A Customer's Journey When Plants Merge or De-merge

Ashet Kikani, Associate Director-Business Systems
United Technologies (Carrier)

Session ID # ASUG82254

About the Speaker

Speaker Name

Ashet Kikani, Associate Director – Business Systems,
United Technologies (Carrier)

- 30+ years of industry experience and 24+ years of SAP and ERP consulting experience focusing on Materials Management, Demand Planning, Production Planning, Workflow, Accounts Payables and Cross Applications
- Experience in various industry verticals like Building and Construction, Hi-Tech, Oil & Gas, Consumer Durables, Financial Services, Food & Beverage, Automobiles etc.
- Consulted to companies like General Electric, General Motors, Ford, Anhueser Busch, Avery Denison, British Petroleum, Comark Computers, Oracle-Storagetek, Helene Curtis, Owens Corning, Bank of America, Coca-Cola, Abbott Labs and Sargento
- Considerable experience in leading teams in different geographies and diverse background
- Platinum Consultant at SAP America, Inc.

Key Outcomes/Objectives

1. Role of Special Procurement Key
2. How demand gets moved from one plant to other
3. Steps at go-live

Agenda

- Company Background
- Current Process
- Make-to-Stock
- Make-to-Order/Engineer-to-Order
- Post Transition
- Questions?

United Technologies

A global leader in building systems and aerospace industries

Our large investments in technology enable us to develop new and improved ways to keep people safe, comfortable, productive and on the move

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OUR BUSINESSES

UTC At A Glance →

Otis

Carrier

Pratt & Whitney

Collins Aerospace

BY THE NUMBERS

240,200
Employees

$66.5B
Net sales

$7.61*
Adjusted diluted earnings per common share from continuing operations

$4.0B**
Total R&D investment includes company- and customer-funded

*As of December 31, 2018. Adjusted diluted earnings per share from continuing operations is a non-GAAP financial measure. For more information on this measure, please refer to the tables in our Fourth Quarter 2018 Results press release.
**As of December 31, 2018.

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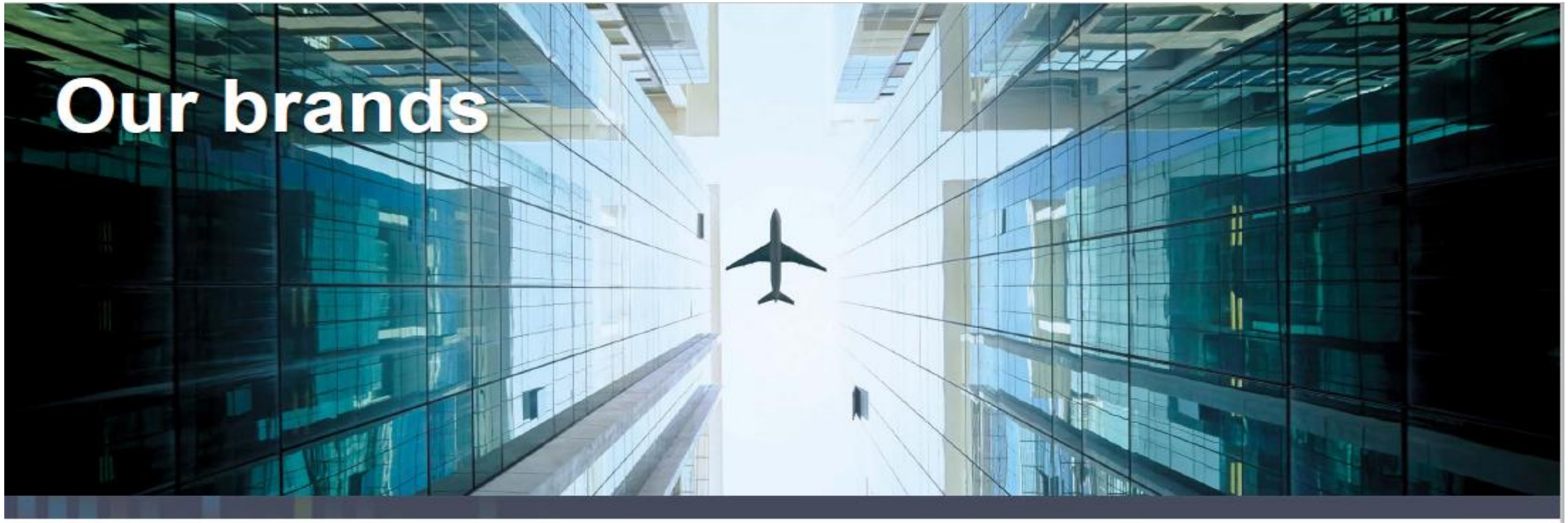

Iconic brands delivering smart, sustainable solutions the world needs

OTIS

Carrier
United Technologies

Chubb
United Technologies

Kidde
United Technologies

GOODRICH

HAMILTON SUNDSTRAND

PRATT & WHITNEY
DEPENDABLE ENGINES

What if you have a cross-company/cross-country fulfillment model?

How does SAP handle it? Can SAP handle it?

What happens if you have MTS and MTO/ETOs?

Cross-Company, Cross-Country Fulfillment Model - MTS

Company Code 1710 (USA)

Company Code 2710 (Mexico)

APO

SIOP

Customer

Plant 5100

Plant 5700

Plant Z

Mexico Plant(s)

1 - Constrained Forecast

2 - Sales order

5 - Outbound Delivery & Customer Invoice

3 - STO

4 - Intercompany delivery & Invoice

Warehouse

MRP at DC

Distribution Center
Planning Plant in SAP - 4300

Supplier´s Portal

MRP

MPS & Scheduling

Procurement

Forecast Acknowledgment ASN

Vendors

Shipping

Manufacturing

MANUFACTURING EXECUTION SYSTEM

4/25/2019

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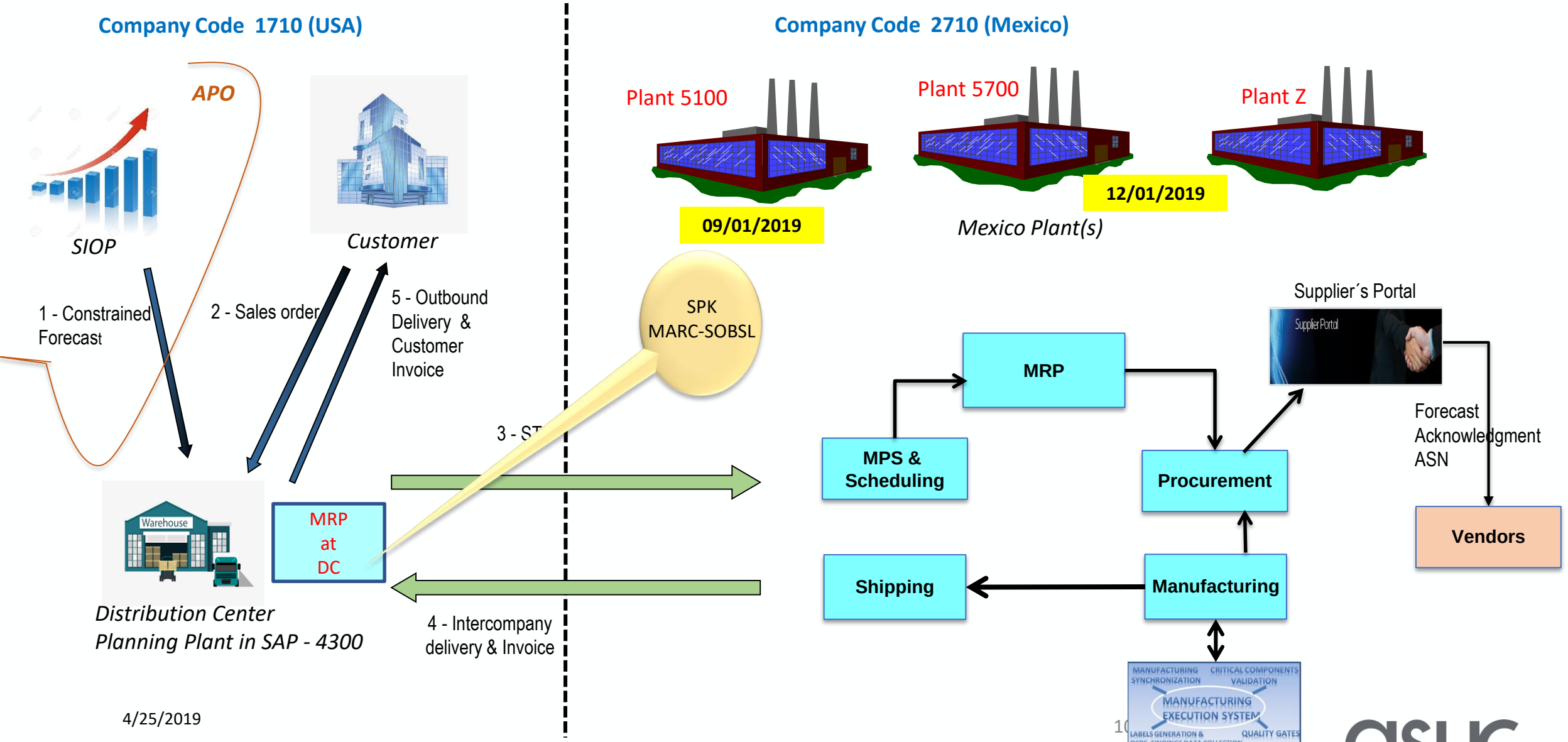
Cross-Company, Cross-country Fulfillment Model - MTS



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Cross-Company, Cross-country Fulfillment Model - MTS

- Running forecast from APO to ECC is for 16 months, sent once a week after adjustments
- Till 09/01/2019, production will happen in Plant A (5100)
- From 12/01/2019, production will start in Plant B (5700)
- Due to long lead times of components, planners/schedulers in Plant B (5700) need visibility to forecast and planned orders much before the production start date of 12/01/2019
- SPK (in planning plant) cannot be changed till go-live as Plant X needs to know what they have to manufacture till 09/01/2019

4300 - Planning Plant
5100 - Current Manufacturing Plant
5700 - Future Manufacturing Plant

