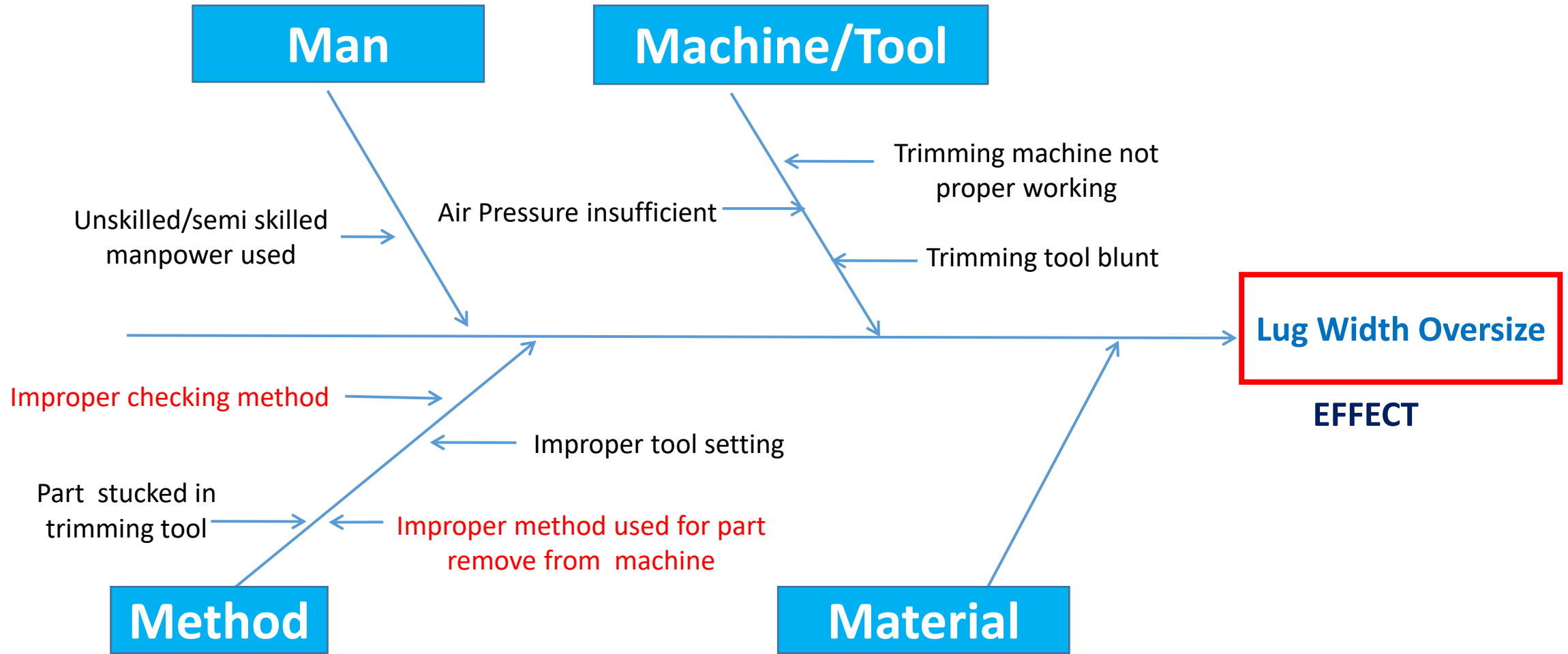


# Analysis –Cause & Effect Diagram



# Probable Cause

Sr. No.	Category	Probable Cause	Verification	Jud (O/X)
1	Man	Unskilled/semi skilled manpower used	Gaurav & moti was aware about the process (WI/PRM/002, Skill matrix(F15/P&A(SKM, Limit Sample	O
2	Machine/Tool	Insufficient air pressure	Observed pressure was 4 kg/cm <sup>2</sup> found ok (WI/PRM/002)	O
3		Trimming machine not working properly	As per machine check sheet found ok	O
4		Trimming tool blunt	Checked reshaping frequency proper adhered found ok	O
5	Method	Improper checking method	At trimming process Part checked by vernier caliper during set-up & in-process inspection , but Possibility is there to bypass . F31/QAD(HIR-TRIM)	X
6		Part Stucked in trimming tool	Observed part no chance of sticking in tool(WI/PRM/002)	O
7		Improper tool setting	Observed setting done properly by tool setter(WI/PRM/002) F31/QAD(HIR-TRIM)	O
8		Improper method used for part remove from machine	When parts are stored at near trimming tool, a part gets stuck in the tool, so that when trimming another part with same condition, the width of the claw increases over of stuck part.	X

# Root Cause Analysis

Occur / Outf.	Problem	Why-1	Why-2	Why-3	Why-4
