

CAR 5.6

A more robust tool to prevent & detect errors.....

REASONS FOR THE CHANGE

Most of the CAR have errors: by typing mistakes or wrong understanding of the calculations.

New CAR will prevent many errors and advise user about data incongruences & risks to be analyzed.

Effective **15th of August 2018**, CAR version 5.5 is obsoleted. **All submissions must be in CAR version 5.6**

Main changes consist on:

- Additional conditional formats
- Additional links between the Capacity Phase, Shared loading, Historical Manufacturing performance and Supplier Declarations and Notes.
- Protection of more cells to avoid manual input.

GENERAL CHANGES

■ Conditional format:

➤ **Orange:** Cells needs data

A5) Required Good Parts / Week		APW Plan	MPW Plan	APW Plan	MPW Plan
H	Percent of parts scrapped				

➤ **Red:** Cells have no proper data
Capacity issue

Predicted Good Parts per wk	Average	Maximum
Required Capacity (APW/MPW)	51	57
Phase 3 Demonstrated Capacity	53	59
Commitment (APPC/MPPC)	50	66

➤ **Yellow:** Data to be reviewed.
Capacity risk

S	Can process contain its changeover, scrap & rework assumptions? $[J/(100\%-H) + (JxR) + (G1x60xG2/N) \leq P]$	YES	YES
T	% Remaining for Availability & Performance Efficiency losses $\{P - [(J/(100\%-H)) + (JxR) + (G1x60xG2/N)]\} / P$	0,3%	1,2%

■ Comments reviewed and updated

MPW	MPW: Maximum Production Weekly; capacity requirement based on a 6 day work week with no additional tooling, equipment or facilities.
-----	--

M	# of identical parts produced per Tool or Machine Cycle
N	Net Ideal Cycle Time (sec/part) $[K / (L*M)]$
P	Theoretical Parts per week at 100% OEE $[G \times 3600 / N]$
Q	Required OEE $[J / P]$

RED colour: the NICT in "SHARED LOADING" tab does not match with this row.
Please check data and correct

■ Printing adjusted for all sheets



Go Further

INTRODUCTION SHEET

Aligned the required forms with the Capacity Analysis and Resources

Name of Sheet / CAR Type	Capacity Planning	Initial Phase 0 (for Phase 1)	Phase 0 for additional manufacturing lines (may require additional completed CAR form)	Phase 0 for all remaining manufacturing lines (for Phase 2)	Phase 3	Capacity Uplift	Quarterly APPC and MPPC Reporting / Web Quote, etc.
Capacity Planning	R	S	S	S	S	S	S
Shared Loading Plan	R*	R*	R*	R*	R*	R*	R*
Detailed Shared Loading plan	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%
Phase 0 PPAP (Run @ Rate)		R	R	R			S
Phase 3 PPAP (Cap Ver)					R	R	R
Historical Mfg Performance	R	R	R	R	R	R	R
VSM	R	R	R	R	R		
Production Support/ Rate of Climb Chart	R	R	R	R	R		
Supplier Declarations and Notes	R	R	R	R	R	R	R

R = Required

S = Suggested

R* = May be required under certain circumstances, see below for examples

Shared Loading Plan is required when there is more than one part in the manufacturing process being analyzed for capacity.



Go Further

INTRODUCTION SHEET

For proper function of the links between tabs, please always update the corresponding phase we are analyzing.

Capacity Analysis Introduction

In the **Capacity Analysis Introduction** tab, please identify the correct reason for the CAR submission. If unsure, then contact STA site engineer.

Capacity Planning
Initial Phase 0 (for Phase 1)
Phase 0 for additional manufacturing lines (may
Phase 0 for all remaining manufacturing lines (for
Phase 3
Capacity Uplift
Quarterly APPC and MPPC Reporting / Web Q

select reason for CAR
submission

Capacity Planning
Initial Phase 0 (for Phase 1)
Phase 0 for additional manufacturing lines (may
Phase 0 for all remaining manufacturing lines (for
Phase 3
Capacity Uplift
Quarterly APPC and MPPC Reporting / Web Q

Shared Loading Plan
Detailed Shared Loading plan
Phase 0 PPAP (Run @ Rate)
Phase 3 PPAP (Cap Ver)
Historical Mfg Performance
VSM
Production Support/ Rate of Climb Chart
Supplier Declarations and Notes

Name of Sheet / CAR Type	Capacity Planning	Initial Phase 0 (for Phase 1)	Phase 0 for additional manufacturing lines (may require additional completed CAR form)	Phase 0 for all remaining manufacturing lines (for Phase 2)	Phase 3	Capacity Uplift	Quarterly APPC and MPPC Reporting / Web Quote, etc.
Capacity Planning	R	S	S	S	S	S	S
Shared Loading Plan	R*	R*	R*	R*	R*	R*	R*
Detailed Shared Loading plan	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%	R if total allocation>90%
Phase 0 PPAP (Run @ Rate)		R	R	R			S
Phase 3 PPAP (Cap Ver)					R	R	R
Historical Mfg Performance	R	R	R	R	R	R	R
VSM	R	R	R	R	R		
Production Support/ Rate of Climb Chart	R	R	R	R	R		
Supplier Declarations and Notes	R	R	R	R	R	R	R

R = Required

S = Suggested

R* = May be required under certain circumstances, see below for examples

Shared Loading Plan is required when there is more than one part in the manufacturing process being analyzed for capacity.

The best practice is to complete the CAR and submit all sheets to Ford, filled out or not.