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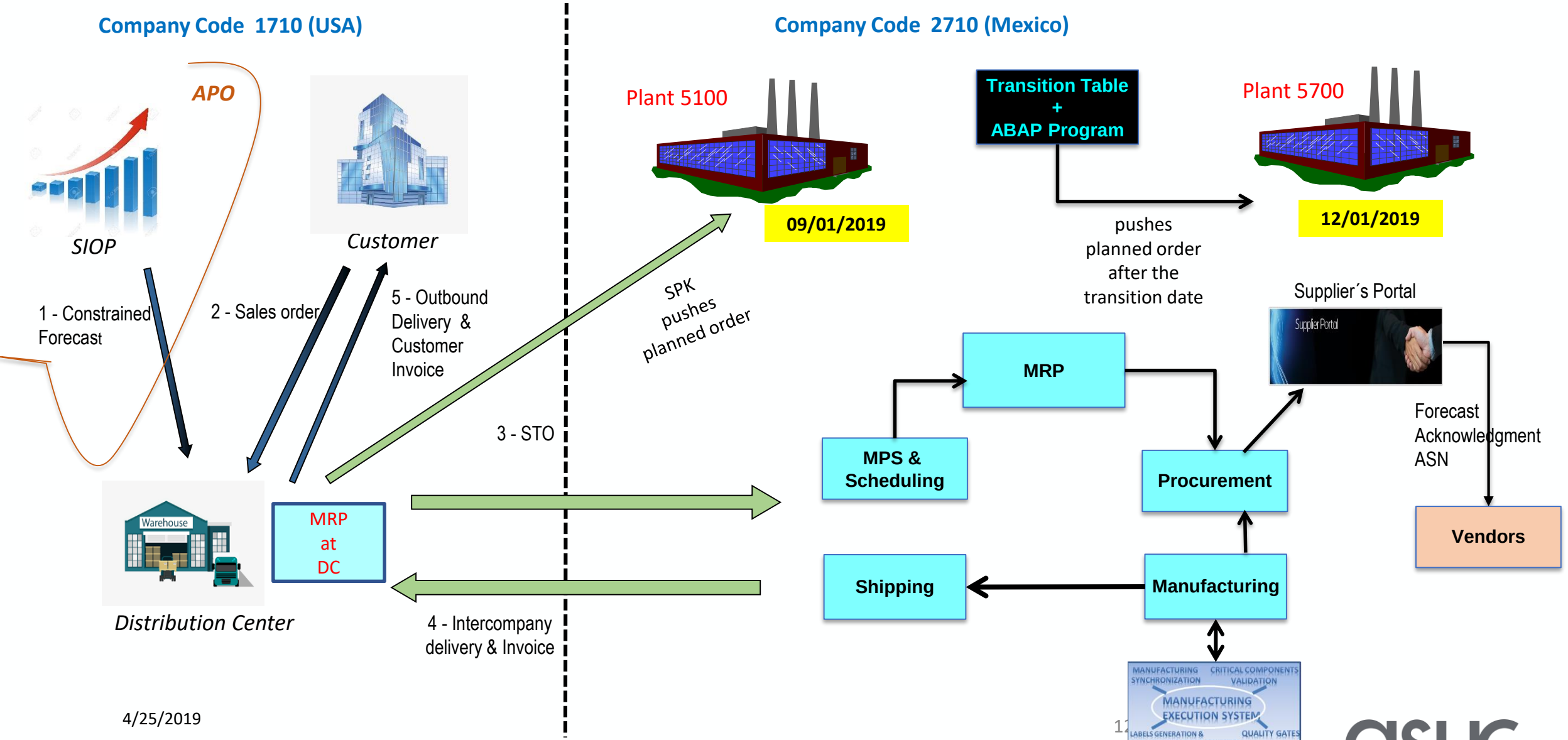
Cross-Company, Cross-country Fulfillment Model - MTS



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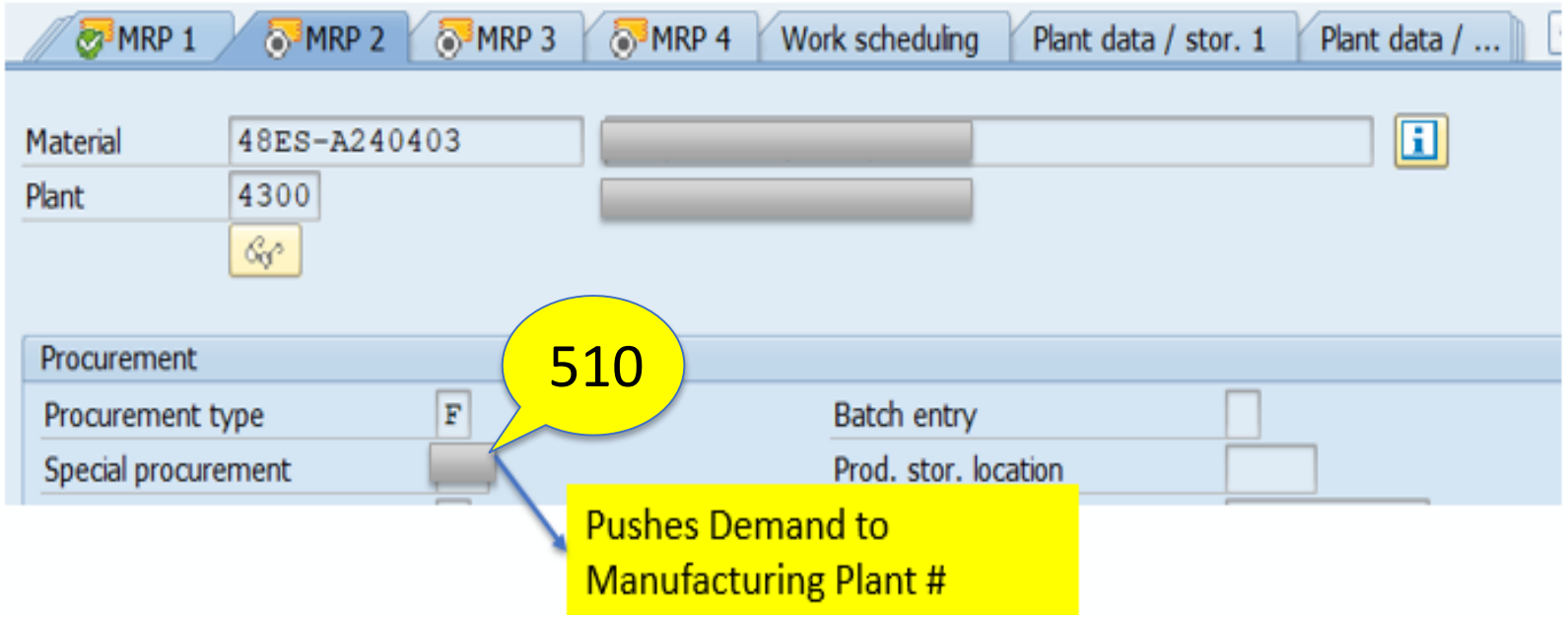
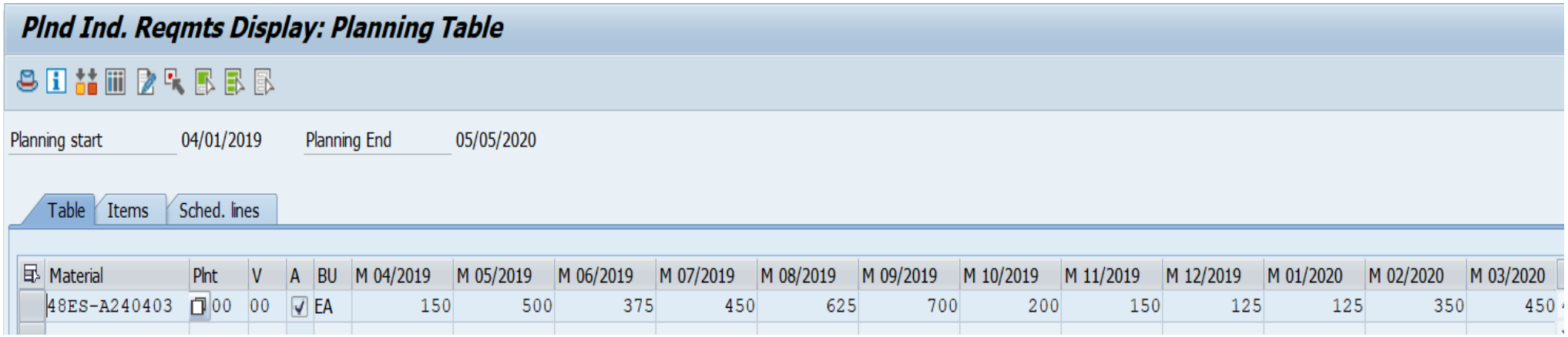
Cross-Company, Cross-country Fulfillment Model - MTS



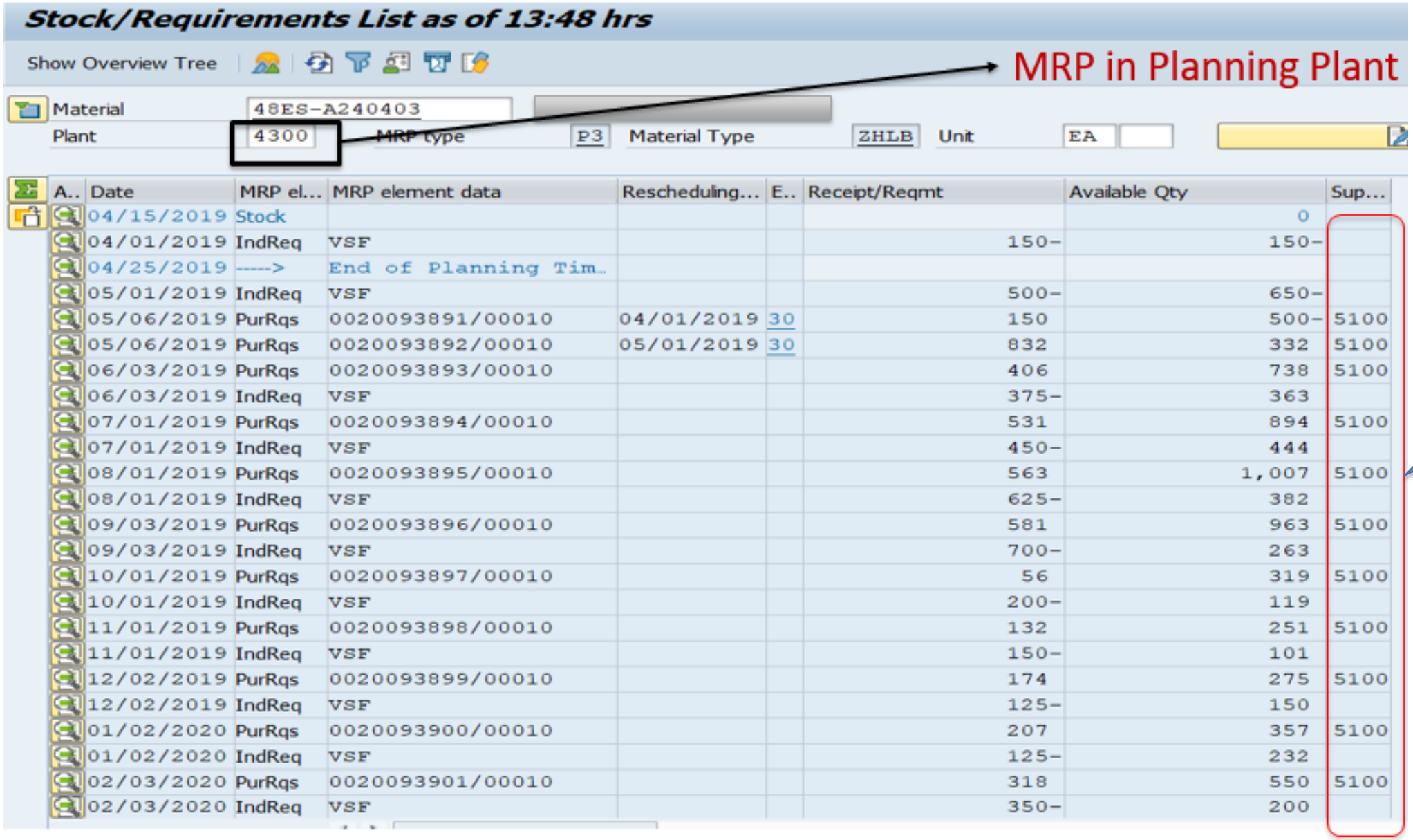
Material Master



Material	Plnt	V	A	BU	M 04/2019	M 05/2019	M 06/2019	M 07/2019	M 08/2019	M 09/2019	M 10/2019	M 11/2019	M 12/2019	M 01/2020	M 02/2020	M 03/2020
48ES-A240403	00	00	☑	EA	150	500	375	450	625	700	200	150	125	125	350	450

