**Control Plan:**

The control plan is a method that is used in manufacturing engineering to ensure that the products made are meeting the quality needed. It is a document that is meant to control the quality of the products in order for them to be efficient and usable for customers and meeting the requirements that the customers want. The following is the control plan of Unipart of bending the fuel fillers:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date:** | |  | | Key Date: | 24-Feb-17 | | | Item Name: | | GPLA-9032-AC | | | |  | | --- | | **PLANNING DOCUMENT** | | |  |
| **Originator:** | | **TL** | | FMEA No. : | CP 00293 | | |  | Release Number: | UEP2E50159129000 | | | **Control Plan** | |  |
| **Project:** | | **L405 NAS TS DD** | | Issue Number: |  | | | | | | |  |  | |  |
| **Project Ref:** | | **Bend lower 34.9mm pipe** | | Process Responsibility: | | UPA | | | | | | |  |  |  |
| **Last Revision:** | | **24/07/17** | | Core Team: | SE - PROJ MAN, KW - QUALITY, TL - MAN ENG, KH - DESIGN | | | | | | | | | **Sheet** | **1 of 1** |
|  | | |  | | --- | |  | | | |  | | --- | |  | | | | | | |  | | |  | |  |
| Part/ Process No. | Process name/ Operation description | Machine, Device, Jig, Tools for Manufacturing | Characteristics | | | Special Char. Class | Methods | | | | | | | Reaction Plan / Corrective Action | |
| Op. No. | Product | Process | Product/Process Specification/ Tolerance | Evaluation/ Measurment Technique | Gauge R & R | Sample | | Control Method | |
| Size | Frequency | Prevention | Detection | Prevention | Detection |
|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | Bend 34.9mm lower pipe |  | 10 |  | Pipe formed to bend gauge | OTH | Program to be used L405 Lower | Visual |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| OTH | Part must be bent correctly | Check with gauge E16317 EGS14825 |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| CC | No splits in pipe | Visual |  | 100 % | 100% | SOP. Skills matrix. | Visual check. 100% leak test on future operation |  |  |
| CC | Tooling must not be worn or damaged | Visual |  | 1 | First off | SOP. Skills matrix. | Visual check. 100% leak test on future operation |  |  |
| OTH | No ripples greater than 2mm | Visual |  | 100 % | 100% | SOP. Skills matrix. | Double visual inspection |  |  |
| OTH | Setting to be correct to SOP | Visual |  | 1 | First off | SOP. Skills matrix. | Double visual inspection |  |  |
| 20 | Trim pipe to length |  | 20 |  | Pipe cut to required length | OTH | Saw tooling must not be worn or damaged | Visual TPM |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| OTH | Pipe must be cut to correct length | Check with gauge E16317 EGS14825 |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| OTH | Saw tooling must not be worn or damaged | Visual TPM |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| OTH | Pipe must be cut to correct length | Check with gauge E16317 EGS14825 |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off checks in bend inspection gauge per shift |  |  |
| 30 | De-burr |  | 30 |  | Pipe de-burred to remove burrs & sharp edges | CC | Pipe must be fully/evenly deburred | Visual |  | 100 % | 100% | SOP. Skills matrix. | Double visual inspection 100%. |  |  |
| CC | Tooling must not be worn or damaged | Visual TPM |  | 1 | First off | SOP. Skills matrix. | Double visual inspection 100%. |  |  |
| 40 | Size Pipe |  | 40 |  | Pipe endformed for roundness to ensure fitment of upper pipe | OTH | Pipe must be end formed | Visual |  | 100 % | 100% | SOP. Skills matrix. | Cannot assemble with upper pipe for welding |  |  |
| OTH | Pipe must be endformed to correct size | Vernier |  | 1 | First off | SOP. Skills matrix. | Cannot assemble with upper pipe for welding |  |  |
| OTH | Setting to be correct to SOP | Visual |  | 100 % | 100% | SOP. Skills matrix. | 100% leak test on future operation |  |  |
| 50 | End form pipe |  | 50 |  | Lower pipe sized for outlet form to specification on hose assy and anti-siphon valve | OTH | Pipe must be end formed | Visual |  | 100 % | 100% | SOP. Skills matrix. | Cannot EOL leak test system |  |  |
| CC | Pipe must be endformed to external 39.5mm+/-1mm | Visual |  | 100 % | 100% | SOP. Skills matrix. | Cannot EOL leak test system |  |  |
| CC | Pipe must be endformed to external 33.1mm+/-1mm | Vernier |  | 1 | First off | SOP. Skills matrix. | Cannot EOL leak test system |  |  |
| OTH | Setting to be correct to SOP | Visual |  | 100 % | 100% | SOP. Skills matrix. | 1st off & 4 off per shift with Go-No go gauge on bend gauge |  |  |
| OTH | Tooling must not be worn or damaged | Visual TPM |  | 1 | First off | SOP. Skills matrix. | 1st off & 4 off per shift with Go-No go gauge on bend gauge |  |  |
| CC | No scoring permitted | Visual |  | 100 % | 100% | SOP. Skills matrix. | Double visual inspection 100%. |  |  |
| 60 | Wash pipe |  | 60 |  | Pipe meets cleanliness spec : Particle size not to exceed 400 Microns /0.6MG when measured in accordance with LRLTM.30.DD.103 | SC | Pipe must conform to cleanliness specified on drawing AUE0176-03 | Visual  Cleanliness test |  | 100 % 1 | 100%  Annual | SOP. Skills matrix. | Double visual inspection 100%. |  |  |
| OTH | Detergent mixture to be correct to SOP | Visual  TPM |  | 100 % 1 | 100%  1stoff, 4 per shift | SOP. Skills matrix. | Double visual inspection 100%. |  |  |
| OTH | Water to be kept clean | Visual  TPM |  | 100 % 1 | 100%  1stoff, 4 per shift | SOP. Skills matrix. | Double visual inspection 100%. |  |  |

This control plan does have some problems such as some things are missing and some things are not clear. We are here to analyse it and try to identify the mistakes in order to make a better control plan document.

The points that needs to be changed or are missing are the following:

1. 1st of all in many points it says that they inspect the 1st and another 4 during the shift, they should specify which 4 are they going to inspect, in my opinion they should divide it to be equally for example if they make 100 fuel fillers per shift then the 1st will be inspected then every 25 there will be an inspection so it is divided equally and that should be specified.
2. In operation 10, last 2 steps, it says there will be double visual inspection. They have to specify who will do them and when, they shouldn’t be done by the same person as he could be seeing the same thing twice while there might be another problem. It should be 2 people inspecting and they should do it after each other. That should be specified in the document.
3. Anything with double visual inspection, must be corrected and specified as the previous one stated.
4. There is no document on how to program the computer to bend the pipe for the exact model given. There should be a document on how to program it and how not to make mistakes so that the program will bend the right model instead of bending the wrong angles on the pipe.