Go Further

A) SECTION

Conditional format to ensure all required cells are fulfilled & Additional fields

A1) Supplier & Part Information		A2) Capacity Requirements		APW	MPW	Select for Analysis
	Supplier Name		Program Code	<PA> Requirements		
	Location/Site Code		Model Year	Revised Requirements		
	Part Name		Part PPAP Level	Source Capacity Req	ATP or Study	
	Part Number		Date of Study	GCP/MCPV		

A3) Key Contacts			
	Name	Phone #	Email
STA Site Engineer			
Supplier Lead			
Ford Buyer			

G	Net Available Time (hours / week) [B*C*(D-(E/60))*F1]	1,10	1,23	4,11	4,59
G1	Planned Minutes per Changeover (into this part #)	45			
G2	Planned Changeover Frequency / Week (into this part #)	0,17			

A5) Required Good Parts / Week		APW Plan	MPW Plan	APW Plan	MPW Plan
H	Percent of parts scrapped			0,5%	
J	Req'd Good Parts / Week to Support Next Process (Accounts for the scrap loss of each process)	52	58	51	57
Required Incoming Parts for Injection		Avg. Weekly	Max Weekly		
		52	58		

A6) Required OEE (Overall Equipment Effectiveness)		APW Plan	MPW Plan	APW Plan	MPW Plan
K	Ideal Cycle Time per Tool or Machine (sec/cycle)	65		255	
L	# of Tools or Machines in parallel	1		1	
M	# of identical parts produced per Tool or Machine Cycle	1		1	
N	Net Ideal Cycle Time (sec/part) [K / (L*M)]	65,00		255,00	
P	Theoretical Parts per week at 100% OEE [G x 3600 / N]	61	68	58	65
Q	Required OEE [J / P]	85,2%	85,2%	88,0%	88,0%
R	Percent of parts reworked (re-run through process)	0,0%			
S	Can process contain its changeover, scrap & rework				

All figures need to be placed (even if it is zero), to avoid to miss a data by error.

A) SECTION

A4) Increased robustness to place the corresponding allocation, **linking the Shared loading with the corresponding Phase:**

F: Drop list to select "Dedicated" or "Shared".

F1: Automatically places 100% for Dedicated or the corresponding allocation % from shared loading (from part marked with x).

A4) Planned Departmental Operating Pattern & Net Available Time for All Customers		Process 1		Process 2	
		APW Plan	MPW Plan	APW Plan	MPW Plan
A	Process description (in value stream order)	Injection		Welding & Assy	
B	Days / Week	5	6	5	6
C	Shifts / Day	3	3	3	3
D	Total Hours / Shift	8	8	8	8
E	Contractual Downtime - lunch breaks, etc (min/shift)	0	0	15	15
F	Dedicated or Shared Process	Shared		Dedicated	
F1	Allocation Percent (enter 100 for dedicated)	0,9%	0,9%	100,0%	100,0%
G	Net Available Time (hours / week) $[B * C * (D - (E/60))] * F1$	1,10	1,23	116,25	139,50
G1	Planned Minutes per Changeover (into this part #)	45			
G2	Planned Changeover Frequency / Week (into this part #)	0,17			

This is one of the most common and dangerous mistakes in CAR: placing more allocation than the Minimum required from Shared Loading, without registering this additional allocation used. Therefore Total process allocation is not properly tracked and process can be oversold without realizing.

With this solution, all allocation used for the part is registered in Shared Loading.



Go Further

A) SECTION

A4) A5) A6): In case of Shared processes, it compares the following data with the corresponding Shared loading plan and shows red if any incongruence:

- Net Available Time (G) [it compares the Working pattern (B, C, D & E)]
- Required Good parts (J)
- Cycle time (N)

A4) Planned Departmental Operating Pattern & Net Available Time for All Customers		Process 1	
		APw/ Plan	MPw/ Plan
A	Process description (in value stream order)	Injection	
B	Days / Week	5	6
C	Shifts / Day	3	3
D	Total Hours / Shift	8	8
E	Contractual Downtime - lunch, breaks, etc. (min/shift)	10	10
F	Dedicated or Shared Process	Shared	
F1	Allocation Percent (enter 100 for dedicated)	0,9%	0,9%
G	Net Available Time (hours / week) [B*C*(D-(E/60))*F1]	1,07	1,20
G1	Planned Minutes per Changeover (into this part #)	45	
G2	Planned Changeover Frequency / Week (into this part #)	0,17	

A5) Required Good Parts / Week		APw/ Plan		MPw/ Plan	
H	Percent of parts scrapped	2,0%			
J	Req'd Good Parts / Week to Support Next Process (Accounts for the scrap loss of each process)	52		52	
Required Incoming Parts for		Avg. Weekly		Max Weekly	
		54		60	

A6) Required OEE (Overall Equipment Effectiveness)		APw/ Plan		MPw/ Plan	
K	Ideal Cycle Time per Tool or Machine (sec/cycle)	65			
L	# of Tools or Machines in parallel	1			
M	# of identical parts produced per Tool or Machine Cycle	1			
N	Net Ideal Cycle Time (sec/part) [K / (L*M)]	65,00		65,00	
P	Theoretical Parts per week at 100% OEE [G x 3600 / N]	60		67	
Q	Required OEE [J / P]	NICT NOK		NICT NOK	

		Planned Departmental Operating Pattern for All Customers for Average Weekly							
		Days / Week	5						
		Shifts / Day	3						
		Total Hours / Shift	8						
		Contractual Planned Downtime - lunch, breaks, etc. (minutes/shift)	0						
Type the letter 'X' in one of the cells below to identify the part that is analyzed during Phase 3 PPAP (Cap Ver)		Net Available Time (NAT) (hrs/week)	120,00						
		Demonstrated OEE (Overall Equipment Effectiveness):	85,2%						
		Enter average OEE from most recent production performance data (from updated Historical Mfg. Performance)							
			Loading Plan to meet Average Weekly						
Part 1 marked for Analysis	Part	Ford Part # or "Non-Ford"	Req'd Good Parts / Week	NICT	Time Req'd @ Demonstrated OEE (hrs/week)	Tool Changeover Time (min/week)	% Allocation Minimum Required	% Additional Allocation	% Allocation Total Required
x	1	A	51	66,0	1,1	45,0	0,9%		0,9%
	2	B	1792	61,2	35,8	45,0	29,8%		29,8%
	3	C	1792	61,2	35,8	40,0	29,8%		29,8%
	4	D	1667	52	28,3	30,0	23,6%		23,6%



