WIPAIRE, INC.

Demand Driven Materials Planning and Execution

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Agenda

- Wipaire Overview
- Demand Driven Planning
  - Results
  - Genesis at Wipaire – MRP or not to MRP?
  - Implementation
  - Daily Planning and Execution
  - Lessons Learned
  - Future State
- Supporting Data

WIPLINE FLOATS

Wipline 13000 Floats


Wipline 10000 Floats

MODIFICATIONS

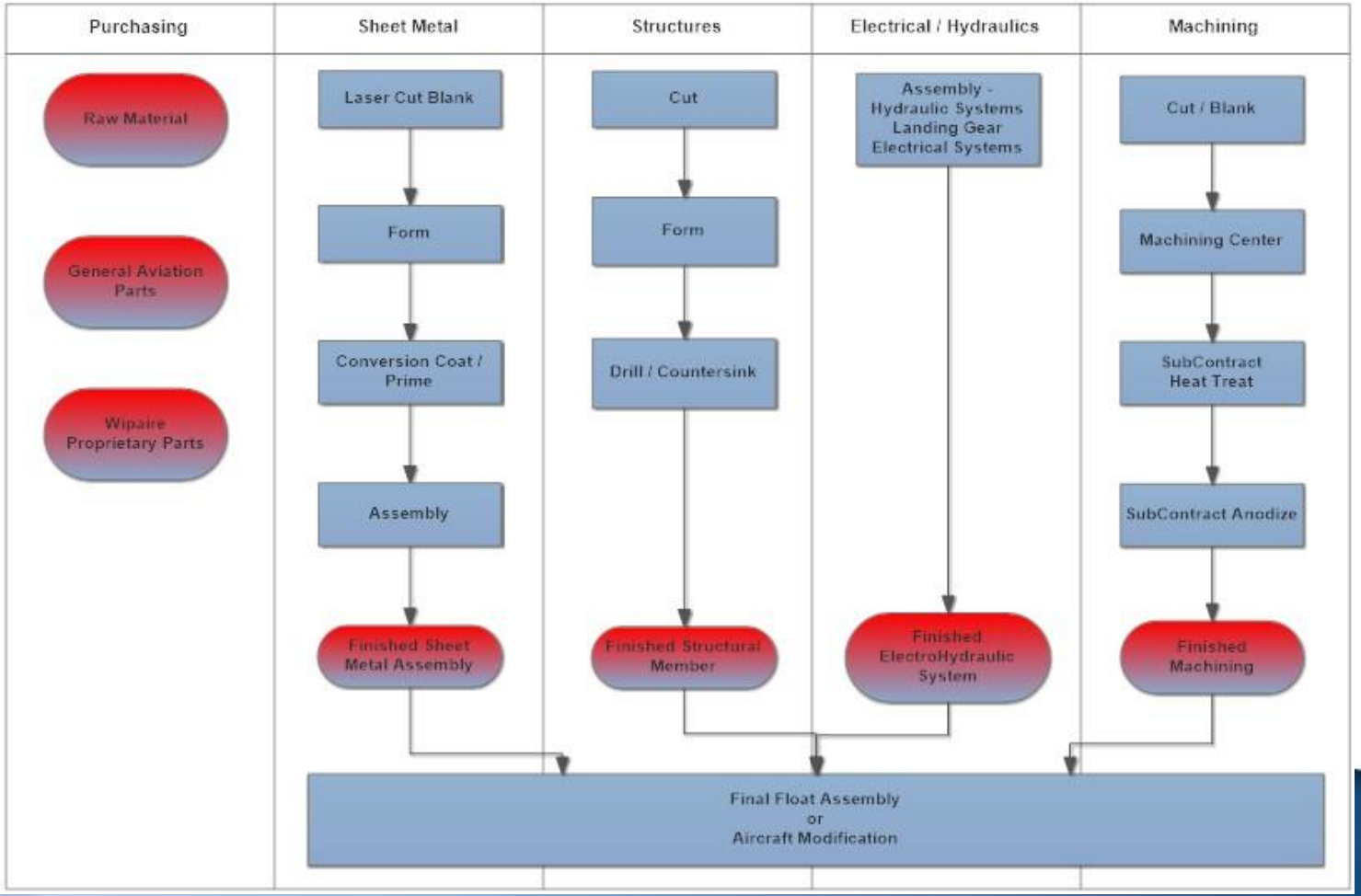
STC’s by Wipaire, Inc.

