

# AWP – Procurement Work Process Addendum and DDMRP

Presented by Yogesh Srivastava  
at COAA Best Practices Conference  
8 May 2019

## COAA AWP Committee



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# Agenda

1. COAA AWP Committee Activities
2. The PWP (Procurement Work Process) Work
3. DDMRP – Demand Driven Materials Requirement Planning
4. Relooking at Procurement: What we purchase?
5. The PWP Report
6. Visibility & enhancement of AWP Process compliance in Supply chain

# Construction matters for the world economy

## 13% of the World GDP

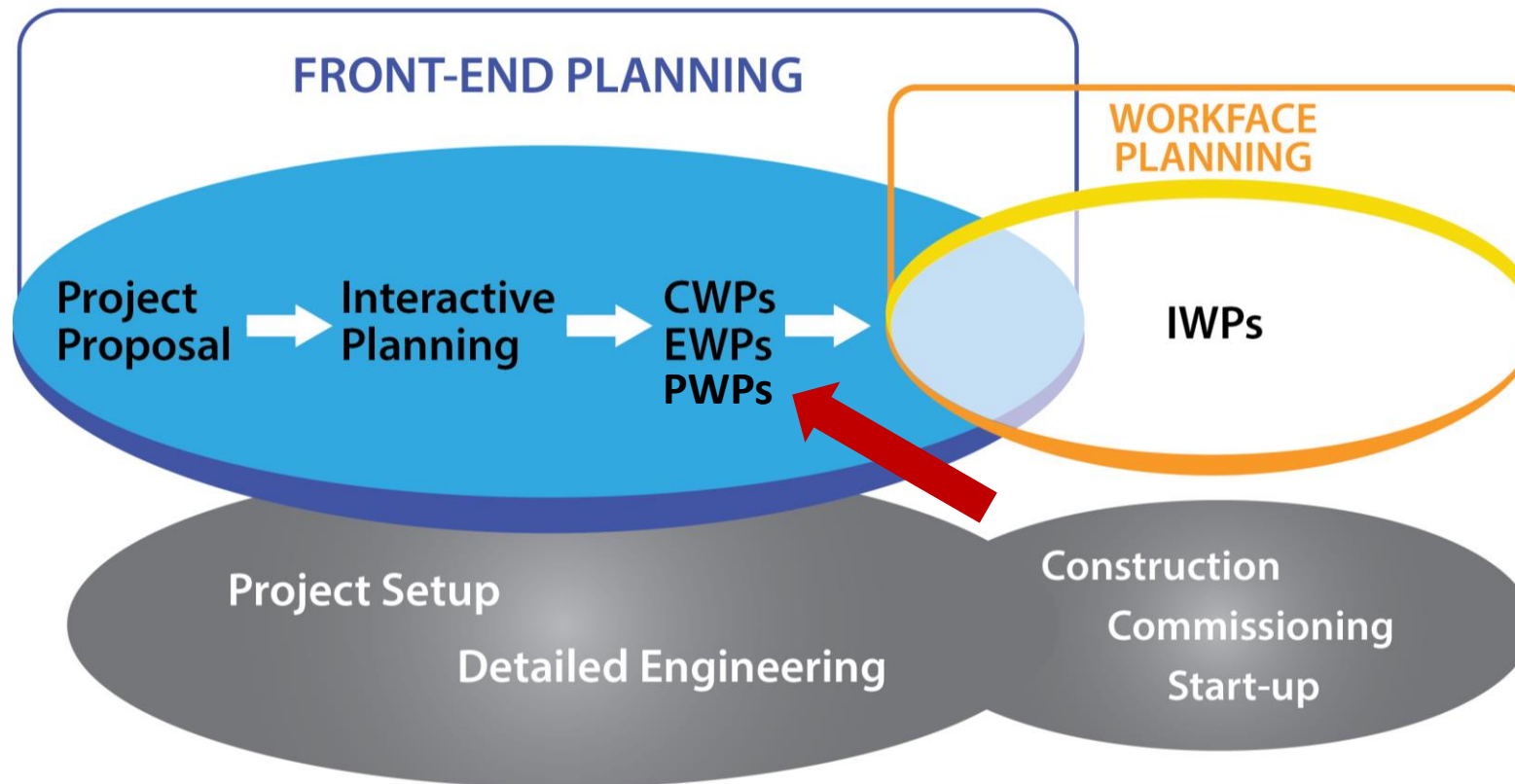
### Major Areas of Work at COAA AWP Committee

1. Path of Construction
2. PWP: Maturing the Procurement Work Process for Material Readiness Assessment by CWP
3. EWP Readiness Assessment & CWP Coupling Point
4. Mindfulness & Productivity
5. Scalability of AWP & ROI