Go Further

A) SECTION

A6) Removed "Round down" of Theoretical Parts per week at 100% OEE (P) to avoid false risk on low volume parts

Unified the Cycle time calculation for APW & MPW, combining both cells into one for the rows K, L, M & N, to avoid copy-paste mistakes

Added conditional format "Yellow" if "% Remaining for Availability & Performance Efficiency losses" (T) $\leq 10\%$, to review OEE feasibility

A6) Required OEE (Overall Equipment Effectiveness)		APW Plan	MPW Plan
K	Ideal Cycle Time per Tool or Machine (sec/cycle)	65	
L	# of Tools or Machines in parallel	1	
M	# of identical parts produced per Tool or Machine Cycle	1	
N	Net Ideal Cycle Time (sec/part) $[K / (L \times M)]$	65,00	
P	Theoretical Parts per week at 100% OEE $[G \times 3600 / N]$	61	68
Q	Required OEE $[J / P]$	85,2%	85,2%
R	Percent of parts reworked (re-run through process)	0,0%	
S	Can process contain its changeover, scrap & rework assumptions? $[Is J / (100\% - H) + (J \times R) + (G \times 60 \times G2 / N) \leq P]$	YES	YES
T	% Remaining for Availability & Performance Efficiency losses $\{P - [J / (100\% - H) + (J \times R) + (G \times 60 \times G2 / N)]\} / P$	1,5%	2,7%

A) SECTION

A7) Locked Total % Allocation from "Shared Loading Plan" Sheet (row U) to avoid manual wrong input. It is automatically placed once the corresponding phase is selected in "Introduction" tab.

A7) Shared Process - Total Allocation Plan		Injection		Welding & Assy	
U	Enter Total % Allocation from "Shared Loading Plan" Sheet	102,1%	77,5%	74,4%	68,7%

Disadvantage: Traceability is lost in the Excel file, once it is updated for other phases. (It is still available in the pdf file)
 We give priority to calculation robustness vs traceability:
Gap analysis will be **RED** when % Allocation >100%

C. Gap Analysis - Required OEE vs. Demonstrated OEE; Predicted Good Parts / Week						
Process Description	Injection		Welding & Assy			
	AP'w Result	MP'w Result	AP'w Result	MP'w Result	AP'w Result	MP'w Result
Demonstrated OEE \geq Required OEE? (Is Z \geq Q?)	SEE ROW U	OK	OK	OK		

B) SECTION

Capacity Planning - B1): Average Historical OEE (Z) is blocked to ensure proper data is placed in the Historical Manufacturing Performance Sheet

B. Supplier Demonstrated OEE (Overall Equipment Effectiveness) - Historical Performance					
B1) Historical Performance (from Historical Mfg Performance Summary)					
Process Description	Injection	Welding & Assy			-
V Supplier Name					
W Supplier Location					
X Site Code for Surrogate Process					
Y Surrogate Customer & Program Reference (~Ford P221)					
List reference Surrogate Process (~Stamping Press					
Z Average Historical OEE	>100%	88,0%			-
Enter any other assumptions for clarification (Part Number, Annual Volume, Operating Pattern, etc.)					
B2) Process Specific Weekly Part Estimate [P * Z]	OEE > 100%	OEE > 100%	51	57	-

Disadvantage: Traceability is lost in the Excel file once OEE is updated for other phases. (It is still available in the pdf file)

We give priority to calculation robustness vs traceability:
OEE RED when any of the 25 sets of OEE is >100% & ensure OEE data availability

B) SECTION

Phase 0- B2) Added AF1 & AF2 to identify the production streams available during the Phase 0 run.

Locked Planned Net Ideal Cycle Time (AF), it is automatically calculated based on the production streams available (AF1 & AF2)

B2) Performance Efficiency			
AE	Total Parts Run (Good, Scrapped, & Reworked)	141	40
AF1	# of CURRENT Tools or Machines in parallel	1,0	1,0
AF2	# of identical parts produced per Tool or Machine Cycle	1,0	1,0
AF	Planned Net Ideal Cycle Time (sec/part) [$K/(AF1*AF2)$]	65,00	255,00
AG	Performance Efficiency ($AE * AF / AC$)	98,5%	100,0%
AH	"Availability" and/or "Performance Efficiency" Losses Not Captured (minutes) [$AC - (AE * AF)$]	2	0

This is fixing the potential error to calculate more capacity than real one: when during Phase 0, the process is running slower than planned in A) section.

B) SECTION

Phase 3- B1): For shared lines, it will not calculate OEE if Change over time ACTUAL (Y) is not placed.

To avoid placing 0 when there is change over time, if that Actual CHOT is less than 50% planned CHOT(A section), cell will be highlighted in yellow.

B. Supplier Demonstrated OEE - Phase 3 PPAP (Capacity Verification)		
B1) Equipment Availability		
	Injection	Welding & Assy
V Total Available Time (Include ACTUAL changeover time for Shared) (minutes)	200	190
W Planned Downtime - lunches/breaks/mtgs. (minutes)	0	0
X Net Available Time (minutes) [V - W]	200	190
Y Shared Equip Changeover Time ACTUAL (minutes)		20
Z Shared Equip Changeover Time Weekly Scaled (minutes) $[Y * (X / 60) / (G / G2)]$	0	15
AB Observed Unplanned Downtime (minutes)	0	0
AC Operating Time (minutes) [X - Y - AB]	200	170
AD Equipment Availability $[(X - Z - AB) / X * 100]$	Actual Changeover	91,9%

This is very common mistake in CAR: to forget including the Change over time in the Phase 3 run.