- Wipline 2100 Floats
- Wipline 2350 Floats
- Wipline 3000 Floats
- Wipline 3450 Floats
- Wipline 6100 Floats
- Wipline 7000 Floats
- Wipline 8750 Floats
- Wipline 10000 Floats
- Wipline 13000 Floats
- C2200 Skis
- C3000 Skis
- C3000A Skis
- C3200 Skis
- C3600 Skis
- CT3000 Tail Ski
- 2000T Tail Ski
- Single Point Fuel System for Kodiak, Cessna 208, 208B, & 208B EX, Airbus Puma
- 2000 lb GWI for Piper Cub
- Turbine Engine Installation for DHC2 Beaver
- 5600 lb GWI for DHC2 Beaver
- Executive Seating for Cessna 208, 208B, and 208B EX
- Hartzell Prop Upgrade for Cessna 180, 182 & 206
- IO-580 Engine for Cessna 182
- 3500 lb GWI for Cessna 182
- Vortex Generators for Air Tractor 802
- Fire Boss Rear Cockpit Trainer Kit for Air Tractor 802
- Pratt & Whitney PT6 Engine for DHC6 Twin Otter
- Wing Strut Modification for DHC2 Beaver
- Co-Pilot Door Installation for Cessna 206
- IO-550 Engine for Cessna 206
- IO-550 Engine for Cessna 185F
- PT6A-27 Engine Installation for DHC2 Beaver
- PT6A-114A Engine Installation for Cessna 208
- Flow Energizers DHC2 Beaver
- PT6A-28 Engine for DHC2 Beaver
- Auxiliary Wing Fuel Tanks for Helio
- S-TEC Autopilot Installation for DHC2
- Replace Engine Cowl & Baffles for Helio
- Vortex Generators for Cessna 208
- Structural Reinforcement Wires for Cessna 180
- Additional Cabin Window Installation for DHC2 Beaver
- Install Pilot, Copilot & Passenger Seats for DHC2 Beaver
- Install Firewall Battery for DHC2 Beaver
- Enlarge Baggage Compartment for DHC2 Beaver
- Wing Tip Extensions for Cessna 206
- Electric Fuel & Primer Pumps for DHC2 Beaver
- Electric Driven Flap Pump for DHC2 Beaver
- Wing Mounted Weather Radar System for AT-802
- Nine Passenger Executive Seating for DHC6 Twin Otter
- Hartzell Prop & Spinner for Cessna 185, 206
- Hartzell 3-Blade Prop & Spinner for DHC2
- Hydraulic Power Pack System for Skis

Manufacturing

- 70 Employees / 40,000 Square Feet
- 56 floats produced (14 models)
  - 40,000 production hours to assemble floats
  - 30,000 production hours to manufacture parts for floats, modifications, and customer service.
- 55 sales order lines filled/day
  - 8,500 unique part numbers filled
  - 90% Demand Driven parts

Manufacturing Flow



Demand Driven - Results

Category	Prior State - TimePhase	DDMRP Planning and Execution
On Time %	40%	90%+
Fill Rate %	25%	75%+
Inventory $	$10.5M	$7.5M
Part Sales Revenue		20% Increase
Daily Planning Vs Customer Service	90% Planning 10% Responding	50% Planning 50% Responding
Execution Priorities	- Squeakiest Wheel - Dates	- Sales Order Demand - Production Demand - On Hand Buffer Status

Production Planning – Prior State

- Float Production Planning (Quarterly)
  - Floats put into production plan 4 to 9 months in advance
    - All assemblies built to float demand (Min/Max at best)
  - Run TimePhased Material Requirements report
    - 250 - 300 pages
    - Plan for BOM one level below Floats
  - Run TimePhase again and again until bottom BOM level reached (5 – 8 times)
- Daily Sales Order demand
  - Run TimePhase to catch new demand.
  - Min/Max levels set on an ad hoc basis

Demand Driven Planning – Why?

- Prior State
  - Poor customer service – despite LOT's of inventory
  - Production planning took too long.
  - Very little flexibility in production mix.
  - Little time left to provide customer service or responsiveness.
  - Constrained capacity – make floats OR service customer?
- Epicor Solution - MRP
  - Highly dependent upon clean Master Data.
  - Little responsiveness to customer demand.
  - How to forecast changing customer service demand?

Implementation

- Early 2017
  - Entering final stretches of full-company integration of Epicor Cloud Manufacturing after 18 months of implementation.
  - 3rd ERP system in three years.
  - Still planning with manual MRP – Timephase report.
  - VP Operations mandating full MRP implementation. Stubborn planner kept resisting (whining).
- Feb 2017 – VP Operations and Sr Planner attend Demand Driven Planner.
  - Great Stuff! But, Epicor is not DDMRP compliant…

Implementation

- Q2 2017
  - Test an Epicor custom solution utilizing Business Activity Query and Dashboard development tools.
  - Model select parts in Excel to determine feasibility for Wipaire.
  - Select De-Coupling points for Manufacturing.
  - Implement a Pilot program.
    - 20 manufactured parts / 20 purchased parts (two weeks)
    - THEN 250 parts (two weeks)

Implementation

- Q3 2017
  - PLANNING - Full Implementation on 10,000 PNs
  - Dramatic improvement in On-Time, Fill Rate, planner priorities, and steady decline in Inventory $.
- Q2 2018
  - Experiencing constrained production capacity and declining customer service.
  - Implementation of EXECUTION dashboards.

Production Planning – Current State

- Float Production Planning (Quarterly – little change)
- Demand Driven parts
  - Monitor DDMRP dashboard and plan accordingly
- MRP (Parts to supply DDMRP buffers)
  - Utilize Epicor MRP process.
  - Firm up jobs within 4 weeks
- Daily Sales Order demand
  - React to customer demand in real time with Customer Service.

Planning - Manufacturing

Purchased | Manufactured | Execution - Manufacturing | Execution - Laser | Execution - Job Picking | Execution - Purchased | DDMRP Part Setup Verification | Outsource project | Execution - SubContract

