

# Eliminating the “Gap” between EPC Contractors and Owner/Operators in Commissioning and Startup

## Components of Successful Commissioning & Startup

### Examples

- Early Design Feedback
- Define “who” “how” and “when”



# Anvil's Experience and Alignment Bridge the EPC Gap Between Contractors and Operators

## Uniquely Experienced People

- Technical Personnel w/ Extensive Project Management and Operations Background
- Front Line Startup Experience with new equipment installation startups
- 26 yrs. experience at a silent running plant versus 5 yrs. with 3+ greenfield startups
  - Have “seen it all” and can rapidly foresee and solve complex issues

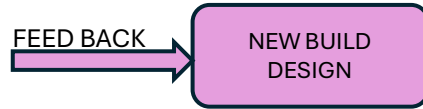
## Alignment

- Proven process plan for commissioning/startup late Select or early Design phase
- Define the “Who” “How” and “When” for commissioning and startup and Execute
- Ongoing collaboration and open dialogue between EPC contractors and operators
  - It sounds simple – but it doesn't happen on its own



# New Design Build - Review & Feedback

*Importance in Defining what it takes for Commissioning and startup BEFORE or DURING Detailed Design NOT during commissioning*



## New Build Requirements for S/U

Eliminate issues during cold start

Select Stage – high level requirements for startup

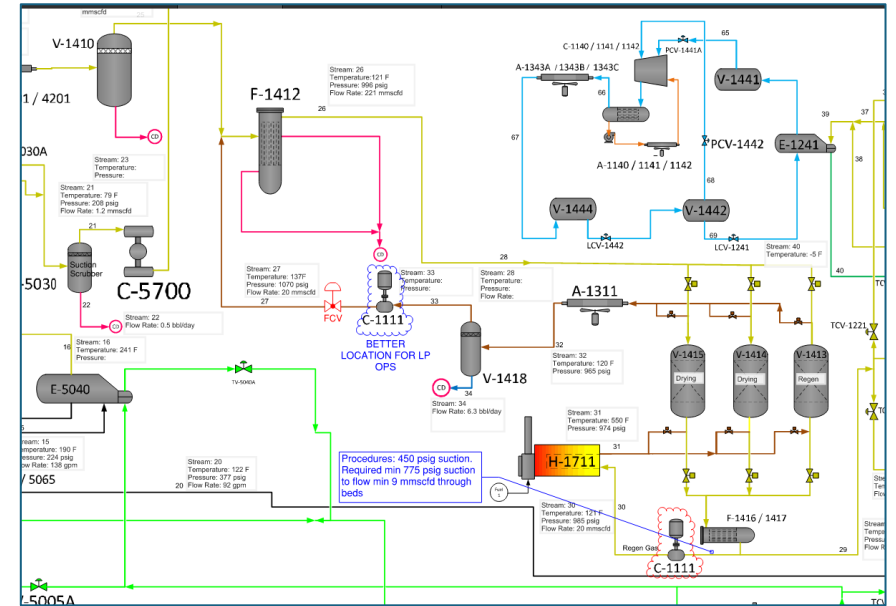
- Startup Lines
- Utility requirements and availability
- Startup modes of operation (lower T, P and flows)
- Tie-ins for startup filters

Define Stage – detail out with any startup modes for equipment

- Check ALL Equipment, Piping, and Controls
- Appropriately sized vents and fill nozzles/lines
- Purging requirements