Forecast in Planning Plant

Cross-Company, Cross-country Fulfillment Model - MTS



Stock/Requirements List as of 13:48 hrs

Show Overview Tree

MRP in Planning Plant

Material 48ES-A240403

Plant 4300 MRP type P3 Material Type ZHLB Unit EA

A..	Date	MRP el...	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Sup...
	04/15/2019	Stock					0	
	04/01/2019	IndReq	VSF			150-	150-	
	04/25/2019	----->	End of Planning Tim…					
	05/01/2019	IndReq	VSF			500-	650-	
	05/06/2019	PurRqs	0020093891/00010	04/01/2019	30	150	500-	5100
	05/06/2019	PurRqs	0020093892/00010	05/01/2019	30	832	332	5100
	06/03/2019	PurRqs	0020093893/00010			406	738	5100
	06/03/2019	IndReq	VSF			375-	363	
	07/01/2019	PurRqs	0020093894/00010			531	894	5100
	07/01/2019	IndReq	VSF			450-	444	
	08/01/2019	PurRqs	0020093895/00010			563	1,007	5100
	08/01/2019	IndReq	VSF			625-	382	
	09/03/2019	PurRqs	0020093896/00010			581	963	5100
	09/03/2019	IndReq	VSF			700-	263	
	10/01/2019	PurRqs	0020093897/00010			56	319	5100
	10/01/2019	IndReq	VSF			200-	119	
	11/01/2019	PurRqs	0020093898/00010			132	251	5100
	11/01/2019	IndReq	VSF			150-	101	
	12/02/2019	PurRqs	0020093899/00010			174	275	5100
	12/02/2019	IndReq	VSF			125-	150	
	01/02/2020	PurRqs	0020093900/00010			207	357	5100
	01/02/2020	IndReq	VSF			125-	232	
	02/03/2020	PurRqs	0020093901/00010			318	550	5100
	02/03/2020	IndReq	VSF			350-	200	

Demand pushed based on SPK

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Cross-Company, Cross-country Fulfillment Model - MTS

Stock/Requirements List as of 14:00 hrs

Show Overview Tree

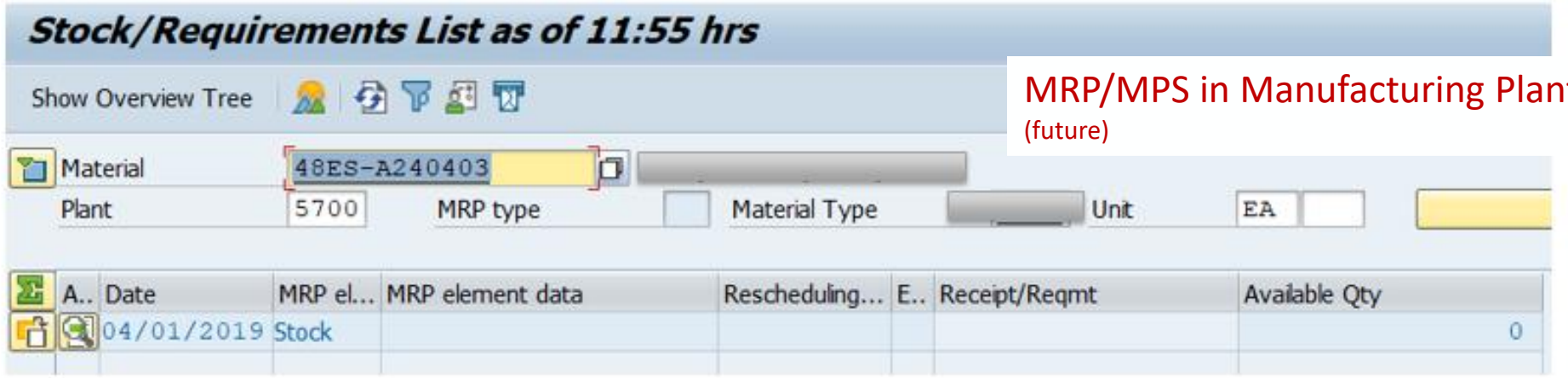
Material 48ES-A240403
Plant 5100 MRP type P3 Material Type ZHLB

MRP/MPS in Manufacturing Plant
(current)

A..	Date	MRP el...	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Pro...	Sup...	Sto...
	04/24/2019	---->	End of Planning Tim.							
	04/26/2019	PldOrd	0012876351/STCK			980	982			0200
	04/26/2019	PRqRel	0020093891/00010			150-	832		4300	
	04/26/2019	PRqRel	0020093892/00010			832-	0		4300	
	06/03/2019	PldOrd	0012876352/STCK			406	406			0200
	06/03/2019	PRqRel	0020093893/00010			406-	0		4300	
	07/01/2019	PldOrd	0012876353/STCK			531	531			0200
	07/01/2019	PRqRel	0020093894/00010			531-	0		4300	
	08/01/2019	PldOrd	0012876354/STCK			563	563			0200
	08/01/2019	PRqRel	0020093895/00010			563-	0		4300	
	08/26/2019	PldOrd	0012876355/STCK			581	581			0200
	08/26/2019	PRqRel	0020093896/00010			581-	0		4300	
	10/01/2019	PldOrd	0012876356/STCK			56	56			0200
	10/01/2019	PRqRel	0020093897/00010			56-	0		4300	
	11/01/2019	PldOrd	0012876357/STCK			132	132			0200
	11/01/2019	PRqRel	0020093898/00010			132-	0		4300	
	11/21/2019	PldOrd	0012876358/STCK			174	174			0200
	11/21/2019	PRqRel	0020093899/00010			174-	0		4300	
	01/02/2020	PldOrd	0012876359/STCK*			207	207			0200
	01/02/2020	PRqRel	0020093900/00010			207-	0		4300	
	02/03/2020	PldOrd	0012876360/STCK*			318	318			0200
	02/03/2020	PRqRel	0020093901/00010			318-	0		4300	
	03/02/2020	PldOrd	0012876361/STCK*			363	363			0200
	03/02/2020	PRqRel	0020093902/00010			363-	0		4300	