### New work

- AWP Playbook: Who, When & How in AWP Implementation

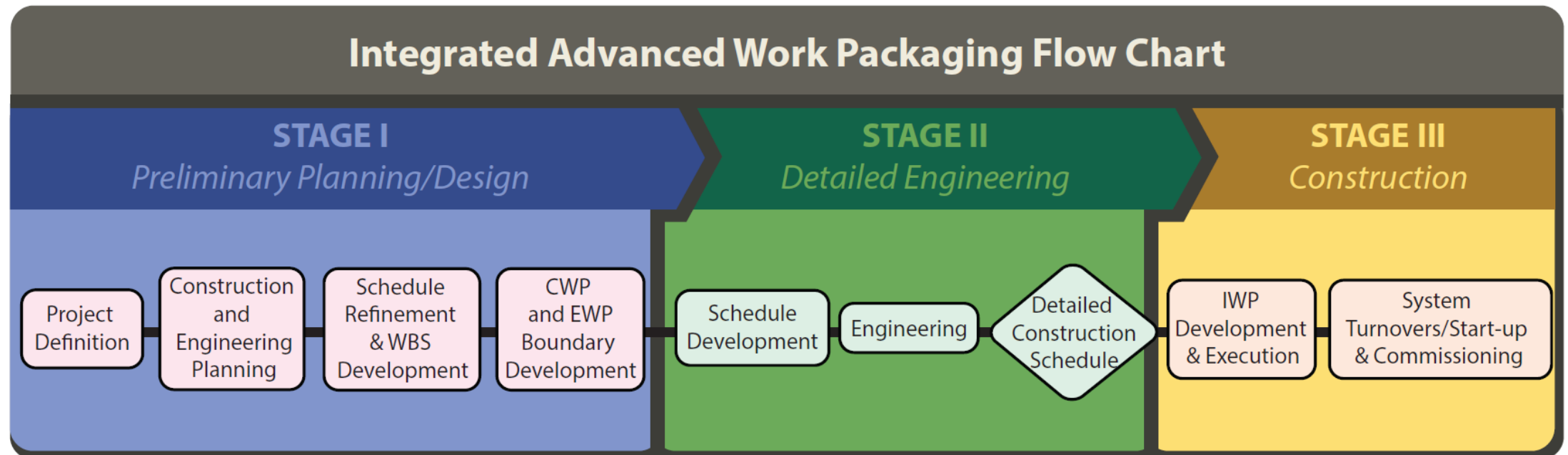
# Advanced Work Packaging



Developed by The Construction Industry Institute (CII)  
<https://www.construction-institute.org>

# AWP/WFP Best Practices continue to evolve

- Construction Industry Institute (CII) & COAA's research team delivered an end to end AWP/WFP Process view



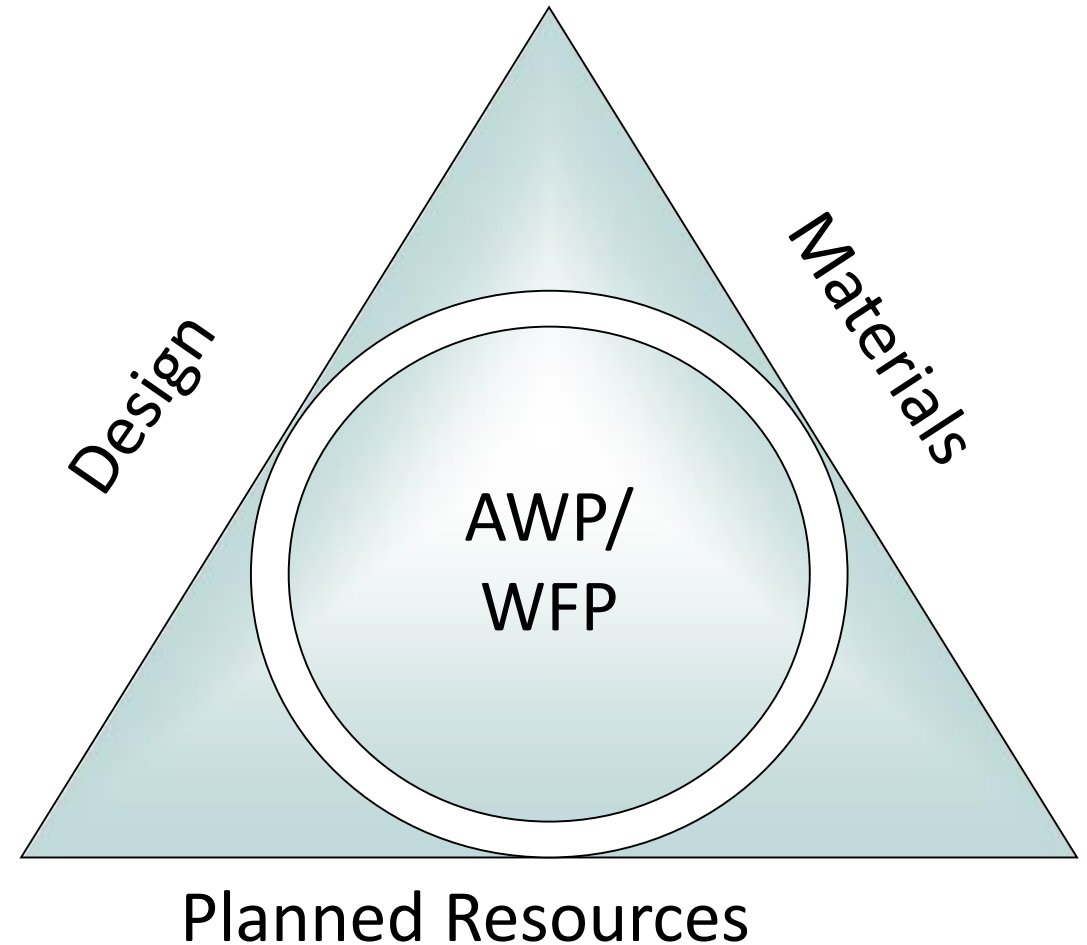
# Plan to work, work the plan: FIWPP & MIWPP

The drivers behind AWP:

- Design certainty
- Material certainty
- Planned resources

Results expected:

