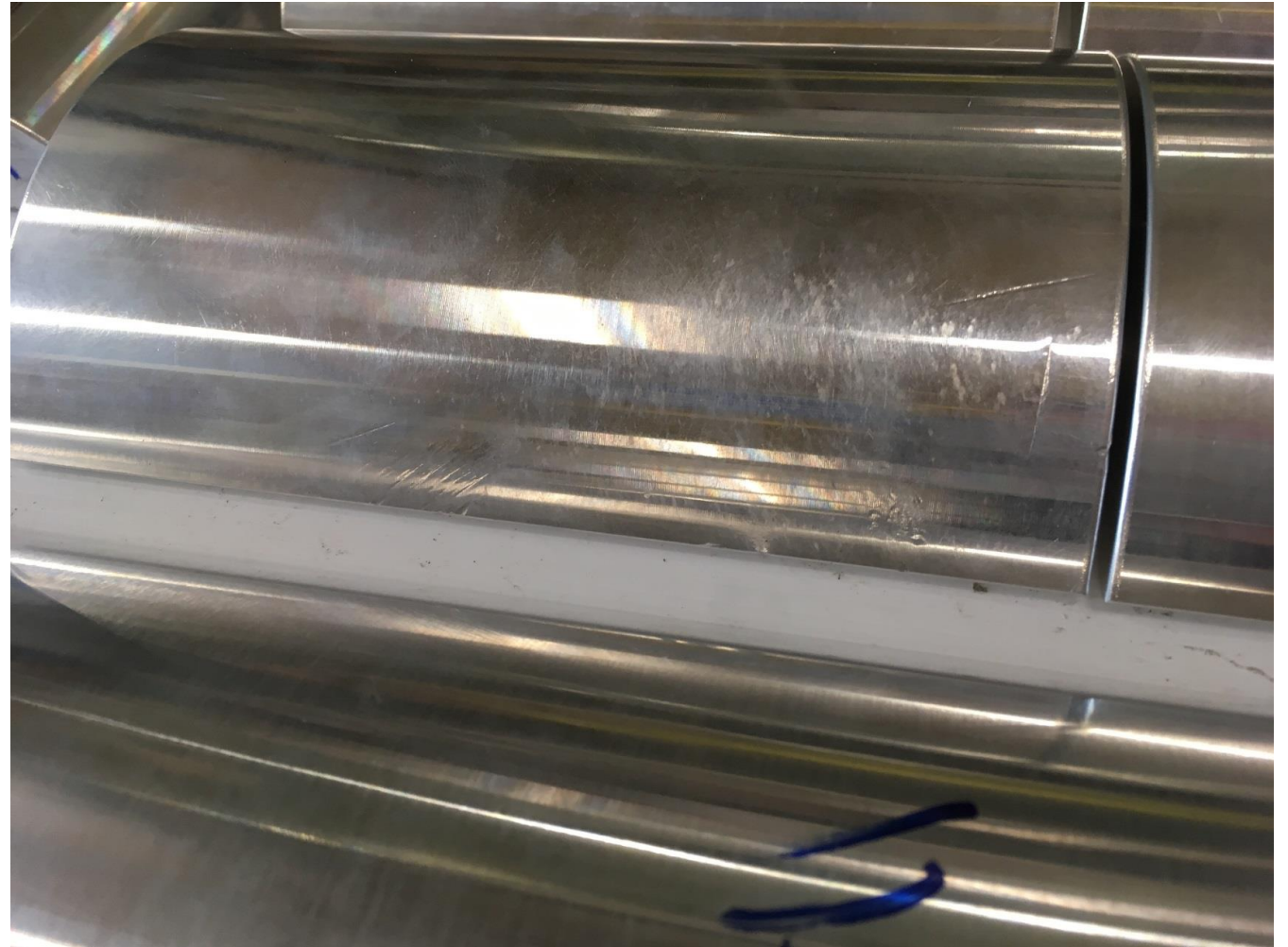


Poor material quality

Poor surface finish

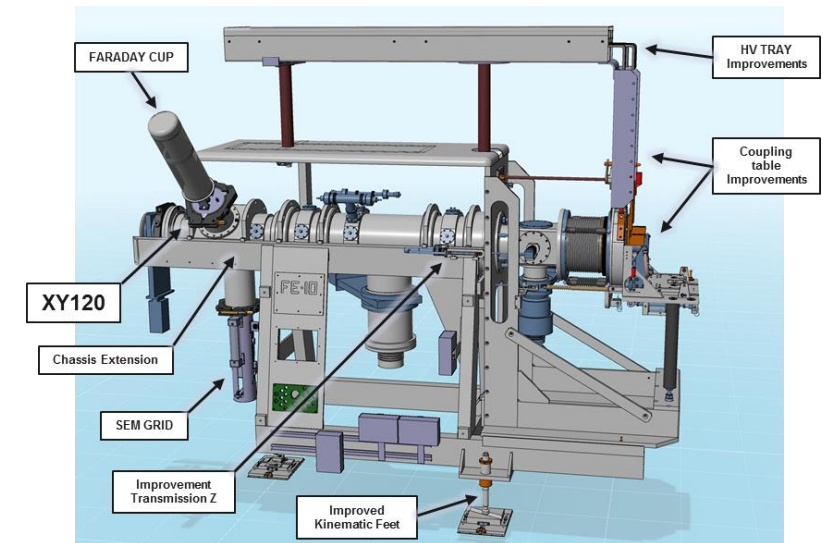


The results of poor packaging

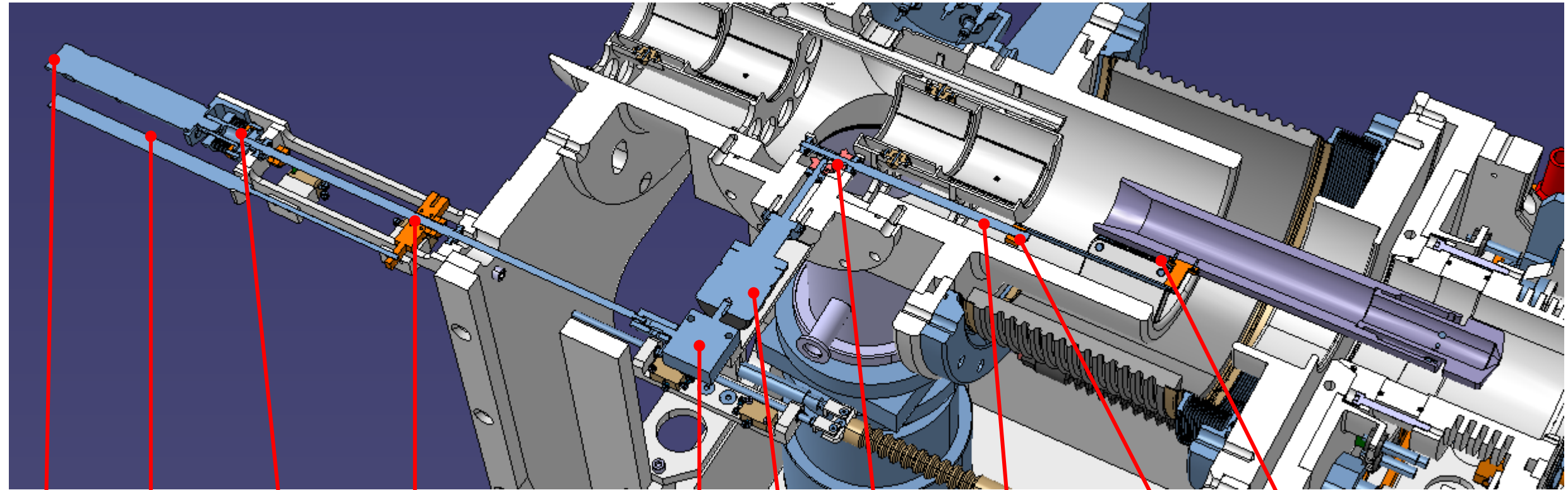


Major modifications

- 3 gas lines to each target. Increase in diameter up to FE connector.
- **New extraction electrode movement**
- 2 RF connectors on each Frontend
- Replacement of all cabling in faraday cages
- New chamber at back of FE



Actual Extraction Electrode movement



Compressed
Air supply
Checked OK

Pneumatic motor
Checked OK

Clutch
Checked OK

External mother screw
Checked OK

90° gear box
???

Rotatory feedthrough
???