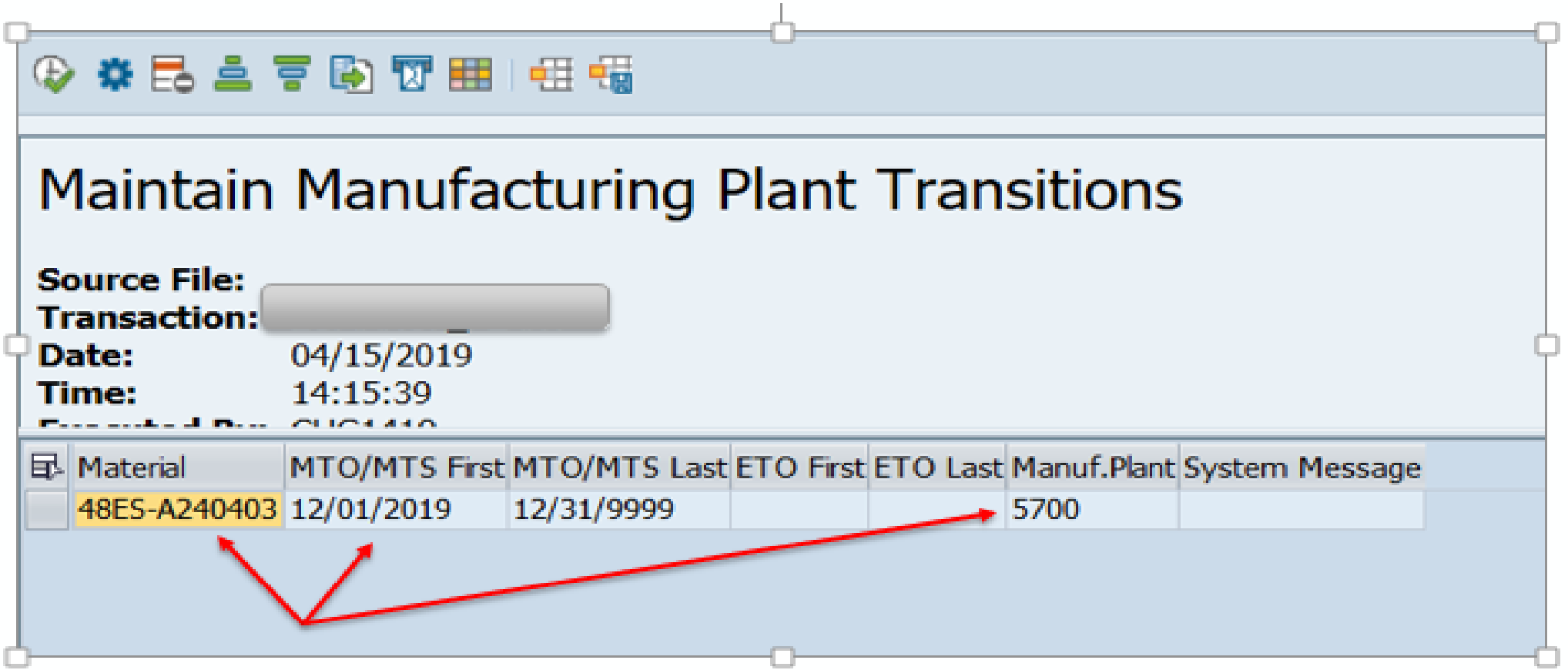
Demand pegged to Planning Plant

Cross-Company, Cross-country Fulfillment Model - MTS



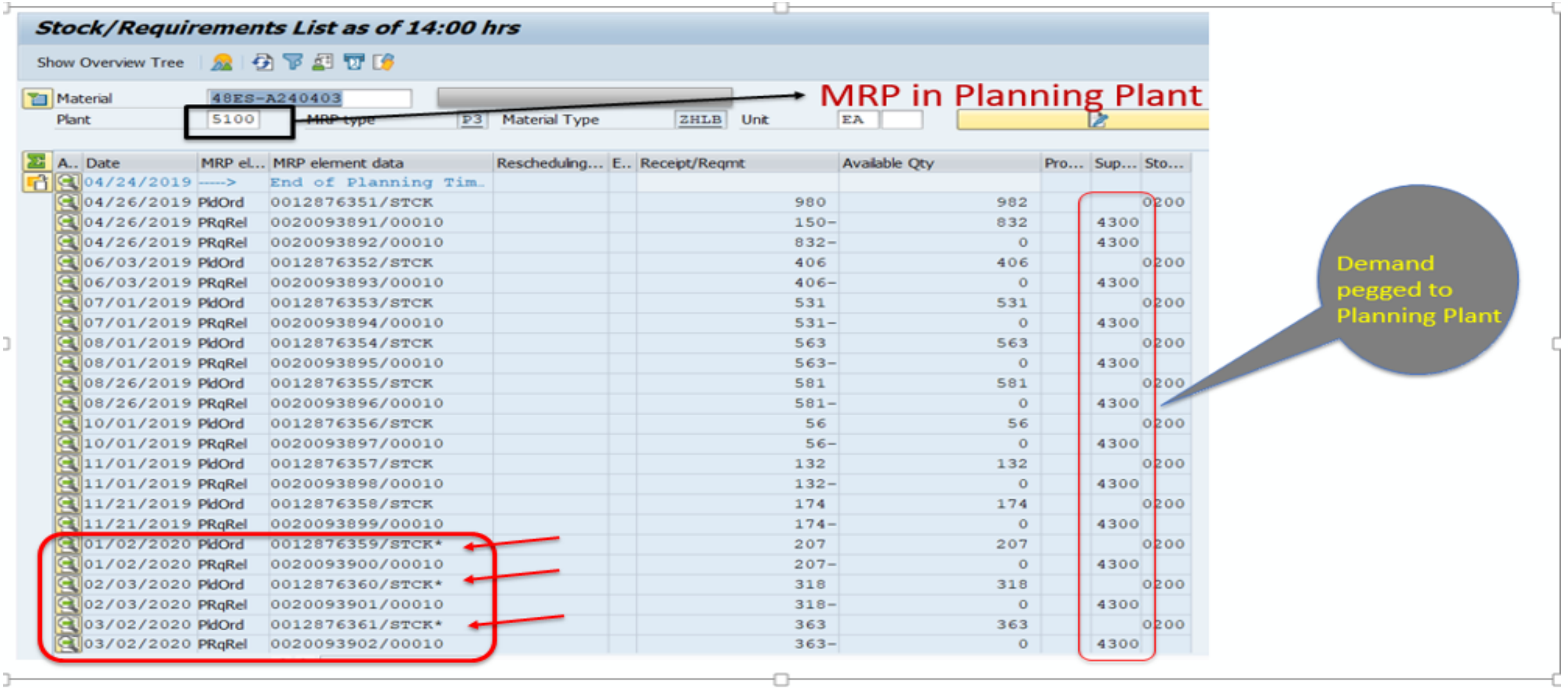
MRP/MPS in Manufacturing Plant
(future)

Cross-Company, Cross-country Fulfillment Model - MTS



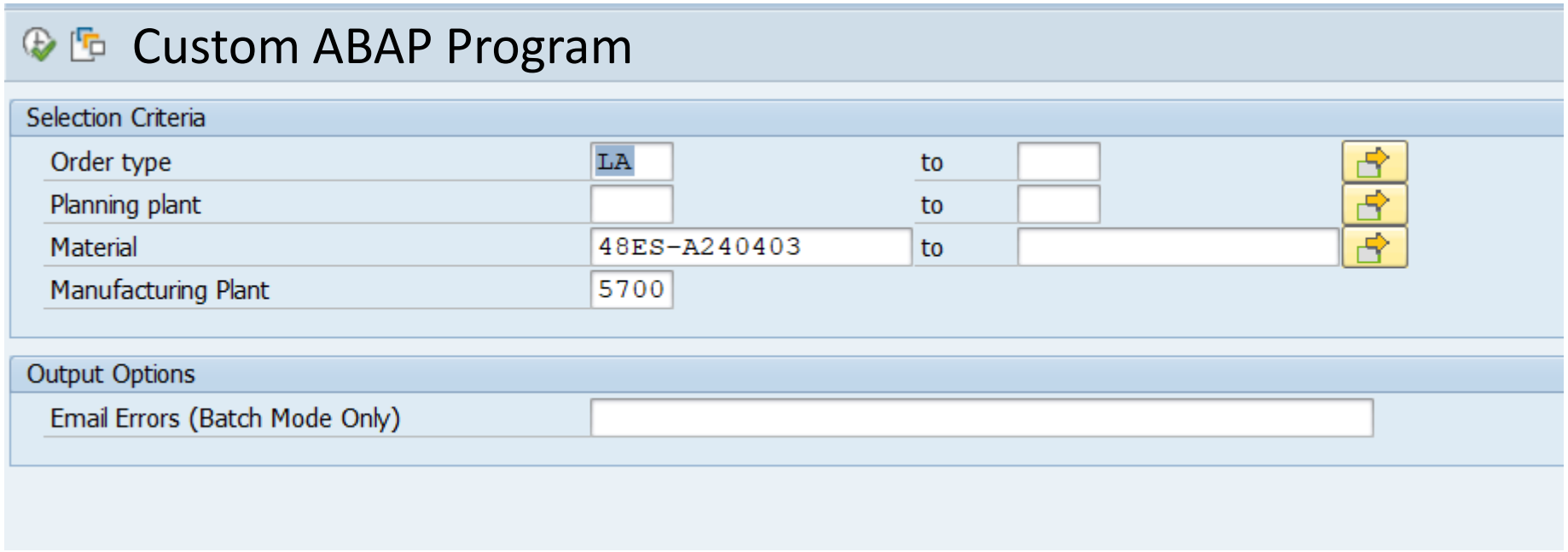
1. Material #
2. Transition Date
3. Manufacturing Plant

Cross-Company, Cross-country Fulfillment Model - MTS



A..	Date	MRP el...	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Pro...	Sup...	Sto...
	04/24/2019	----->	End of Planning Tim…							
	04/26/2019	PldOrd	0012876351/STCK			980	982			0200
	04/26/2019	PRqRel	0020093891/00010			150-	832		4300	
	04/26/2019	PRqRel	0020093892/00010			832-	0		4300	
	06/03/2019	PldOrd	0012876352/STCK			406	406			0200
	06/03/2019	PRqRel	0020093893/00010			406-	0		4300	
	07/01/2019	PldOrd	0012876353/STCK			531	531			0200
	07/01/2019	PRqRel	0020093894/00010			531-	0		4300	
	08/01/2019	PldOrd	0012876354/STCK			563	563			0200
	08/01/2019	PRqRel	0020093895/00010			563-	0		4300	
	08/26/2019	PldOrd	0012876355/STCK			581	581			0200
	08/26/2019	PRqRel	0020093896/00010			581-	0		4300	
	10/01/2019	PldOrd	0012876356/STCK			56	56			0200
	10/01/2019	PRqRel	0020093897/00010			56-	0		4300	
	11/01/2019	PldOrd	0012876357/STCK			132	132			0200
	11/01/2019	PRqRel	0020093898/00010			132-	0		4300	
	11/21/2019	PldOrd	0012876358/STCK			174	174			0200
	11/21/2019	PRqRel	0020093899/00010			174-	0		4300	
	01/02/2020	PldOrd	0012876359/STCK*			207	207			0200
	01/02/2020	PRqRel	0020093900/00010			207-	0		4300	
	02/03/2020	PldOrd	0012876360/STCK*			318	318			0200
	02/03/2020	PRqRel	0020093901/00010			318-	0		4300	
	03/02/2020	PldOrd	0012876361/STCK*			363	363			0200
	03/02/2020	PRqRel	0020093902/00010			363-	0		4300	

Cross-Company, Cross-country Fulfillment Model - MTS



Cross-Company, Cross-country Fulfillment Model - MTS

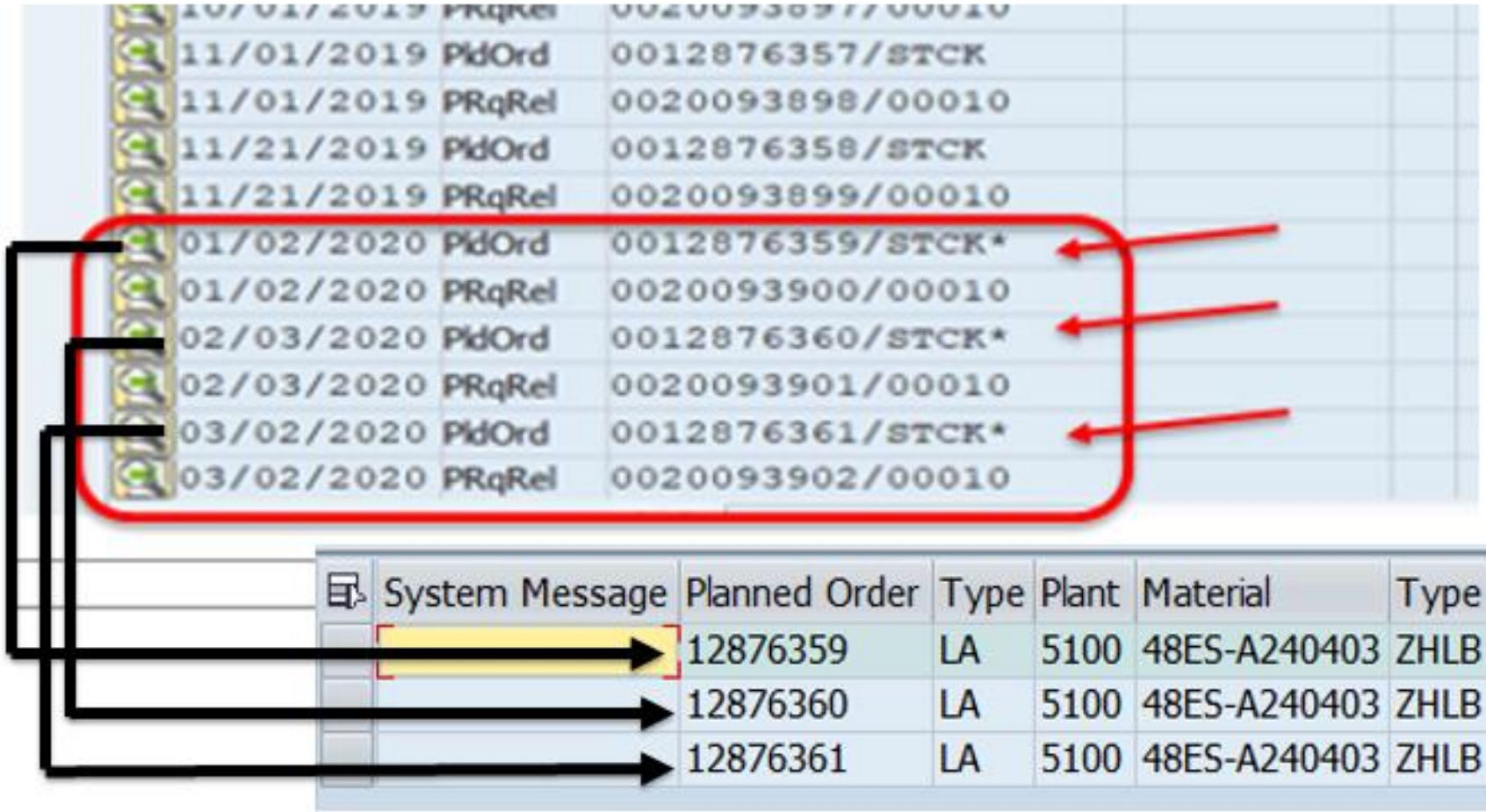
Expected Results:

