Production Capacity Plan

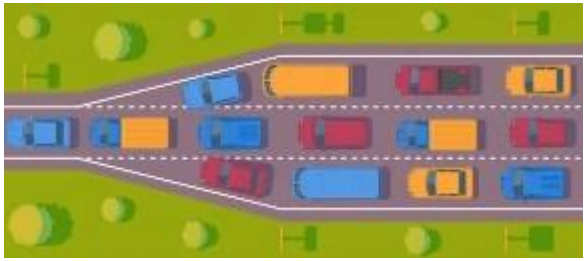
What is it?

- A series of 3 key worksheets (plus 2 optional worksheets) to provide evidence that your facilities have sufficient capacity to meet a new products demand



Why do I need it?

- To demonstrate that **every** process you use has enough capacity
- To identify which process is the **bottleneck**
- To identify your facilities **unallocated (free) time**

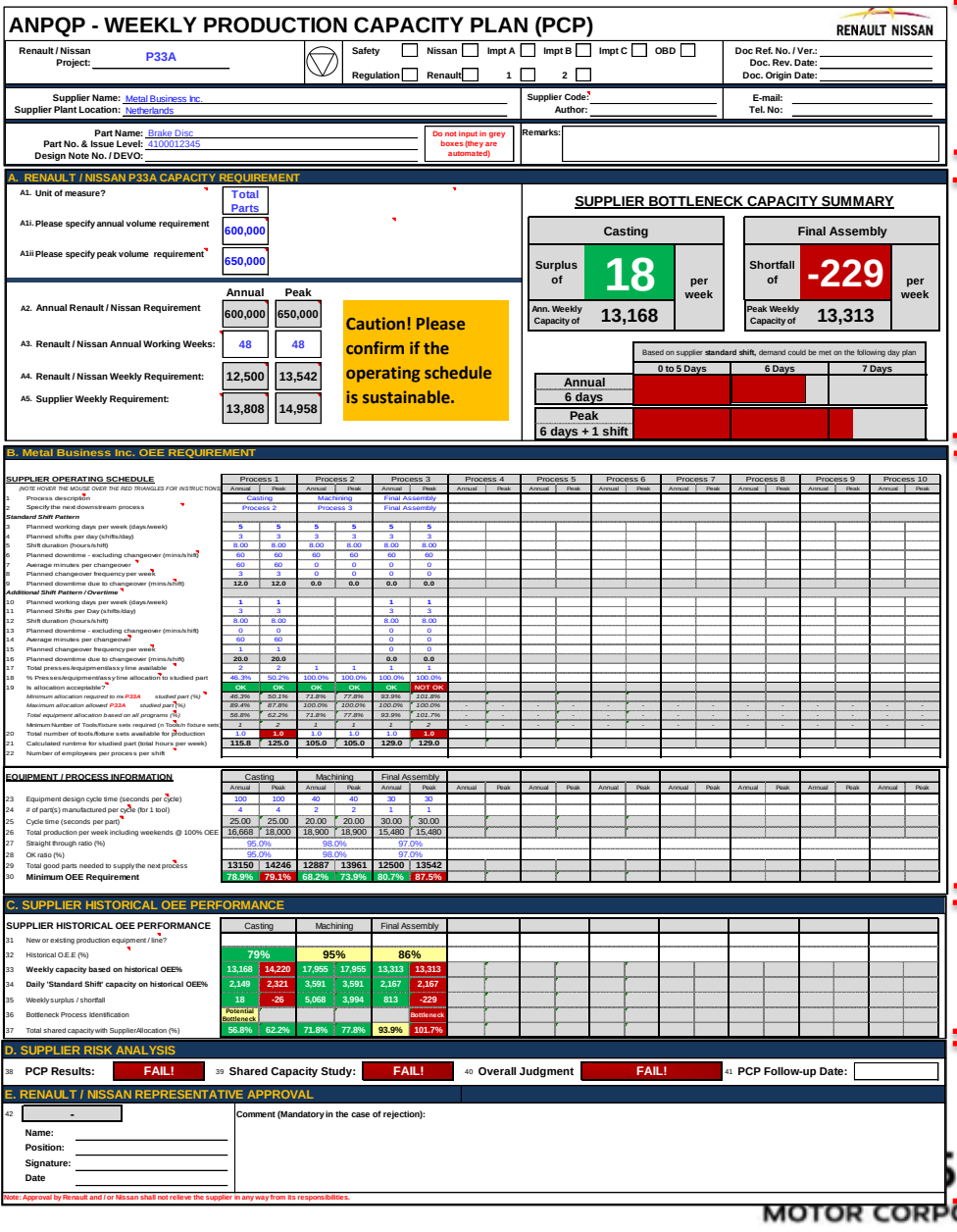




- To identify the **constraints imposed** by your product mix including making other customers products

NISSAN
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Worksheet 1) Production Capacity Study



ANPQP - WEEKLY PRODUCTION CAPACITY PLAN (PCP)

RENAULT NISSAN

Renault / Nissan Project: P33A

Safety ☐ Nissan ☐ Impt A ☐ Impt B ☐ Impt C ☐ OBD ☐
Regulation ☐ Renault ☐ 1 ☐ 2 ☐

Doc Ref. No. / Ver.:
Doc. Rev. Date:
Doc. Origin Date:

Supplier Name: Metal Business Inc.
Supplier Plant Location: Netherlands

Supplier Code:
Author:
E-mail:
Tel. No:

Part Name: Brake Disc
Part No. & Issue Level: 4100012345
Design Note No. / DEVO:

Do not input in grey boxes (they are automated)

Remarks:

A. RENAULT / NISSAN P33A CAPACITY REQUIREMENT

		Annual	Peak
A1. Unit of measure?		Total Parts	
A1i. Please specify annual volume requirement		600,000	
A1ii Please specify peak volume requirement		650,000	
A2. Annual Renault / Nissan Requirement		600,000	650,000
A3. Renault / Nissan Annual Working Weeks:		48	48
A4. Renault / Nissan Weekly Requirement:		12,500	13,542
A5. Supplier Weekly Requirement:		13,808	14,958

Caution! Please confirm if the operating schedule is sustainable.

SUPPLIER BOTTLENECK CAPACITY SUMMARY

Casting			Final Assembly		
Surplus of	18	per week	Shortfall of	-229	per week
Ann. Weekly Capacity of	13,168		Peak Weekly Capacity of	13,313	

Based on supplier **standard shift**, demand could be met on the following day plan

	0 to 5 Days	6 Days	7 Days
Annual 6 days			
Peak 6 days + 1 shift			

B. Metal Business Inc. OEE REQUIREMENT

SUPPLIER OPERATING SCHEDULE (NOTE HOVER THE MOUSE OVER THE RED TRIANGLES FOR INSTRUCTIONS)

	Process 1		Process 2		Process 3		Process 4		Process 5		Process 6		Process 7		Process 8		Process 9		Process 10	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