DDMRPMfgV3: Summary

Part	Description	Rev	Subcontract	Zone	Priority	OrderNow	OnHandQty	MakeQty(+)	TFQtyIn(+)	InTransitQty (+)	JobQty(-)	SOQty(-)	TFQtyOut (-)	= NetFlow	Red	TopYellow	TopGreen	SuspectQty
3A08613-001	Spacer Retract Handle	A	☐	1	50%	1	0	2			1			1	2	2	2	0
8A12003-055	Washer, 1.25 OD, .475 ID, .063 Thk	A	☑	1	55%	10	12							12	13	19	22	0
8A09003-054	Ass'y, Bracket, Hand Pump, RH	F	☑	1	70%	3	7							7	8	9	10	0
21A16576-001	Support, Main Gear (PA-18)	-	☐	2	43%	4	3							3	3	5	7	0
21A02055-008	Fitting, Float Fuselage Upper Rt (PA-18)	F	☑	2	50%	1	0	2				1		1	1	2	2	0
21A03356-047	Spreader Bar (2100/2350)	B	☐	2	50%	2	2	2			2			2	2	3	4	0
21A08000-133	Cable Assy, Retract, Left Hand	-	☐	2	50%	2	4				2			2	2	3	4	0
21A08000-135	Cable Assy, Steering	-	☐	2	50%	2	4				2			2	2	3	4	0
13A02029-001	Fitting, Strut Fuselage Fwd.(Left)	D	☑	2	50%	2	3				1			2	1	3	4	0
13A04098-004	Assembly, End Cap, Outer Cyl, Shock Strut	E	☐	2	50%	3	1	3				1		3	2	4	6	0
13A07201-003	End Cap - Nose Box	E	☑	2	50%	3	9				6			3	2	5	6	0
13A12001-036	Clamp-Elev. Feel Spring	B	☑	2	50%	1	1							1	1	2	2	0
1005629	Hinge, Access Door, Pylon, Kodiak	A	☑	2	50%	2	4				2			2	1	3	4	0
6A01156-123	Access Cover Reinforcement	B	☑	2	50%	1	4				3			1	1	2	2	0
1001459	Assy, Cable, 3/32, 18', RH Turnbuckle end	B	☐	2	50%	2	4				2			2	2	3	4	0
1008698	Bushing .625 ID	C	☐	2	50%	5	5							5	4	7	10	0
10A08000-166	Cable, Retract	B	☐	2	50%	3	7				4			3	2	4	6	0
10A09000-293	Assembly, Cylinder, Probe Jack	F	☐	2	50%	2	1	5			4			2	2	3	4	0
10A09207-009	Manifold, Hydraulic	C	☑	2	50%	2	1	3			2			2	1	3	4	0
13A01210-003	Fitting Forward Slide Tube	G	☑	2	50%	2	0	4				2		2	1	3	4	0
13A08000-120	Bungee Cord Assy.	E	☐	2	54%	6	7							7	5	9	13	0
13A02163-037	Doubler, Fuselage Step	B	☐	2	57%	3	0	4						4	3	5	7	0
13A01000-196	Bulkhead Assy. Stn. #12 & 13	A	☐	2	57%	3	2	4			2			4	3	5	7	0
11D1366-13	Lug, Rigger, Shock Cord	M	☐	2	57%	3	4							4	4	6	7	0
10A09000-321	Hyd. Line, Manifold to Deck	A	☐	2	57%	3	12				8			4	3	5	7	0
10A06000-037	Bearing Assembly Lower	B	☐	2	58%	5	4	10			7			7	4	8	12	0
21A02462-005	Wire Pull(Glastar,PA-18,206)	G	☑	2	60%	2	0	7			2	2		3	2	4	5	0
8A08000-043	Cable Assy. Pulley Stn. #23	B	☐	2	62%	5	24				12	4		8	5	9	13	0
8A08183-006	Stop, Water Rudder	C	☑	2	63%	3	13				4	4		5	2	6	8	0
6A05533-001	Spring, Lock	B	☑	2	64%	4	7	6			4	2		7	3	8	11	0
1003548	Seal, Nose Wheel, Outboard	B	☐	2	64%	14	25							25	15	27	39	0

