

Meeting:	4th FAIR-BINP workshop Discussion on FDR of Super-FRS FoS diagnostic chamber		
Date:	29.05.2019 09:00-12:00	Author: S. Purushothaman	
Participants:	Martin Winkler (MW), Sivaji Purushothaman (SP), Alexander Krasnov (AK), Martin Marenich (MM), Chiara Nociforo (CN), Christos Karagiannis (CK), Martin Gleim (MG), Ivan Mukha (IM), Alexander Bergmann (AB), Konstantin Istomin (KI), Velonas Vasileios (VV), Andreas Kraemer (AKr), Joerg Kurdal (JK)		
Distribution:	Haik Simon, Sivaji Purushothaman, Martin Marenich, Chiara Nociforo, Christos Karagiannis, Martin Gleim, Ivan Mukha, Alexander Bergmann, Helmut Weick, Konstantin Istomin, Martin Winkler, Joerg Kurdal, Andreas Kraemer, Velonas Vasileios		
Document Number:			

A: Action, D: Decision, I: Information		Who	Due Date
1. Status of SFRS diagnostic chamber FDR document preparation			
I	<p>BINP proved 2D drawings and 3D models prior to the workshop and GSI engineering department (Gleim, Martin) checked the 2D drawings and Alexander Bergmann performed a DMU check. The results of these studies and comments from SFRS group members and alignment group are presented.</p> <p>Remark on a sequence of a serial production of the diagnostic chambers.</p> <p>The proposed sequence of production is:</p> <p>FoS – the vacuum chamber FPF2DK1 and its support, then</p> <p>Serial Production – 1st- FLF6DK1, 2nd- FMF1DK1, then a copy of FPF2DK1, then FPF3DK1, FPF4DK1, FMF2DK1, FMF2DK2, FMF2DK3, FMF3DK1, FHF1DK1, FHF1DK2, FLF1DK1, FLF2DK1, FLF3DK1, FLF4DK1, FLF5DK1, FRF1DK1, FRF2DK1, FRF3DK1.</p>		All actions must be taken before the FDR of FoS diagnostic chamber

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<p>I</p> <p>The last chamber FTF1DK1 to be cylindrical.</p> <p>The FoS chamber together with 1st-of-series FLF6DK1 and 2nd-of-series FMF1DK1 cover all types of flanges. The latter two may hosts all types except the F550 which is for Disk Degrader only.</p>		

2. DMU check of 3D model –discussion on presentation by Alexander Bergmann

A	<p>1. please use part names as described in data exchange guideline F-TG-B-02e-DARL_T1-v3 https://edms.cern.ch/document/1229366/7</p>	AB	All actions must be taken before the FDR of FoS diagnostic chamber
	<ul style="list-style-type: none"> Will be addressed 	AK	
A	<p>2. GSI doesn't need 3D-Models for welding seams! Please only provide Information about welding seams in 2D-Drawings. Please remove these parts from „FSVB_FPF2DK1_0101AS“– Assembly in the 3D-Model Delivery.</p>	AB	
	<ul style="list-style-type: none"> Will be addressed 	AK	
A	<p>3. Skeleton with installation space is missing.</p>	AB	
	<ul style="list-style-type: none"> Alexander Krasnov is not aware of this and Ivan will check if this is uploaded to EDMS. The stp file of a chamber skeleton with installation space has been sent to A.Krasnov 	AK	
A	<p>4. Cyrillic letters are generally excluded from delivery due to import problems! Standard parts should be renamed, due to Cyrillic letters!</p>	AB	
	<ul style="list-style-type: none"> Will be addressed 	AK	
A	<p>5. conflict with conceptual design of media board</p>	AB	
	<ul style="list-style-type: none"> Proposal: 150mm lower position of the upper fiducial targets 	AK	
	<ul style="list-style-type: none"> This is possible but drawings should be changed and this will cause delays. FAIR and BINP agreed to proceed with the change 	AK	
A	<p>6. more fiducial targets asked by alignment group (possibility for an analysis of bending, higher accuracy)</p>	AB	
A	<ul style="list-style-type: none"> Proposal: all together 4 more fiducial targets -> for the left and right (in respect to the beam direction) wall of the chamber, in middle position of upper and lower existing fiducial targets. 	AK	
A	<ul style="list-style-type: none"> This is possible but drawings should be changed and this will cause delays. FAIR and BINP agreed to proceed with the change 		