1 Process description	Casting		Machining		Final Assembly															
2 Specify the next downstream process	Process 2		Process 3		Final Assembly															
Standard Shift Pattern																				
3 Planned working days per week (days/week)	5	5	5	5	5	5														
4 Planned shifts per day (shifts/day)	3	3	3	3	3	3														
5 Shift duration (hours/shift)	8.00	8.00	8.00	8.00	8.00	8.00														
6 Planned downtime - excluding changeover (mins/shift)	60	60	60	60	60	60														
7 Aerage minutes per changeover	60	60	0	0	0	0														
8 Planned changeover frequency per week	3	3	0	0	0	0														
9 Planned downtime due to changeover (mins/shift)	12.0	12.0	0.0	0.0	0.0	0.0														
Additional Shift Pattern / Overtime																				
10 Planned working days per week (days/week)	1	1			1	1														
11 Planned Shifts per Day (shifts/day)	3	3			3	3														
12 Shift duration (hours/shift)	8.00	8.00			8.00	8.00														
13 Planned downtime - excluding changeover (mins/shift)	0	0			0	0														
14 Aerage minutes per changeover	60	60			0	0														
15 Planned changeover frequency per week	1	1			0	0														
16 Planned downtime due to changeover (mins/shift)	20.0	20.0			0.0	0.0														
17 Total presses/equipment/assy line available	2	2	1	1	1	1														
18 % Presses/equipment/assy line allocation to studied part	46.3%	50.2%	100.0%	100.0%	100.0%	100.0%														
19 Is allocation acceptable?	OK	OK	OK	OK	OK	NOT OK														
Minimum allocation required to mi P33A studied part (%)	*46.3%*	*50.1%*	*71.8%*	*77.8%*	*93.9%*	*101.8%*														
Maximum allocation allowed P33A studied part (%)	*89.4%*	*87.8%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*														
Total equipment allocation based on all programs (%)	*56.8%*	*62.2%*	*71.8%*	*77.8%*	*93.9%*	*101.7%*														
Minimum Number of Tools/fixture sets required (n Tools/n fixture sets)	1	2	1	1	1	2														
20 Total number of tools /fixture sets available for production	1.0	1.0	1.0	1.0	1.0	1.0														
21 Calculated runtime for studied part (total hours per week)	115.8	125.0	105.0	105.0	129.0	129.0														
22 Number of employees per process per shift																				

