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| Traveler Title | SNS PPU Cavity String Beamline Bellows Inspection Traveler |
| Traveler Abstract | Traveler defines inspection process for cavity string beamline bellows |
| Traveler ID | SNSPPU-CST-INSP-BLBP |
| Traveler Revision  | R1 |
| Traveler Author | K. M. Wilson |
| Traveler Date | 1-Oct-20 |
| NCR Informative Emails | kwilson, edaly, forehand, huque |
| NCR Dispositioners | kwilson, edaly, huque |
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| Approval Names | K. M. Wilson | A. DeKerlegand | E. Daly |  |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | Reviewer | Project Manager |  |

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| References | List and Hyperlink all documents related to this traveler. This includes, but is not limited to: safety (THAs, SOPs, etc), drawings, procedures, and facility related documents. |
| 104211500-M8U-8200-A029 BELLOWS ASSEMBLY | 104211500-M8U-8200-A030\_BELLOWS FLANGE | 104211500-M8U-8200-A036\_BELLOWS (CONVOLUTED) 3.00 I.D. X 3.38 LG |  |  |
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| Revision Note |  |
| R1 | Initial release of this Traveler. |

Could you add file upload boxes to step 2, 3, 4, and 5  please?  Also, I suggest making a new step or maybe just including in step 1 somewhere for the inspector to engrave  "1"  on OD of first flange and opposite other end of part "2" to identify flanges apart from one another.  I think this will help a lot if we generate a NCR for a scratch to easily identify which flange is the problem. Does this sound okay? Will these bellows be plated inside?

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| Step No. | Instructions | Data Input |
| **General handling guidelines: Bellows are extremely fragile. They should be handled carefully at all times. Particular care should be taken to protect seal surfaces, which are easily scratched, and convolutions, which can dent with minor contact. When being transported or stored, flanges should be covered with plastic caps, and bellows should be covered by bellows protection. Bellows covers/protection may be removed (carefully) for inspection, but should be reinstalled after inspection.** |
| 1 | **Initial Inspection** |
| Steps 1, 2 and 5 should be performed for all beamline bellows. |
| Technician NameDate of InspectionSerial Number of part | [[TechName]] <<SRF>>[[InspectionDate]] <<TIMESTAMP>>[[BLBPSN]] <<BLBPSN>> |
| Is part clean, free from dust, oil, finger prints or other contaminants? | [[PartCleanOk]] <<YESNO>> |
| Visually inspect the bellows convolutions. There should be no dents of 1/16” or larger, or any dents with sharp edges, or other damage. (Smaller, shallow dents should be noted in comments, but no NCR should be issued.) | [[DamageOk]]<<YESNO>> |
| There should be no deep pits on inside or outside surfaces. (Shallow indentations should be noted in comments, but no NCR should be issued.) | [[PitsOk]] <<YESNO>> |
| There should be no unusual discoloration to the stainless steel, especially around the welds. | [[ColorationOk]] <<YESNO>> |
| Welds are good; i.e., welds on ID of part should be smooth and flush, with no crevices, cracks or protrusions. Are all welds present that are supposed to be? Example of unacceptable weld is shown below. | [[WeldsOk]] <<YESNO>> |
| Comments Upload photos of any damage. | [[VisualInspComment]] <<COMMENT>>[[VisualInspPhoto]] <<FILEUPLOAD>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 2 | **Examine Seal Surfaces** |
| Measure surface finish of seal groove on first flange. (Flanges are identical, so “first” is arbitrary.) Indicate “no” if roughness is equal to or higher than 16 uin.  | [[Finish1Ok]] <<YESNO>>[[Finish1Comment]] <<COMMENT>> |
| Measure surface finish of seal groove on second flange. Indicate “no” if roughness is equal to or higher than 16 uin.  | [[Finish2Ok]] <<YESNO>>[[Finish2Comment]] <<COMMENT>> |
| Examine the seal groove on first flange for any scratches in the area of the seal. Indicate “no” if scratches are found and the surface needs polishing. | [[Scratches1Ok]] <<YESNO>>[[Scratches1Comment]] <<COMMENT>> |
| Examine the seal groove on second flange for any scratches in the area of the seal. Indicate “no” if scratches are found and the surface needs polishing. | [[Scratches2Ok]] <<YESNO>>[[Scratches2Comment]] <<COMMENT>> |
| Any files can be uploaded here. | [[Step2Upload]] <<FILEUPLOAD>> |
| 3 | **This step is to be performed on parts 1, 2, 8, 16, and 24.****Dimensional check. To verify dimensions, the following are needed: a #10-24 UNC go/no-go gauge; a probe marked to indicate the 0.29” hole depth. All dimensions are from drawing 104211500-M8U-8200-A030, Bellows Flange.** |
| Using go/no-go gauge, verify that all three holes on the outside surface of the flanges at each end (3 holes per flange, 6 total) are correctly tapped to #10-24 UNC. | [[ThreadOk]] <<YESNO>>[[ThreadComment]] <<COMMENT>> |
| Using the probe, verify that all three holes on the outside surface of the flanges at each end (3 holes per flange, 6 total) are 0.29 in deep. | [[DepthOk]] <<YESNO>>[[DepthComment]] <<COMMENT>> |
| Any files can be uploaded here. | [[Step3Upload]] <<FILEUPLOAD>> |