- Productivity
- Cost certainty
- Schedule certainty
- Improved Safety



# Why PWP?

PWP is the bridge that gets us from how we buy to how we build

AWP in PWP: Early involvement to influence procurement upstream and have strategy for site materials

Can start during the POC for Material planning by CWAs

Scope clarity and alignment

Relevance of how construction is going to do the work with SCM

Three tie points are: EWP, PWP and POs

PWPs may have direct correlation to POs or multiple POs

# Materials Requirement Planning



# Typical Material Requirements Planning

- T--18~24 weeks: High level forecast  
No visibility into variant level demand
- T+4~8 wks firm demand: Weekly Message  
OEM Demand vs Supplier Capacity planning
- T+1~3 week firm demand: Daily Message  
Next 2 Weeks production | Day wise variant level demand
- Hourly Broadcast: Current Day Production  
Hourly requirement of variant level for sequenced parts



# MRP: Materials Requirement Planning

MRP uses forecasts of finished products to calculate component requirements based-on the Bill of Materials (BoM), and schedules the production or procurement of components based-on the respective lead times.

- forecast at the SKU level has to be highly accurate; difficult to get
- inaccurate forecasts gets amplified across the system
- Difficult to use output of MRP for executing day-to-day shop floor activities

# Limitations of current process to handle complexity



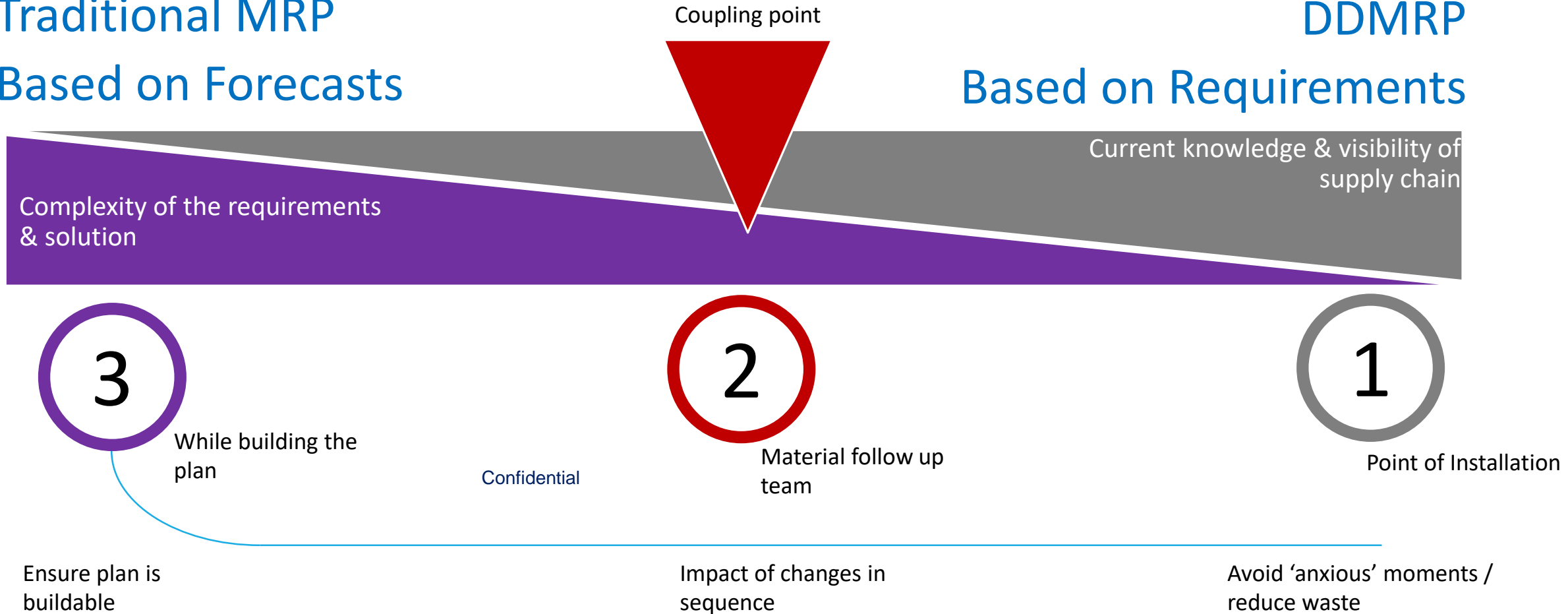
Existing MRP methods find hard to prepare themselves to build a demand centric supply chain.

Difficult to simulate and analyze the impact of the demand changes in near real time

# Incorporate Demand Driven Materials Planning

## Traditional MRP Based on Forecasts

## DDMRP Based on Requirements



# MRP – Forecast based method

## *Segment 1*

Material management on shop floors / field

Visibility should cover 1 to 3 days starting from the time of broadcast to suppliers up to the time sub-assemblies reach the point of fit

Require solutions like in-transit visibility and dynamic routing

# MRP – Forecast based method

## *Segments 2 and 3*

Planners and follow up teams

Visibility of two to three weeks

Ability to simulate various possible impacts to the plan or sequence, and identify the plan or sequence that is achievable with reasonable confidence

# Demand Driven MRP

# The Challenge

Two main reasons why companies still find supply chain management challenging in spite of having invested in state-of-the-art technology solutions

1. The first is the use of the Materials Requirement Planning (MRP) model for formal planning in isolation (outdated)  
*Unfit in highly variable and uncertain construction landscape*
2. The second is inability to adopt effective pull-based models available owing to certain misconceptions.  
*Misconceptions around pull-based improvement methods like lean and theory of constraints*