EQUIPMENT / PROCESS INFORMATION

	Casting		Machining		Final Assembly															
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
23 Equipment design cycle time (seconds per cycle)	100	100	40	40	30	30														
24 # of part(s) manufactured per cycle (for 1 tool)	4	4	2	2	1	1														
25 Cycle time (seconds per part)	25.00	25.00	20.00	20.00	30.00	30.00														
26 Total production per week including weekends @ 100% OEE	16,668	18,000	18,900	18,900	15,480	15,480														
27 Straight through ratio (%)	95.0%		98.0%		97.0%															
28 OK ratio (%)	95.0%		98.0%		97.0%															
29 Total good parts needed to supply the next process	13150	14246	12887	13961	12500	13542														
30 **Minimum OEE Requirement**	78.9%	79.1%	68.2%	73.9%	80.7%	87.5%														

C. SUPPLIER HISTORICAL OEE PERFORMANCE

SUPPLIER HISTORICAL OEE PERFORMANCE	Casting		Machining		Final Assembly															
31 New or existing production equipment / line?																				
32 Historical O.E.E (%)	79%		95%		86%															
33 **Weekly capacity based on historical OEE%**	13,168	14,220	17,955	17,955	13,313	13,313														
34 **Daily 'Standard Shift' capacity on historical OEE%**	2,149	2,321	3,591	3,591	2,167	2,167														
35 Weekly surplus / shortfall	18	-26	5,068	3,994	813	-229														
36 Bottleneck Process Identification	Potential Bottleneck					Bottleneck														
37 Total shared capacity with SupplierAllocation (%)	56.8%	62.2%	71.8%	77.8%	93.9%	101.7%														

D. SUPPLIER RISK ANALYSIS

38 PCP Results: FAIL! 39 Shared Capacity Study: FAIL! 40 Overall Judgment FAIL! 41 PCP Follow-up Date:

E. RENAULT / NISSAN REPRESENTATIVE APPROVAL

42 -

Name:
Position:
Signature:
Date

Comment (Mandatory in the case of rejection):

Note: Approval by Renault and / or Nissan shall not relieve the supplier in any way from its responsibilities.

Header

- Generic

Section A:

- Customer demand (Left Hand Side)
- Result summary (Right Hand Side)

Section B:

- Suppliers operating schedule
- Suppliers process information
- Each column represents 1 process

Section C:

- Suppliers current OEE performance
- Identifies bottle neck process
- Predicted weekly output

Section D & E

- Judgment and approval

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Sheet 1) Customer Volume Requirement

Select unit of measure - as specified in your RFQ:

- ❑ Parts volume (Europe & Asia)
- ❑ Vehicle volume (NNA region only)

A. NISSAN CAPACITY REQUIREMENT		
A1. Unit of measure?	Total Parts	
A1i. Please specify annual volume requirement		
A1ii. Please specify peak volume requirement		
	Annual	**Peak**
A2. Annual Nissan Requirement	0	0
A3. Nissan Annual Working Weeks:		
A4. Nissan Weekly Requirement:	0	0
A5. Supplier Weekly Requirement:	0	0