All demand from the planning plant after 12/01/2019, should go to another manufacturing plant

Planned Order Conversions

System Message	Planned Order	Type	Plant	Material	Type	Qty	Start	Finish
	12876359	LA	5100	48ES-A240403	ZHLB	207.000	01/02/2020	01/02/2020
	12876360	LA	5100	48ES-A240403	ZHLB	318.000	02/03/2020	02/03/2020
	12876361	LA	5100	48ES-A240403	ZHLB	363.000	03/02/2020	03/02/2020

Cross-Company, Cross-country Fulfillment Model - MTS



System Message	Planned Order	Type	Plant	Material	Type	Qty	Start	Finish
	12876359	LA	5100	48ES-A240403	ZHLB	207.000	01/02/2020	01/02/2020
	12876360	LA	5100	48ES-A240403	ZHLB	318.000	02/03/2020	02/03/2020
	12876361	LA	5100	48ES-A240403	ZHLB	363.000	03/02/2020	03/02/2020

Planned orders from Plant 5100 will be converted to Pur Req in 5700

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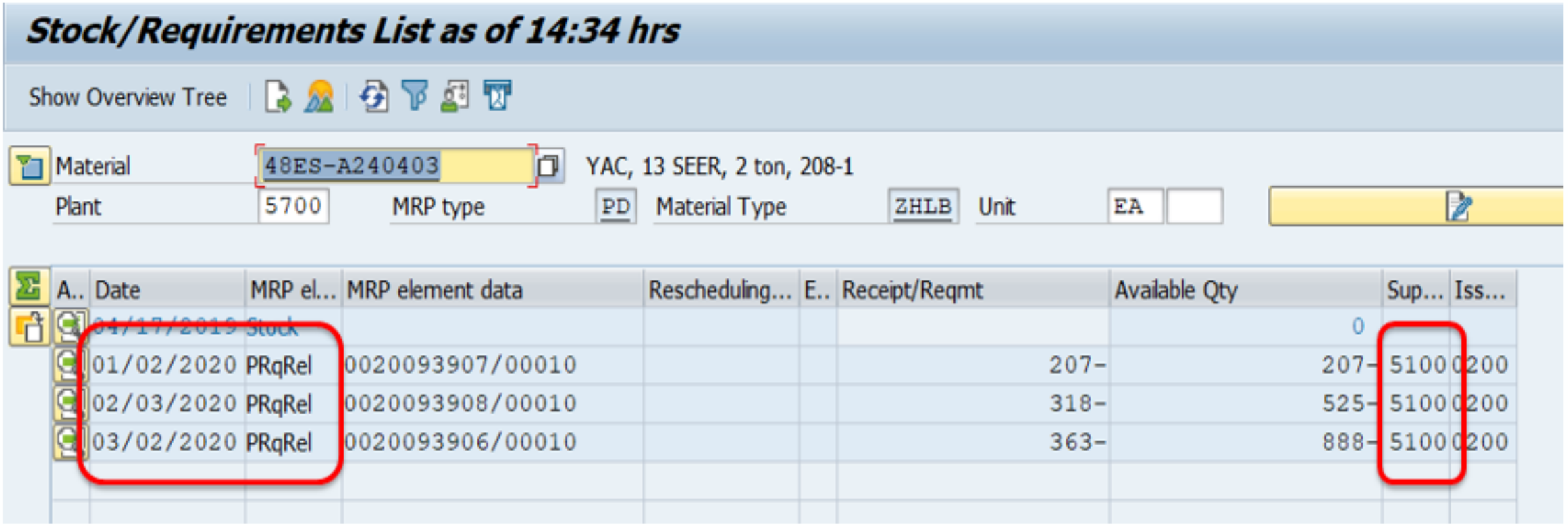
Cross-Company, Cross-country Fulfillment Model - MTS



Stock/Requirements List as of 14:34 hrs

Show Overview Tree

Material 48ES-A240403 YAC, 13 SEER, 2 ton, 208-1

Plant 5700 MRP type PD Material Type ZHLB Unit EA

A..	Date	MRP el...	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Sup...	Iss...
	04/17/2019	Stock					0		
	01/02/2020	PRqRel	0020093907/00010			207-	207-	5100	0200
	02/03/2020	PRqRel	0020093908/00010			318-	525-	5100	0200
	03/02/2020	PRqRel	0020093906/00010			363-	888-	5100	0200

Planned orders from Plant 5100 converted to Pur Req in 5700

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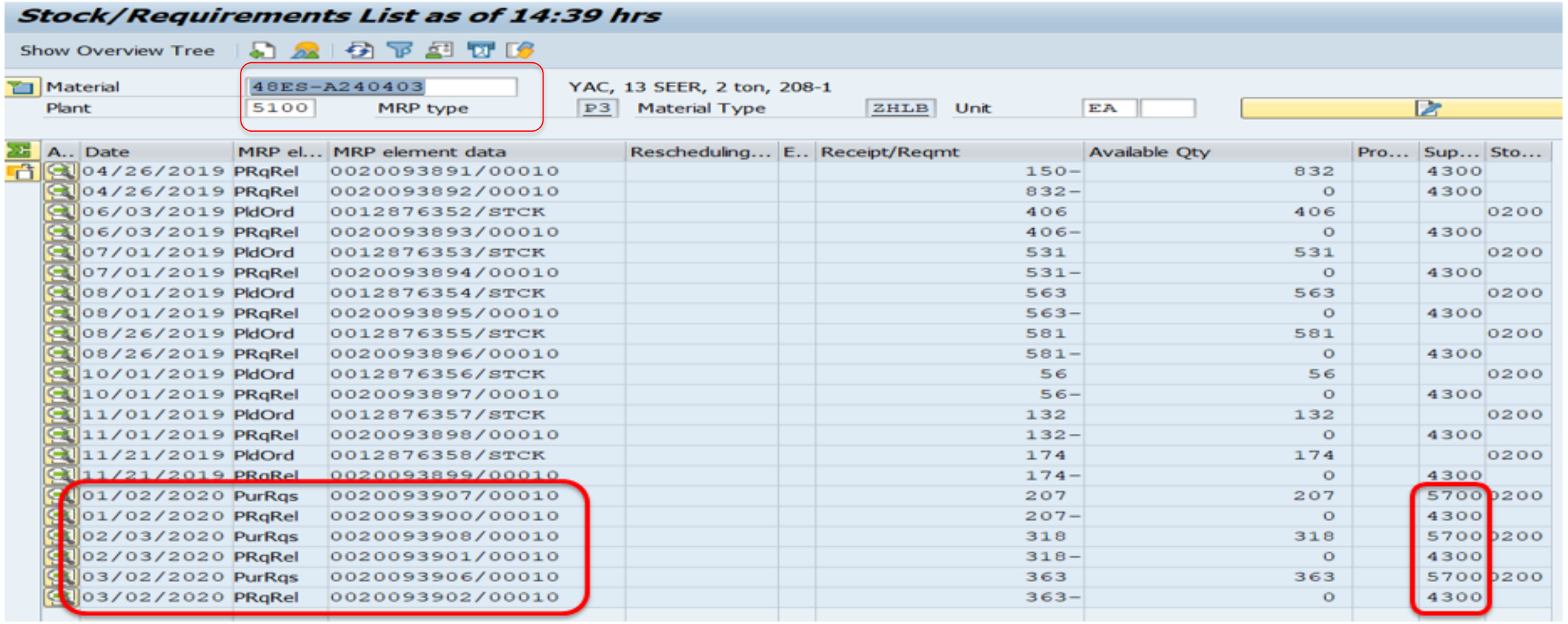
Cross-Company, Cross-country Fulfillment Model - MTS



Stock/Requirements List as of 14:39 hrs

Show Overview Tree

Material 48ES-A240403 YAC, 13 SEER, 2 ton, 208-1
Plant 5100 MRP type P3 Material Type ZHLB Unit EA

A..	Date	MRP el...	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Pro...	Sup...	Sto...
	04/26/2019	PRqRel	0020093891/00010			150-	832		4300	
	04/26/2019	PRqRel	0020093892/00010			832-	0		4300	
	06/03/2019	PldOrd	0012876352/STCK			406	406			0200
	06/03/2019	PRqRel	0020093893/00010			406-	0		4300	
	07/01/2019	PldOrd	0012876353/STCK			531	531			0200
	07/01/2019	PRqRel	0020093894/00010			531-	0		4300	
	08/01/2019	PldOrd	0012876354/STCK			563	563			0200
	08/01/2019	PRqRel	0020093895/00010			563-	0		4300	
	08/26/2019	PldOrd	0012876355/STCK			581	581			0200
	08/26/2019	PRqRel	0020093896/00010			581-	0		4300	
	10/01/2019	PldOrd	0012876356/STCK			56	56			0200
	10/01/2019	PRqRel	0020093897/00010			56-	0		4300	
	11/01/2019	PldOrd	0012876357/STCK			132	132			0200
	11/01/2019	PRqRel	0020093898/00010			132-	0		4300	
	11/21/2019	PldOrd	0012876358/STCK			174	174			0200
	11/21/2019	PRqRel	0020093899/00010			174-	0		4300	
	01/02/2020	PurRqs	0020093907/00010			207	207		5700	0200
	01/02/2020	PRqRel	0020093900/00010			207-	0		4300	
	02/03/2020	PurRqs	0020093908/00010			318	318		5700	0200
	02/03/2020	PRqRel	0020093901/00010			318-	0		4300	
	03/02/2020	PurRqs	0020093906/00010			363	363		5700	0200
	03/02/2020	PRqRel	0020093902/00010			363-	0		4300	

