



**PSB Upgrade**  
LIU Project

**TE/MSC-MNC activities**

**LIU-PSB**

A. Newborough

11<sup>th</sup> September 2018



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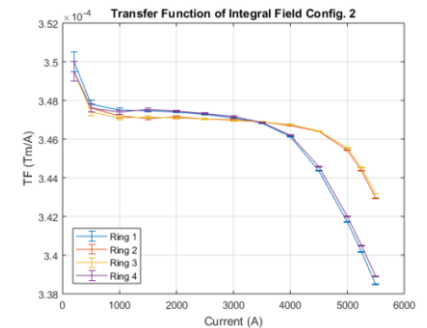
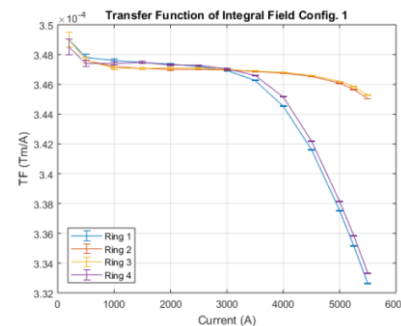


WU 91872

## Deliver operational Main Bending Magnet shimming & Saturation modifications

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- Documents
  - PSB-MB-ER-0001
  - Indico 458040
  - ECR: MBH-EC-0001 (1<sup>st</sup> draft under approval)
- Stainless steel plates
  - CA 7192716
  - HEAVY MECHANICAL COMPLEX 3 – PAKISTAN
  - Delivery ~ Winter 2018
- Laminated side plates
  - DI 2589715
  - Van Halteren Metaal BV, Holland
  - Delivery Winter 2019
- Shimming material & fixings
  - CA7328748, J3049272
  - Various
  - Delivery Winter 2018



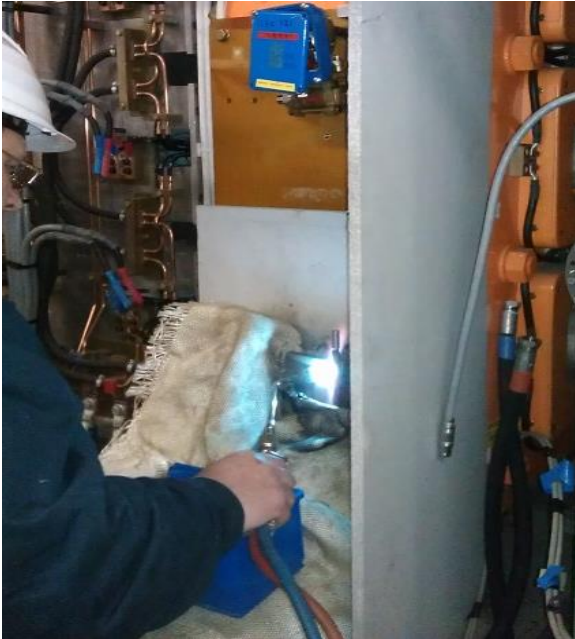
Magnetic measurement report under preparation.



WU 91870

## Deliver operational Main Magnet cooling mods

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- Stage 1 - upgrade of interlocks and brazed connections (COMPLETED)
  - detailed in EDMS 1393802, 1393798 and completed during LS1 with BINP collaboration
- Stage 2 - upgrade of the damping resistors
  - detailed in ECR PSB-M-EC-0001 (under approval)
  - Extensive measurements and simulations have been carried out between BE/APP, TE/EPC and TE/MSC. The initial results show that the proposal to double the ohmic value of the resistors is 'probably' ok and remains the baseline (installation December 2018). Beam Dynamics will be performed and Frank Schmidt will present the full findings in the near future.