*Inefficiencies in supply chains as planners resort to manual methods of planning and execution using excel spreadsheets*



# MRP in Isolation

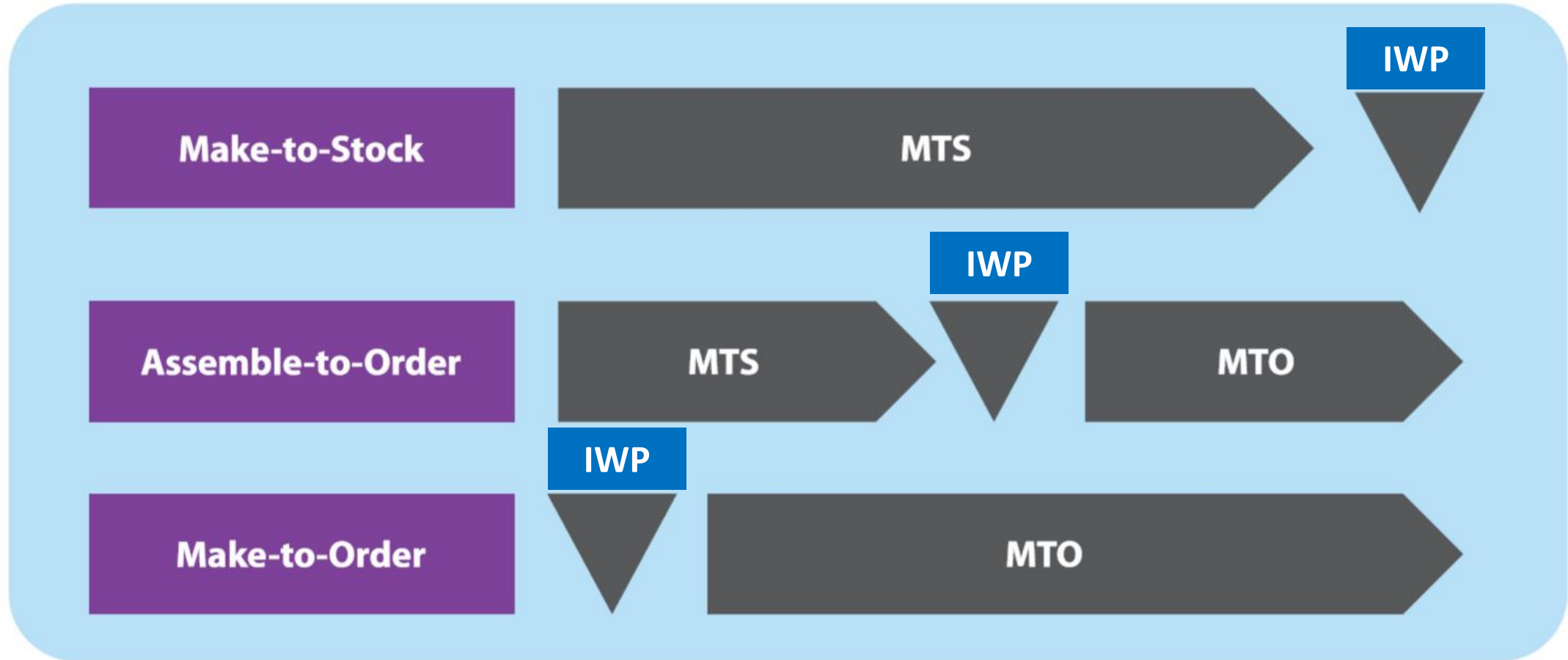
- For MRP to work effectively, the forecast at the SKU level has to be highly accurate.
- However in today's volatile and dynamic world, accurate forecasts are difficult to get.
- MRP is a highly interconnected way of planning. Any noise in the form of inaccurate forecasts gets amplified across the system
- It is difficult for planners to use the output of MRP for executing day-to-day shop floor activities, and it is no surprise that planners resort to using spreadsheets for planning.

## Demand Drive Materials Requirement Planning

Popular notion:

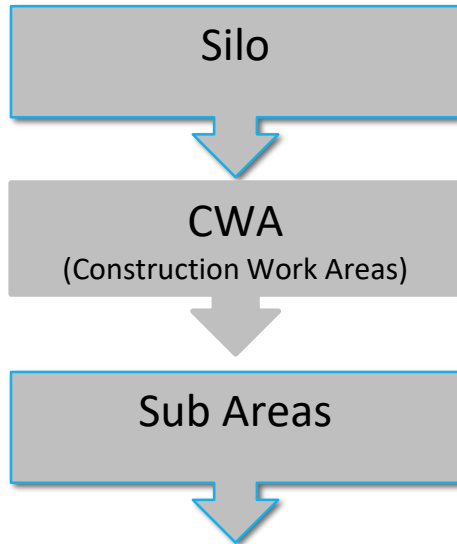
The pull production system is customer order driven, while push is based on forecasting. In other words, pull is Make-To-Order (MTO)