Planned orders from Plant 5100 converted to Pur Req in 5700

Cross-Company, Cross-country Fulfillment Model - MTS

Stock/Requirements List as of 15:33 hrs

Show Overview Tree

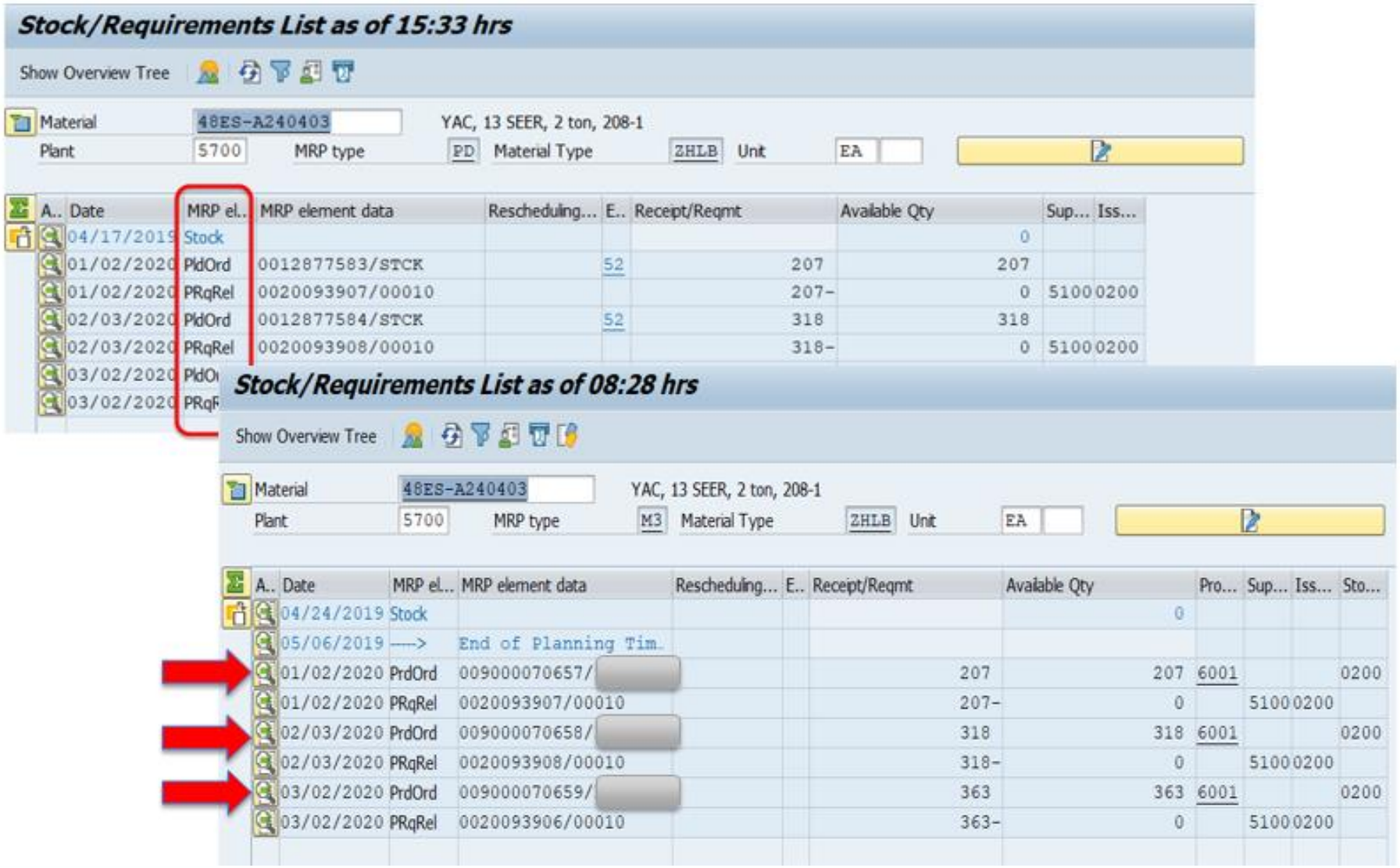
Material 48ES-A240403 YAC, 13 SEER, 2 ton, 208-1

Plant 5700 MRP type PD Material Type ZHLB Unit EA

A..	Date	MRP el..	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Sup...	Iss...
	04/17/2019	Stock					0		
	01/02/2020	PldOrd	0012877583/STCK		52	207	207		
	01/02/2020	PRqRel	0020093907/00010			207-	0	5100	0200
	02/03/2020	PldOrd	0012877584/STCK		52	318	318		
	02/03/2020	PRqRel	0020093908/00010			318-	0	5100	0200
	03/02/2020	PldOrd	0012877585/STCK		52	363	363		
	03/02/2020	PRqRel	0020093906/00010			363-	0	5100	0200

Pur Req in 5700 converted into Planned orders after MRP run

Cross-Company, Cross-country Fulfillment Model - MTS



Stock/Requirements List as of 15:33 hrs

Show Overview Tree

Material 48ES-A240403 YAC, 13 SEER, 2 ton, 208-1
Plant 5700 MRP type PD Material Type ZHLB Unit EA

A..	Date	MRP el..	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Sup...	Iss...
	04/17/2019	Stock					0		
	01/02/2020	PldOrd	0012877583/STCK		52	207	207		
	01/02/2020	PRqRel	0020093907/00010			207-	0	5100	0200
	02/03/2020	PldOrd	0012877584/STCK		52	318	318		
	02/03/2020	PRqRel	0020093908/00010			318-	0	5100	0200
	03/02/2020	PldOr							
	03/02/2020	PRqR							

Stock/Requirements List as of 08:28 hrs

Show Overview Tree

Material 48ES-A240403 YAC, 13 SEER, 2 ton, 208-1
Plant 5700 MRP type M3 Material Type ZHLB Unit EA

A..	Date	MRP el..	MRP element data	Rescheduling...	E..	Receipt/Reqmt	Available Qty	Pro...	Sup...	Iss...	Sto...
	04/24/2019	Stock					0				
	05/06/2019	---->	End of Planning Tim.								
	01/02/2020	PrdOrd	009000070657/			207	207	6001			0200
	01/02/2020	PRqRel	0020093907/00010			207-	0		5100	0200	
	02/03/2020	PrdOrd	009000070658/			318	318	6001			0200
	02/03/2020	PRqRel	0020093908/00010			318-	0		5100	0200	
	03/02/2020	PrdOrd	009000070659/			363	363	6001			0200
	03/02/2020	PRqRel	0020093906/00010			363-	0		5100	0200	

Planned Orders converted to Prd Orders in Manufacturing Plant (future)

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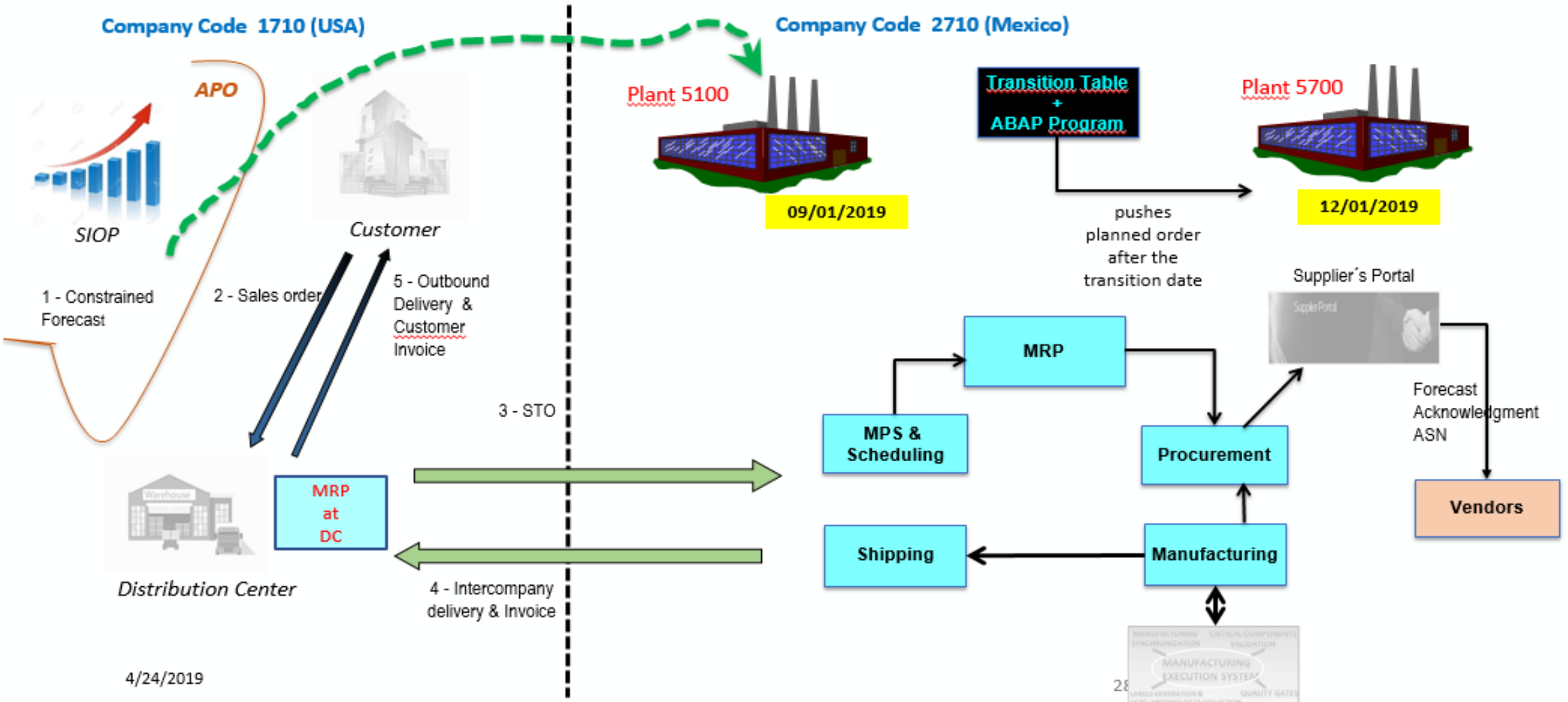
MTO/ETO are different

- We have KMATs and nested KMATs
- We use Super BOMs
- Extensive use of VC
- VC drives the BOMs
- By some estimate, we can make an ETO in about 500 billion combinations
- For forecasting L1 components, we use the concept of Planning Materials
  - KMATs are not forecasted, planning materials tied to the KMAT is forecasted
  - Planning Materials have super mini-BOMs, KMATs have super BOMs
- **Forecast for Planning Materials gets exploded into multiple L1 components and goes directly to manufacturing plant, not to the planning plant**