Sheet 1) Specify your processes

B. Metal Business Inc. OEE REQUIREMENT

SUPPLIER OPERATING SCHEDULE

(NOTE HOVER THE MOUSE OVER THE RED TRIANGLES FOR INSTRUCTIONS

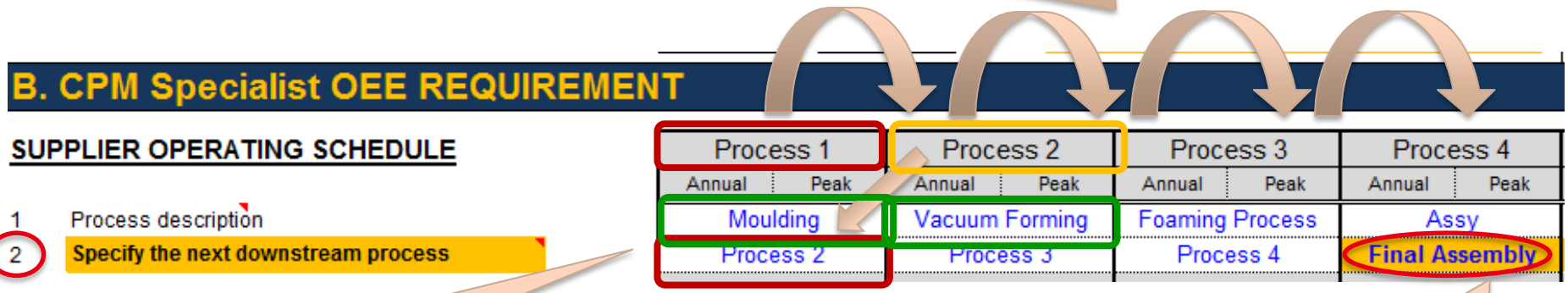
		Process 1		Process 2		Process 3		
		Annual	Peak	Annual	Peak	Annual	Peak	An
1	Process description	Casting		Machining		Final Assembly		
2	Specify the next downstream process	Process 2		Process 3		Final Assembly		
Standard								
3	P	**5**	**5**	**5**	**5**	**5**	**5**	
4	P	3	3	3	3	3	3	
5	S	8.00	8.00	8.00	8.00	8.00	8.00	
6	P	60	60	60	60	60	60	
7	A	60	60	0	0	0	0	
8	P	3	3	0	0	0	0	
9	Pl	**12.0**	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**	
Additional Shift Pattern / Overtime								
10	Planned working days per week (days/week)	**1**	**1**					
11	Planned Shifts per Day (shifts/day)	3	3					
12	Shift duration (hours/shift)	8.00	8.00					
13	Planned downtime - excluding changeover (mins/shift)	0	0					
14	Average minutes per changeover	60	60					
15	Planned changeover frequency per week	1	1					
16	Planned downtime due to changeover (mins/shift)	**20.0**	**20.0**			**0.0**	**0.0**	
17	Total presses/equipment/assy line available	2	2	1	1	1	1	
18	% Presses/equipment/assy line allocation to studied part	46.3%	50.2%	100.0%	100.0%	100.0%	100.0%	
19	Is allocation acceptable?	OK	OK	OK	OK	OK	NOT OK	
	Minimum allocation required to m **P33A** *studied part (%)*	*46.3%*	*50.1%*	*71.8%*	*77.8%*	*93.9%*	*101.8%*	
	Maximum allocation allowed **P33A** *studied part (%)*	*89.4%*	*87.8%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	
	Total equipment allocation based on all programs (%)	*56.8%*	*62.2%*	*71.8%*	*77.8%*	*93.9%*	*101.7%*	
	Minimum Number of Tools/fixture sets required (n Tools/n fixture sets)	*1*	*2*	*1*	*1*	*1*	*2*	
20	Total number of tools/fixture sets available for production	1.0	**1.0**	1.0	1.0	1.0	**1.0**	
21	Calculated runtime for studied part (total hours per week)	**115.8**	**125.0**	**105.0**	**105.0**	**129.0**	**129.0**	
22	Number of employees per process per shift							