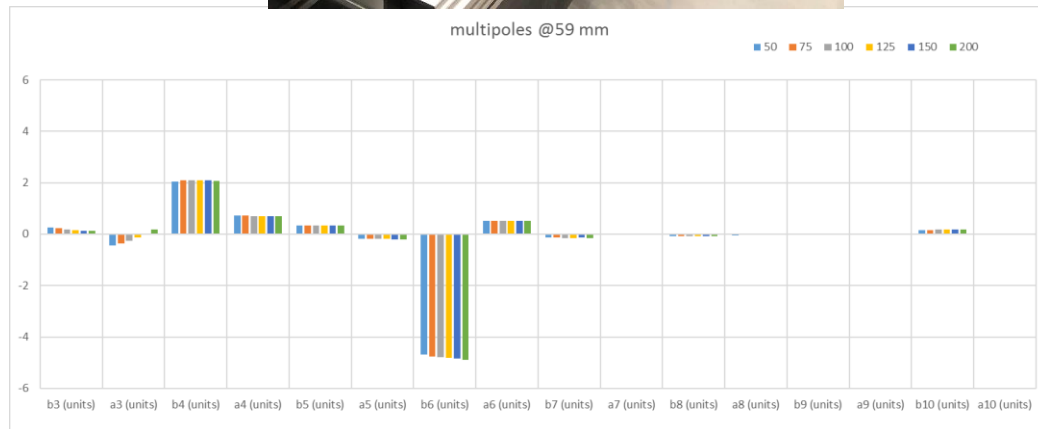
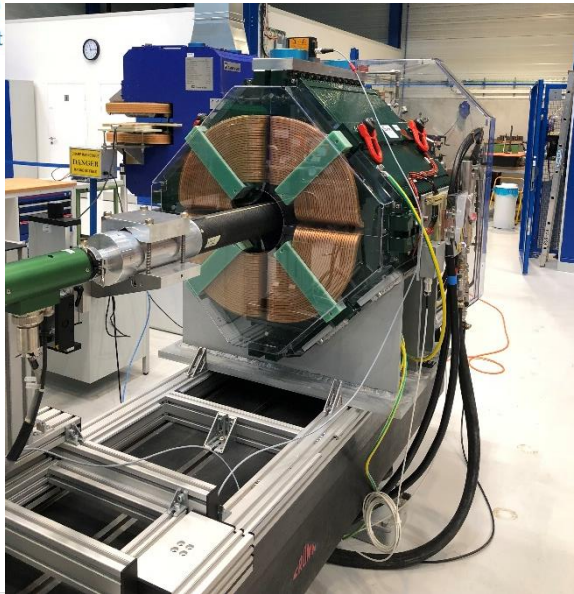


## WU 112579 BI Bending (V) magnet



- Detailed: PSB-MBVDB-ER-0001, ECR: PSB-LJ-EC-0001,
- 2/2 magnets received
- Magnetic measurement S/N1 EDMS: 1816629 (DRAFT under discussion), S/N2 to be performed in b.311 including dynamic study

<https://norma-db.web.cern.ch/design/PXMBVDB4WC/>



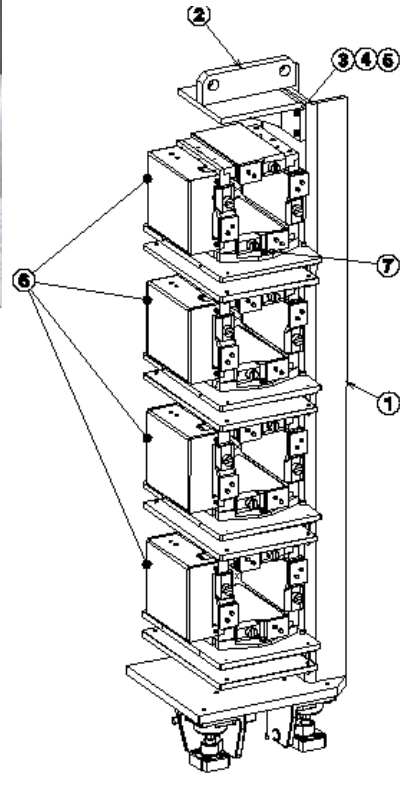
<https://norma-db.web.cern.ch/design/PXMQNCUNWP>

- Detailed in PSB-MQ-ER-0001
- Information already given by MSC for the ECR which is under preparation by TE/ABT
- Pre-series delivered
  - Magnetic measurements (acceptance tests) confirmed the field quality with reduced end chamfer.
  - As designed chamfer will be machine at CERN.
- Series delivery with final chamfer expected Winter 2019.
- Supports designs under approval.