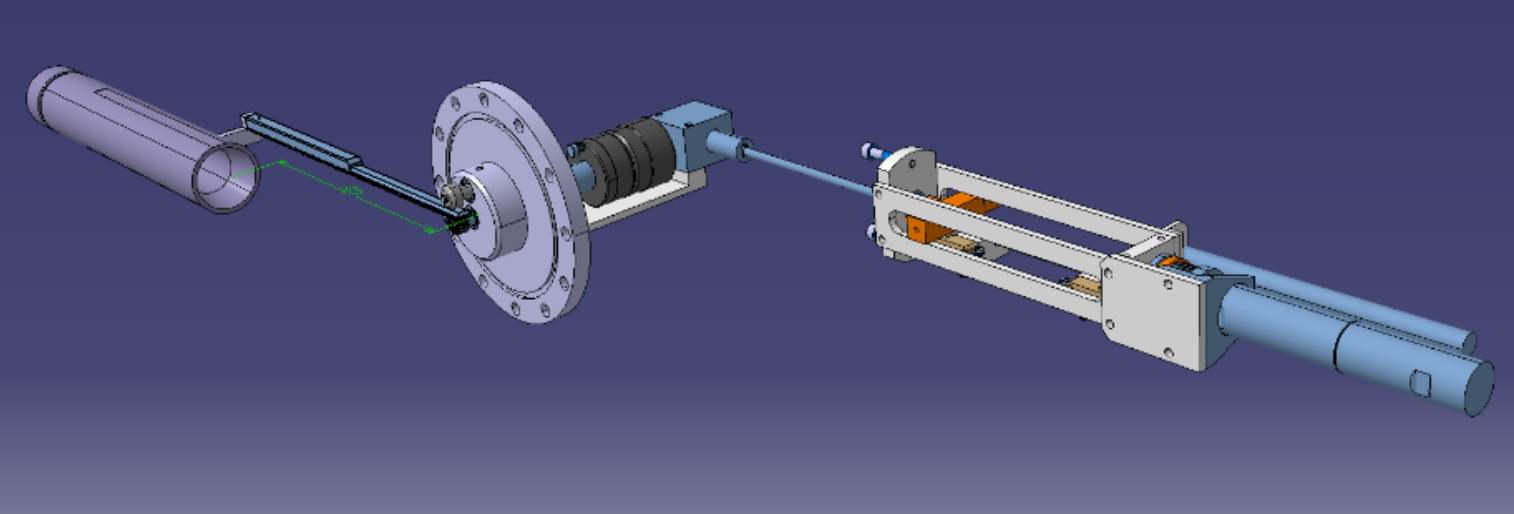
90° pinions
???

Internal mother screw
???

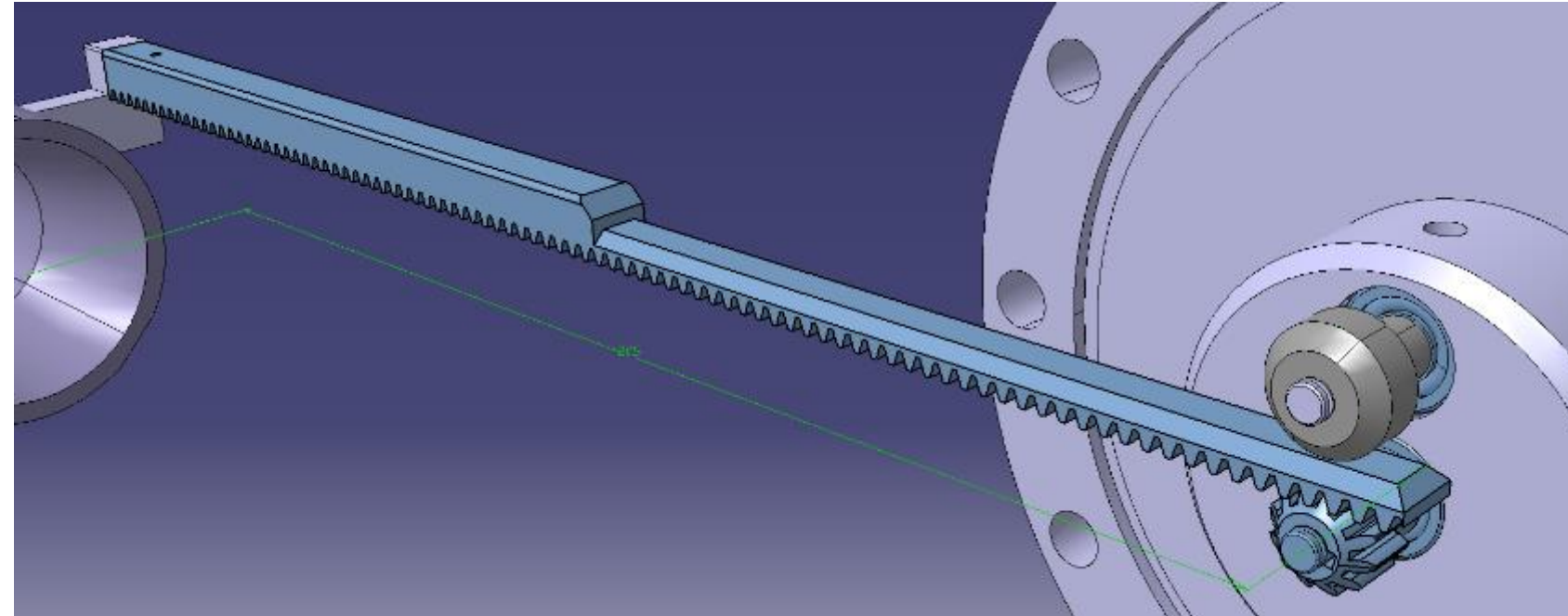
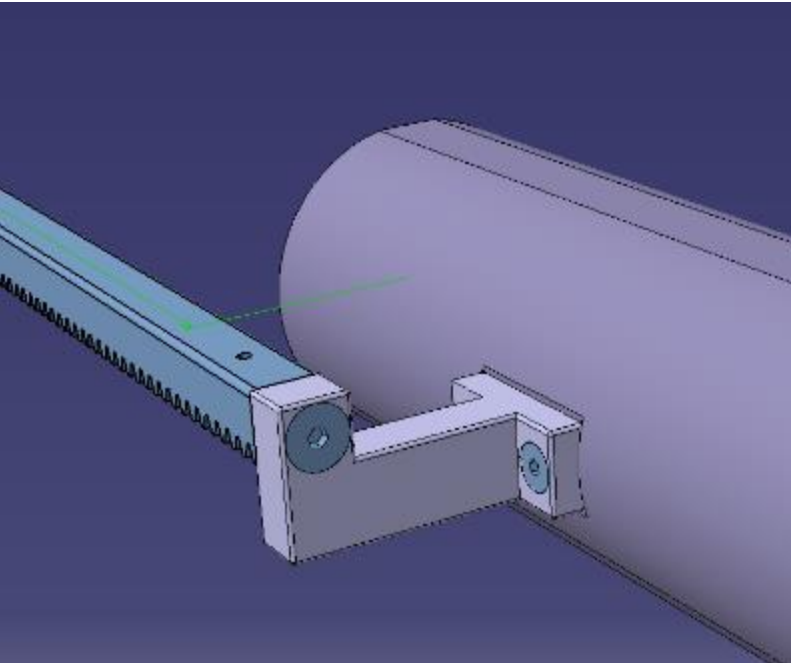
Bronze nut
???