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| 4 | **This step is to be performed on parts 1, 2, 8, 16, and 24.****Dimensional check.** **The two flanges are identical. Either may be designated “flange 1” and “flange 2.”****Please engrave “1” on the OD of one flange, and “2” on the OD of the other for future reference.** |
| 104211500-M8U-8200-A030 Flange 1  |
| Diameter to inside of lip | 4.919 | +/-0.005 | [[Dimension1Ok]] <<YESNO>> |
| Diameter to outside of bolt holes | 4.608 | +/-0.005 | [[Dimension2Ok]] <<YESNO>> |
| Diameter to inside of bolt holes | 3.920 | +/-0.005 | [[Dimension3Ok]] <<YESNO>> |
| Diameter to outside of seal surface | 3.843 | +/-0.005 | [[Dimension4Ok]] <<YESNO>> |
| Diameter to inside of seal surface | 3.475-3.476 |  | [[Dimension5Ok]] <<YESNO>> |
| ID of flange | 2.995 | +/-0.005 | [[Dimension6Ok]] <<YESNO>> |
| Height of lip | 0.079 | +/-0.005 | [[Dimension7Ok]] <<YESNO>> |
| Depth of seal groove | 0.121 | +/-0.001 | [[Dimension8Ok]] <<YESNO>> |
| 104211500-M8U-8200-A030 Flange 2 |
| Diameter to inside of lip | 4.919 | +/-0.005 | [[Dimension1Ok]] <<YESNO>> |
| Diameter to outside of bolt holes | 4.608 | +/-0.005 | [[Dimension2Ok]] <<YESNO>> |
| Diameter to inside of bolt holes | 3.920 | +/-0.005 | [[Dimension3Ok]] <<YESNO>> |
| Diameter to outside of seal surface | 3.843 | +/-0.005 | [[Dimension4Ok]] <<YESNO>> |
| Diameter to inside of seal surface | 3.475-3.476 |  | [[Dimension5Ok]] <<YESNO>> |
| ID of flange | 2.995 | +/-0.005 | [[Dimension6Ok]] <<YESNO>> |
| Height of lip | 0.079 | +/-0.005 | [[Dimension7Ok]] <<YESNO>> |
| NR Flange Sealing Surface Finish | 0.121 | +/-0.001 | [[Dimension8Ok]] <<YESNO>> |
| Any files can be uploaded here. | [[Step4Upload]] <<FILEUPLOAD>> |

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| 5 | **Storage** |
| Plastic caps should be applied to the flanges at both ends for storage. Convolutions should be covered with bellows protection.  | [[StorageTech]] <<SRF>>[[StorageDate]] <<TIMESTAMP>> |