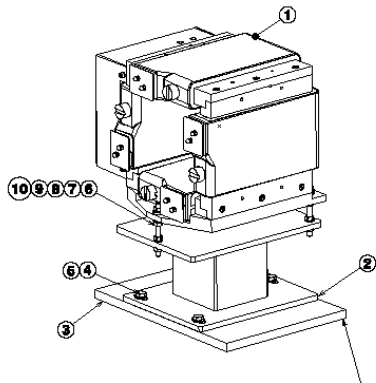


# WU 112580 BI Correctors

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- Detailed in EDMS: 1277962, 1341091, ECR: PSB-LJ-EC-0001, CPS-LJ-EC-0006
- 22/22 Magnets delivered, 8 required for upgrade, 14 for consolidation
- Magnetic measurements are to be repeated in b.311
- Support structures expected end of September
  - Simple design for single units
  - Shielded design for stack to avoid magnetic cross-talk



<https://norma-db.web.cern.ch/design/PXMCCLAWAP>



## WU 91873

### Deliver operational Main BHZ Magnets (two Yokes + 4 coil sets)



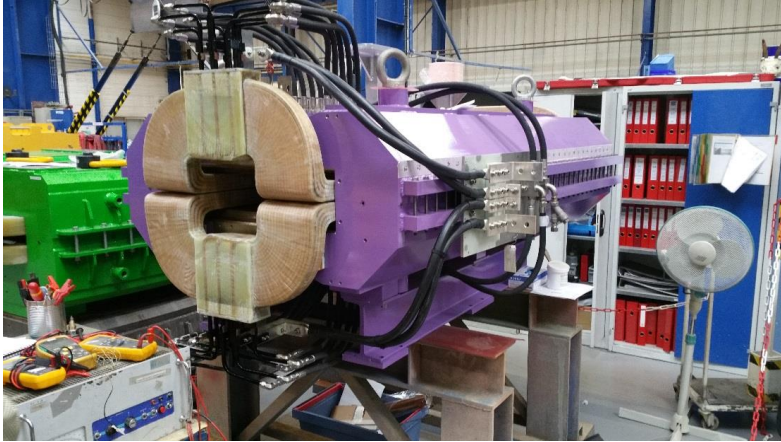
- Detailed in PSB-MB-ER-0001, ECR: PSB-MBH-EC-0001 (under approval), PSB-LJ-EC-0015 (under approval).
- 16/32 coils delivered, 2 rejected with NC to be replaced by end of the week. Remain 16 coils due in 2019 (needed for installation in the magnets removed from the machine)
- 3/3 yokes delivered
- Assembly of the 1<sup>st</sup> magnet is well underway with a plan to deliver it to magnet measurements before the end of October. Assembly of the 2<sup>nd</sup> magnet will be started in parallel.



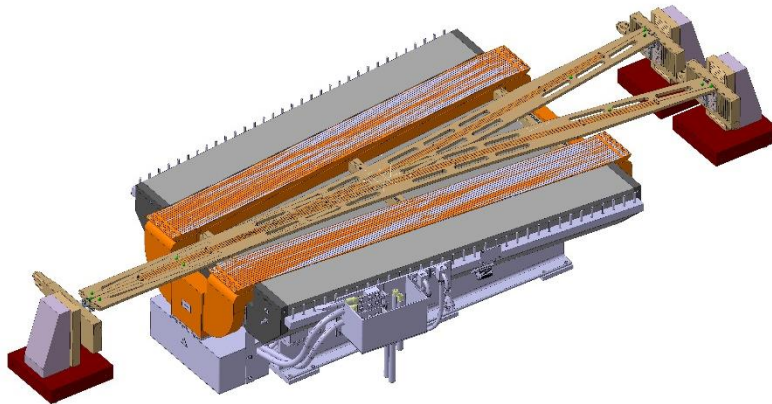


# WU 112581 Bending Magnet BT.BHZ 10

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- Detailed in PSB-MBHGA-ER-0001
- Information already given by MSC for the ECR which is under preparation by TE/ABT
- 1/2 magnets assembled at Sigmaphi, Open NC on coil shimming to be corrected before shipment to CERN. Delivery expected by end of September. Dedicated magnetic measurement system has been developed.