B) SECTION

Phase 3- B2): Locked Net Ideal Cycle Time (AF), it is automatically linked to N. If planned cycle time is not achieved, it will penalize the Efficiency.

B2) Performance Efficiency			
AE	Total Parts Run (Good, Scrapped, & Reworked)		
AF	Net Ideal Cycle Time (seconds/part) [N]	-	
AG	Performance Efficiency ($AE * AF / AC$)	-	
AH	"Availability" and/or "Performance Efficiency" Losses Not Captured (minutes) [$AC - (AE * AF)$]	-	

This is fixing the potential error to calculate more capacity than real one: when during Phase 3, the process is running slower than planned in A) section.

C) SECTION

Added robustness to identify risks: placing **RED** and the following messages:

"See Row S" --> Process cannot contain Changeover, Scrap & Rework assumptions

"See Row U" --> Total allocation is not in place (the corresponding Phase needs to be selected in the Introduction Sheet) or Total allocation is higher than 100%

Q	Required OEE [J / P]	85,2%	85,2%	88,0%	88,0%
R	Percent of parts reworked (re-run through process)	0,0%		0,0%	
S	Can process contain its changeover, scrap & rework assumptions? $[Is J/(100\%-H) + (JxR) + (G1x60xG2/N) \leq P]$	NO	YES	YES	YES
T	% Remaining for Availability & Performance Efficiency losses $\{P - [(J/(100\%-H)) + (JxR) + (G1x60xG2/N)]\} / P$	-0,1%	1,1%	3,4%	4,3%
Enter any other assumptions for clarification					
A7) Shared Process - Total Allocation Plan					
U	Enter Total % Allocation from "Shared Loading Plan" Sheet	84,1%	77,5%	104,4%	98,7%

C. Gap Analysis - Required OEE vs. Demonstrated OEE; Predicted Good Part				
Process Description	Injection		Welding & Assy	
	AP'w Result	MP'w Result	AP'w Result	MP'w Result
Demonstrated OEE ≥ Required OEE? (Is AM ≥ Q?)	SEE ROW S	OK	SEE ROW U	OK

Error messages indicating that CAR cannot be approved:

"OEE>100": Required OEE or Demonstrated OEE is >100%

"RISK": Demonstrated OEE < Required OEE

"See Row U": Total allocation is not in place (the corresponding Phase needs to be selected in the Introduction Sheet) or Total allocation is higher than 100%

"See Row S": Process cannot contain Changeover, Scrap & Rework assumptions

C) SECTION

Phase 0: Added section "Phase 0 Capacity with current installation" → it calculates the current capacity based on current production streams available

Predicted Good Parts per wk	Average	Maximum
Required Capacity (APW/MPW)	51	57
Phase 0 Demonstrated Capacity	53	59
Phase 0 Capacity with current installation	26	29

It provides the Capacity with all machines & tools planned.

It provides the Capacity with current machines & tools available during Phase 0.

In case of delay of the additional tools or machines needed, it provides the current available capacity to support the demand.

C) SECTION

Demonstrated Capacity (Phase 0 & 3): Calculation changed considering the worst downstream scrap scenario from each process (Planned or Run results)

	Process 1		Process 2		Process 3	
A5) Required Good Parts / Week	APW Plan	MPW Plan	APW Plan	MPW Plan	APW Plan	MPW Plan
H Percent of parts scrapped	3,0%		0,5%		1,0%	

B3) Quality Rate	#	%	#	%	#	%
AJ # Parts Scrapped	10	1,5%	68	10,0%	2	0,3%

CAR 5.5

Predicted Good Parts per wk	Average	Maximum
Required Capacity (APW/MPW)	10000	11000
Phase 0 Demonstrated Capacity	10063	12076

Demonstrated Capacity is calculated with the planned scrap from A) Section. Ignoring the real results from the run in B) Section

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Predicted Good Parts per wk	Average	Maximum
Required Capacity (APW/MPW)	10000	11000
Phase 3 Demonstrated Capacity	9107	10929

Demonstrated Capacity is calculated with the worst scrap rate.

In this sample, as bottleneck operation is Process 1, the scrap considered is:
 Process 3 → Planned Scrap from A5) - H
 Process 2 → Scrap from the run B3) - AJ



C) SECTION

Commitment (APPC/MPPC) included also in Capacity planning & Phase 0

Added robustness to **identify wrong Commitments (APPC/MPPC)**: **RED** if lower than Required Capacity or if higher than Demonstrated Capacity

Predicted Good Parts per wk	Average	Maximum	Predicted Good Parts per wk	Average	Maximum
Required Capacity (APW/MPW)	18050	19100	Required Capacity (APW/MPW)	51	57
Phase 3 Demonstrated Capacity	21416	23223	Phase 3 Demonstrated Capacity	53	59
Commitment (APPC/MPPC)	18600	19000	Commitment (APPC/MPPC)	55	59

C) SECTION

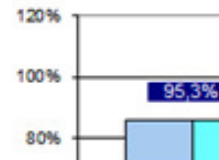
Commitment (APPC/MPPC) : Warning message when **Commitment volume is more than 10% higher than the Required Capacity** → to ensure Phase 3 OEE can be sustained based on updated Historical Data and to verify that all Tier N / sub suppliers can provide the new volumes.