Input ALL the process names in the order shown in the process flow diagram

Enter data for each process in a unique column

Sheet 1) Linking Downstream Processes

Follow this logic with each process



Link each process to the next downstream process. Use the drop down menu to link the 'process number'

e.g. if moulding feeds vacuum forming

Link process 1 to process 2

The last process should always be set to show **Final Assembly** (even if its not actually assembly, it just tells the sheet the part is ready for despatch)

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Sheet 1) Your Operating Schedule

B. Metal Business Inc. OEE REQUIREMENT

SUPPLIER OPERATING SCHEDULE

(NOTE HOVER THE MOUSE OVER THE RED TRIANGLES FOR INSTRUCTIONS)

		Process 1		Process 2	
		Annual	Peak	Annual	Peak
1	Process description	Casting		Machining	
2	Specify the next downstream process	Process 2		Process 3	
	Standard Shift Pattern				
3	Planned working days per week (days/week)	**5**	**5**	**5**	**5**
4	Planned shifts per day (shifts/day)	3	3	3	3
5	Shift duration (hours/shift)	8.00	8.00	8.00	8.00
6	Planned downtime - excluding changeover (mins/shift)	60	60	60	60
7	Average minutes per changeover	60	60	0	0
8	Planned changeover frequency per week	3	3	0	0
9	Planned downtime due to changeover (mins/shift)	**12.0**	**12.0**	**0.0**	**0.0**
	Additional Shift Pattern / Overtime				
10	Planned working days per week (days/week)	**1**	**1**		
11	Planned Shifts per Day (shifts/day)	3	3		
12	Shift duration (hours/shift)	8.00	8.00		
13	Planned downtime - excluding changeover (mins/shift)	0	0		
14	Average minutes per changeover	60	60		
15	Planned changeover frequency per week	1	1		
16	Planned downtime due to changeover (mins/shift)	**20.0**	**20.0**		
17	Total presses/equipment/assy line available	2	2	1	1
18	% Presses/equipment/assy line allocation to studied part	46.3%	50.2%	100.0%	100.0%
19	Is allocation acceptable?	OK	OK	OK	OK
	Minimum allocation required to me ***P33A*** *studied part (%)*	*46.3%*	*50.1%*	*71.8%*	*77.8%*
	Maximum allocation allowed ***P33A*** *studied part (%)*	*89.4%*	*87.8%*	*100.0%*	*100.0%*
	Total equipment allocation based on all programs (%)	*56.8%*	*62.2%*	*71.8%*	*77.8%*
	Minimum Number of Tools/fixture sets required (n Tools/n fixture sets)	*1*	*2*	*1*	*1*
20	Total number of tools/fixture sets available for production	1.0	1.0	1.0	1.0
21	Calculated runtime for studied part (total hours per week)	**115.8**	**125.0**	**105.0**	**105.0**
22	Number of employees per process per shift	1		1	

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- Input your **standard** shift pattern & planned downtime for each process in the ‘Annual’ column
- Input alternative shift pattern to support **peak** volume in the ‘Peak’ column
- Where peak proposal requires **irregular** shifts/overtime, open the ‘hidden’ cells to allow flexible input
- Product/tool changeover time is treated as **planned downtime**. Its deducted automatically from available runtime

Sheet 1) Equipment allocation



JAGUAR LAND ROVER + NISSAN

B. Metal Business Inc. OEE REQUIREMENT

SUPPLIER OPERATING SCHEDULE

(NOTE HOVER THE MOUSE OVER THE RED TRIANGLES FOR INSTRUCTIONS)

		Process 1		Process 2	
		Annual	Peak	Annual	Peak
1	Process description	Casting		Machining	
2	Specify the next downstream process	Process 2		Process 3	
	Standard Shift Pattern				
3	Planned working days per week (days/week)	**5**	**5**	**5**	**5**
4	Planned shifts per day (shifts/day)	3	3	3	3
5	Shift duration (hours/shift)	8.00	8.00	8.00	8.00
6	Planned downtime - excluding changeover (mins/shift)	60	60	60	60
7	Average minutes per changeover	60	60	0	0
8	Planned changeover frequency per week	3	3	0	0
9	Planned downtime due to changeover (mins/shift)	**12.0**	**12.0**	**0.0**	**0.0**
17	~~Total presses/equipment/assy line available~~	~~2~~	~~2~~	~~1~~	~~1~~
18	% Presses/equipment/assy line allocation to studied part	100.0%	100.0%	100.0%	100.0%
19	Is allocation acceptable?	NOT OK	NOT OK	OK	OK
20	Total number of tools/fixture sets available for production	1.0	**1.0**	1.0	1.0
21	Calculated runtime for studied part (total hours per week)	**125.0**	**125.0**	**105.0**	**105.0**
22	Number of employees per process per shift	1		1	

