



EDMS NO.
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REV.
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VALIDITY
DRAFT

REFERENCE : NOT REQUIRED

DFX meeting #39

Date: 2020/01/10

Project/Activity: WP6a

TE-MS: Iole Falorio [IF]

TE-VSC: Paul Cruikshank [PC]

EN-MME: Julien Pascal Dequaire [JD], Daniel Dominguez Ochoa [DO], Robin Betemps [RB]

SOTON: Wendell Bailey [WB], Yifeng Yang [YY]

Excused : Amalia Ballarino [AB], Jerome Fleiter [JF], Yann Leclercq [YL], Antonio Perin [AP], Vittorio Parma [VP], Jorge Pelegrin [JP], Serge Claudet [SC]

Agenda: <https://indico.cern.ch/event/876272/>

- Status updates on 3D model, 2D drawings and calculations

DISCUSSION

Discussion on the introduction of 4 Invar bars

- SOTON proposes the introduction of 4 Invar bars of 12 mm diameter to relief stress at the vacuum barrier and cage. Two 25 mm diameter invar bars would have done the job but there is not enough space for this diameter [YY] ;
- SOTON would like to eliminate the current pivot/ball type fitting where the Invar bar contacts the vacuum vessel. The modelling has shown that too much freedom at this boundary increases the loading on the vacuum barrier and cage. The strategy for the fixations of the extremities has to be further discussed and agreed [YY]→**Action**;

Decision on the fabrication method for the bottom dome

- The proposal from CERN was to fabricate it from a single billet. The company LTI Metaltech prefers to fabricate the dome and then proceed to the welding of the ring and the cage [YY];

Update on the modelling analysis to complete the design report

- The sequence of cases that SOTON has dealt with has been presented in slide 5 and 6 of their presentation. The final configuration include a rotation of the cage and a strengthening of the rotated cage with 3 vertical ribs in each pillar (case 5) [YY];
- From SOTON side all calculation have been performed and meet the requirements [YY];
 - It is observed that it might be difficult to manufactures the spines in the pillars and suggested to use grooves instead (obtained by bending the material) [RB];
 - SOTON will check the feasibility [YY];
- The final design changes required by SOTON according to the performed calculations have been listed and include the addition of the spine in the pillars, the cage rotation, the 4 invar bars integration (slide 7) [YY];
 - The thickness reduction of the vacuum flange supporting cage requested for weight reduction can be avoided to limit the number of changes to the 2D drawings [PC];



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- The step file of the cage will be shared after the meeting [YY]→**Action**;
- CERN is not convinced by the introduction of the 4 invar bars. There will be an internal discussion and an eventual alternative will be proposed [RB,PC]→**Action**;
- All pressure cases with the cage rotated and the 4 invar bars implemented have been performed and the all the requirements are met. The plan is to update the report and circulate it before the end of January [YY]→**Action**;

Minutes for UK visit

- The NoBo did not see any obstacle with the clamping approach, some more explanation on the entire system and sequence of test will be provided [PC];
- A proposal on the low cobalt material suppliers will be provided [PC]→**Action**;
- SOTON will send feedback on the UK visit minutes→**Action**;

State of 2D drawings plan and

- If not many modifications required, the totality of the DFX drawings will be available in two weeks time [RB];
- The drawings that include the assembly sequence will be available 2 weeks after the 2D drawings [RB];
- At the end of next week there will be an internal review on the 2D drawings [RB];
- After receiving the 2D drawings from CERN LTI Metaltech will produce a set of manufacturing drawings that will be presented at the production readiness review. The estimated time for this production is 3 weeks from 2D drawings reception [YY];
- For financial issue the review should be scheduled for the beginning of March [YY];
- The components are expected to be delivered by August/September 2020 if there are not delays on the actual baseline [YY];

Future steps target plan:

- 29th January: send 2D drawings to SOTON (Control 1 inspection complete but not signed);
- During the preparation of the assembly drawings the 3D model can be frozen and the 2D drawings can start to be shared with the company to allow enough time for the manufacturing drawings from LTI (target deadline on the 28th of February);
- 4-5th February: visit of Soton at CERN (validate Control 1 and Control 2);
- Week btw 2nd-6th of March: Production Readiness Review. The company could be invited to participate or the review could be asked to be hosted in UK;
- 10th of March: SOTON can start placing invoices.

ACTIONS of #39

Discussion on the invar bars extremities	all	
Sharing step file of the cage	WB,YY	
Feedback on the introduction of the 4 invar bars	PC,RB,YL	

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Proposal of low cobalt material suppliers to the UK company	PC	
Circulation of updated design report	YY,WB	End of Jan
Feedback on UK visit minutes	WB,YY	
PENDING ACTIONS		
Check the assembly interference of the bottom ring of the dome after increment of thickness	WB	
Feedback on calculation list presentation	YL	
34.1 Decision on the responsibilities of the cryo extension line		PC, AB, SC
34.7 Share global models between CERN and SOTON	On-going	YY,WB,YL
31.6 Ask confirmation to MSC-SCD that the reserved volume for NbTi-NbTi splices is sufficient – check the technical report by YL & JF	On-going	PC, AB
31.7.1 Decision on the circulation list for the functional specification		PC,AB
Documents:		
Prepared by: Iole Falorio	Date: 2020-01-15	
Distribution List: All attendees		