It is strongly recommended to perform a new CAR with these committed volumes

B4) Overall Equipment Effectiveness (OEE)			
AM Phase 3 OEE [AD * AG * AL]	95,3%		
B5) Process Specific Weekly Part Estimate [P * AM]	4912	5071	
B6) Observed Average Cycle Time (sec/cycle)	60,0		
C. Gap Analysis - Required OEE vs. Demonstrated OEE; Pr			
Process Description		INJECTION MACHINE N° 25	
		APW Result	MPW Result
Demonstrated OEE ≥ Required OEE? (Is AM ≥ Q?)		OK	OK
Predicted Good Parts per wk	Average	Maximum	
Required Capacity (APW/MPW)	4417	4562	
Phase 3			
Demonstrated Capacity	4912	5071	
Commitment (APPC/MPPC)	4912	5071	

120%
100%
80%

95,3%



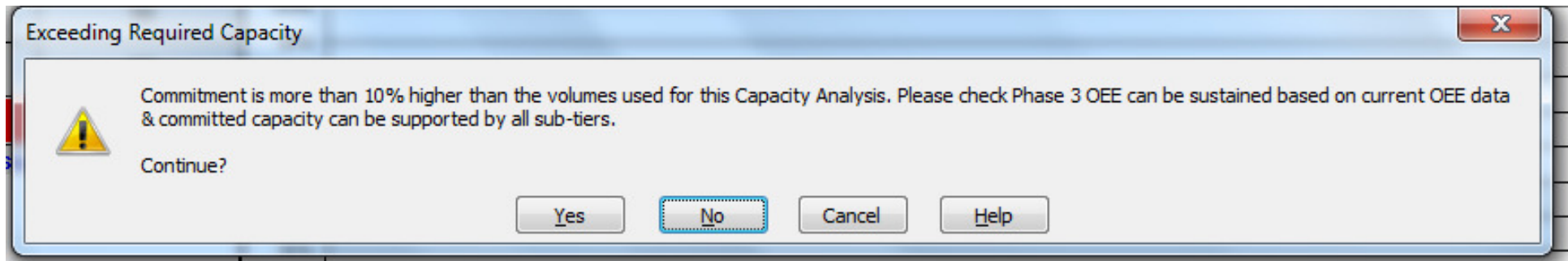
Compare the OEEs to ensure sustainability & Verify that all Tier N / sub suppliers can provide the new volumes.



Demonstrated OEE (Overall Equipment Effectiveness): Enter average OEE from most recent production performance data; Historical Mfg Performance may be used for this calculation	85,7%
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C) SECTION

Commitment (APPC/MPPC) : Warning message when Commitment volume is more than 10% higher than the Required Capacity (Continuation)



<u>FOR STA USE</u>		Commitment is more than 10% higher than the Capacity Requirements (APW / MPW) used for this Capacity Analysis. Please check Phase 3 OEE can be sustained based on current OEE data, additionally, verify committed capacity can be supported by all sub-tier suppliers including shared loading at sub-tier
Site Engineer	STA LL6 Supervisor	Approved
		Rejected
Signature/Date	Signature/Date	

C) SECTION

Link between C) Section & Supplier Declarations and Notes to ensure the sub-tiers capacity analysis is done for the corresponding phase and the Capacity planner is certified (all fields need to be completed)

Capacity planning → At least Capacity planning needs to be done for all sub-tiers

Phase 0 → At least Phase 0 needs to be done for all sub-tiers

Phase 3 → Phase 3 need to be done for all sub-tiers.

Planned Capacity	Check Decl. and Notes	Check Decl. and Notes
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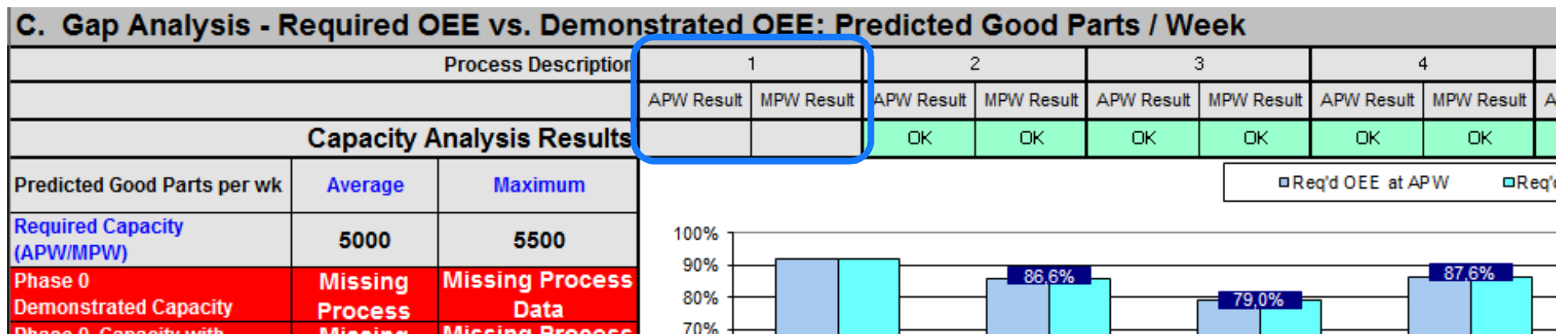
Phase 0 Demonstrated Capacity	Check Decl. and Notes	Check Decl. and Notes
Phase 0 Capacity with current installation	Check Decl. and Notes	Check Decl. and Notes