Planning - Purchasing

DDMRPPurV4: Summary

Part	Description	Rev	Name	Zone	Priority	OrderNow	OnHandQty	POQty(+)	RcvQty(+)	TFQtyIn (+)	InTransitQty (+)	JobQty(-)	SOQty(-)	TFQtyOut (-)	= NetFlow	SuspectQty
NAS1515H08L	Washer, Nylon		Aviall	1	1%	180	139					138			1	0
AN6-20A	Bolt, Airframe, 3/8-24 Thread, 1-7/1		KLX Aerospace Solutions AK	1	5%	106	17					12			5	0
AN10-30A	Bolt, 5/8-18 Thread, Steel Cad II Pla		Visionaero	1	17%	24	19					4	10		5	0
21A08525-005	Spring, rudder horn extension(21,23	-	Western Spring Manufacturin	2	3%	32	3					2			1	0
MS28775-216	O Ring, DIA 1.109, AN6227-21		Aviall	2	3%	31	5						4		1	0
1005639	Buoyancy Foam, Side, BH6-BH9, 8	E	Amcon, Inc.	2	11%	25	13					10			3	0
MS35206-215	Screw, Pan Head, STL. CAD 2, 4-40		Aviall	2	14%	102	49					33			16	0
13A04315-001	Fitting, Axle	H	Ultra Industries Inc	2	14%	12	0	10				8			2	0
13A12000-009	Weldment, Finlet Mount, Lower	G	J & E Manufacturing Compan	2	15%	11	0	10				8			2	0
1005318	Bolt, Pylon, .750-16 UNF, 10" grip	C	Proto-Type Machine	2	20%	12	5					2			3	0
8A02458-004	Barrel Nut(2452-126)	D	Cizion	2	21%	11	5					2			3	0
AN10-31A	Bolt, Airframe, 5/8-18 Thread, 2-5/1		Airfasco	2	24%	26	8								8	0
1008752-03	Fairing, Main Strut, Twin Otter, RH,	A	Master Composites, Inc.	2	25%	3	2					1			1	0
13A04289-001	Tube, Main Gear	E	Imagineering Machine Inc	2	27%	11	9					5			4	0
1008202	Wire Harness, Main to Wing, LGAS	B	NRI Electronics, Inc.	2	38%	5	3								3	0
1001924	Main wire harness, Aux Instr Panel	K	NRI Electronics, Inc.	2	40%	3	1	3				2			2	0
13A04498-002	Cylinder, Inner, Shock Strut, 10/130	E	Treffers Precision/PAS Tech I	2	45%	11	11					2			9	0
AN43B5A	Bolt Eye, 1/4-28 Thread, #10 Bolt Si		KLX Aerospace Solutions AK	2	46%	7	6								6	0
8A02273-007	Rod, Slide, Float	F	Ultra Industries Inc	2	48%	26	0	50				7	19		24	0
RM030	Bar 2024T351 2.50in X 2.50in X 1	A	Earle M Jorgensen Company	2	55%	7	15					6			9	0
NAS1149F0363	Washer		Aviall	2	56%	205	549					290			259	0
1001925	Wire Harness, Auxiliary Instrument	E	NRI Electronics, Inc.	2	57%	3	6					2			4	0
RM164	Sheet 6061T4 .090in X 48in X 144i	A	TW Metals, Inc.	2	57%	7	13					3			9	0
MS21044N4	Nut, Hex Locking Nylon Insert Steel		Aviall	2	62%	128	370					165			205	0
AN5-33A	Bolt, Steel, 5/16-24 Thread, 2.938"		Aviall	2	63%	11	19								19	0
1005339	Spacer, 208 Gear Journal	A	GNW Machine, Inc.	2	67%	3	10					4			6	0
GPP1250-40	Pressure Switch		Aerospace Control Products, I	2	74%	10	0	36				8			28	14
08231	Bearing, Cup (non-chrome)		Timken Receivables Corporati	2	74%	9	20	6							26	0
291-33K-RC	Resistor		Mouser Electronics, Inc.	3	5%	0	1								1	0
NAS561P6-12	Pin		KLX Aerospace Solutions AK	3	5%	0	11								11	0
MS21062L3	Nutplate, One Lug Floating, 10-32 T		KLX Aerospace Solutions AK	3	6%	0	14					11			3	0

Execution – Prior State

- Epicor shop report provides a list of jobs within each work center, sorted by Operation Due Date
  - Machine Shop example
    - Shop is two weeks behind plan
    - Oldest job was due in Aug 2018
    - Priority Dispatch Report is 28 pages long
  - Which would mean the priority for production is:
    - For the shop supervisor – most efficient work – catch up.
    - For the float shop supervisor – the part shortages preventing float start/completion.
    - For Customer Service – Overdue Sales Orders
    - For Planning – Whoever is complaining loudest

Execution – Prior State

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Department: 10-MFG \ 10-Mfg Department

Resource Grp: *WGMAS | 10-Mfg Machining Department*

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					---Setup Hours---		--Production Hours--				
Job Number	**Asm**	**Seq**	**Oper. ID**	**Run Qty.**	**Estimated**	**Load**	**Estimated**	**Load**	**Next Res. Grp**	**Start**	**Due**
*** Current Work (In progress or 100% complete through prior operation)											
- - - - - - - - - - **MACH01 \ Machinist 01**											
258971	0	30	WGMAS	3.00	1.00	1.00	0.51	0.51	WGQQC	8/21/2018	8/21/2018
Part Number :	**13A01428-001 \ Angle, Trunion Spt., Lt.**									**# Machines :**	1
Priority:	NORMAL				**Prim. Lbr. Res.:**	True			**Labor Entry Method:**	Time and Quantity	
*** Current Work (In progress or 100% complete through prior operation)											
- - - - - - - - - - **MACH01 \ Machinist 01**											
258964	0	30	WGMAS	3.00	1.00	1.00	0.51	0.51	WGQQC	8/21/2018	8/21/2018
Part Number :	**13A01428-002 \ Angle, Trunion Spt., Rt.**									**# Machines :**	1
Priority:	NORMAL				**Prim. Lbr. Res.:**	True			**Labor Entry Method:**	Time and Quantity	
*** Current Work (In progress or 100% complete through prior operation)											
- - - - - - - - - - **MACH01 \ Machinist 01**											
259706	0	10	WGMAS	2.00	0.50	0.50	1.00	1.00	WGIIV	8/29/2018	8/29/2018
Part Number :	**Joggle Die Inserts \ Joggle Die Inserts**									**# Machines :**	1
Priority:	NORMAL				**Prim. Lbr. Res.:**	True			**Labor Entry Method:**	Time and Quantity	

Execution – Current State

- Priorities are in descending order:
  - Job Priority Code (AOG, Urgent, Normal)
  - Stock Out (Current Flow is negative)
    - Sales Order demand (RED)
    - Job Demand (YELLOW)
  - On Hand Buffer Status – On Hand inventory compared to Red Zone (Safety Stock)
  - Operation Due Date

Execution - Manufacturing

Purchased | Manufactured | Execution - Manufacturing | Execution - Laser | Execution - Job Picking | Execution - Purchased | DDMRP Part Setup Verification | Outsource project | Execution - SubContract

DDMRPMfgExecution: Summary

Next Operation

- Next Operation : WGAAS (67 items)
- Next Operation : WGCPT (38 items)
- Next Operation : WGGPT (14 items)
- Next Operation : WGHAS (9 items)
- Next Operation : WGHQC (6 items)
- Next Operation : WGIQC (4 items)
- Next Operation : WGMAS (122 items)

