

New KSW magnet in 16L1

PSB-MKKSW-EC-0001-00-40

Update after Comments

For Approval

L. Feliciano TE-ABT-FPS

— Seen by **NEWBOROUGH Antony**

Care has to be taken when considering the installation of the mu-metal around the vacuum chambers. I understand that the equipment drawings for the vacuum chambers are still to be created, but on the integration drawings the mu-metal is obviously too close the corrector magnet apertures.

— Seen by **HANSEN Jan**

The new mu-metal shielding has been updated with respect to the comments made by Antony and the old drawing SI.3.40.1096.0 for 16L1 (120.0000000000 shielding to the end of the corrector magnet)

The 3D model for 16L1 and PSBVCDX_0006 has been changed, but drawing PSBLJ_UI0001 still require to be modified by EN/MEF for the next version of this document.

— Seen by **RIFFAUD Benoit**

Comment on Antony's remark: manufacturing drawings have been completed according to requirements from TE-VSC, including , modification is required, please contact EN-MME design office asap.

3.5 DHZ16L1 VACUUM CHAMBERS

Engineers in charge: J. Hansen, A. Newborough

The current vacuum chambers (drawing ref. SI.3.49.1377.2) item 4 in Figure 1, which connect the BR.MM16L1 assembly magnets and the BR.MCC16L1 assembly magnets, shall be removed from their present location in section 16L1, will become obsolete, and shall be replaced by eight new vacuum chambers and bellows. The new vacuum chambers, shown in the layout drawing PSBLJ_UI0001, shall connect the BR.MM16L1 assembly magnets with the 16L1 KSW magnet and 16L1 KSW magnet with the BR.MCC16L1 assembly magnets. Equipment drawings shall be created for the vacuum chambers and bellows. Mu-metal will be installed on the vacuum chambers.

Care has to be taken when considering the installation of the mu-metal around the vacuum chambers

3.6 DHZ16L1 MAGNETS

Engineers in charge: A. Newborough

The current BR.MM16L1 once out the machine will be fully certified before re-installation into the machine which will take at least one week per magnet.

An alternative is to prepare in advance four spare magnets with the new chambers already installed. The spare magnets need to be refurbished with new coils before being assembled in the new stack, this solution will also reduce considerably the WDP.