6x bearings
???

New Extraction Electrode Design



Tested for 600 movements on test stand
= ~15 years of operation
Installed on Off-line 2 and MEDICIS Frontends



HRS Frontend Status

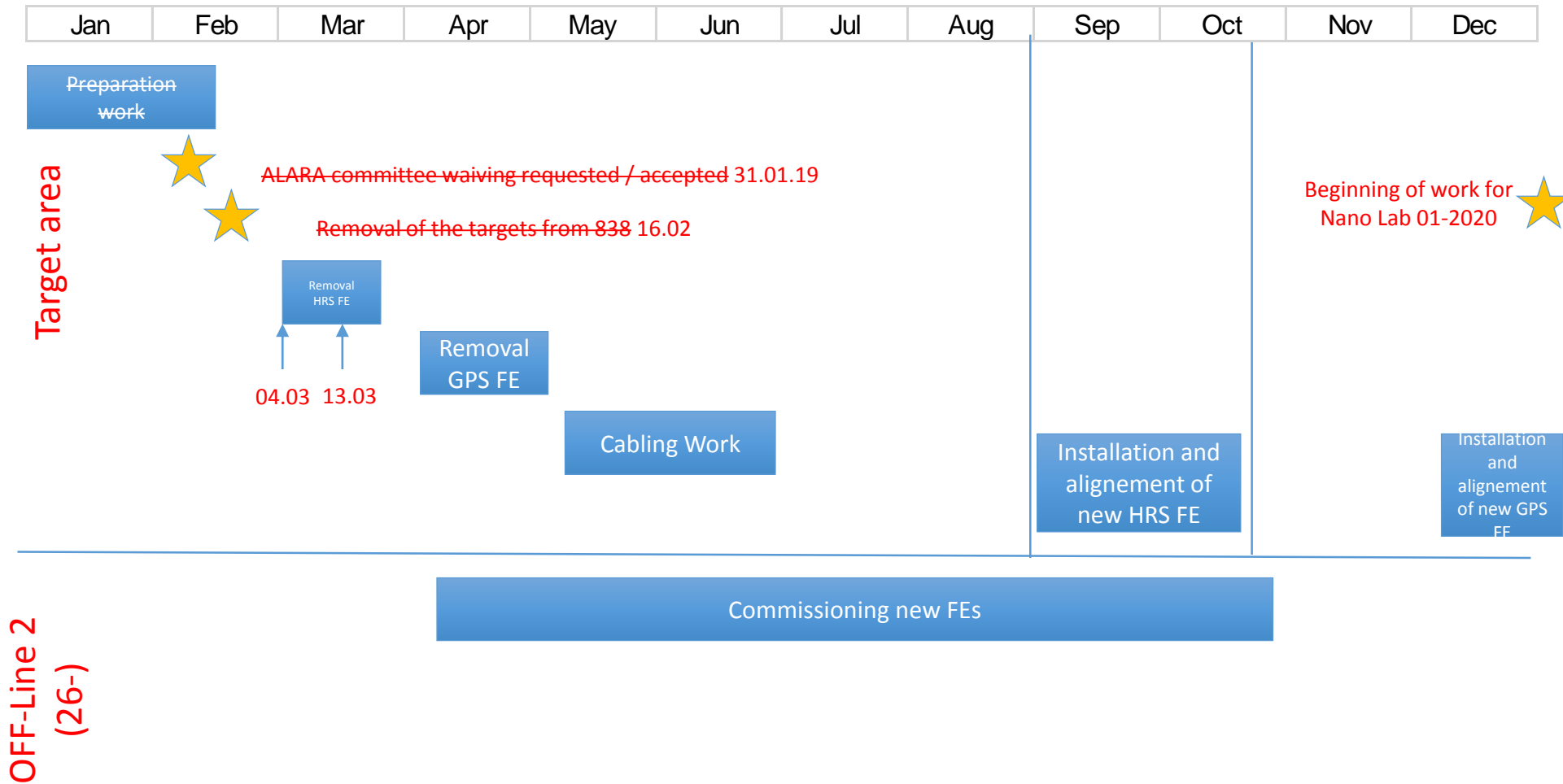
- Main assembly finished
- Internal alignment done
- Should finish with auxiliary parts and cabling by the end of this month
- Testing on Off-line 2 as from the beginning of April
- Production of next FE should be faster
 - All parts order or duplicated
 - No more delays expected