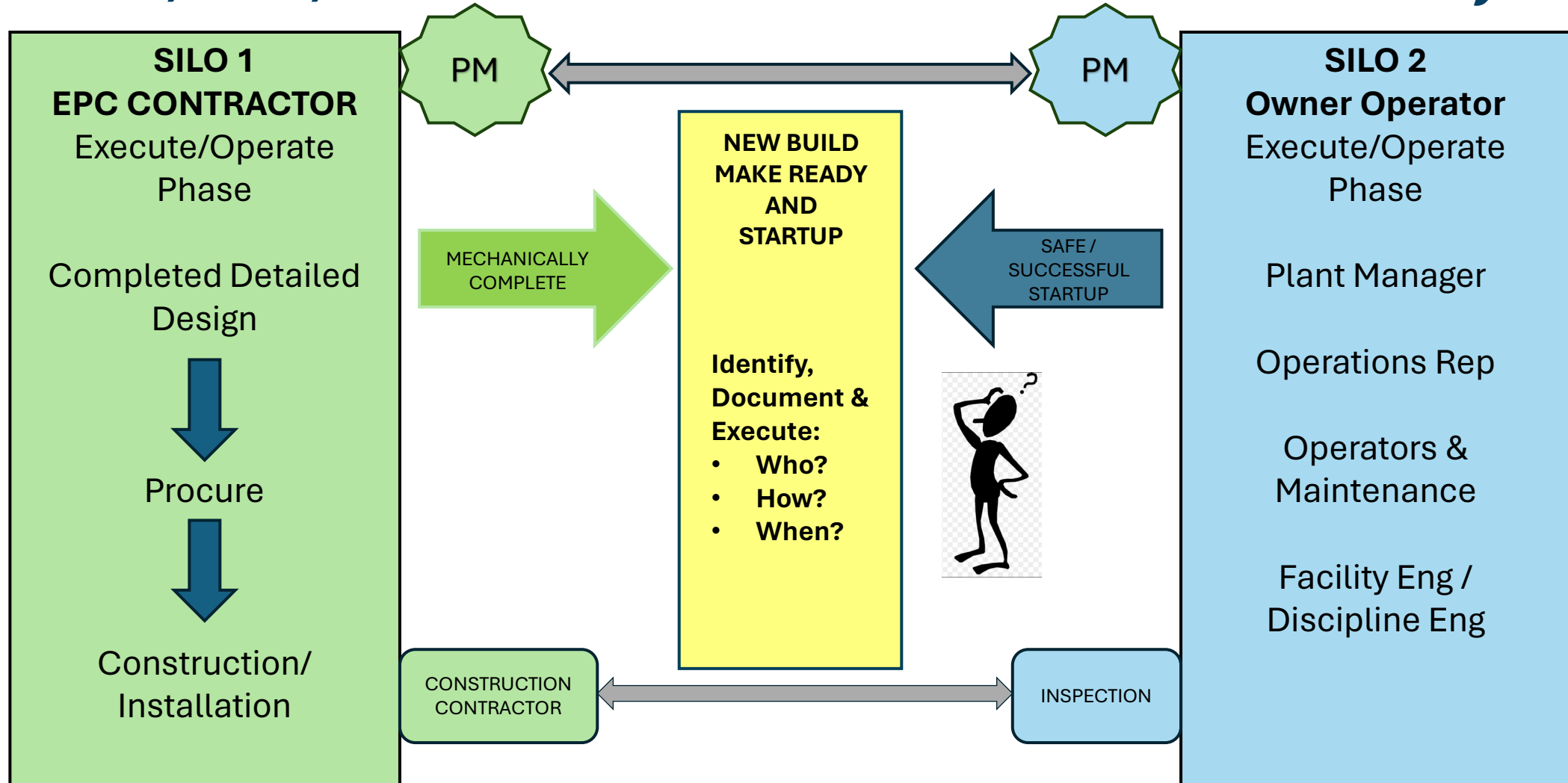
## EXAMPLE: CRYO Plant Dryout Design

- \$\$\$ Spent on ability to Convert a two-Stage compressor into single state for gas plant dry out
- Couldn't run Dehy unit regen centrifugal compressor at lower dry out pressure
  - Long Piping runs and high DP
  - Wrong location of regen compressor to allow lower operating pressure for dryout
- With higher pressure dry out:
  - Modify dry out sequence and reverse flow jumper line to keep from freezing out
  - Extra prep work on site.