# The Different Triggers



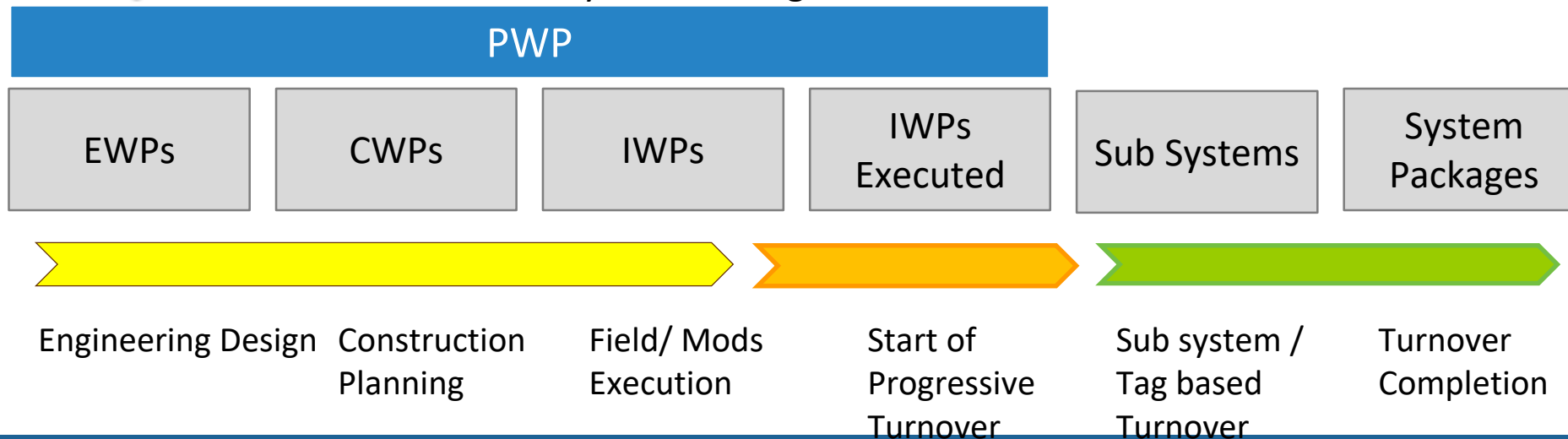
# Data a Key Aspect of Procurement

# PWP in the AWP Work Process

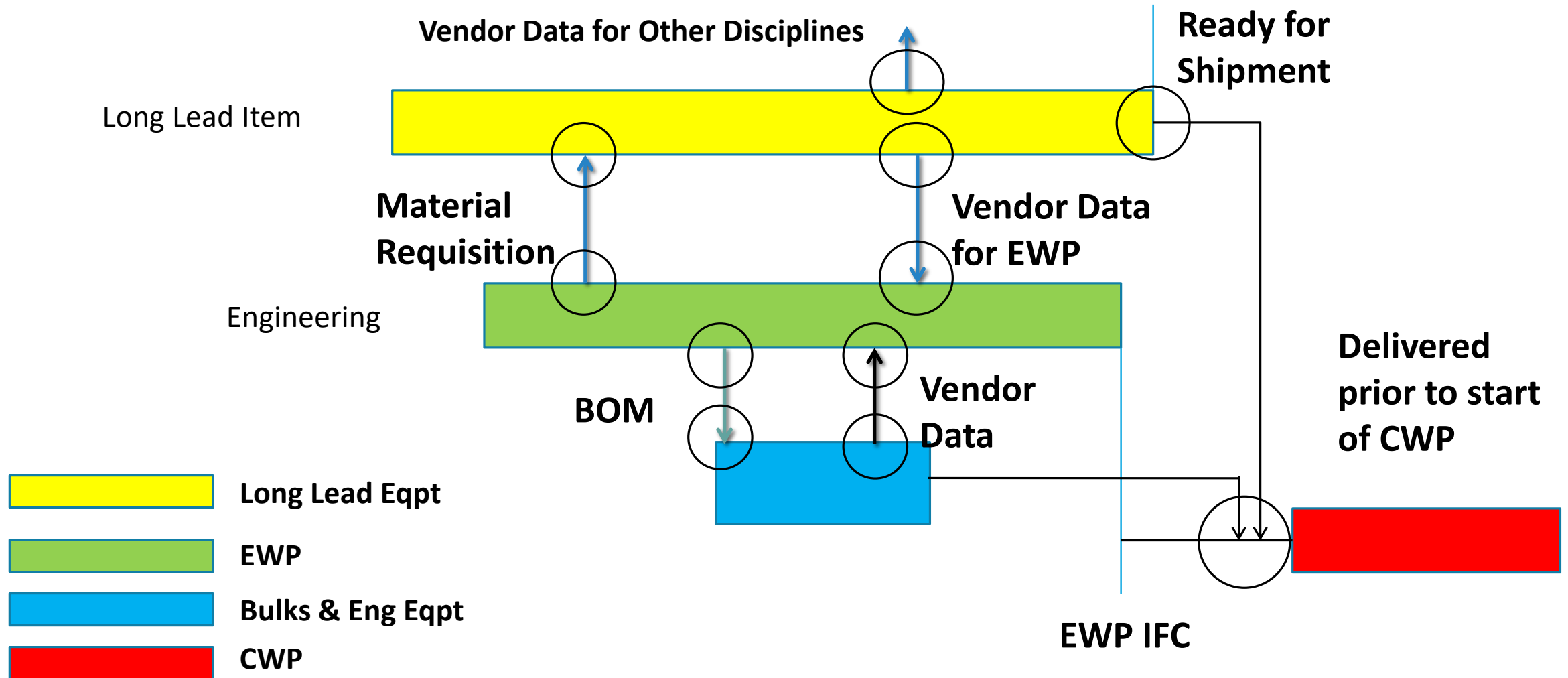


## WORK PACKAGES / COMPLETION / TURNOVER

- EWP: Engineering deliverables
- CWP: EWP + Construction
- IWPs: Foreman level work execution package
  - FIWP: Field installation work packages
  - MIWP: Module Installation work package
- Sub systems
- System Packages

