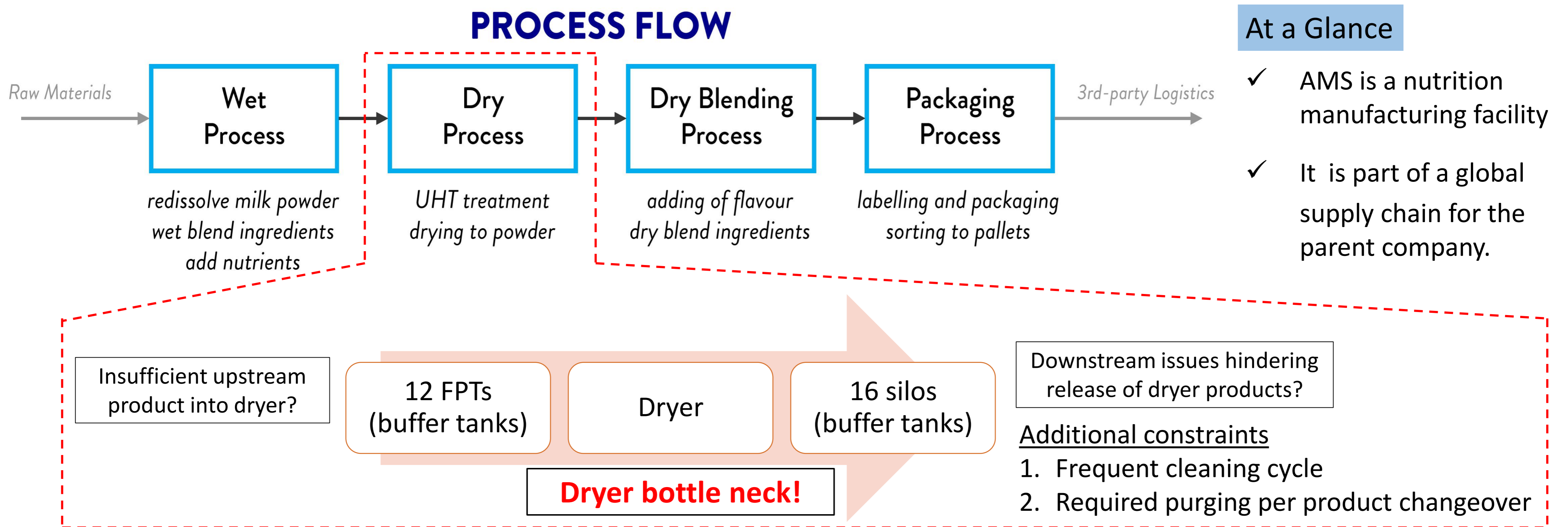


PROBLEM DESCRIPTION



METHODOLOGY

Objective

To minimize dryer idle time caused by cleaning processes and disruptions to other processes in the system.

Choice of approach

WIP sizing

Control work-in-process (WIP) in FPTs and silos to allow dryers to run continuously in case of unforeseen delays in other processes.

- ✓ Easier to implement
- ✓ AMS preference

Scheduling

Optimize production schedule to reduce frequency of purging due to product changeover.