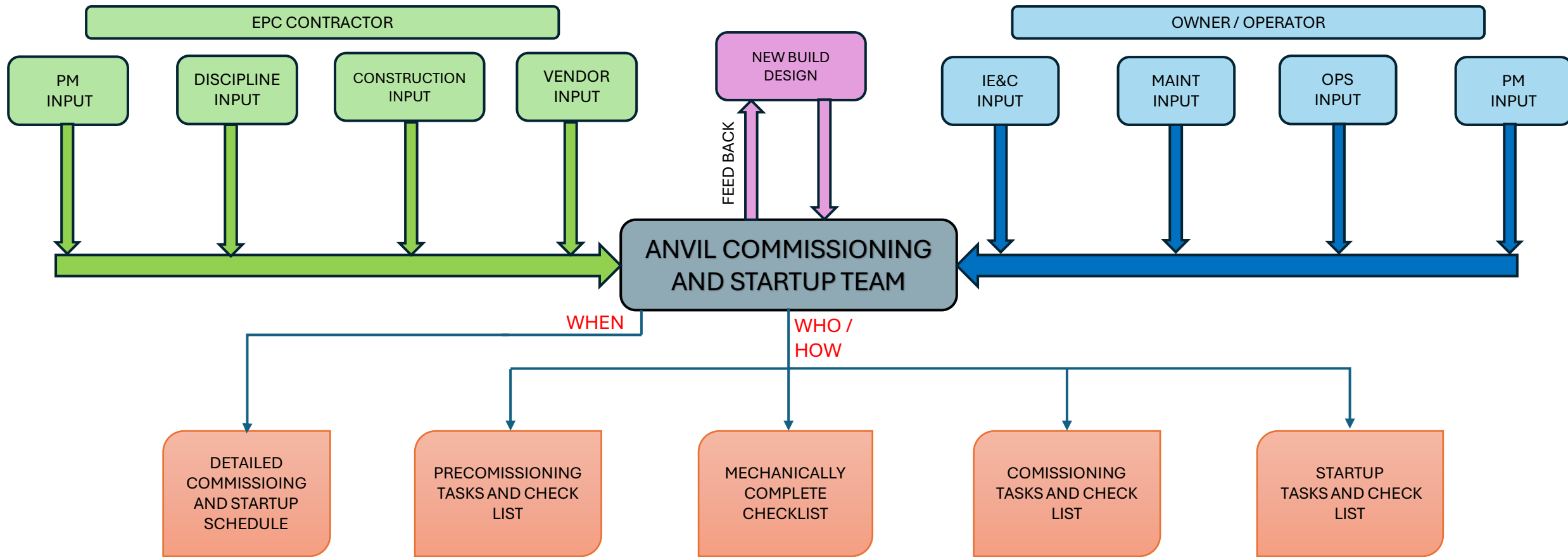


# THE GAP Between EPC Contractors and Owner/Operators