Cross-Company, Cross-country Fulfillment Model – MTO/ETO



4/24/2019

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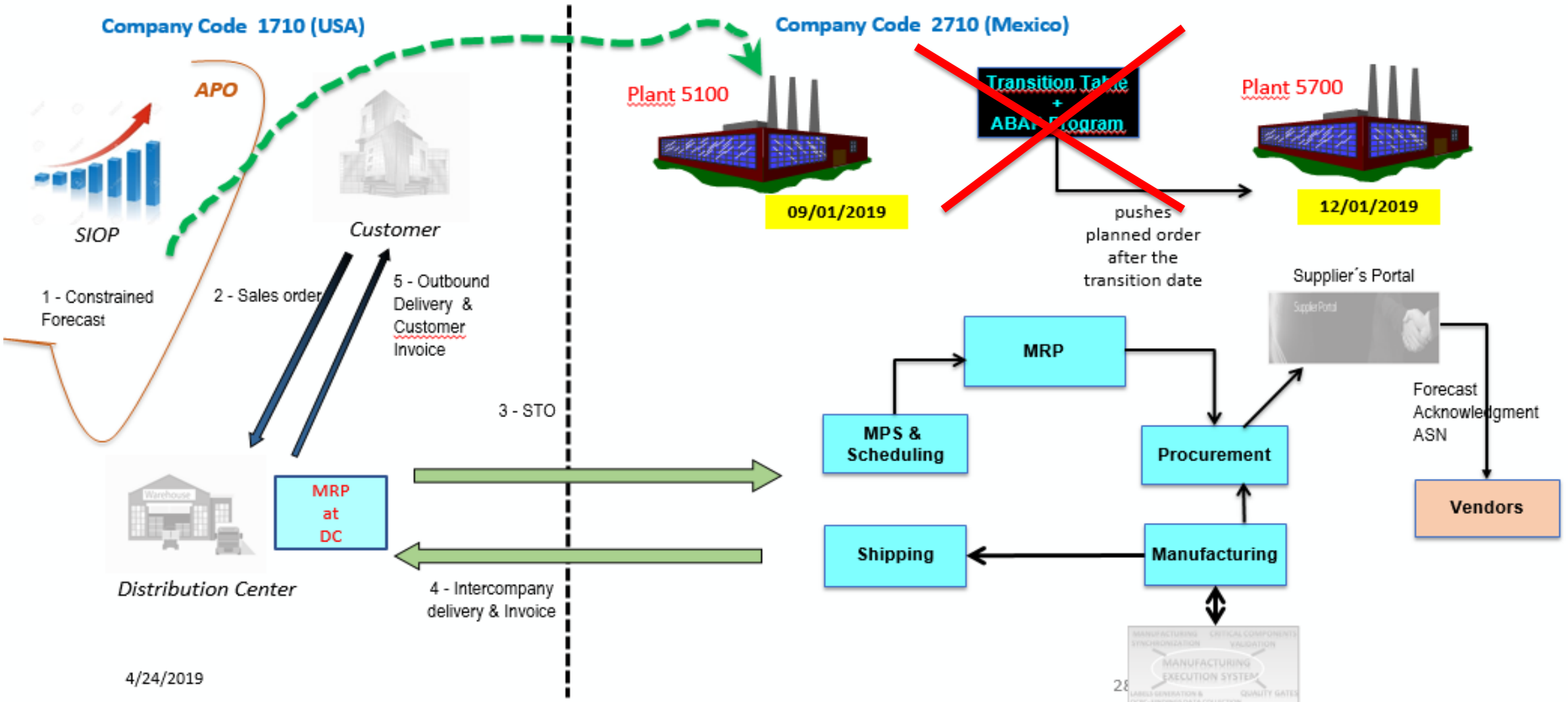
Cross-Company, Cross-country Fulfillment Model – MTO/ETO



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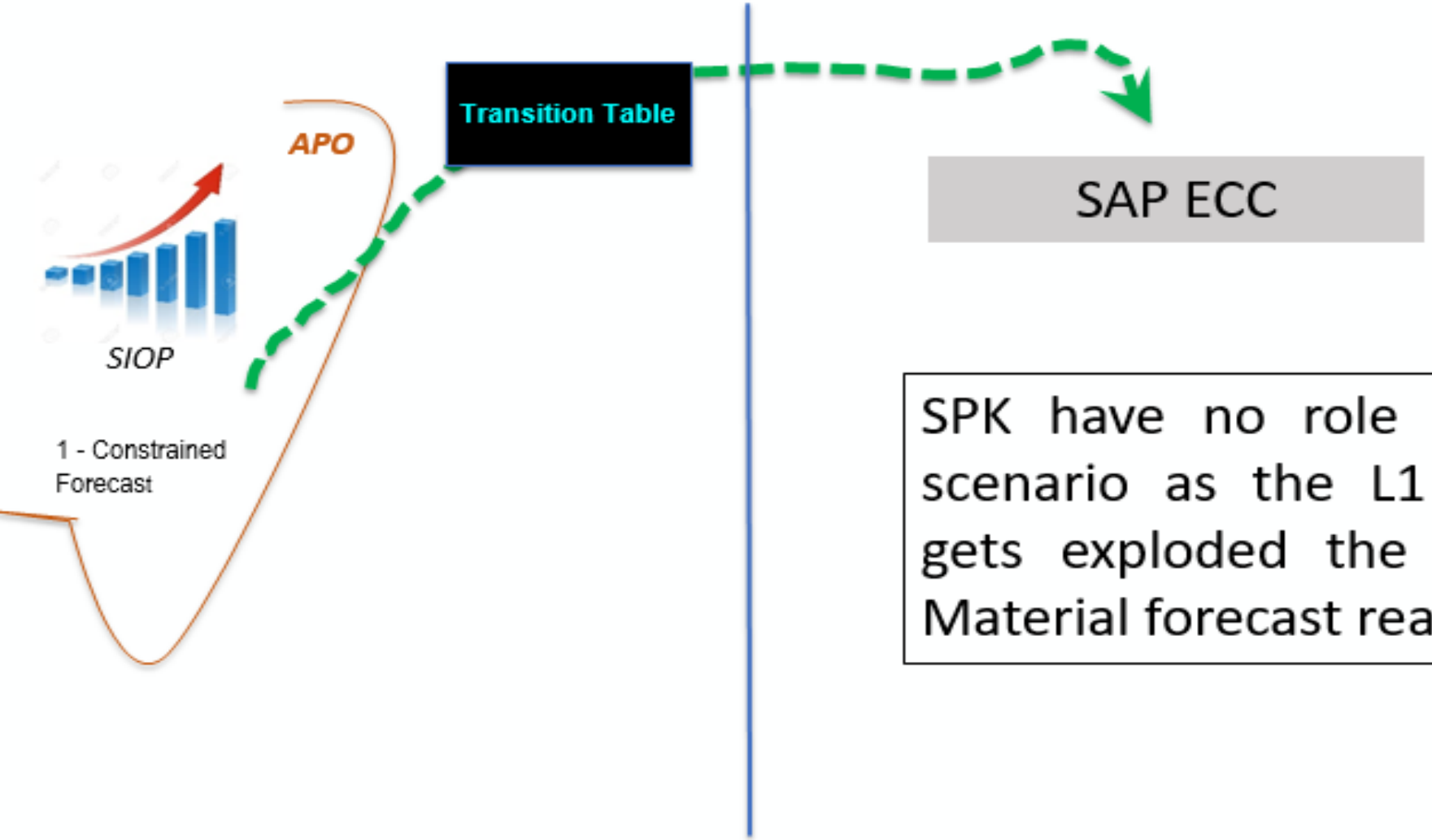
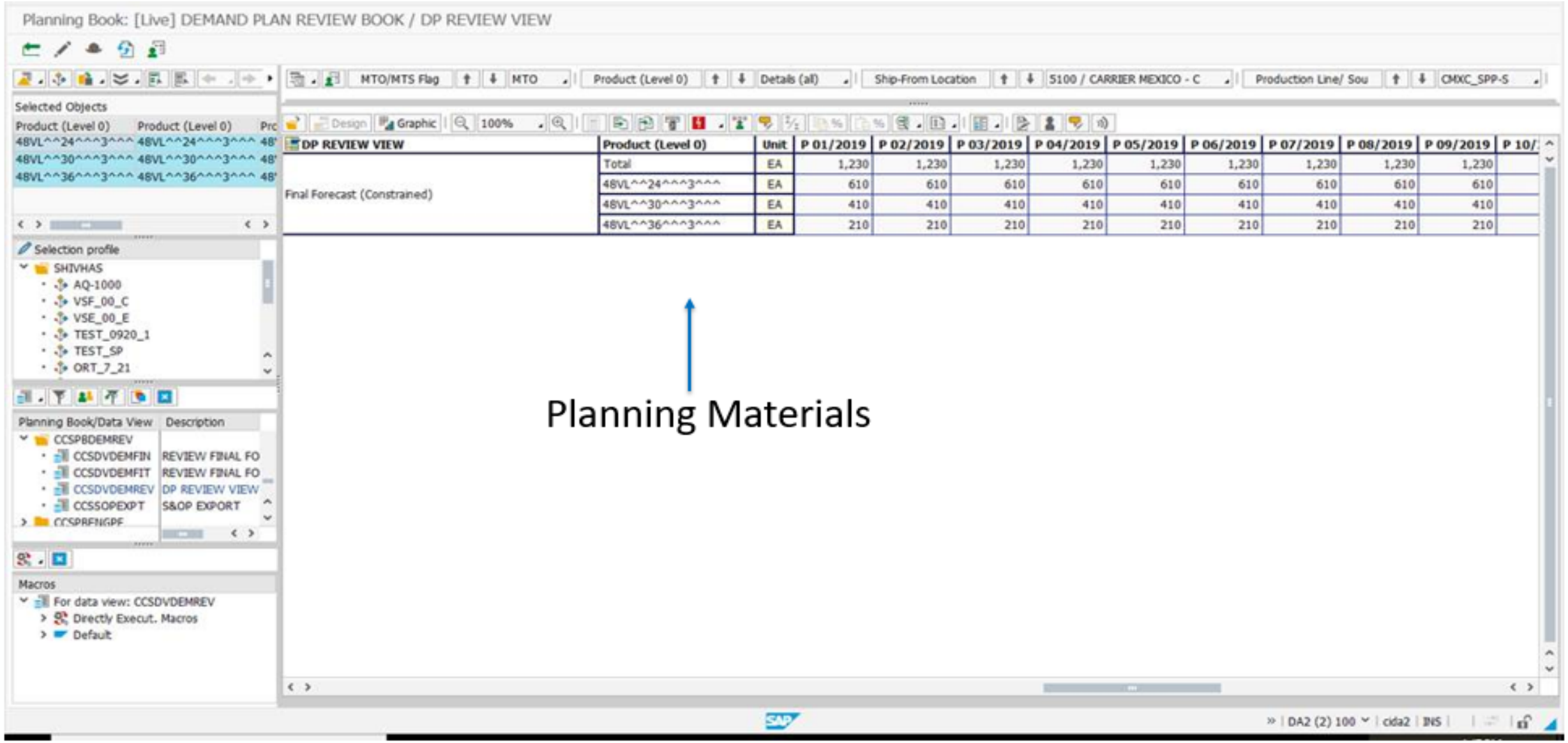
Cross-Company, Cross-country Fulfillment Model – MTO/ETO