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<p>7. beam height</p> <ul style="list-style-type: none"> a. 2000mm nominal (1985mm structure+15mm for floor compensation) current value 1997mm + 17mm not accepted! b. (floor compensation with collection of 2mm, 5mm, 10mm plates okay, accepted) <ul style="list-style-type: none"> • Will be addressed <p>8. Installation space</p> <ul style="list-style-type: none"> a. Anchor points exceed the installation space -> no collision, tolerated b. chamber floor lower than specified-> no collision, no escape route conflict -> tolerated c. centering pin exceed the installation space -> interface, tolerated d. interface for pumping supports exceed the installation space, tolerated e. Proposal: Enlargement of the installation space <ul style="list-style-type: none"> • Will be addressed <ul style="list-style-type: none"> f. Flange position: a shifting of interface due to enlargement! The value "280mm" is formally okay. Is there an agreement of these shifted interface?, but there is a shifting of interface due to enlargement! Is there an agreement of these shifted interface? <ul style="list-style-type: none"> • shift of a flange position is tolerated. <p>9. Is electrical grounding required?</p> <ul style="list-style-type: none"> • This topic is not addressed in the detail spec. Company will check if there are any guidelines or recommendations and will update the BINP colleagues. • possibility of electrical grounding will be provided by the requested holes in the support stand. <p>10. Is there a mechanical Analysis for the stand?</p> <ul style="list-style-type: none"> • Will be addressed 	<p>AB</p> <p>AK</p> <p>AB</p> <p>AK</p> <p>AB</p> <p>AB</p> <p>SP</p> <p>AB</p> <p>AK</p>	<p>All actions must be taken before the FDR of FoS diagnostic chamber</p>

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3. Check of 2D model b GSI egg. department (Martin Gleim), SFRS group (Christos Karagiannis), Alignment group ()–discussion on presentation by Ivan Mukha			
<p>I</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>I</p>	<p>the report on drawing inspection and comments on the scanned drawings indicate that there is still a room for improvement. But the drawings are fine in general.</p> <p>Comments from Martin Gleim</p> <ol style="list-style-type: none"> 1. When assembling the vacuum chamber, information for the leak rate and cleaning is missing. <ul style="list-style-type: none"> • will be addressed 2. For the individual parts of the vacuum chamber, the material specification is only "Stainless Steel". This should be specified in more detail. <ul style="list-style-type: none"> • Already addressed 3. In some cases, machined surfaces which are not sealing surfaces were indicated with a surface roughness of Rz 6.3 microns. Please specify Rz 25 microns for such areas. <ul style="list-style-type: none"> • will be addressed 4. In the case of the interface plate of the feet, the position tolerance of the threaded holes is missing. <ul style="list-style-type: none"> • Comments will be sent to Alexander and this will be addressed. 5. The base frame looks somewhat fragile compared to the vacuum chamber. <ul style="list-style-type: none"> • Analysis of the frame will be performed 6. The horizontal struts of the frame have only a general tolerance. With the longest strut of 3080mm, a difference in length of 4mm is expected in the worst case. <ul style="list-style-type: none"> • Tolerances of the frame component length is 4 mm and this: this will be checked addressed 7. Some drawings have recurring spelling errors. <ul style="list-style-type: none"> • Will be addressed <p>Comments from Christos Karagiannis</p> <ol style="list-style-type: none"> 1. The alignment feet of the chamber are placed at the corners or at the edge of the chamber. This could allow a larger bending of the chamber. Are there any calculations of the chamber bending /strength by fully equipped chamber (8 drives x750kg each) under vacuum? What is the max bending of it? <ul style="list-style-type: none"> • Stress analysis is updated and this issue is addressed and results are within specs (only for vacuum chamber not the support frame) 	<p>MG</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>MG</p> <p>AK</p> <p>CK</p> <p>AK</p>	<p>All actions must be taken before the FDR of FoS diagnostic chamber</p>

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A	<p>2. The struts of the chamber stand are not cross reinforced. Are there any strength calculations?</p> <ul style="list-style-type: none"> Stress analysis of the frame will be performed. 	CK AK	
A	<p>3. Suggestion: the holder plates which are carrying the threads for the media boards and are welded at the side of the chamber could be exchanged with one long one along the chamber. Single plates were suggested by us, but the long plate has some advantages for the welding and positioning against several single plates.</p> <ul style="list-style-type: none"> Since there will be already a change in engineering drawings due to proposed changes, this suggestion will be also considered. 	CK AK	
I	<p>4. The position of top fiducial holders placed at the media board side are not useful. There are the media boards with cables and tubes and I think these fiducial holders should be moved. We should ask the alignment group for that.</p> <ul style="list-style-type: none"> <i>Topic already discussed earlier</i> 	CK	
A	<p>5. At the media board side, we should foresee some threads along the support for cable management. All cables come from the back side of the chamber from the floor till up to the media boards.</p> <ul style="list-style-type: none"> The threads should be on both sides. Please send a sketch and will be adapted. 	CK AK	
Comments from Velonas Vasileios			
I	<p>1. We want at least two more fiducials at the middle of the chamber in order to control, if necessary, the deflection of such a large chamber.</p> <ul style="list-style-type: none"> Already addressed 	VV	
I	<p>2. We have to be careful on which side the fiducials are attached, namely looking toward the tunnel side (not to the aisle side).</p> <ul style="list-style-type: none"> Already addressed 	VV	