Outline

- Production of new Frontends
 - status
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- **Removal of old Frontends**
 - Status
- The first time we replace 2 Frontends AND adjacent beam diagnostic chambers

PROVISIONAL SCHEDULE 2019



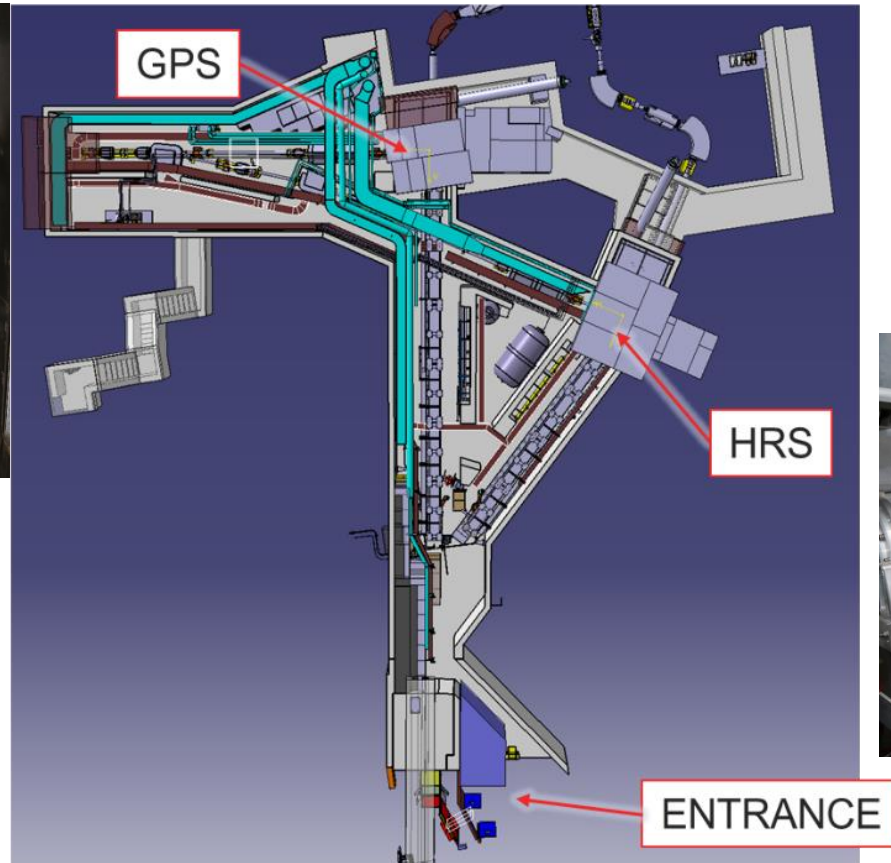
ADMINISTRATIVE WORKS

References	GPS	HRS
✓ IMPACT	123409	123487
✓ DIMR	7980657	7980676
✓ WDP	1640	1646
Collective Dose	7747uSv	8962uSv
Max. Individual Dose	1547uSv	1635uSv