Code	Job	This Job Qty	Part	Description	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OpStart	ActiveTrans	Name	Date	Time	Est Hrs	Act Hrs
URG	278469	8.00	8A07185-002	Link Trolley Nose Gear	0			2		-2	2/26/19	☑	Kyle Mindiola	2/28/2019	08:37	4.80	0.00
URG	277605	2.00	8A02198-014	Fitting, Strut Mid. Lower Link	1			1		0	2/25/19	☐				0.66	0.05
NORMAL	279094	8.00	8A02409-001	Tube-Front Strut Support	0		1	2		-3	3/7/19	☐				1.19	0.00
NORMAL	279123	2.00	8A02198-008	Fitting, Strut Center Top	0			1		-1	3/14/19	☐				0.67	0.00
NORMAL	278865	10.00	8A02195-006	Fitting, Strut to Fuselage Fwd.	0		2			-2	3/14/19	☐				4.46	0.00
NORMAL	277507	10.00	10A06000-037	Bearing Assembly Lower	4		7			-3	2/21/19	☐				2.60	0.00
NORMAL	273127	2.00	13A02056-012	Fitting, Strut Fwd. Upper Rt.	1		3			-2	1/7/19	☑	Stephen Podg	2/28/2019	09:15	1.46	0.05
NORMAL	276641	4.00	10A01357-075	Angle, Bulkhead, Vertical Trunion Extension	1		2			-1	3/5/19	☐				0.40	0.00
NORMAL	278620	11.00	13A03030-004	Fitting, Spreader Bar Aft.	4		6			-2	2/28/19	☐				3.85	0.00
NORMAL	274868	6.00	13A06098-001	Yoke, Nose Wheel Fork	4		7			-3	1/31/19	☑	Thomas Drisco	2/28/2019	06:32	6.00	0.00
NORMAL	274262	6.00	13A07104-001	End, Nose Gear Track Left.	5		6			-1	2/20/19	☐				9.00	0.00
NORMAL	273968	1.00	6A02368-001	Step, Fwd. Btm. Lt.	0					0	1/21/19	☐				1.00	0.00
NORMAL	273969	1.00	6A02368-002	Step, Fwd. Btm. Rt.	0					0	1/21/19	☐				1.00	0.00
NORMAL	273970	2.00	6A02368-007	Step, Aft. Lt.	0					0	1/21/19	☐				2.00	0.00
NORMAL	273971	2.00	6A02368-008	Step, Aft. Rt.	0					0	1/21/19	☐				2.00	0.00
NORMAL	274288	2.00	8A03410-002	Spreader Bar, Rear	0					0	1/23/19	☐				3.50	0.00
NORMAL	275151	8.00	1002206	Kicker Strut, AT802	0					0	1/30/19	☐				12.00	0.00
NORMAL	275368	1.00	6A03358-001	Spreader Bar	0					0	2/4/19	☐				0.10	0.00
NORMAL	275252	3.00	1003158	Window, Hinged, Outer, 206 (2515 Light Grey)	0					0	2/11/19	☐				3.00	0.00
NORMAL	276765	1.00	8A01357-018	Angle, Spreader Bar Panel	0					0	2/14/19	☐				0.12	0.00
NORMAL	277619	2.00	13A02056-009	Fitting, Strut Mid. Upper Aft.	0					0	2/21/19	☐				0.60	0.00
NORMAL	277760	1.00	1007621	Panel, Aft Spreader Bar, Front, Left Float, 6100	0					0	2/25/19	☐				1.50	0.00
NORMAL	277602	2.00	8A05195-001	Cap, Slide Tube Aft.	0					0	2/25/19	☐				0.27	0.00

Execution – Laser (Grouping Raw Material)

Raw Material : 1002796 (2 items)

Raw Material : 38762/400MIL (2 items)

Raw Material : 91594A250 (1 item)

Raw Material : RM001 (4 items)

Code	Part	Description	Raw Material Qty	Job	Start Date	Production Qty	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OHBufferStatus
NORMAL	10A01001-	Plate Scoop, Tunnel	3.57	278206	3/12/19	2.00	2		2			0	200%
NORMAL	10A01001-	Plate Scoop, Tunnel	3.57	278209	3/12/19	2.00	2		2			0	200%
NORMAL	8A08001-0	Doubler, Water Rudder Blade, Left	13.84	277629	4/3/19	12.00	11		5			6	458%
NORMAL	8A08001-0	Doubler, Water Rudder Blade, Right	18.45	277638	4/2/19	16.00	11		5			6	458%

Raw Material : RM002 (3 items)

Code	Part	Description	Raw Material Qty	Job	Start Date	Production Qty	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OHBufferStatus
NORMAL	8A08002-0	Pulley Bracket, Water Rudder	0.84	278873	3/18/19	4.00	1					1	83%
NORMAL	1006030	Doubler, Depth Finder, 8750	0.25	278157	5/6/19	1.00	0					0	100%
NORMAL	1004126	Spar, Aft, Auxilary Fin, Upper	4.92	278903	3/20/19	4.00	4		2			2	400%

Raw Material : RM003-1 (2 items)

Code	Part	Description	Raw Material Qty	Job	Start Date	Production Qty	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OHBufferStatus
NORMAL	11A1580	Washer	0.36	278599	2/19/19	18.00	3					3	31%
NORMAL	6A13003-0	Doubler, Top Wing, Right, 5600 LB G.W. Beaver	8.05	278889	3/25/19	1.00	1			1		0	100%

Raw Material : RM004 (9 items)