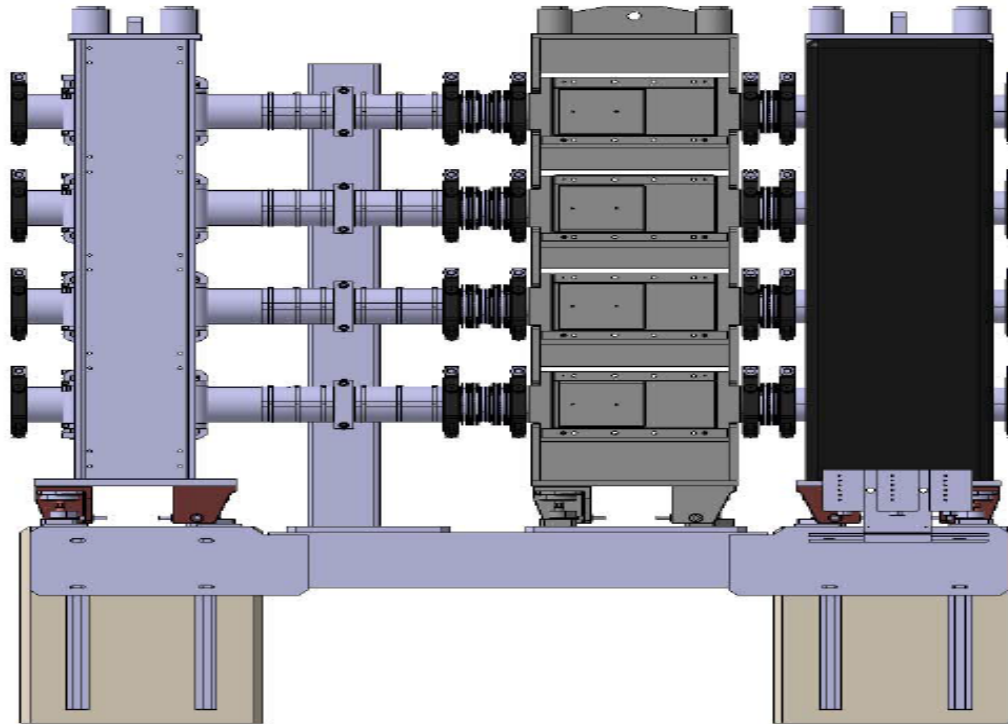


Figure 9, 3D internal view including the new KSW16L1 magnet, and altered vacuum chambers.

Page comments

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Sec 7.1 Organisation

- Operational radiation protection: Change Comments to: The ALARA Level of the intervention will be decided according to the Work and Dose Planning.
- Radioactive Waste: YES

7.1 ORGANISATION

Requirement	Yes	No	Comments
IMPACT – VIC:	x		
Operational radiation protection (surveys, DIMR...):	x		The ALARA Level of the intervention will be decided according to the Work and Dose Planning.
Radioactive storage of material:	x		The four vacuum chambers + the support structure of 2L1 KSW magnet. A buffer zone and traceability by TREC will be required.
Radioactive waste:	x		Eight half magnets belonging to present 2L1 will become obsolete.

I am surprised that several comments from the last approval round have not been taken into account for this version.

Before releasing this version I would kindly ask you to implement those.

As examples the comments from A. Newborough (include workflow from removal until re-installation, as the total duration will exceed significantly the 1 wk mentioned for installation), G. Minchev (power converter rack is in BCER, not BRF2), J-M. Cravero, C. Bertone.

It is not clear to me from this ECR if the neighboring magnet stacks finally have to be removed for this intervention.

3. DETAILED DESCRIPTION

The painting bump, required for the H⁻ charge-exchange injection system, is made using a series of 4 horizontal kicker stacks (KSW), outside the injection region to produce a closed orbit offset of 35 mm at the injection foil. The four KSW will be used to accomplish painting in the horizontal phase space to match the injected beams to the required emittances.

Some of the existing KSW magnets will need to be re-engineered and re-located. The present layout configuration and the electrical parameters of the KSW Painting Magnets will significantly change. The major modifications that are required are:

- a) The 1L1 magnet stack will be removed from its present location as shown to give a place for the new injection system (ECR: PSB-L-EC-0001);
- b) A new 16L1 magnet stack ([PSBMKSW0001](#) - EDMS I.D. 1133985) will be installed in section 16L1.
- c) Other minor changes include the installation of a new magnet in 16L4 and moving the currently installed 16L4 magnet to position 2L1. Since this will not have any impact on the layout, this action is not subject to an ECR.

I am surprised that several comments from the last approval round have not been taken into account for this version.

Before releasing this version I would kindly ask you to implement those.

As examples the comments from A. Newborough (include workflow from removal until re-installation, as the total duration will exceed significantly the 1 wk mentioned for installation), G. Minchev (power converter rack is in BCER, not BR2), J-M. Cravero, C. Bertone.

It is not clear to me from this ECR if the neighboring magnet stacks finally have to be removed for this intervention.

3.3 KSW16L1 GIRDER FOR SUPPORT THE MAGNET

Engineers in charge: L.M. Coralejo Feliciano, W. Weterings, B. Riffaud

The KSW16L1 magnet shall be installed on the girder, as shown in Figure 7, 8 and 9.

Based on static structural ANSYS calculations show that the girder, concerning the installation of the BR.KSW.16L1 stack (~400kg), as designed by Jean-Michel Lacroix (ST0671074_01), has minimum deformation (0.1mm) and stresses (25MPa, effect of the screw holes) as shown in figure 10, 11 and 12.

3.4 KSW16L1 POWER CONVERTERS

Engineer in charge: G. Grawer

The power converters for the KSW magnets will be installed in building 361 in the BCER room using the present 1L1 KSW magnet electrical cabinet, which will become obsolete. For this system, new cables shall be installed.