Phase 3 Demonstrated Capacity	Check Decl. and Notes	Check Decl. and Notes
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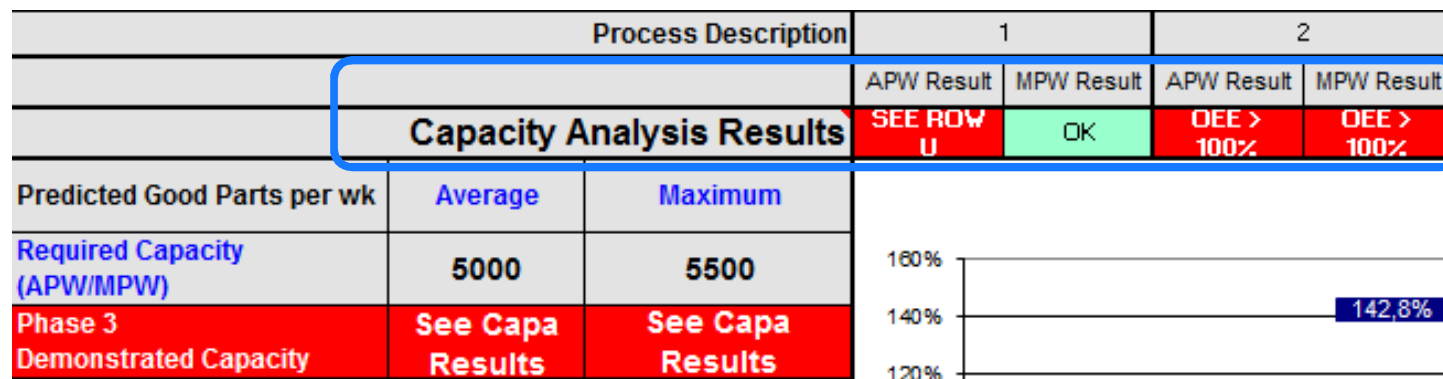
C) SECTION

Additional Error messages:

Missing Process Data: if any of the identified processes in A) Section have no proper data in B) to calculate capacity:



See Capacity Results: if Capacity Analysis Results RED warning is not allowing to properly calculate real Capacity.



SHARED LOADING

➤ **Demonstrated OEE is linked to “Historical Manufacturing Performance”,** it can be overwritten but it is highlighted when a different figure is placed:

RED → OEE placed in Shared loading is **higher** than Historical Performance OEE

YELLOW → OEE placed in Shared loading is **lower** than Historical Performance OEE

➤ **MPW OEE cell is blocked** (automatically linked to APW OEE)

Shared-Loading Plan for PROCESS 1 Milling				
Type the letter "X" in one of the cells below to identify the part that is analyzed during Phase 3 PPAP	Shared Process Loading Plan	NICT = Net Ideal Cycle Time (sec/part)	Date of Study	27-Aug-2017
	Study Phase (please enter in "Introduction" TAB)	Phase 3 PPAP (Cap Ver)	PROCESS 1	Milling
	Planned Departmental Operating Pattern for All Customers for Average Weekly		Planned Departmental Operating Pattern for All Customers for Max Weekly	
	Days / Week	5	6	
	Shifts / Day	3	3	
	Total Hours / Shift	8	8	
	Contractual Planned Downtime - lunch, breaks, etc. (minutes/shift)	0	0	
	Net Available Time (NAT) (hrs/week)	120,00	144,00	
	Demonstrated OEE (Overall Equipment Effectiveness): Enter average OEE from most recent production performance data (from updated Historical Mfg. Performance)	85,0%	85,0%	

SHARED LOADING

- **More rows added** to place parts, up to 50 (to be unhide for usage).
- **3 columns added:** "**Application/ Vehicle Line**" for each part
 "% **Additional Allocation**" and "% **Allocation Total Required**", to ensure proper tracking of Total Allocation.
- **NICT of MPW is automatically linked** to NICT of APW
- **Warning message of "Detailed Shared loading Required"** when Total Allocation is >90%

Part 2 marked for Analysis	Part	Application / Vehicle Line	Ford Part # or "Non-Ford"	Req'd Good Parts / Week	NICT	Time Req'd @ Demonstrated OEE (hrs/week)	Tool Changeover Time (min/week)	% Allocation Minimum Required	% Additional Allocation	% Allocation Total Required	Req'd Good Parts / Week	NICT	Time Req'd @ Demonstrated OEE (hrs/week)	Tool Changeover Time (min/week)	% Allocation Minimum Required	% Additional Allocation	% Allocation Total Required
x	1	V408	AAA	1598	57	29,8	60,0	24,8%	2,0%	26,8%	1636	57	30,5	60,0	21,2%	2,0%	23,2%
	2	C520	BBB	1144	66	24,7	60,0	20,6%		20,6%	1200	66	25,9	60,0	18,0%		18,0%
	3	V480+C520	CCC	152	66	3,3	60,0	2,7%		2,7%	206	66	4,4	60,0	3,1%		3,1%
	4	CD platform	DDD	1024	66	22,1	30,0	18,4%		18,4%	1152	66	24,8	30,0	17,3%		17,3%
	5	CD391	EEE	152	66	3,3	15,0	2,7%		2,7%	156	66	3,4	15,0	2,3%		2,3%
	6	No Ford	FFF	597	71,3	13,9	60,0	11,6%	1,5%	13,1%	620	71,3	14,4	60,0	10,0%	1,5%	11,5%
	7	No Ford	GGG	704	71,3	16,4	30,0	13,7%		13,7%	770	71,3	17,9	30,0	12,5%		12,5%
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																
	16																
	17																
	18																
	19																
	20																
	49		Other % Allocation - Description														
	50		Other % Allocation - Description														
Percentage of Net Available Time not utilized for production (%) (PM, etc.)																	
Total % Allocation				5371		113,4		Detailed Shared Loading Required		98,0%	5740		121,4				87,8%
If Total % Allocation > 100%, loading plan exceeds capacity																	

Add % of Additional Allocation needed for the part.
Just to be used in case that:
 * The part has lower OEE than Average Demonstrated process OEE.
 * Temporal additional allocation needed due to prolonged time to reach the demonstrated OEE during ramp up stage

The use of Additional Allocation is an Exception, not a rule.