Code	Part	Description	Raw Material Qty	Job	Start Date	Production Qty	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OHBufferStatus
NORMAL	1007778	Stiffener, Baggage Door, Front, 6100	3.12	277513	3/5/19	2.00	0		2			-2	0%
NORMAL	1007777	Stiffener, Baggage Door, Center and Rear, 6100	6.24	277515	3/5/19	4.00	0		4			-4	0%
NORMAL	1007779	Stiffener End Cap, Baggage Door, 6100	0.64	277516	3/5/19	4.00	0		4			-4	0%
NORMAL	21S01004-	Skin, Side Outboard Fwd. Rt.	25.30	278567	3/14/19	2.00	0					0	0%
NORMAL	4A13004-0	Stringer, Wing Tip Extension, C-206	2.85	278646	3/6/19	13.00	12		12			0	111%
NORMAL	8A12004-0	Rib, Auxilary Fin	0.40	278021	3/5/19	2.00	2		2			0	167%
NORMAL	1004109	Bracket, Auxilary Fin, Lower	0.07	278898	3/25/19	4.00	4		2			2	400%
NORMAL	1004117	Rib, Auxilary Fin	0.28	278899	3/19/19	4.00	4		2			2	400%
NORMAL	1004118	Rib, Auxilary Fin	0.42	278900	3/19/19	4.00	4		2			2	400%

Raw Material : RM005 (6 items)

Code	Part	Description	Raw Material Qty	Job	Start Date	Production Qty	OnHandQty	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= CurrentFlow	OHBufferStatus
NORMAL	1005349	Skin, Pylon Leading Edge Left Float	14.64	278757	3/12/19	3.00	0					0	0%
NORMAL	21A01003-	Splash Rail	4.86	273137	4/11/19	7.00	4					4	333%

Execution - Purchasing

Clear | sed | Manufactured | Execution - Manufacturing | Execution - Laser | Execution - Job Picking | Execution - Purchased | DDMRP Part Setup Verification | Outsource project | Execution - SubContract

DDMRPPurExecution: Summary

Part	Description	ClassID	OHBufferStatus	OnHandQty	RcvInsp (+)	TFQtyIn (+)	JobQty (-)	SOQty (-)	TFQtyOut (-)	= Current Flow	PO	Line	Release	Due Date	Supplier Qty	Name
1001571	Gasket, baggage cover	DPNE	0%	0				4		-4	116382	1	1	3/8/19	50.00	American Flex
13A02000-079	Fly Wire, Ass'y Fwd (AN680AC-4838) 10,000/13,000	DPNE	0%	0				3		-3	114966	1	1	3/8/19	20.00	Steen Aero La
2552-064RET	Retainer, 1/2" Bottom	DHDW	0%	0			2	4		-6	116528	2	1	3/1/19	20.00	Visionaero
8A02273-007	Rod, Slide, Float	DPNE	0%	0			7	23		-30	115789	1	1	3/1/19	50.00	Ultra Industrie
6A04093-002	Spacer, Main Wheel Axle	DPNE	0%	0					5	-5	116481	4	1	3/29/19	70.00	Ultra Industrie
1CRW1	O-RING	DHDW	100%	0					1	-1	116336	1	1	2/27/19	25.00	Applied Power
1006032	8000/8750, Jack Stand, Each	PACC	100%	0					1	-1						
1009966	Wiper, Shock Strut, T-Seal	DPNE	100%	0					1	-1						
1009877B	Blank, Base, Fuel Manifold	DPNE	0%	0			2			-2						
1009878B	Blank, Plate, Fuel Manifold, Top	DPNE	0%	0			2			-2						
GPP1250-40	Pressure Switch	DACP	0%	0			8			-8	116553	1	1	6/17/19	16.00	Aerospace Co
GPP1250-40	Pressure Switch	DACP	0%	0			8			-8	114527	1	1	3/6/19	10.00	Aerospace Co
GPP1250-40	Pressure Switch	DACP	0%	0			8			-8	116128	1	1	5/28/19	10.00	Aerospace Co
10A06512-004	Ball Retainer, Nose Pivot	DPNE	0%	0			3			-3	115818	1	1	2/20/19	25.00	Ultra Industrie
10D2684-1B	Blank, Arm, Ski Attaching, C2200, C3000, C3200	DPNE	0%	0			2			-2	112433	1	1	2/22/19	6.00	Ultra Industrie
10D2684-2B	Blank, Arm, Ski Attaching, C2200, C3000, C3200	DPNE	0%	0			4			-4	112433	2	1	2/22/19	7.00	Ultra Industrie
13A04315-001	Fitting, Axle	DPNE	0%	0			8			-8	116596	1	1	3/8/19	10.00	Ultra Industrie
13A04315-001	Fitting, Axle	DPNE	0%	0			8			-8	116596	2	1	4/5/19	12.00	Ultra Industrie
1002855	Front Plug, Probe Jack	DPNE	0%	0			3			-3	115435	1	1	3/5/19	6.00	Proto-Type Ma
13A12000-009	Weldment, Finlet Mount, Lower	DPNE	0%	0			8			-8	115793	1	1	2/25/19	10.00	J & E Manufa
13A12000-010	Weldment, Finlet Mount, Upper	DPNE	0%	0			6			-6	115793	2	1	2/25/19	10.00	J & E Manufa
22759-16-20-9	Wire, 20 AWG, White, Marked GE8	DACP	4%	1			92			-91	116319	2	1	2/26/19	2,000.00	WireMasters, I
1006831	Assembly, Controller, LGAS	DPNE	33%	1			2			-1	116536	1	1	3/29/19	3.00	NRI Electronic
1006831	Assembly, Controller, LGAS	DPNE	33%	1			2			-1	116536	2	1	3/29/19	5.00	NRI Electronic
1006831	Assembly, Controller, LGAS	DPNE	33%	1			2			-1	116536	3	1	3/29/19	3.00	NRI Electronic
1006831	Assembly, Controller, LGAS	DPNE	33%	1			2			-1	115253	1	1	3/22/19	10.00	NRI Electronic
3A08000-096-3	Hinge, Pivot, Water Rudder	DPNE	93%	14			42			-28						
1005720B	Blank, Angle, Attach, Strap, MLG Bay, LF Rear	DPNE	100%	1			2			-1	116503	4	1	3/27/19	6.00	CNC Innovatio
1003385	Assembly, Clamp, Fairing, Filler Tube	DPNE	100%	1			2			-1	116111	1	1	3/8/19	3.00	Stainless Flow
1003386	Assembly, Filler Pipe	DPNE	100%	1			2			-1	116111	2	1	3/8/19	3.00	Stainless Flow
AN26-25A	Bolt, Clevis, 3/8-24 Thread, 1-1/4" Grip, 1-39/64" Length	DHDW	100%	1			2			-1	116422	3	1	2/28/19	20.00	Visionaero
RM155	Sheet 6061T6 .080in X 48in X 144in	DDRM	100%	0			69			-69	116472	1	1	2/28/19	288.00	TW Metals, In