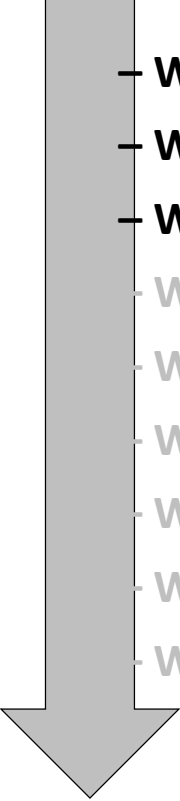
- ☐ Safety derogation approved to skip ALARA committee <https://edms.cern.ch/document/2080160/1>

SITUATION


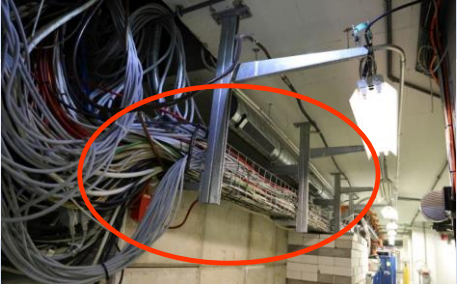
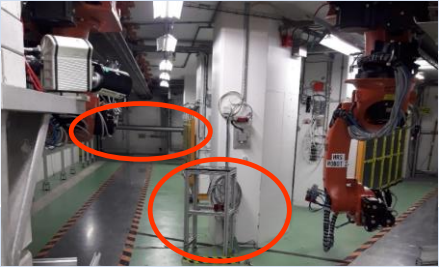
TARGET AREA




PROVISIONAL SCHEDULE FOR HRS FE REMOVAL

- 
- **WEEK #10 – PHASE 0** : REQUIREMENT TO REMOVE THE Fes
 - **WEEK #10 – PHASE 0** : PREPARATION TO **HRS** FE REMOVAL
 - **WEEK #10-11 – PHASE 1** : **HRS** FE REMOVAL
 - WEEK #XX – PHASE 1 : BACK PART OF **HRS** FE REMOVAL (SEMGRID AND BE-BI DEFLECTORS)
 - WEEK #XX – PHASE 2 : CABLING WORKS
 - WEEK #XX – PHASE 3 : REINSTALLATION OF THE NEW FE AND ALIGNMENT
 - WEEK #XX – PHASE 4 : COUPLING AND CONNECTION
 - WEEK #XX – PHASE 5 : VERIFICATION, ADJUSTMENT, TESTS
 - WEEK #XX – PHASE 6 : FINAL WORKS




PHASE 0 : REQUIREMENT TO REMOVE THE FEs

STEP	WHO	DATE	PICTURE
<input type="checkbox"/> Remove targets from target area (16.02.18) <input type="checkbox"/> IMPACT 123971	EN-HE, EN-STI, HSE-RP	16.02.18	
<input type="checkbox"/> Height to verify in 179 corridor (ventilation duct) for FE removal = 223cm available	EN-STI		
<input type="checkbox"/> Manufacturing plug for FE	EN-STI (S. Marzari)	01.03.19	
<input type="checkbox"/> Change the position (height of the cable tray) at the target area entrance	EN-HE, HSE-RP J-L. Grenard	04.03.19	
<input type="checkbox"/> Unmount the MONTRAC gate (1) and unmount exchange point (2)	EN-STI / EN-SMM	01.03.19 (1) 06.03.19 (2)	
<input type="checkbox"/> Test to do with the new FE chassis in the target area (EDH 7668116 and 7668149)	EN-HE, EN-STI	06.03.19	
<input type="checkbox"/> Unmount the BTY line for the GPS SIDE	TE-VSC (J. Somoza) HSE-RP	?	
<input type="checkbox"/> Install floor plates above the tranches (beginning and end) <input type="checkbox"/> (EDH 7669892)	EN-HE	06.03.19	