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- Later the PCP will study capacity for lines shared with other OEMs
- However to populate the formulas, a temporary figure is needed
- **Always input 100% allocation initially,** even if a line is shared
- **All cells must be complete** before the data is passed to the shared capacity sheet for auto populating
- You have to re-visit this data after completing worksheet 3

Worksheet #3: Shared Capacity Study



What is it?

- Validates % of a facilities available capacity allocated to making a new product

Why do I need it?

- To identify the constraints imposed from other customers products
- To identify the lines ‘free’ (unallocated) time

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Worksheet #3: Shared Capacity Study

Grey cells are formulas (no input necessary)

Process 1	Casting	Supplier Available Time per Week	
		Average	Peak
1. Total Equipment Available		2	2
2. Total Machine Runtime Available (Minutes / Week)		15000	15000
3. OEE% Assumption			
4. Actual SFVC OEE%			

NPQP - SUPPLIER SHARED

Studied (new) part application is automatically populated into row 1

Part	5a. Program Code	5b. Part Numb…	…olume	…eak %		6. Estimated Parts Requirement / Week		7. Equipment Net Cycle Time (seconds)		8. Historical OEE%	9. Runtime Required per week (minutes) @ OEE Assumption		10. % Allocation Required / Equipment or Process	
						Annual	Peak	Annual	Peak		Annual	Peak	Annual	Peak
1	P33A	41000 RR00A	600,000			13,150	14,246	25	25	79.0%	6936	7514	**46.2%**	**50.1%**
2	L42P	41000-xxxxx	400,000	15%										
3														
28														
29						0	0				-	-	-	-
30											-	-	-	-
Max Weekly Capacity:											**…pment Utilization:**		**75.5%**	**83.8%**
If Total											**…nd Process Fails.**			

For Alliance common parts, specify annual volume for other models from latest ADCP data (or RFQ)

List all other parts that run on the same equipment / process

Up to 30 processes can be specified

We don't need part numbers for competitor parts. Part names or a code is enough

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Adjusting the PCP front worksheet

SUPPLIER OPERATING SCHEDULE		Process 1		Process 2	
(NOTE HOVER THE MOUSE OVER THE RED TRIANGLES FOR INSTRUCTIONS)		Annual	Peak	Annual	Peak
1	Process description	Casting		Machining	
2	Specify the next downstream process	Process 2		Process 3	
Standard Shift Pattern					
3	Planned working days per week (days/week)	**5**	**5**	**5**	**5**
4	Planned shifts per day (shifts/day)	3	3	3	3
5	Shift duration (hours/shift)	8.00	8.00	8.00	8.00
6	Planned downtime - excluding changeover (mins/shift)	60	60	60	60
7	Average minutes per changeover	60	60	0	0
8	Planned changeover frequency per week	3	3	0	0
9	Planned downtime due to changeover (mins/shift)	**12.0**	**12.0**	**0.0**	**0.0**
Additional Shift Pattern / Overtime					
10	Planned working days per week (days/week)	**1**	**1**		
11	Planned Shifts per Day (shifts/day)	3	3		
12	Shift duration (hours/shift)	8.00	8.00		
13	Planned downtime - excluding changeover (mins/shift)	0	0		
14	Average minutes per changeover	60	60		
15	Planned changeover frequency per week	1	1		
16	Planned downtime due to changeover (mins/shift)	**20.0**	**20.0**		
17	Total presses/equipment/assy line available	2	2	1	1
18	% Presses/equipment/assy line allocation to studied part	47.0%	50.0%	100.0%	100.0%
19	Is allocation acceptable?	OK	REVIEW	OK	OK
	Minimum allocation required to m P33A studied part (%)	*46.3%*	*50.1%*	*71.8%*	*77.8%*
	Maximum allocation allowed P33A studied part (%)	*70.6%*	*66.3%*	*100.0%*	*100.0%*
	Total equipment allocation based on all programs (%)	*75.5%*	*83.8%*	*71.8%*	*77.8%*
	Minimum Number of Tools/fixture sets required (n Tools/n fixture sets)	*1*	*2*	*1*	*1*
20	Total number of tools/fixture sets available for production	1.0	**1.0**	1.0	1.0
21	Calculated runtime for studied part (total hours per week)	**117.5**	**125.0**	**105.0**	**105.0**
22	Number of employees per process per shift	1		1	