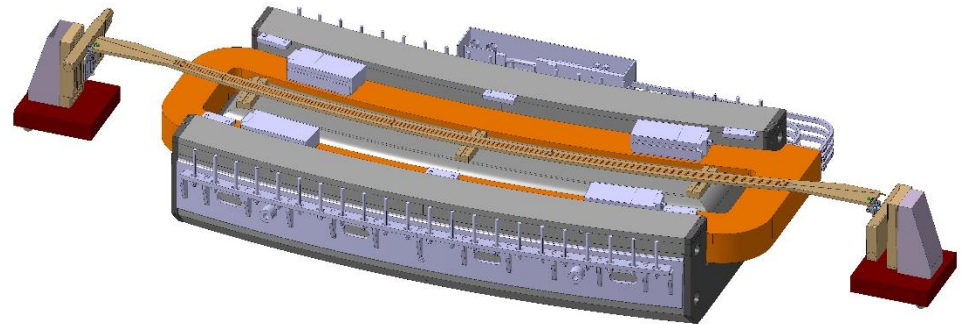
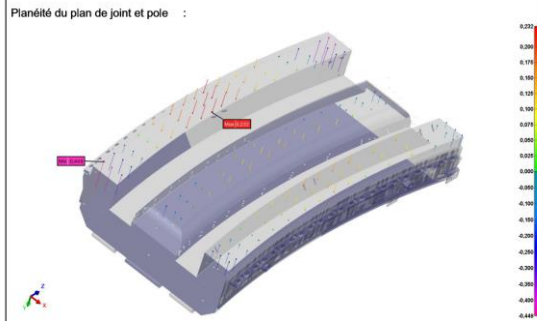


<https://norma-db.web.cern.ch/design/PXMBHGAWWP>



## WU 136495 Bending Magnet BTM.BHZ 10

- Detailed in PSB-MBHGA-ER-0001
- Information already given by MSC for the ECR which is under preparation by TE/ABT
- 4/4 coils have been molded, 3/4 have open NC which are being treated before acceptance by CERN
- 2/2 yokes have been stacked and cured but neither of them are in tolerance and are yet to be accepted by CERN.
- On the critical path!
- Dedicated magnetic measurement system has been



<https://norma-db.web.cern.ch/design/PXMBHGAWWP>



## WU 91874 Other Magnets BT, BTP&BTM



- Concerns the following magnets:
  - BT1.BVT10, BT2.BVT10 & BT2.BVT20
  - BT2.DVT10, BT3.DVT20 & BT1.DVT30
- Detailed in PSB-MD-ER-0001
- Information already given by MSC for the ECR which is under preparation by TE/ABT
- Coils being fabricated at TESLA UK, pre-series expected September 2018, Series Winter 2019
- Yokes being fabricated at CERN
  - 1/3 DVT finished, 2/3 underway
  - 0/3 BV1, tooling ready
  - 0/2 BV2, tooling ready



# WU 112583 Installation and FSU during LS2

**General** | Notes | Data Quality | History | EVM | Contracts

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You can report progress for this workunit using this form or edit its non-EVM content doing click on *Edit* button.