DDMRP – Wipaire Style

- View on inventory – it's an asset!
  - If in doubt, stock it, lot's of it.
- Implementation Commitment
  - If sold or consumed in the previous six months, it has a stocking plan.
  - All modification kits have a stocking plan.
- Demand Spikes – It's a small company, COMMUNICATE!
- Average Daily Usage Window – 5 1/2 months in the past, two weeks into the future.

Master Data Factors

- Lead Time Factor
  - Long Lead (42 days or more) – 25%
  - Medium (Between 14 and 42 days) – 50%
  - Short (Less than 14 days) – 100%
- Variability (Safety) Factor
  - Default at 20%
  - Adjust as circumstances require, considering
    - Part specific factors
    - Cash flow vs Customer Service
- De-Coupled Lead Time – 14 days plus sub-contract

Lessons Learned

- "It's better to be roughly right than precisely wrong"
  - Don't get paralyzed by precise master data settings.
    - Lead Time
      - De-Coupled (14 days plus subcontract)
      - Purchased
    - Variability Factor
  - Model, Implement, Monitor, Fine Adjustments.
  - Metrics (conventional metrics start to drive conflict/wrong decisions) Past Due vs Backlog vs Buffer status

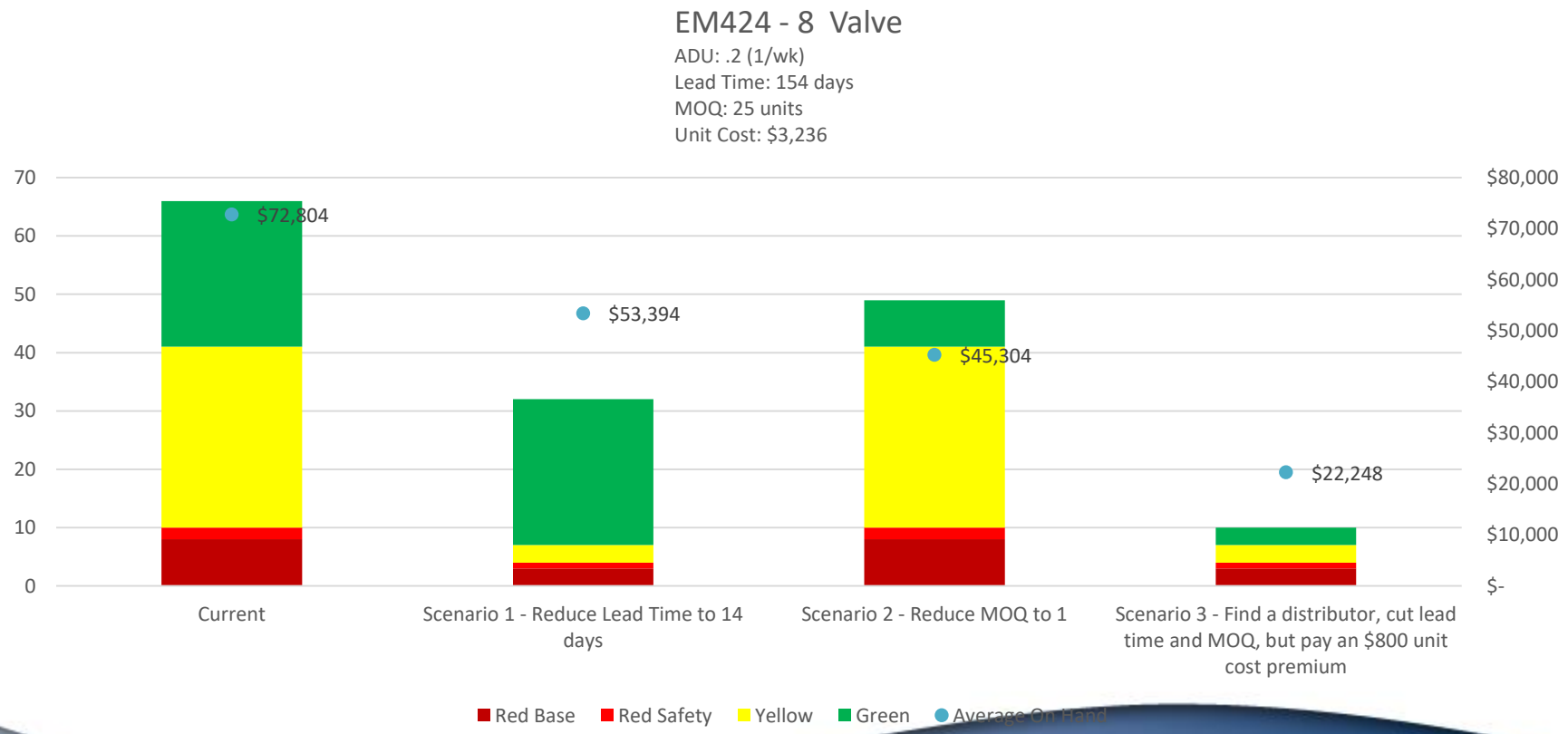
Lessons Learned

- Simplify and go fast!
  - Most benefits were realized at initial implementation.
  - Have a Plan B, but give it a shot.
    - Parts can be toggled between MRP and DDMRP with Part Class setting.
  - Refinements have been added over two years since.
- Execution should be closely attached to Planning.
  - In some cases it could or should precede.

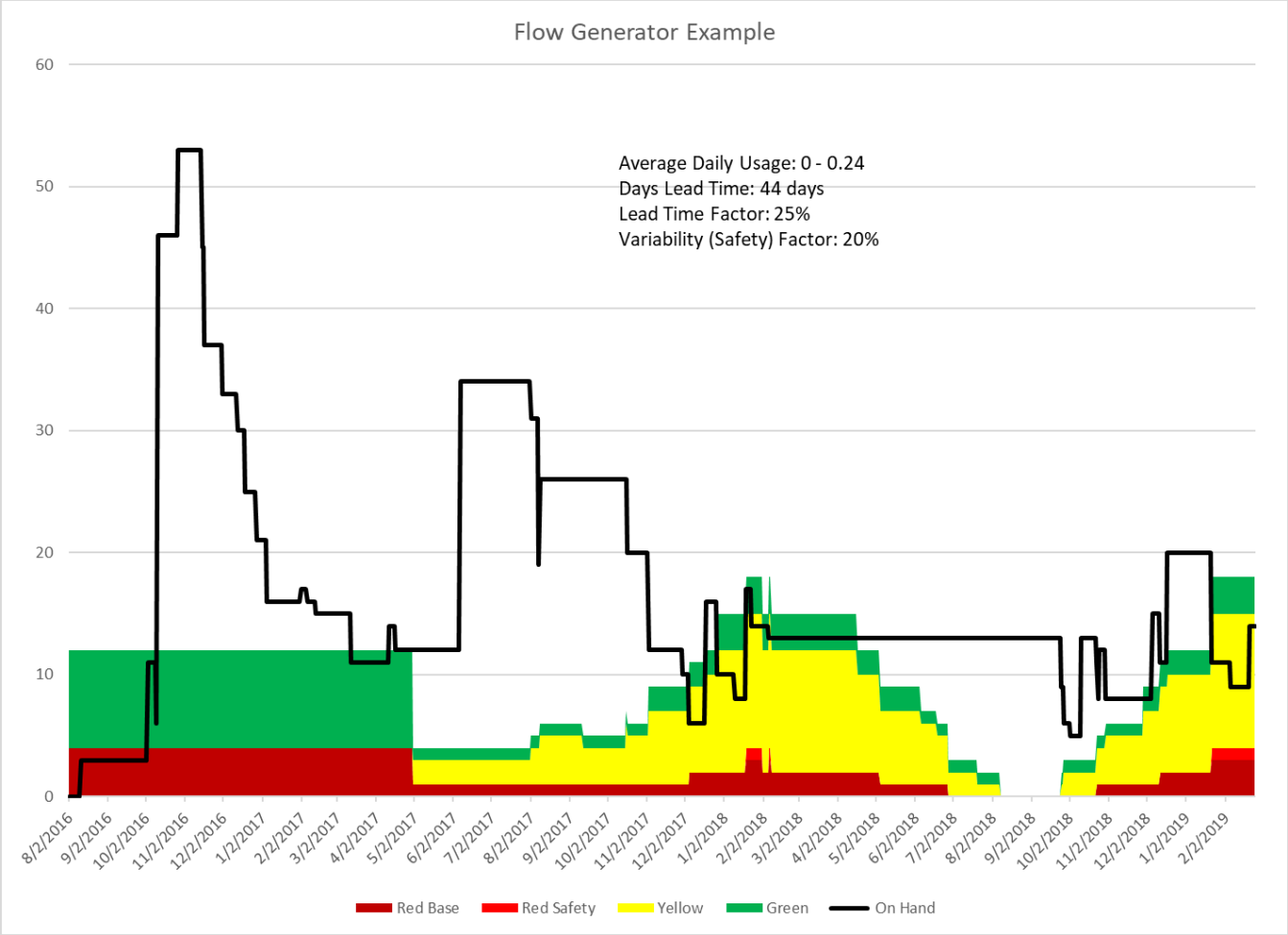
Future Enhancements

- Planning zones written to Part Master table
  - Updated daily
  - Common logic for all six dashboards, opportunity for additional dashboards/views
  - 10X speed improvement
- Medium-Term capacity planning and execution tool
- Small floats added to planning dashboard?

Appendix Information
Inventory $ Vs Unit Cost



Appendix Information



Appendix Information