Comments recorded in EDMS for NCR 2905753 (CA01 leak check):

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 |  by  | **IZQUIERDO BERMUDEZ Susana** |   | (TE-MSC) |

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| Thanks for this non-conformity. Two remarks:- The NCR is attached to the cold mass pressure test. However I think the problem was after cryo-stating. If it is the case, I would attach the NCR to the correct step, and I would give details on that are the welds that were checked and were OK (if the test after cold mass passed, the longitudinal and orbital welds passed), of course adding references to the corresponding [EDMS document](https://edms.cern.ch/ui/doc/document) (I only find one now for pressure tests, [EDMS 2917012](https://edms.cern.ch/ui/doc/2917012), but I guess this is not the only pressure test that was perform along the manufacturing.- It is important that for the second cold mass, the leak test procedure is shared with CERN/Vacumm before performing the tests, and that results are shared inmideatly such that corrective actions can be applied in a timely manner to avoid this problem in future cold masses. |

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 |  by  | **PEREZ ESPINOS Jaime** |   | (TE-VSC) |

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| Recall of events¿ Leak test of LQXFA cold mass 20 Dec 2022¿ Circulation of NCR 29 June 2023¿ VSC requests further info on NCR 13 July 2023 ¿ see edms comments¿ Zoom meeting WP3, US, VSC 09 August 2023 ¿ see edms commentsDuring the meeting of 09 August 2023, VSC confirmed it didn¿t have sufficient evidence to evaluate if the coldmass is sufficiently tight. VSC highlight there is significant weakness in the leak testing execution with respect to common practice ¿ no written procedure, no instrumentation schematic, no annotated graphs at the time of execution, no system calibration. VSC do not understand why an NCR is issued by the US inspector if the US collaboration believe that the results indicate tightness conformity. Additional information was requested at the meeting of 9 August (see edms comments) with the goal to complement the version 0.2 of the NCR with data from the test in Dec 2022 and also perform some complementary measurements during the foreseen cold test. However the collaboration has only partially provided the additional data in its comments of 29/08/2023 and the updated NCR v0.4.Based on the provided data, VSC would not recommend the installation of the cold mass LQXFA/B01 in the LHC tunnel without further tightness confirmation at CERN or elsewhere. The present leak testing data does not allow to confirm tightness with respect to the specification of 1 E-9 mbarl/s, but there is no indication that a helium leak exists in the range that would be detrimental to short-term operation at the IT String. It should be noted that prior to installation at the IT String this cryoassembly will be equipped (at CERN) with a service module welded to the cold mass volume, and will be subjected to a global leak test including the cold mass; discovery of a helium leak at that stage would lead to a longer leak localisation campaign as its origin would be uncertain.VSC further recommends that WP3, US and VSC continue to work together in advance of the next cold mass leak test.Paul and Jaime |

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 |  by  | **DUARTE RAMOS Delio** |   | (TE-MSC) |

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| As a complement to what as been written above, please note that it is not planned to repeat the leak test of the cryoassemblies upon arrival at CERN and we do not have the required tooling to do so.After reception at CERN, we will do the second phase of cryostat assembly, where we install a so-called service module plus interface piping at both ends of the cryoassembly. There are multiple designs of service modules and interfaces depending on the installation slot. As with all assemblies to be completed under WP3, we will perform a combined pressure and leak test of all cryogenic circuits to validate the global leak tightness prior to installation. This final leak test limits the search location of an eventual leak detected in the tunnel to the components of the interconnects, which are accessible for repair in-situ.The success of the final pressure and leak test prior to installation depends on the leak checks done throughout the assembly process and eventual repais. If we detect leak at the final test, its location will be difficult to identify and, even if we do find it, a repair may require partial or total disassembly. This is to say that all intermediate leak checks, such as the one addressed in this document, are critical for the success of the assembly. |

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|  |   | **Accepted** |

 |  by  | **BLOWERS James** |   | (Other) |

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| Regarding the attachment of this NCR to the asset, it should have been attached to the cryostated assembly and not the coldmass. It has been moved to be attached to the cryostated assembly in MTF. |

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 |  by  | **MILANESE Attilio** |   | (TE-MSC) |

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| Thanks for this document. I agree with the comments of Delio and Susana. In addition, the document could explicitly give the level of the NCR - it states non-critical (1, 2 or 3). |

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 |  by  | **GARCIA GAVELA Hector** |   | (ATS-DO) |

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| A new version will be prepared in order to address all the comments that have been provided in the WP Evaluation. |

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|  |   | **Accepted with Warning** |

 |  by  | **TODESCO Ezio** |   | (TE-MSC) |

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| Suggestions of modification to the document to account for comments of Delio, Susana and Jamie.DECISIONBased on the provided data, VSC would not recommend the installation of the cold mass LQXFA/B01 in the LHC tunnel without further tightness confirmation. On the other hand there is no indication that a helium leak exists in the range that would be detrimental to short-term operation at the IT String. Therefore the NCR is closed as concession.The results of the leak test at CERN after the phase II cryostating shall be added to this NCR. It is noted that in any case this cold mass will be reworked to cure the QH issues, therefore in the present form it cannot be installed in the tunnel.CORRECTIVE ACTIONSFor the future cold masses (starting from CM02) the leak test procedure is shared with CERN/Vacumm before performing the tests, and that results are shared immediately such that corrective actions can be applied in a timely manner to avoid this problem in future cold masses |

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