SHARED LOADING

- Automatically place the Required Good parts , NICT and Tool Changeover Time, when the “X” is selected for the corresponding part.

Part 2 marked for Analysis	Part	Application / Vehicle Line	Ford Part # or "Non-Ford"	Req'd Good Parts / Week	NICT
x	1		H6BG 1A111 AA		
	2		HX7G 1A111 AB	3141	37,5
	3		JA6G1A111 AA		
	4		Customer A		
	5				
	6				

As the cells are not blocked, user must be careful to avoid deleting the formulas.

- Addition of **DATE OF REVIEW OF ALL SHARED LOADINGS OR THE MASTER**, to ensure all Shared loadings are up to date & **Supplier Signature of the Shared loading** (Without date or if date is prior to Date of Study of the corresponding phase, it will display the Total allocation in RED)



If Total % Allocation > 100%, loading plan exceeds capacity	
DATE OF REVIEW OF ALL SHARED LOADINGS OR THE MASTER	SUPPLIER OPERATION MANAGEMENT APPROVAL
	Signature

HISTORICAL MANUFACTURING PERFORMANCE

- **Reinforce robustness:** if any **OEE** data is **>100%**, it will not calculate Average OEE as data collection system is not **appropriate**.

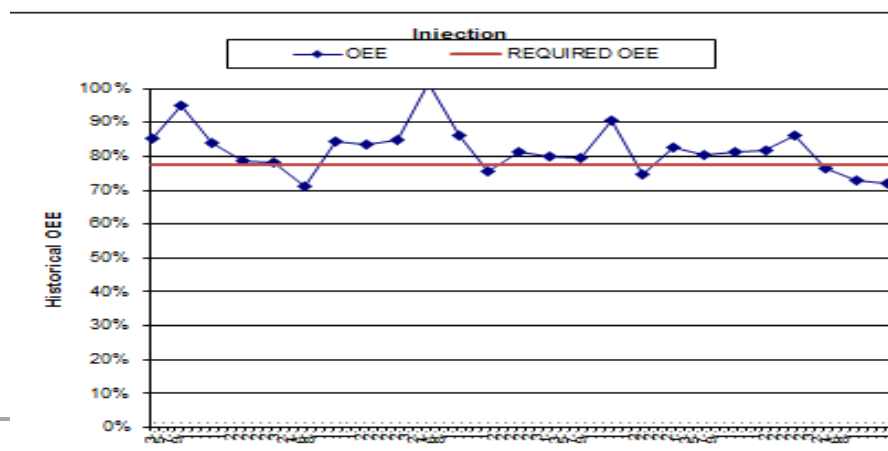
Demonstrated Performance History (could be surrogate)		GPP =			
		Injection			
WK#	Date	GPP	NICT	NAT	OEE
WK1	3-Mar-2017	6921	40	90,0	85,4%
WK2	10-Mar-2017	9631	40	112,5	95,1%
WK3	17-Mar-2017	8478	40	112,5	84%
WK4	24-Mar-2017	4785	40	67,5	78,8%
WK5	31-Mar-2017	6325	40	90,0	78,1%
WK6	7-Apr-2017	5753	40	90,0	71,0%
WK7	14-Apr-2017	7699	40	101,3	84,5%
WK8	21-Apr-2017	8470	40	112,5	83,7%
WK9	28-Apr-2017	7721	40	101,3	84,7%
WK10	5-May-2017	9241	40	101,3	101,4%
WK11	12-May-2017	8735	40	112,5	86,3%
WK12	19-May-2017	4593	40	67,5	75,6%
WK13	26-May-2017	8224	40	112,5	81,2%
WK14	2-Jun-2017	8076	40	112,5	79,8%
WK15	9-Jun-2017	5803	40	81,0	79,6%
WK16	16-Jun-2017	8437	40	103,5	90,6%
WK17	23-Jun-2017	5303	40	78,8	74,8%
WK18	30-Jun-2017	2503	40	33,8	82,4%
WK19	7-Jul-2017	5697	40	78,8	80,4%
WK20	14-Jul-2017	3292	40	45,0	81,3%
WK21	21-Jul-2017	6612	40	90,0	81,6%
WK22	28-Jul-2017	8722	40	112,5	86,1%
WK23	4-Aug-2017	6205	40	90,0	76,6%
WK24	11-Aug-2017	7374	40	112,5	72,8%
WK25	18-Aug-2017	5842	40	90,0	72,1%
AVERAGE OEE					>100%
REQUIRED OEE					77,6%

- **OEE Yellow** → weekly OEE lower than Required OEE

- Added the **Required OEE**

- Allow average OEE calculation if first week there is no data for a process

- **NAT Yellow** → When more than 24 hours x 6 days (144hrs)



Go Further

SUPPLIER DECLARATIONS AND NOTES

- Clarified the declaration regarding sub-tier suppliers capacity & Included number of suppliers (Total & Completed)
- Added comment for sustainability of Committed capacity
- Removed error checks that cannot take place with this version

Capacity Analysis Supplier Declarations and Notes

Item #	Declaration/Note	User Response (blue shaded cells)
1	Supplier confirms that all sub-tier suppliers have been verified to meet capacity requirements for the phase (No / Capacity Planning / Phase 0/ Phase 3 / Not applicable when no sub-tier suppliers):	
	TOTAL Number of sub-tier suppliers	
	Number of sub-tier suppliers COMPLETED for the corresponding phase	
2	Supplier used the following method to complete sub-tier supplier capacity analysis:	
3	All Committed capacity declared in Ford GCP/MCPV capacity planning systems based on this CAR assessment are validated throughout the value chain and are sustainable as demonstrated by continuous monitoring of manufacturing OEE and Shared Loading.	
4	Date on which Capacity Planner completed CAR training:	
5	Name of Capacity Planner:	
6	Email of Capacity Planner:	