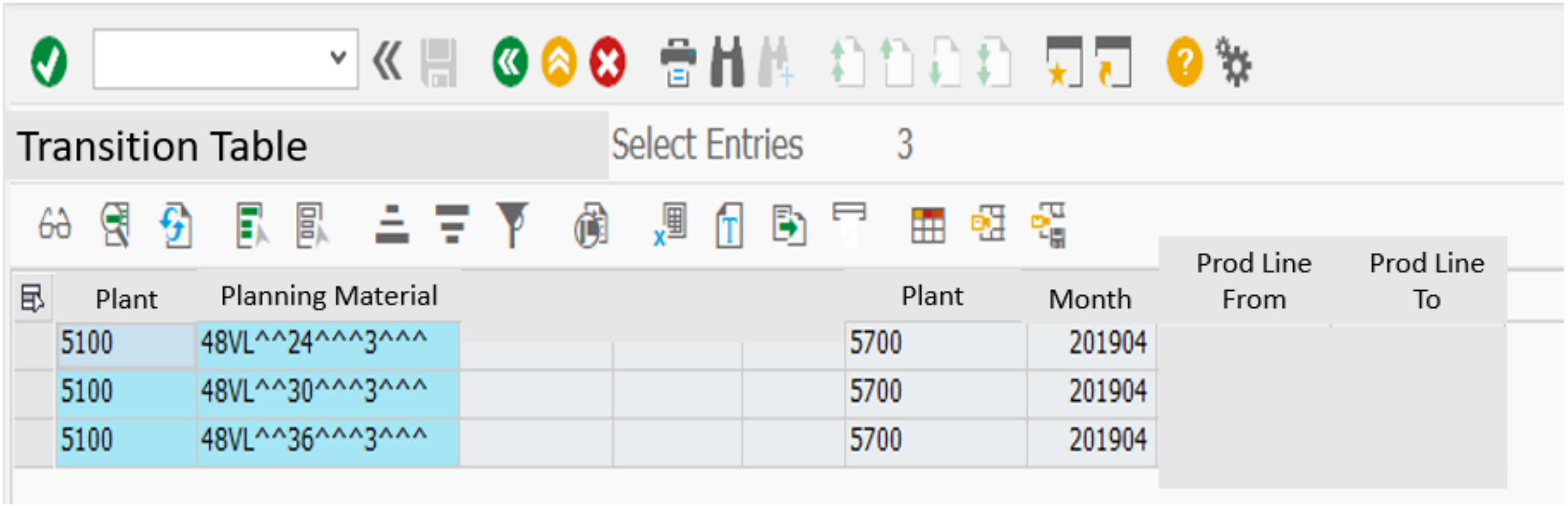


SPK have no role to play in MTO/ETO scenario as the L1 component demand gets exploded the instant the Planning Material forecast reaches ECC

Cross-Company, Cross-country Fulfillment Model – MTO/ETO



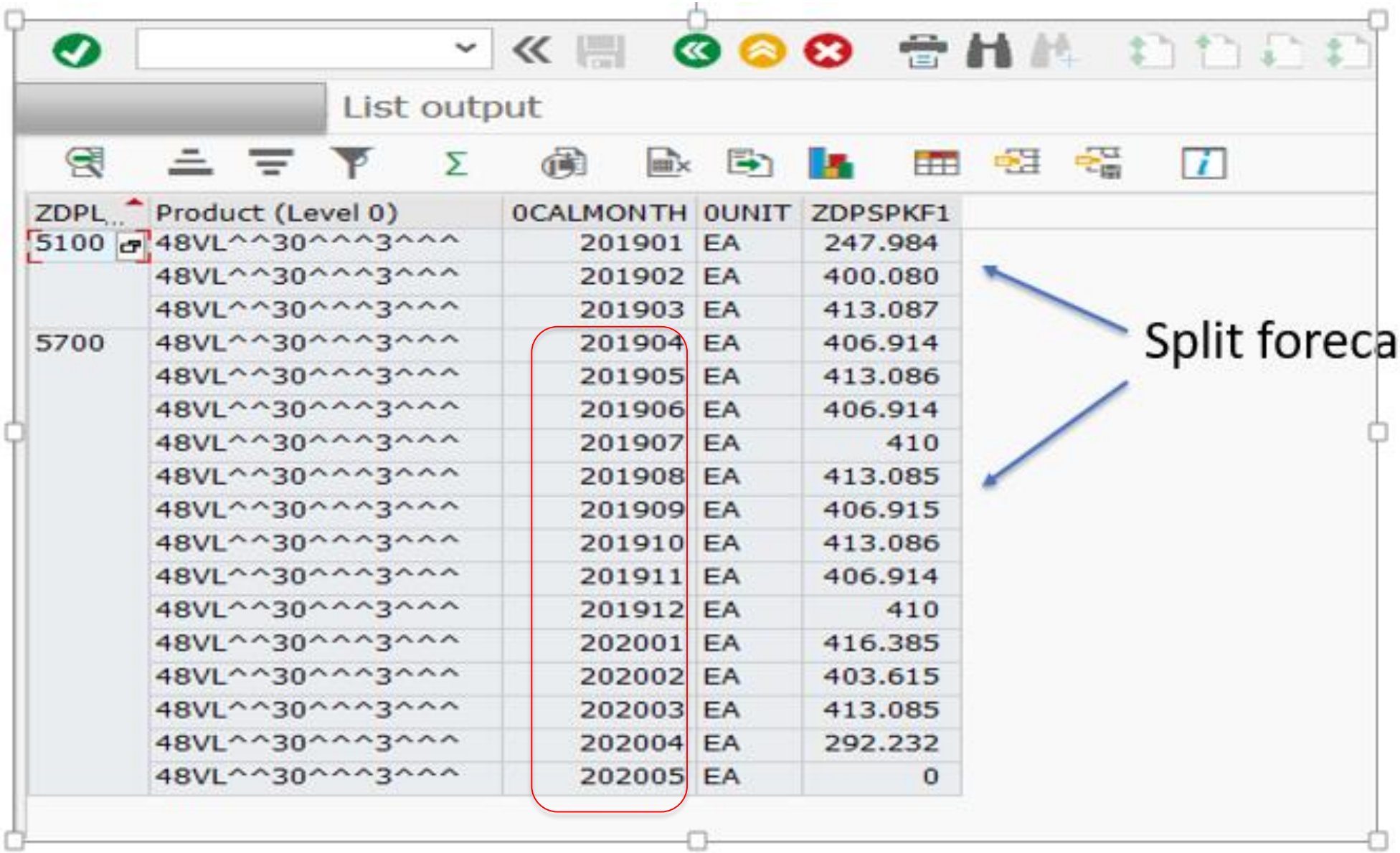
Cross-Company, Cross-country Fulfillment Model – MTO/ETO



Transition Table Select Entries 3

Plant	Planning Material	Plant	Month	Prod Line From	Prod Line To
5100	48VL^^24^^^3^^^	5700	201904		
5100	48VL^^30^^^3^^^	5700	201904		
5100	48VL^^36^^^3^^^	5700	201904		

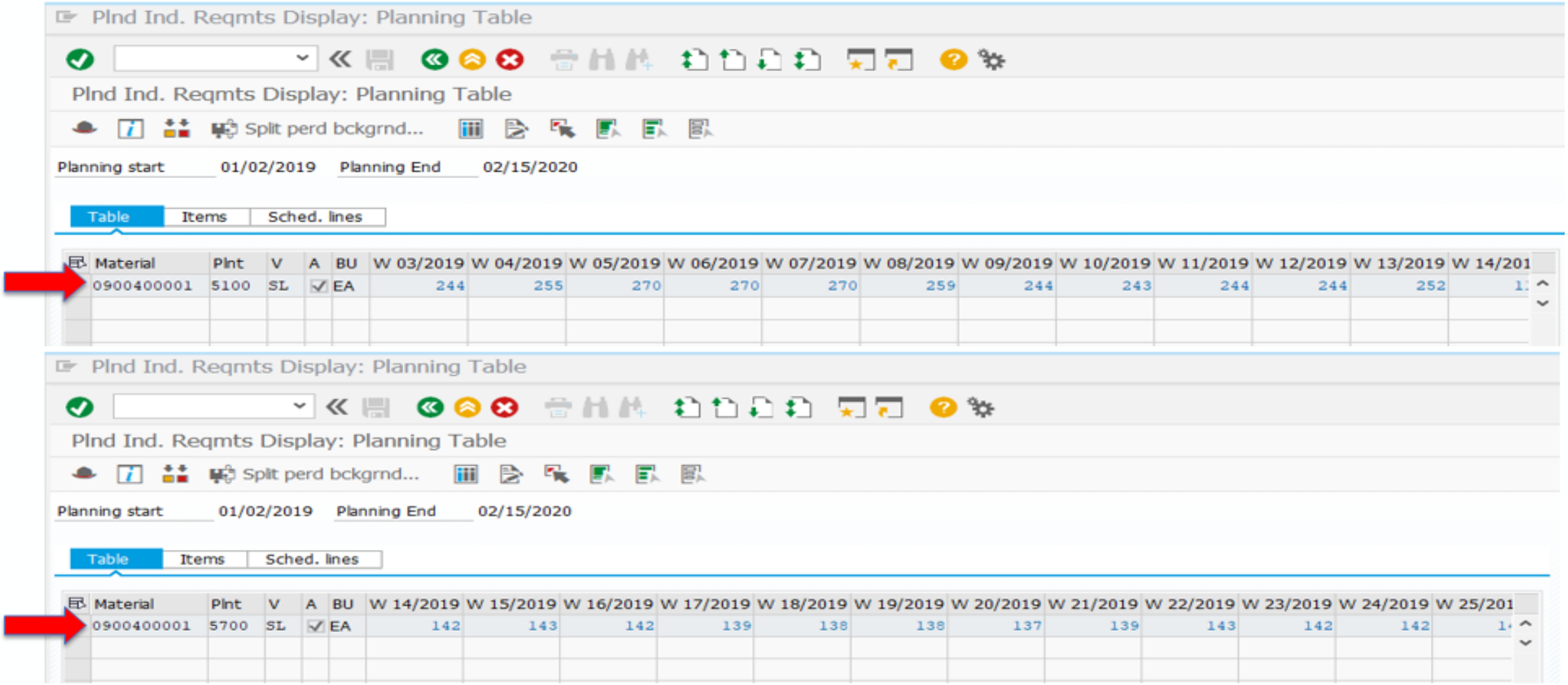
Cross-Company, Cross-country Fulfillment Model – MTO/ETO



ZDPL...	Product (Level 0)	0CALMONTH	0UNIT	ZDPSPKF1
5100	48VL^^30^^^3^^^	201901	EA	247.984
	48VL^^30^^^3^^^	201902	EA	400.080
	48VL^^30^^^3^^^	201903	EA	413.087
5700	48VL^^30^^^3^^^	201904	EA	406.914
	48VL^^30^^^3^^^	201905	EA	413.086
	48VL^^30^^^3^^^	201906	EA	406.914
	48VL^^30^^^3^^^	201907	EA	410
	48VL^^30^^^3^^^	201908	EA	413.085
	48VL^^30^^^3^^^	201909	EA	406.915
	48VL^^30^^^3^^^	201910	EA	413.086
	48VL^^30^^^3^^^	201911	EA	406.914
	48VL^^30^^^3^^^	201912	EA	410
	48VL^^30^^^3^^^	202001	EA	416.385
	48VL^^30^^^3^^^	202002	EA	403.615
	48VL^^30^^^3^^^	202003	EA	413.085
	48VL^^30^^^3^^^	202004	EA	292.232
	48VL^^30^^^3^^^	202005	EA	0

Cross-Company, Cross-country Fulfillment Model – MTO/ETO

L1 component forecast



Post Transition - @ Cutover

Task	MTS	MTO/ETO
Forecast in APO	No Change	1. Remove forecast in “old” Manufacturing Plant 2. Enter forecast in “new” Manufacturing Plant
Special Procurement Key	Change key pointing to “new” Manufacturing Plant	No change – Keep it blank
Transition Table	Remove all entries	Remove all entries
Capacity	Update new values (if different)	Update new values (if different)

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Q&A

For questions about this session, contact me at:

ashet.kikani@carrier.utc.com
561-657-3520 (cell)

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