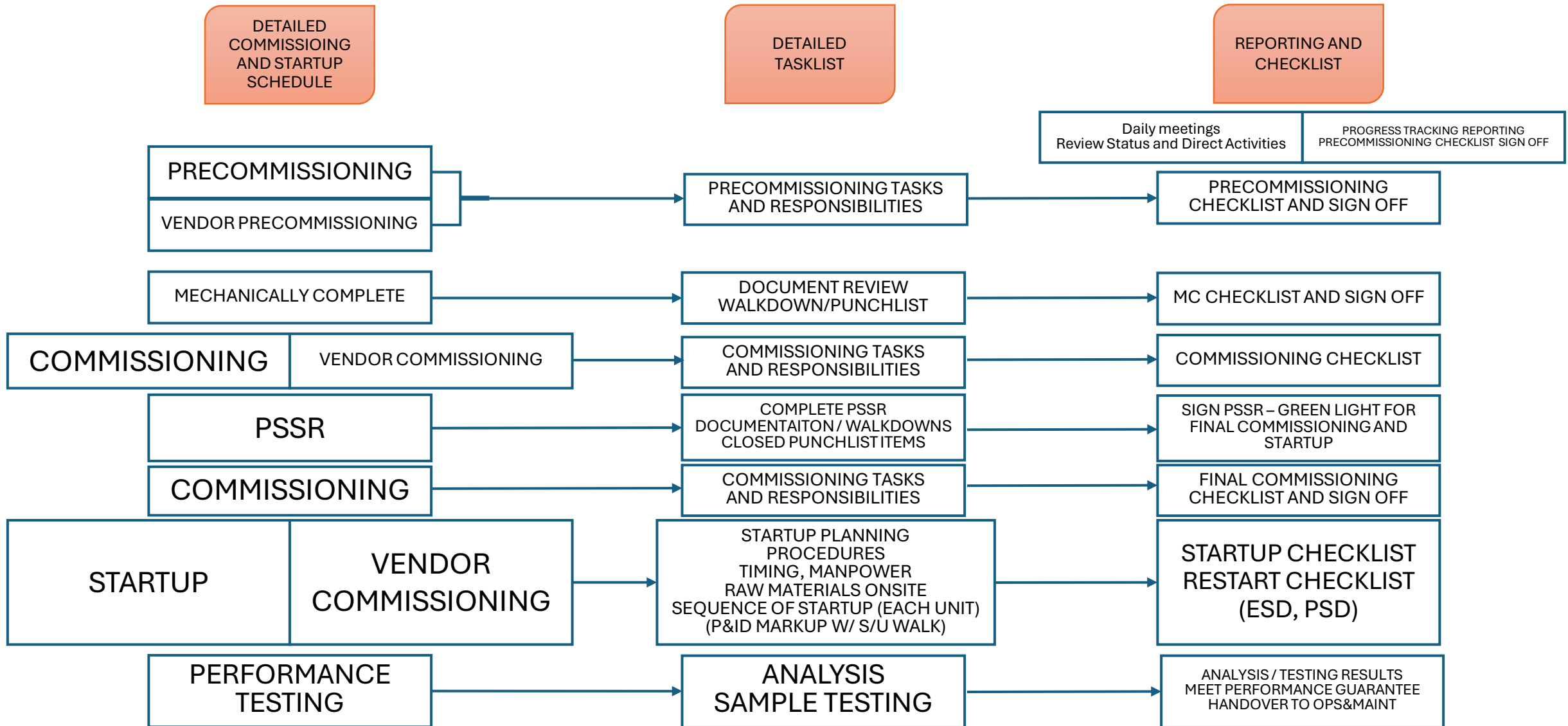
*The "who", "how", and "when" of Commission & S/U Needs to be Defined Early*