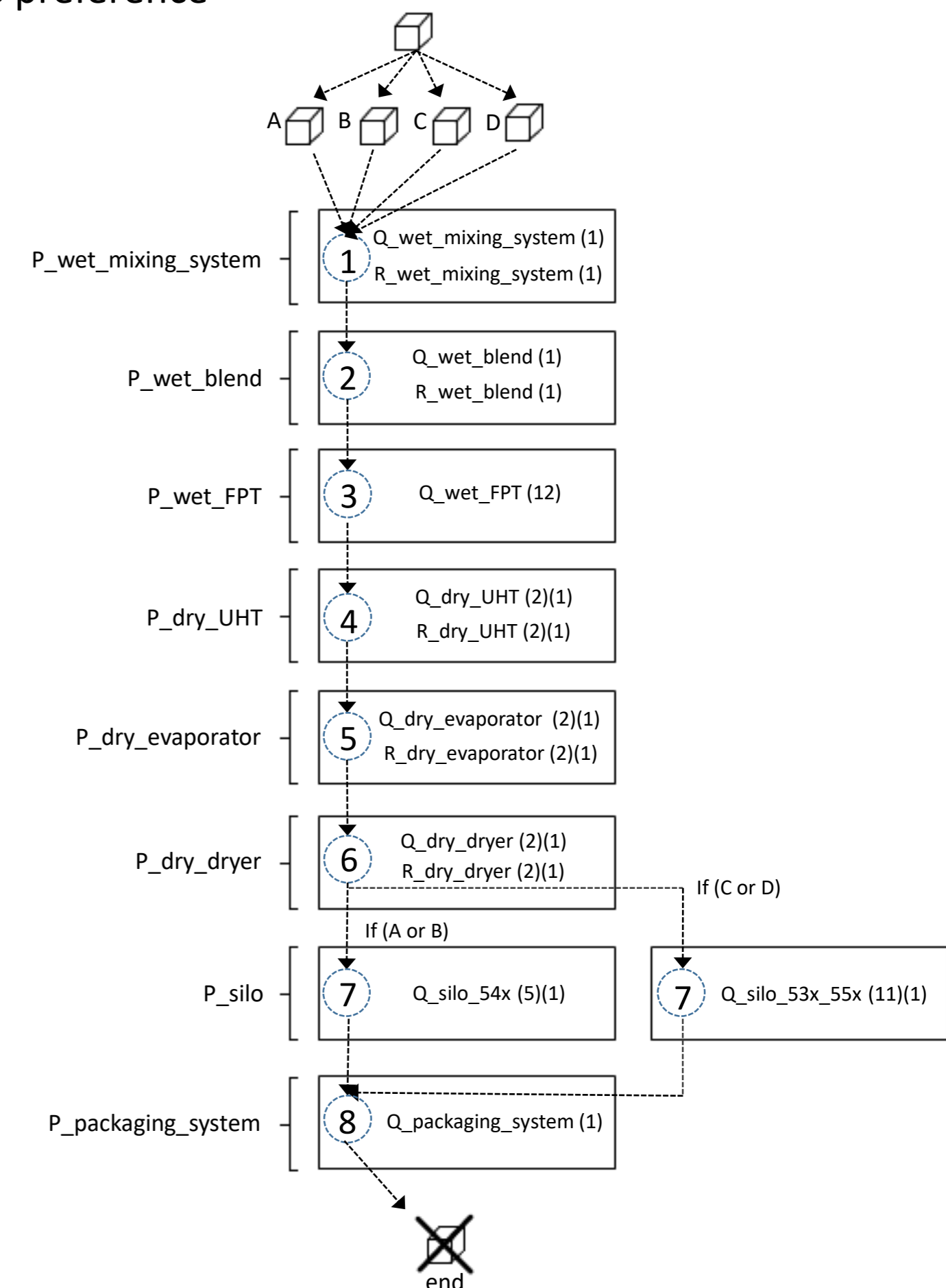
Choice of technique

Simulation

- ✓ Models complex manufacturing process down to its details
- ✓ Does not compromise real life operations
- ✓ Ability to test various solutions for its predicted effectiveness

Linear Programming

- X Possibility of over-simplifying the actual constraints in the math model
- X Possibility of long computational time



RESULTS

- By setting our base case as no WIP control, the effects of varying WIP sizes were investigated.
- Breakdowns in packaging were simulated to model issues in downstream processes.