Occurrence	Trimming part stucked in tool ,chance of claw width over	Sometime parts get stuck up in Die after trimming and does not fly even puff of air. Operator keep running the machine continue, then core plate lug pressed by punch and claw width size become over.	There is narrow space for the trimming tool to come off when the part is stuck	No provision in tool to avoid such type issue	Claw width oversize possibility not considered as an failure mode in PFMEA during trimming
Outflow	Checking method not sufficient to detect claw width over size on one claw at trimming & PDI	Claw width checked by vernier caliper ,during set-up, houlry & PDI, which does not ensure of whole lot /parts	Claw width oversized (One claw) possibility not considered while defined in control plan	No criteria for defining the inspection method in control plan	Procedure not available for control plan & inspection standard



## Countermeasure & Standardization

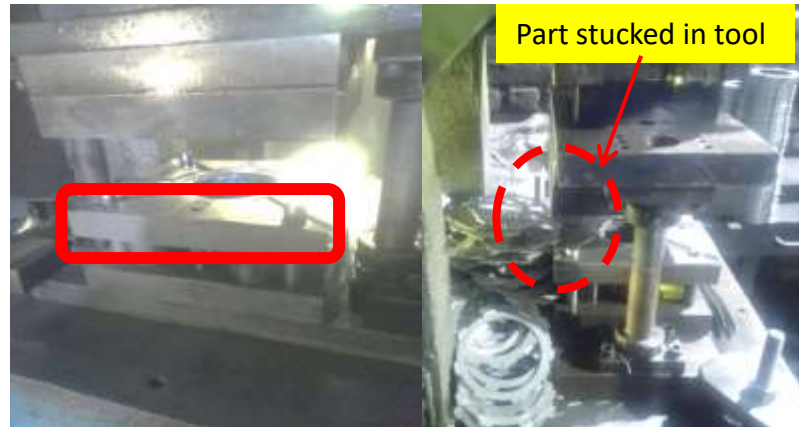
# Occurrence Countermeasure

## Occurrence Countermeasure

- Part ejection system to be made in trimming tool to avoid stuck issue . Done 2.11.2023

## Illustration

Before



Part stucked in tool due to there is 0.50 mm draft in tool chance of claw width over size

After



3.0 mm slot provided in tool to avoid claw width over size ,No chance of oversize