# Anvil's Experience, Management, and Ownership of the "Who," "How," and "When" of Commission & S/U



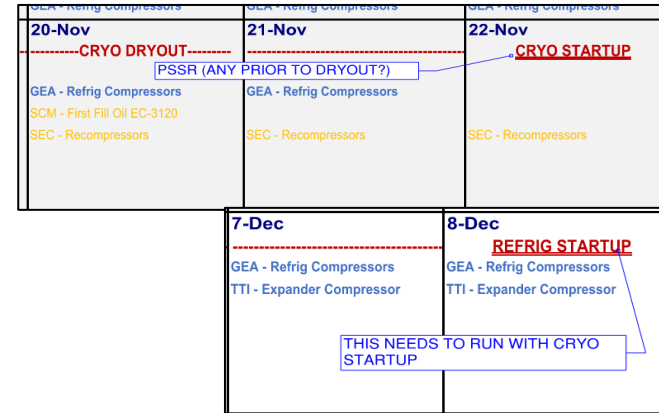
# Schedule, Task List, and Checklist



# Starting Tasklist/Schedule Versus Revised Tasklist/Schedule

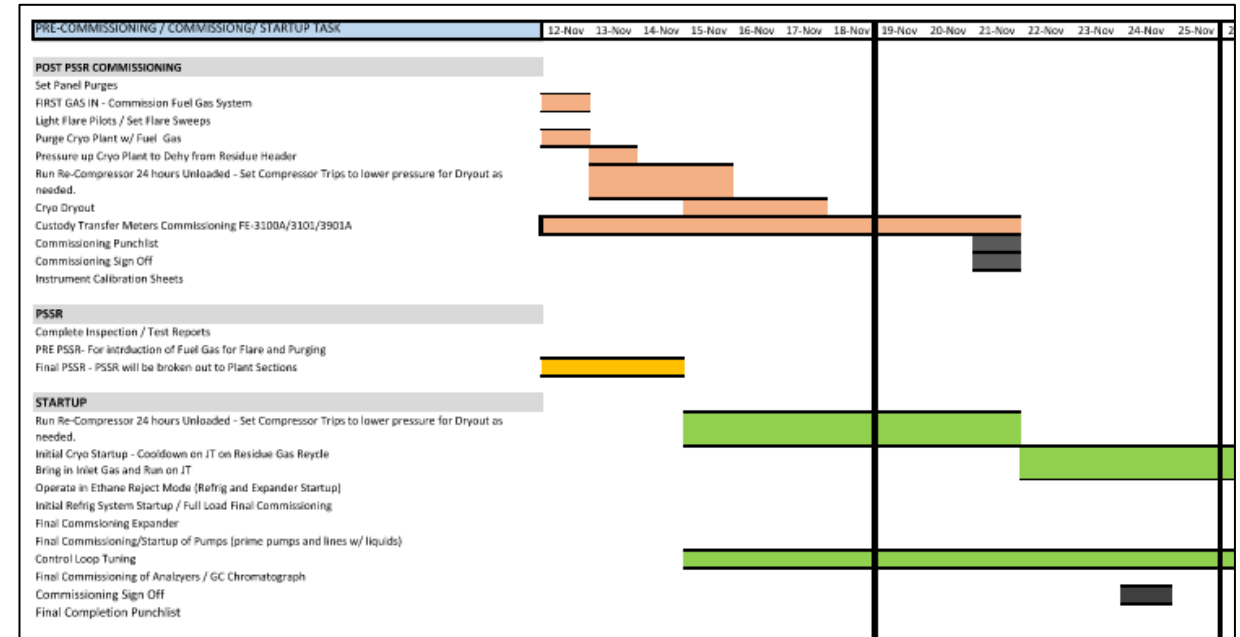
## Initial Tasklist/Schedule

- Missing required steps/milestones
- Missing Tasks
  - PSSRs
  - “Startup” for one day
- Steps/Task out of order – doesn’t follow required sequence
- Missing “Who is responsible” in Tasklist
  - Includes Vendors – Operators - Contractor



## Revised Tasklist/Schedule

- **Project Task List**
  - List All Detailed Tasks
  - Who’s Responsible / # of days to complete
- **Project Task List Schedule**
  - Take Task List and integrate based on timing (what has to lead or lag an activity)
  - Add # of Days and make schedule
- **Updated Calendar Schedule**
  - Update Simplified List of Task/Milestones in Calendar (High Level)





# Summary

## What Anvil Provides

### Experienced People (For commissioning and startup)

- Have the experience and knowledge for commissioning and startup
- Proven process plan for commissioning/startup in Select phase or early in the design phase

### Alignment

- Detail Project Task List Schedule
- Ongoing collaboration and open dialogue between EPC contractors and operators

### Bridging the Gap Between EPC Contractors and Owner/Operators

- Identify and document the *Who*, *How*, and *When* for a smooth handover process



# Thank You

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gratulations



Anvil Team!