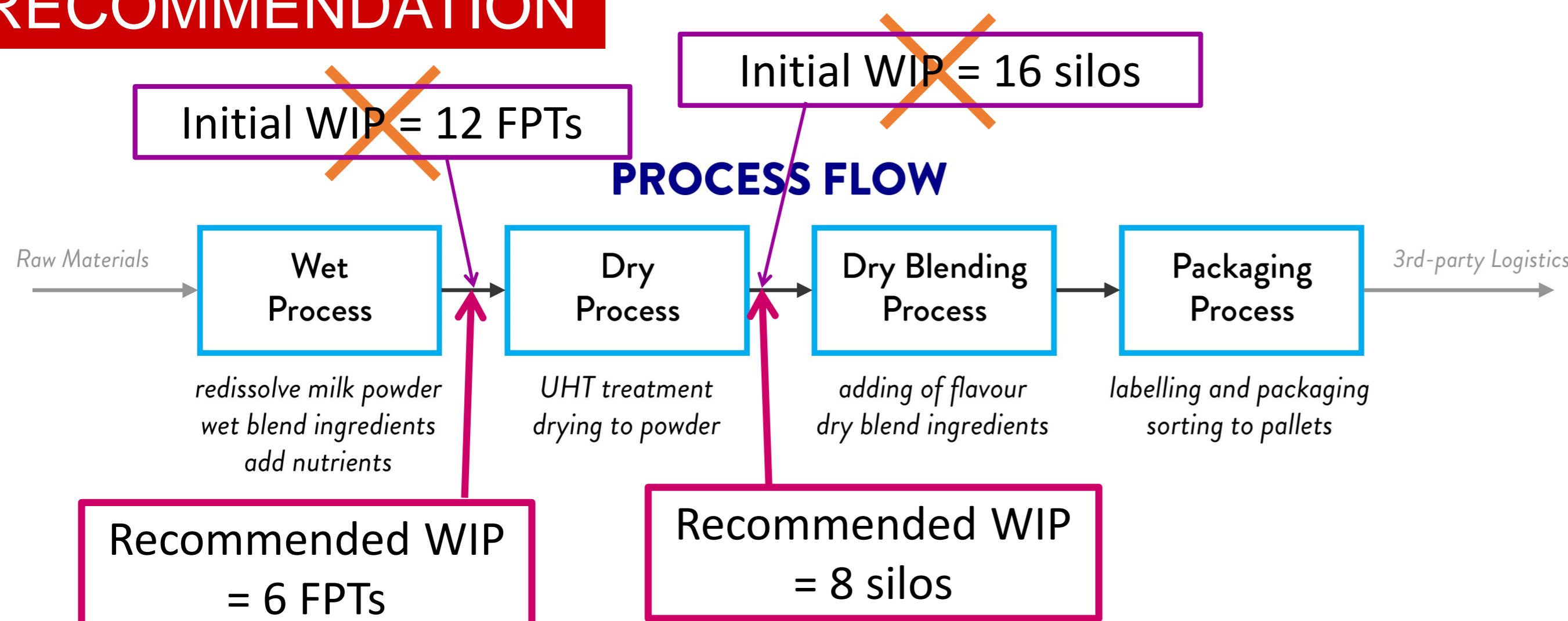
WIP Sizes		Dryer Run [A] (hours)	Total Time [B] (hours)
FPTs	Silos		
Full	Full	34.2	827
Full	Half	52.1	1297
Full	Quarter	63.1	2718
Half	Half	45.3	1078
Half	Full	27.3	844
Quarter	Full	19.7	850

[A] – Dryer run times during breakdown in packaging system
[B] Total time – total simulation run time

Optimal case

- Lower WIP control at FPTs leads to shorter Dryer Run [A].
- Lower WIP control at Silo leads to longer Dryer Run [A].
- However, both WIP controls lead to a longer total time experienced (trade-off between dryer utilization and cycle times of products)

RECOMMENDATION



FUTURE DIRECTIONS

- ✓ Expansion of the Simulation Model
 - Simulate other parts of the process and add in more scenarios to optimize the process further
- ✓ Scheduling Solution
 - Explore the linear programming methodology to optimize the production scheduling
- ✓ Consider Cost Factor
 - Introduce the cost constraints of each process in our solutions to make sure they are feasible for the company