Baseline	Status*	Description*	WBS*	Holder*	me	Start Date*	Finish Date*	Comments
Baseline 8.4	AC	Installation and FSU/Associate during LS2	LIU-PSB 3	A. Newborough		01-Jan-2017	31-Dec-2019	

**MATERIAL RESOURCES**

Account*	Description*	BC	RBC	Org Unit	Amount*	Currency*	Start	Finish	Comments
SERVICES	FSU work	99281			150,000	CHF			

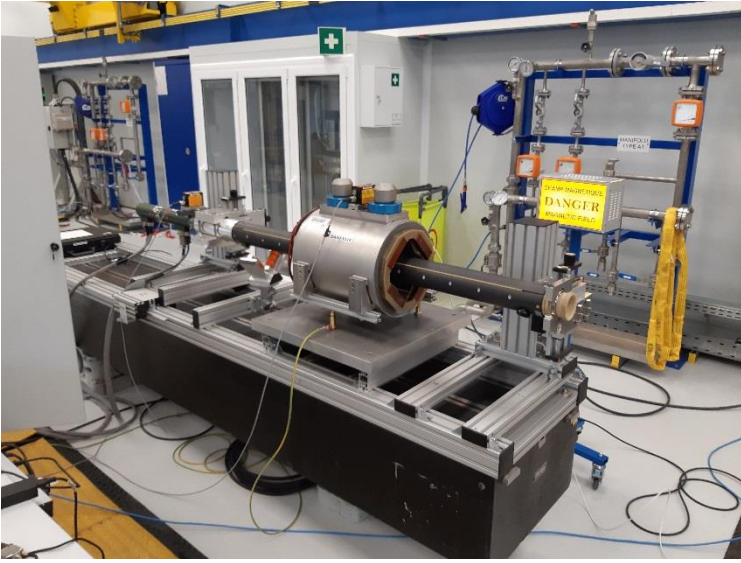
  

**DELIVERABLES**

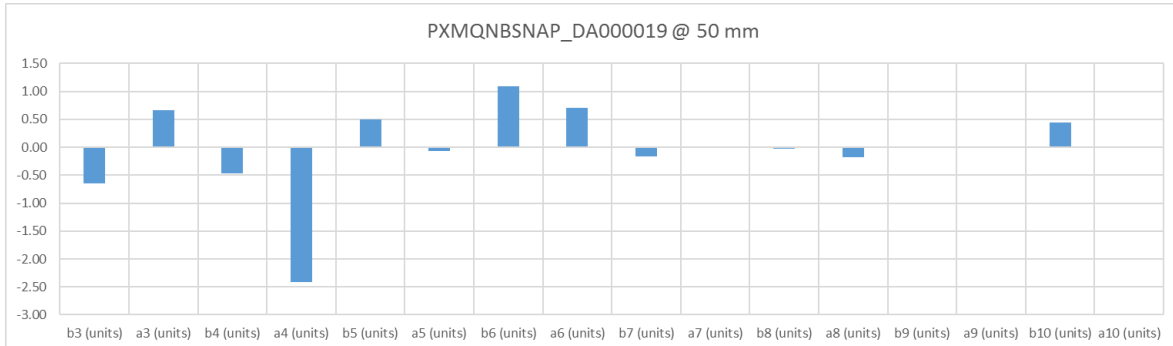
Description*	Weight*	Actual quantity*	Total quantity*	Unit*	Start	Finish	Comments
Associate 2017	24768	12	12	U	01-Jan-2017	31-Dec-2017	50% paid by LIU. V.
Associate 2018	24768	8	12	U	01-Jan-2018	31-Dec-2018	50% paid by LIU
FSU/Associate 2019	100464	0	100	%	01-Jan-2019	31-Dec-2019	

TE/MSK are working resource 'Master plan', the type of resource (Collaboration, FSU, Temporary labour) needed during the installation phase will be soon decided.

# Consolidation LINAC to PSB Quadrupoles



- Detail:ATS/NOTE/2013/037, ECR PSB-LJ-EC-0001, CPS-LJ-EC-0006
- 20/20 quadrupoles received
- Magnetic measurements underway in b.311
- Support structures expected end of September.



<https://norma-db.web.cern.ch/design/PXMQNBSNAP>



## Summary

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- All work unit orders are placed
- Most work units are well advanced with deliveries expected over the next months.
- The critical items include:
  - The new BTM.BHZ10 where the manufacturer is having difficulties achieving the required tolerances on the yoke, however we believe that delivery will be 'just in time'. Close and constant follow-up is in place.
  - The recombination dipole and bending magnets will be ready by spring 2019, on time for the planned installation.



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