- After you have populated the **shared** facility worksheet, you need to correct the **initial PCP worksheet** 1 with the shared data result
- Remove the temporary 100% figure and replace it with the shared allocation % from the shared worksheet
- The PCP worksheet will automatically repopulate & make a judgement using the new shared data

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Worksheet #2: T2000

What is it?

- Validates your ability to meet your planned KPI whilst **building at full speed**
- Actual T2000 production build data is validated against PCP planned targets





Why do I need it?

- Advises what volume you *would achieve* based upon T2000 evidence (shortfalls identified before SOP)
- Automatically calculates OK/NG judgement

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Sheet 2) Operational Availability

- Record the critical T2000 metrics then input them into PCP template

Note specific USA style formatting for date/time

Build time (run time) auto calculated

If the actual changeover time exceeds the PCP original plan, the difference is auto recorded as unplanned downtime

Enter good parts made, parts scrapped & parts reworked

C. Metal Business … E - T2000

	Equipment Operational Ava… ility				
33	T2000 start date / time (Enter as MM/DD/YY HH:MM AM or PM) (eg. 1/1/16	Cas…	5/1/19 8:00 AM	…9 8:00 AM	5/1/19 8:00 AM
34	T2000 end date / time (Enter as MM/DD/YY HH:MM AM or PM) (eg. 1/1/16		5/1/19 4:00 P…		
35	Total available time (minutes)		480		
36	Planned downtime (breaks, lunch, dinner, meetings, etc)		50		
37	Planned changeover duration (minutes)		60		
38	Net available time (minutes)		370.00		
39	Actual equipment changeover time (minutes)		75		
40	Unplanned downtime due to changever (minutes)		15	0	0
41	Observed unplanned downtime (minutes)		25	50	60
42	Operating time (minutes)		330	380	370
43	**Equipme…**		**89.2%**	**88.4%**	**86.0%**
	Quality Yield	Casting		Machining		Final Assembly	
		Total	%	Total	%	Total	%
52	Total parts scrapped	10	1.3%	15	1.5%	5	0.7%
53	Total parts reworked						
54	**Quality Yield (%)**	**98.7%**		**98.5%**		**99.3%**	

Sheet 2) OEE result & Judgement

Overall Equipment Effectiveness (OEE)		Casting		Machining		Final Assembly	
55	T2000 O.E.E (%)	83.3%		76.4%		80.8%	
56	Weekly capacity based on T2000 OEE%	13890	15000	14431	14431	12510	12510
57	Daily 'Standard Shift' capacity based on T2000 OEE%	2000	2448	2886	2886	2037	2037
58	Weekly surplus / shortfall	7061	[illegible]981	1544	470	10	-1032
59	Total shared capacity (%)	49.2%	5[illegible]	[illegible]9.3%	96.7%	99.9%	108.2%

Re-evaluates your capacity based upon T2000 evidence

Predicted parts weekly surplus/shortfall based upon your T2000 performance

- Traffic light judgement provided

D. T2000 SUMMARY

60 **T2000 Results:** FAIL! 61 **Shared Capacity Study** FAIL! 62 **T2000 Summary:** FAIL! 63 **T2000 Follow-up Date**

E. RENAULT / NISSAN REPRESENTATIVE APPROVAL

64

Name:

Position:

Signature:

Date

Comment (Mandatory in the case of rejection):

Note: Approval by Renault and / or Nissan shall not relieve the supplier in any way from its responsibilities.

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Questions?

A more detailed training pack is available via the B2B web portal

Alternatively, please consult your local engineer for details

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