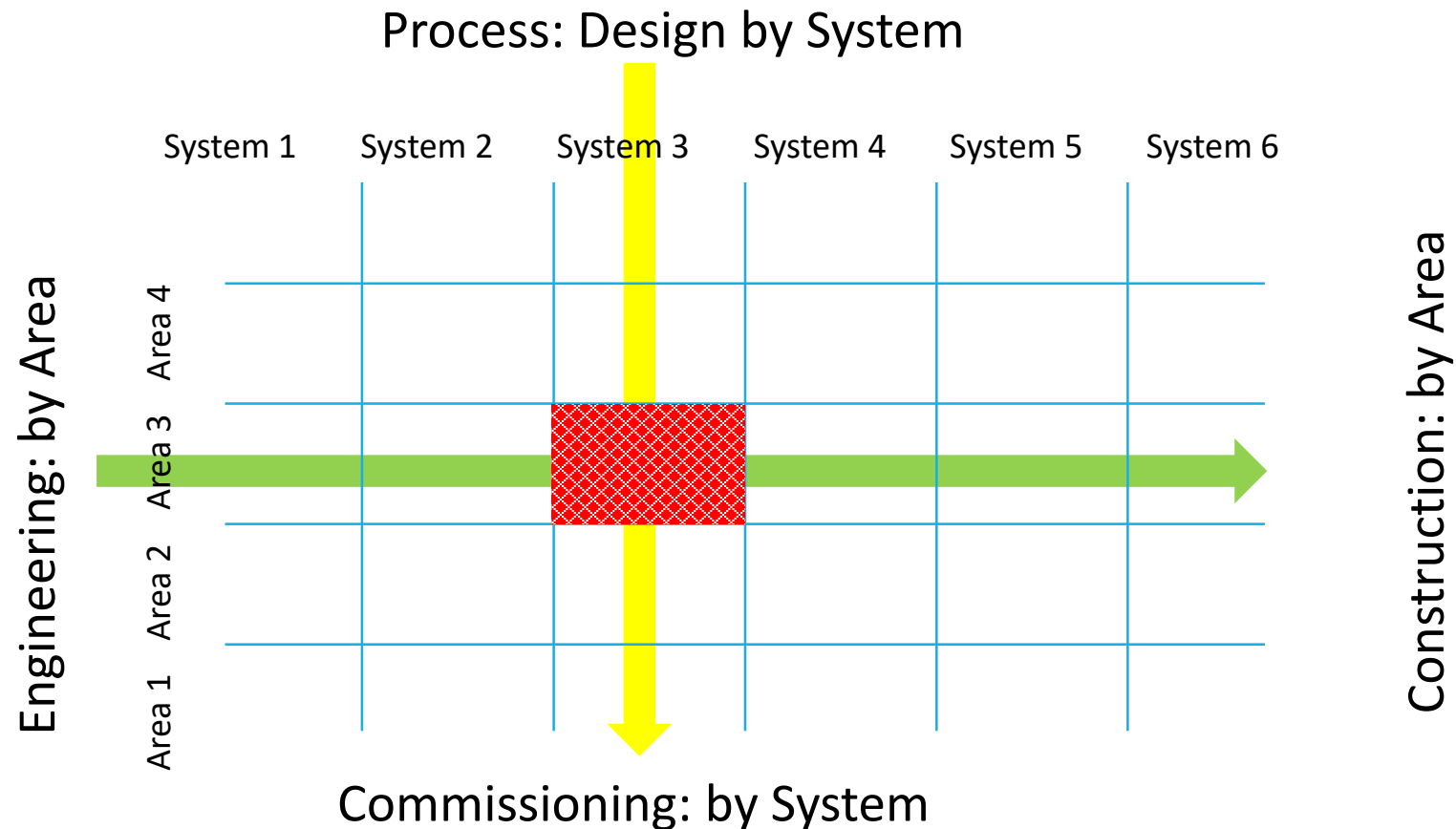


# What schedule points are tracked?



## Area and System based definition

- Need for EWP/CWP (area based) and TCP (system driven) attributes in deliverables