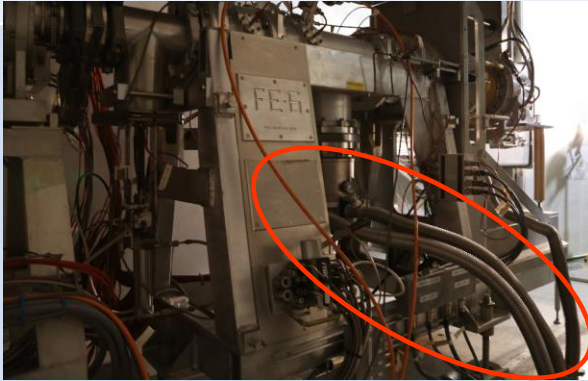
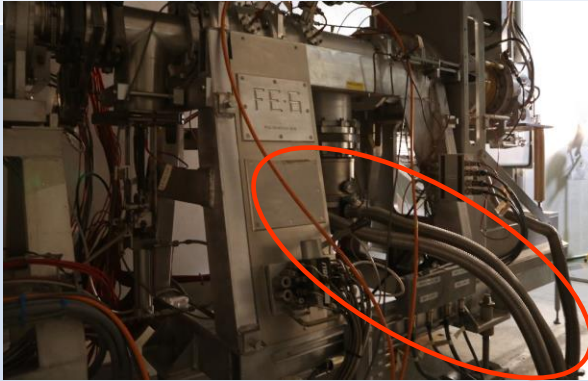
PHASE 0 : PREPARATION TO HRS FE REMOVAL

STEP	WHO	DATE	PICTURE
<input type="checkbox"/> Put the FE and separator to atmosphere	TE-VSC (J. Somoza)	07.03.19 08h30	
<input type="checkbox"/> Water purge HT and BT <input type="checkbox"/> Air purge	EN-CV (J-M. VUAILLAT) EN-STI	07.03.19 09h00	
<input type="checkbox"/> Removal plug target and installation of a sealed plug on the FE (<i>training to do on OFFLINE</i>)	EN-STI (R. Catherall)	07.03.19 14h00	
<input type="checkbox"/> Shut off / lock out water, compressed air, electricity on FE	EN-STI, EN-CV (J-M. VUAILLAT)	07.03.19 15h00	
<input type="checkbox"/> Unmount the MONTRAC cover	EN-STI (R. Catherall)	08.03.19 8h30	

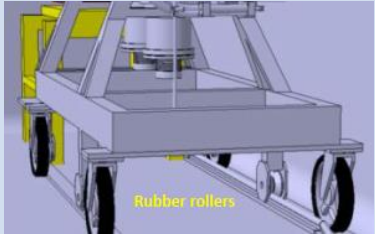


PHASE 0 : PREPARATION TO HRS FE REMOVAL

STEP	WHO	DATE	PICTURE
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Provisioning shielding (EN-STI/EDH) <input type="checkbox"/> Shielding of the BEAM DUMP and protons line (EDH 7678773) 	EN-HE	08.03.19 09h00	
<ul style="list-style-type: none"> <input type="checkbox"/> Removal back part of the coiffe 	EN-STI (R. Catherall)	11.03.19 8h30	
<ul style="list-style-type: none"> <input type="checkbox"/> Cabling disconnection (Water, Air, Electricity HT) 	EN-STI (T. Giles)	11.03.19 10h00	

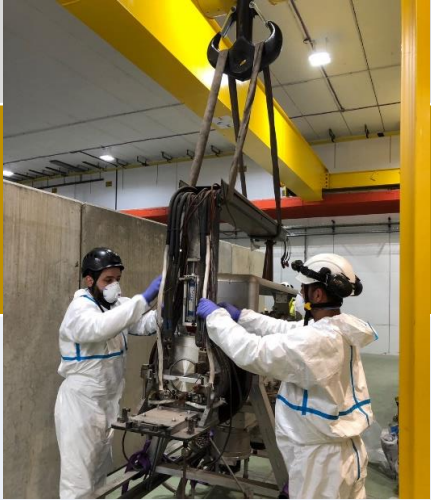

PHASE 0 : PREPARATION TO HRS FE REMOVAL

STEP	WHO	DATE	PICTURE
<input type="checkbox"/> Cabling disconnection (Water, Air, Electricity BT)	EN-STI (T. Giles)	11.03.19 10h00	
<input type="checkbox"/> Disconnect the vacuum wires and gauges	TE-VSC or EN-STI (A. GUTIERREZ)	11.03.19 14h00	
<input type="checkbox"/> Put to ATM primary pumps and disconnection of TOMBAC	TE-VSC (J. Somoza)	11.03.19 15h00	

PHASE 1 : HRS FE REMOVAL

STEP	WHO	DATE	PICTURE
<input type="checkbox"/> Install the wheels on the HRS FE	EN-STI (J. Cruikshank)	12.03.19 8h30	
<input type="checkbox"/> Disconnect PS 195 and put a plug with seal <input type="checkbox"/> install plug on back part (deflector + BE/BI part)	TE-VSC (J. Somoza)	12.03.19 10h00	
<input type="checkbox"/> Install plate on the floor to pass the threshold of the faraday cage	EN-STI (R. Catherall)	15.03.19 08h30	
<input type="checkbox"/> Evacuation of the FE to the Target area entrance	EN-HE, EN-STI (R. Catherall)	15.03.19 09h00	