**Benefit : No chance of lug width over size during trimming process**

# Occurrence Countermeasure

## Occurrence Countermeasure

## Illustration

- PFMEA updated for claw width oversize at one claw .Done 2.11.2023

Before

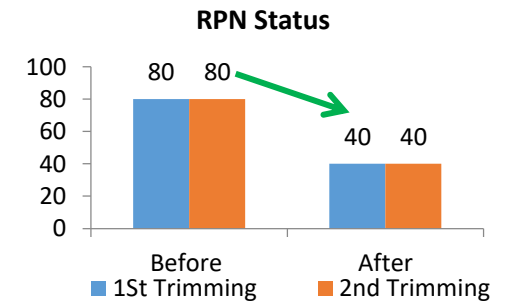
Op. No.	Process Step / Function	Requirement	Potential Failure Mode	Potential Effects of Failure	Severity Classification	Potential Cause of Failure	Current Process		Detection	Control Action
							Control	Frequency		
Revised Stage PFMEA										
88	1 <sup>st</sup> Trimming	Part used for less than other appearance level	Part may be damaged	Defective parts leading to scrap or rework	3	Claw width punch and die being damaged / Wrong setting	Trimming	1	1	80
90	2 <sup>nd</sup> Trimming	Part should be free from damage (claw, etc.)	Damage depends on using machine	Defective parts leading to scrap or rework	3	Claw width punch and die being damaged / Wrong setting	Trimming	1	1	80
		Dimension should meet in part drawing requirement	The Claw Width is not correct	Dimension error due to using machine	3	Part being higher than of the tolerance / Wrong setting	Trimming	1	1	80
		Part should not allowed in the part	Part not correct as per drawing	Part not correct as per drawing	3	Part not correct as per drawing	Trimming	1	1	80

Claw width oversize possibility not covered in PFMEA and adhered

After

Op. No.	Process Step / Function	Requirement	Potential Failure Mode	Potential Effects of Failure	Severity Classification	Potential Cause of Failure	Current Process		Detection	Control Action
							Control	Frequency		
Revised Stage PFMEA										
88	1 <sup>st</sup> Trimming	Part used for less than other appearance level	Part may be damaged	Defective parts leading to scrap or rework	3	Claw width punch and die being damaged / Wrong setting	Trimming	1	1	40
90	2 <sup>nd</sup> Trimming	Part should be free from damage (claw, etc.)	Damage depends on using machine	Defective parts leading to scrap or rework	3	Claw width punch and die being damaged / Wrong setting	Trimming	1	1	40
		Dimension should meet in part drawing requirement	The Claw Width is not correct	Dimension error due to using machine	3	Part being higher than of the tolerance / Wrong setting	Trimming	1	1	40
		Part should not allowed in the part	Part not correct as per drawing	Part not correct as per drawing	3	Part not correct as per drawing	Trimming	1	1	40

Claw width at 8 places oversize possibility covered in PFMEA at Trimming 1& 2 and adhered(RPN reduced)



Benefit : RPN reduced from 80 to 40

# Out Flow Countermeasure

## Outflow Countermeasure

- Inspection method to be improved –Done(2.11.2023)

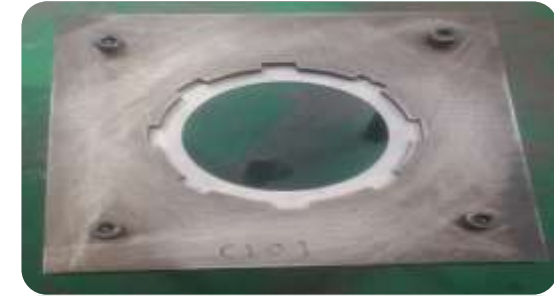
## Illustration

Before



Lug width checked by vernier caliper 1 pc after 2 hrs ,chance of defected parts bypass

After



Indexing Gauge made and adhered to detect lug width oversize .

Inspection started by indexing gauge 20 nos/hr

**Benefit : Claw width issue easy to detect during inspection**

# Out Flow Countermeasure

## Outflow Countermeasure

- Poison test to be done to verify the effectiveness of inspection- Done(2.11.2023)

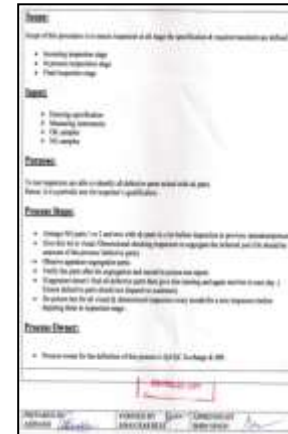
## Illustration

Before



Poison test mechanism not available

After



Procedure made and adhered for poison test

Benefit : Effectiveness improve of inspection