ADDITIONAL TABS

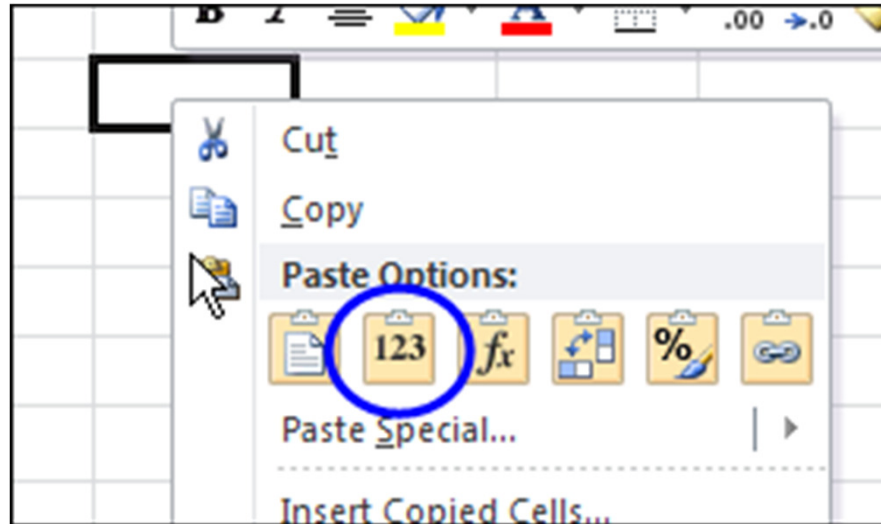
- Tab for “**PPC confirmation**”: To place screenshot of:
 - ❖ GCP/MCPV (PPC maintenance Page)
 - or
 - ❖ Web-quote (Capacity ATP response page)

- Tab for “**CAR submission history**”: to capture the CAR changes that impacts Capacity (volumes, NICT, scrap, OEE, etc.)

CAR Submission History										
CAR Submission when change occurred:										
Date:										
All Processes		APW / MPW								
P R O C E S S 1	0	Working pattern (NAT)								
		NICT								
		Total Allocation for Shared lines								
		Demonstrated OEE								
		Planned Scrap/ Rework	Scrap %							
			Rework %							

USER TIPS

As copy-paste option is also changing the formats, to ensure the conditional formats are working properly is highly recommended to paste only the values



To clarify any doubt regarding CAR 5.6, please contact your Site STA or euca paci@ford.com

QUESTIONS & ANSWERS

Can a CAR be approved if there is any Orange, Yellow or Red?

CAR must not be approved with Orange or Red:

ORANGE indicates the cell needs data.

RED indicates cells have no proper data or there is Capacity Issue

CAR may be approved with Yellow, if the data has been reviewed and there is no risk.

YELLOW: data to be reviewed. There is a potential capacity risk that needs to be evaluated.

QUESTIONS & ANSWERS

In a shared process, why the Required OEE is matching with the Demonstrated OEE?

The Minimum Allocation Required is calculated considering the Demonstrated OEE from the “Historical Manufacturing Performance” tab, therefore the Required OEE is matching the Demonstrated OEE, unless additional allocation is placed.

Input

Output

Shared Loading
Capacity Planning
Phase 0 / Phase 3

Days / Week	✓
Shifts / Day	✓
Total Hours / Shift	✓
Contractual Planned Downtime	✓
Demonstrated OEE	
Req'd Good Parts / Week	✓
NICT	✓
Days / Week	
Shifts / Day	
Total Hours / Shift	
Contractual Planned Downtime	
Allocation Percent (enter 100 for dedicated)	
Req'd Good Parts / Week to Support Next Process	
Net Ideal Cycle Time (sec/part) [K / (L*M)]	

% Allocation
Minimum
Required ✓

Maths commutative property

Required OEE [J / P]



Go Further

CAR USER GUIDE AND ERROR STATES UPDATED

CAR User Guide → Restructured to find easier the information & More visual

A7 Shared Process – Total Allocation Plan – Required for operations that are shared / cross loaded

A7) Shared Process - Total Allocation Plan		-	-
U	Total % Allocation from "Shared Loading Plan" Sheet		

- U **AUTO-LOAD.** Total % Allocation from "Shared Loading Plan" sheet (note: this field is prepopulated from the "[Shared Loading Plan](#)" when the Introduction worksheet pull-down selection is made appropriate to each PPAP phase).
- YELLOW:** Total Allocation is >90%, therefore a Detailed Shared Loading Plan is mandatory.
- RED:** Total Allocation is >100%
- RED & "Check Shared tab":** Please check date in "SHARED LOADING", row 71

CAR Error States → Simplified & Checklist added

B1) Historical Performance (from Historical Mfg Performance Summary)									
Process Description									
V	Supplier Name	<input type="checkbox"/>	Check data is clearly identifying the source of the Historical / Surrogate OEE						
W	Supplier Location	<input type="checkbox"/>							
X	Site Code for Surrogate Process	<input type="checkbox"/>							
Y	Surrogate Customer & Program Reference (~Ford P221) List reference Surrogate Process (~Stamping Press #12)	<input type="checkbox"/>							
Z	Average Historical OEE	<input type="checkbox"/>	RED: One or more OEE figures in the Historical Mfg Performance are higher than 100%						
Enter any other assumptions for clarification (Part Number, Annual Volume, Operating Pattern, etc.)		<input type="checkbox"/>	Use this row to clarify the Historical / Surrogate performance data						
B2) Process Specific Weekly Part Estimate [P * Z]									