# SCM Focus on Two Key Deliverables

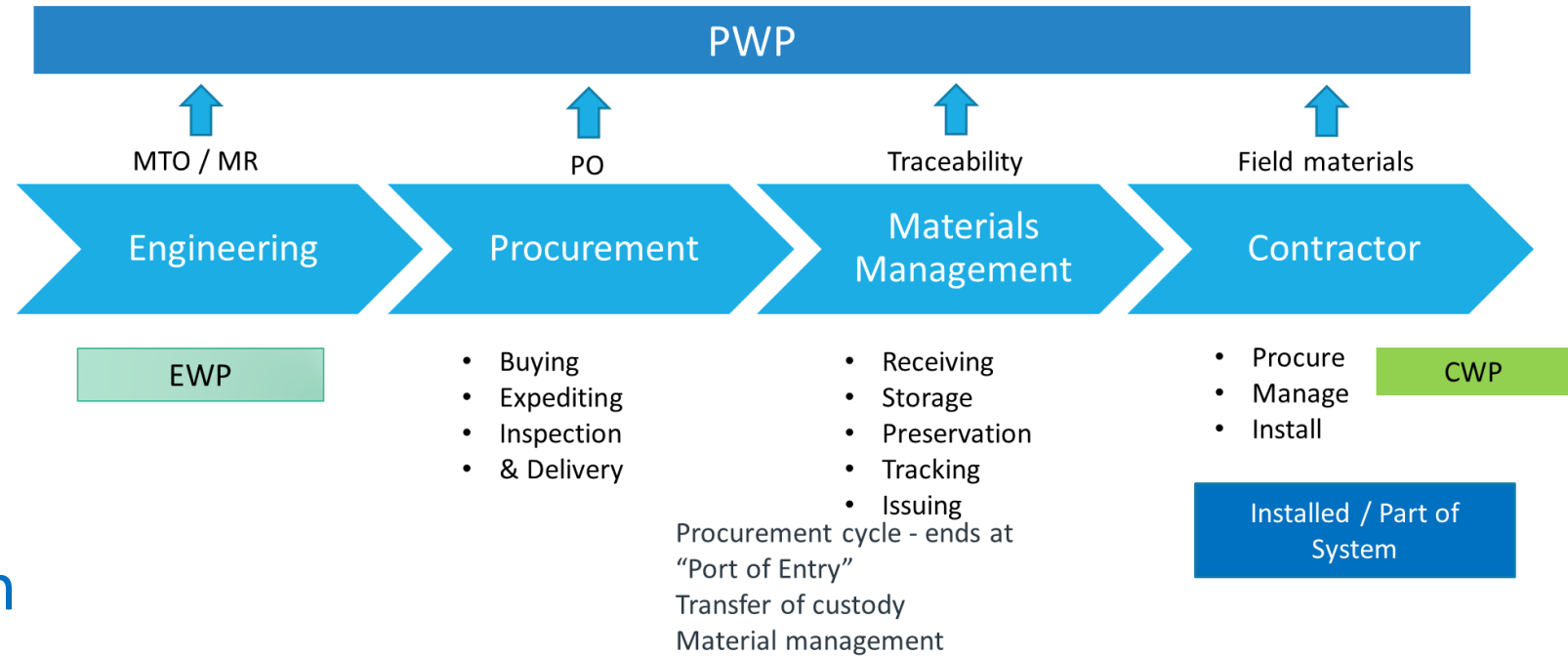
1. The Commodity: Required at Site (RAS)
2. The Vendor Data: Requirement of Vendor Data (ROV)



# The PWP Report

# PWP: The Procurement Work Process

- Improvements in Process, Technology and Supplier
- Demand driven Materials Requirement Planning
- RT 344, improvement in the Visibility across the long process in SCM



# Improve the SCM Visibility

Across Engineering, Supply Chain and Construction process

Improving confidence in materials from a process point of view and meeting the key dates

Clear identification of Roles and Responsibilities through out the procurement to installation process

Improve management of Changes, early identification of information that is not known and ensuring smooth flow

Improve visibility in logistics, shipping and receiving,

# A Complex, Global Supply Chain

## RT 344 Linking the Supply Chain through Visibility



### Improved Integration of the Supply Chain in Materials Planning and Work Packaging

Siloed stakeholders impedes visibility

Disparate systems | Asymmetric data | Misaligned incentives



# A Complex, Global Supply Chain



# What is a PWP Report?

**Complete list of all supplied material and equipment for an EWP/CWP**

- Engineered equipment
- Bulk
- Field supply (to be supplied by contractor)

**Who is requesting, buying, expediting, receiving, holding it**

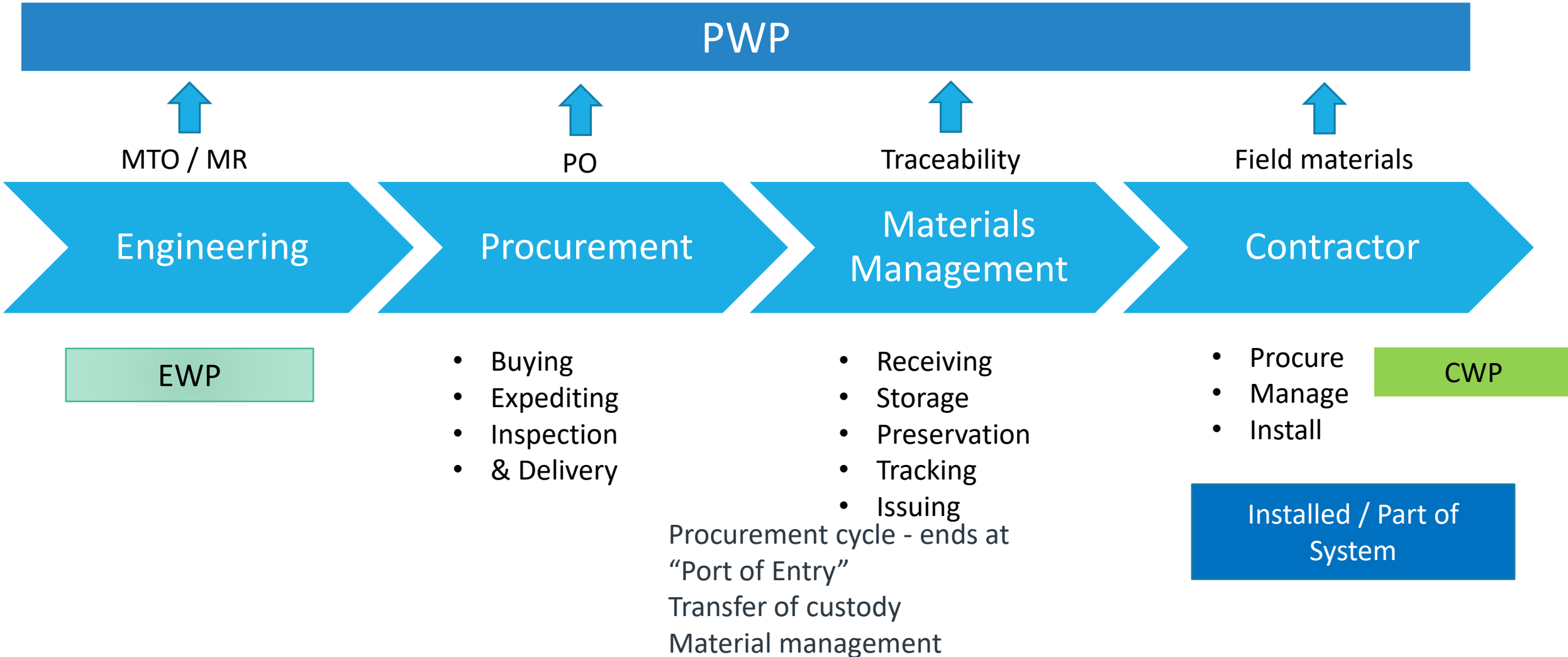
**Listing of all important dates that have to be met**