PHASE 1 : HRS FE REMOVAL

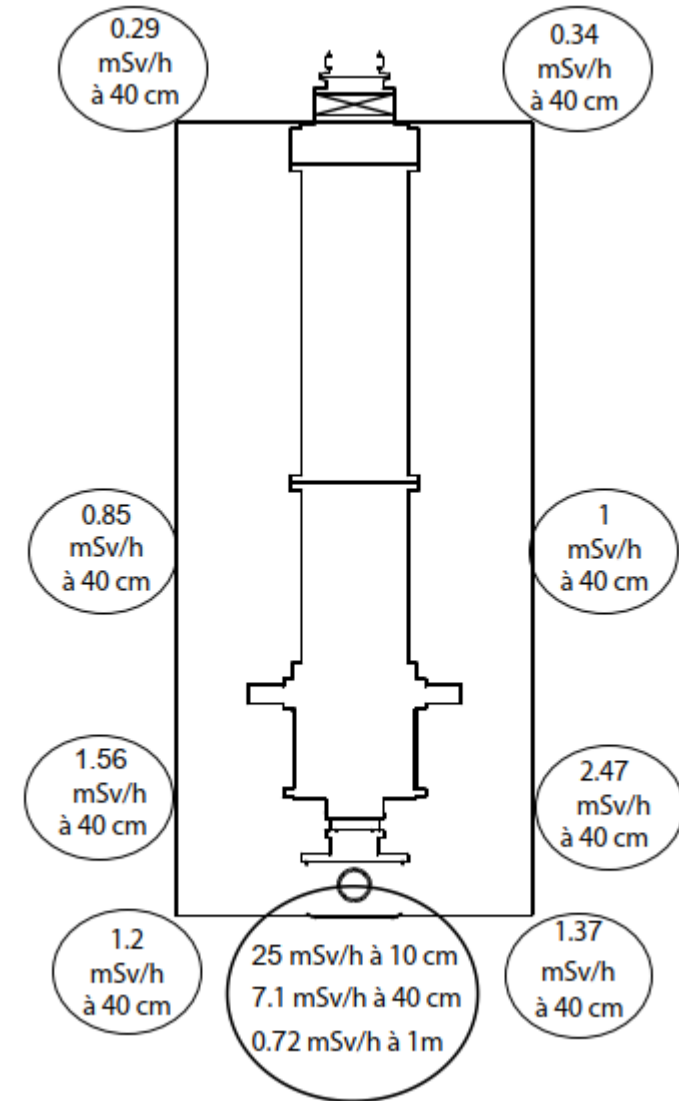
STEP	WHO	DATE	PICTURE
<ul style="list-style-type: none"> <input type="checkbox"/> Set a plastic sheet on the floor <input type="checkbox"/> RP control of FE and fixation of contamination <input type="checkbox"/> Set a protection/confinement around the ceramic part 	<p>HSE-RP EN-STI</p>	<p>15.03.19 10h30</p>	
<ul style="list-style-type: none"> <input type="checkbox"/> Removal of potentiometers x2 	<p>EN-STI (T.Giles)</p>	<p>15.03.19 11h30</p>	
<ul style="list-style-type: none"> <input type="checkbox"/> Transfer of the HRS FE to ISR <input type="checkbox"/> working hour or outside ? <li style="color: #c00000;">Changed from 10h00 to 14h00 <input type="checkbox"/> EDH: 7669598 	<p>EN-HE, HSE-RP, EN-STI (R.Catherall)</p>	<p>15.03.19 14h00</p>	
<ul style="list-style-type: none"> <input type="checkbox"/> <i>Removal of the FE coiffe at ISR</i> 	<p><i>EN-HE</i></p>	<p><i>After transferring GPS FE to ISR</i></p>	
<ul style="list-style-type: none"> <input type="checkbox"/> Various Removal : floor ventilator + canal 	<p>TE/VSC ?</p>	<p>15.03.19 15h00</p>	

Old HRS FE status



- FE successfully extracted from Faraday cage and sprayed for fixing contamination.

Dose rates of HRS FE



Other tasks

- New HT modulator has been installed on GPS.
- Old tape station has been removed from the CA0 beamline.
 - FTS to go in CA0 beam line at end of this month
- Refurbishment of the Off-line 1 separator on-going

- Thank you for your attention.