**Provides link for all material/equipment to POs**

**Provides link to latest logistics / expediting**

**PWP could have an element of providing leading indicators**

# PWP: Life Cycle



# Review the PWP Template

## Who

Owner buying it

EP

Contractor

PWP changes ownership through the lifecycle

## Where

From home office

Site

Global supply chain

Decide early on the Project the hand-offs:  
Procurement to Materials Manager to  
Contractor

## What: Depends on what you are buying

- Engineered item
- Bulk
- Field buy



# Value Proposition of PWP

- Visibility to supply chain on how project will be executed
- Visibility to Construction on how the material is being bought and level of confidence in having it at site before opening work front
- Material Management not chasing individual POs
- Early alignment with Materials Manager during POC development
- Use as a leading indicator of how material/equipment is available to site

# Departments & Functional Interfaces

# SCM & Advanced Work Packaging

1. The Big Contract and Contracted Scopes of Work
2. Engineering to SCM
3. Vendor data to SCM
4. SCM to Constructor
5. SCM in Progressing
6. SCM in Close-out
7. Transportation and Logistics (Till gate / In-site)

# Contractual

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## Recommendations to Owners

### Contractual Issues

- Ensure prequalifications for ability to support AWP implementation.
- **T&C's support incentives for timely completion of CWPs, EWPs, and PWPs.**

# SCM & Engineering

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## Recommendations to Owners

### Review Schedule

- Each CWP supported by predecessor EWP(s)
- **Dates for associated vendor data tied to each EWP.**
- Adequate lag from scheduled EWP IFC date and associated start of CWP.)

### Review Procurement Packages

- ALL materials / equipment can be traced back to individual EWP
- ALL materials / equipment can be traced back to individual SYSTEM

# Criticality of SCM

Engineering isn't necessarily interested in SCM process and understanding their constraints

Engineers lack visibility to the SCM process

Within the various disciplines in engineering, there needs to be some level of cross discipline understanding and implications from an SCM point of view

Time line for procurement activities should be well understood and assist in evaluation changing engineering information

SCM should not assume / but confirm that the scheduling information from Project Planning is brought in to the SCM systems.

# Vendor data to SCM

Vendor data for EWP completion

The problem of EWP releases with holds

Change management issues

The dependencies of CWP, IWPs on the EWP information

The EWP Release Plan

*Need SCM to come up with ways so that vendor data comes in timely, required format, progressive turnover of information*

# SCM to Constructor

Ability to track materials by the Engineering work package

Ability to track materials by what sub-system it belongs to

Ability to manage order release by CWP

Ability to bag / tag by CWP

Ability to provide IWP based visibility if possible



# SCM – during Progress

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Material at hand by Package that's not  
withdrawn from warehouse

# SCM – during IWP Close-out

Planned versus Actual quantities

Overages / deficiencies

Progressive turnover of data and documents  
by packages

A party to attest package completion

# Transportation & Logistics

## □ Getting it to site

- Package identifier in material movement
- Prioritization per CWP build plan

## □ In-site

- Traceability by tag/package
- Constraint removal
- Custody

# PWP & Redesign of SCM

# DDMRP

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Typical forecast based methods from Engineering to Supply Chain, Vendor, Site

Demand driven method: Site requirement variations, Supply Chain Office to the Vendor

Need Systems for:

- Greater Collaboration
- Improved Connectivity
- Enhanced Cognitive abilities

# Rethink: What are you buying?

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1. The Item / Commodity
  - Needed later per the RAS Date
2. The Vendor Data
  - Needed earlier as per RAV Date

A supply chain redesign mandates breaking 'silos and suspicions' both, within the E&P and across supplier communities

- How can vendors & manufacturers enable this collaboration?
- How do they ensure flow of information and materials in near real time?
- How can they manage variability in demand in long & complex supply chain?
- How can they optimize inventories & working capital?

- **Connectivity**

Digital technologies can help the supply chain record dynamic changes in demand and planning;

achieve a single version of truth across all data silos, enabling visibility and agility in the supply chain

- **Collaboration**

Continuous engagement for relevance and responsiveness, keep the flow of material and information smooth;

Enabling transparency and real time data sharing, propagate holistic and integrated decision making

- **Cognition**

Analyze data from different streams across the network, and re-position the supply chain;

Driving automation using digital technologies and machine learning



# AWP – Procurement Work Process Questions

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