Natural Gas STAR Program

Total Emission Reduction by Optimization of Compressor Utilization

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ONEOK Partners
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Why Optimization?

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- ***Existing models provided sufficient analysis for steady state commercial project assessment, however, did not contain performance data needed to assess costs of compression and optimal compressor sequence of operation***

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- ***Existing models provided sufficient analysis for steady state commercial project assessment, however, did not contain performance data needed to assess costs of compression and optimal compressor sequence of operation***
- ***The optimization team spent several months per pipeline reviewing data and meeting with operators at every compressor station to create models usable for this new purpose***

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Collaboration & Coordination

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- ***Daily coordination occurs between the modeling team, gas control, commercial and operations***
- ***This investment has yielded returns and benefits across the user groups and stakeholders***
  - **Customers, Environmental, Operations, Commercial, Gas Control, Safety, etc.**

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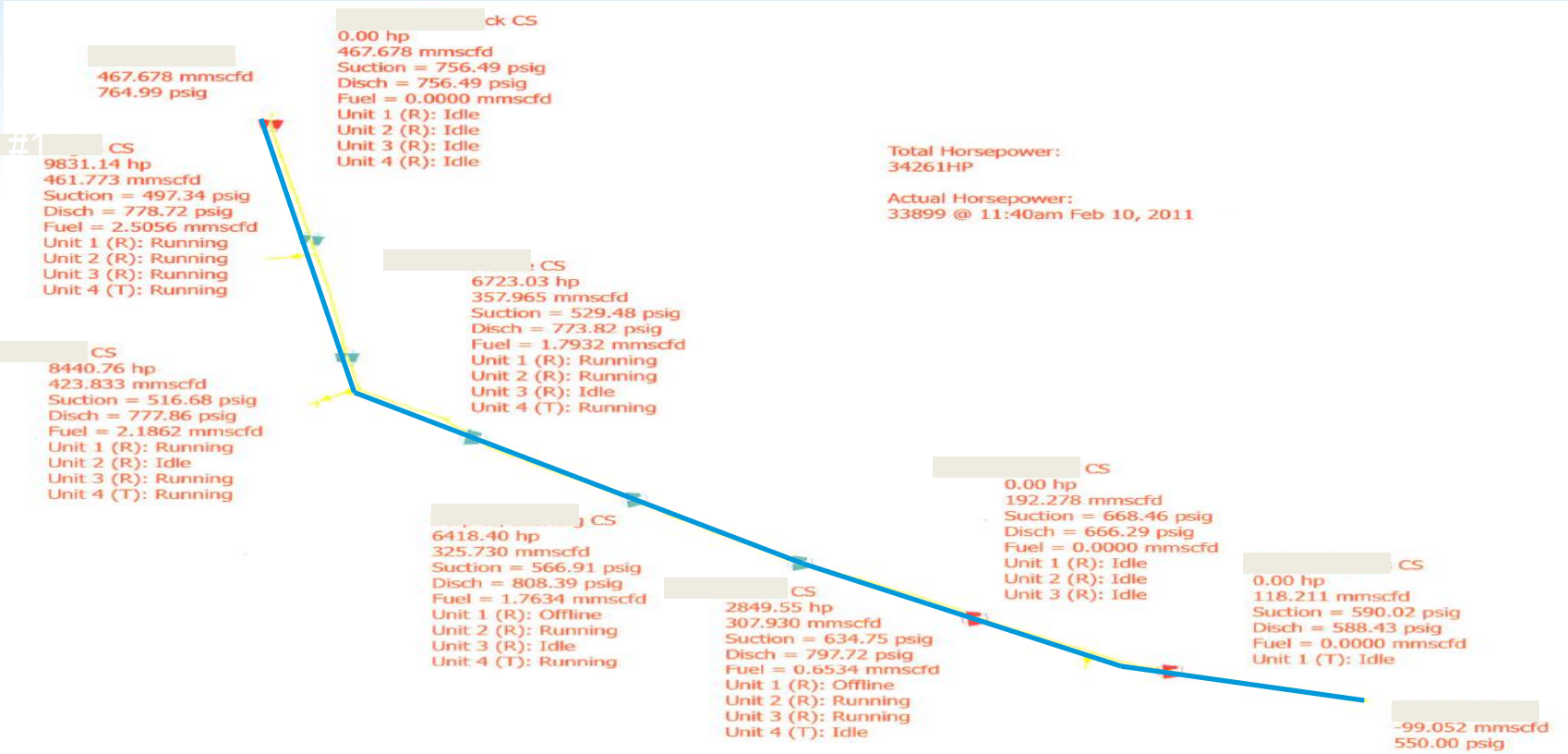
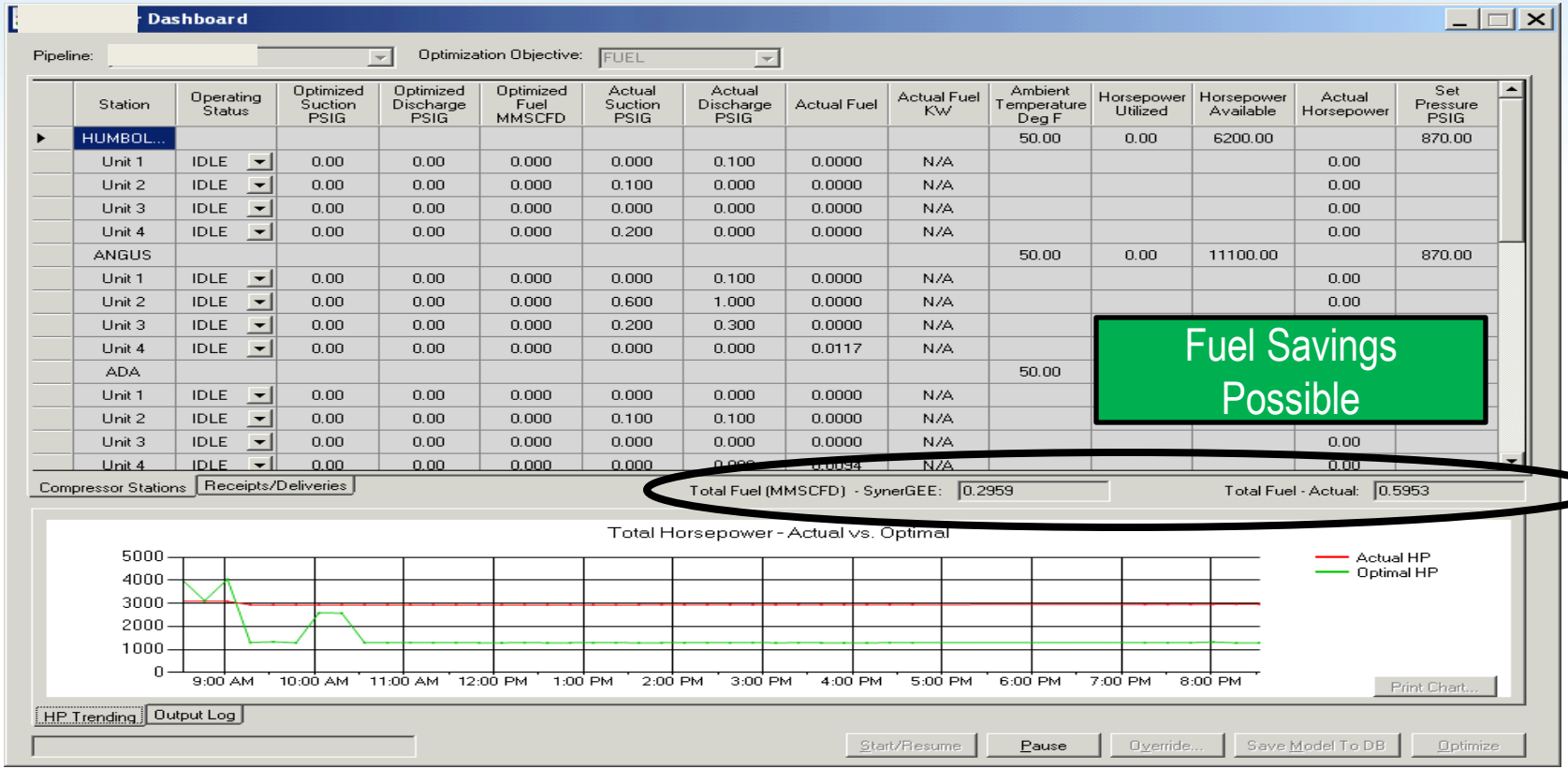
Model Output

Manual Setup and Analysis by Engineering



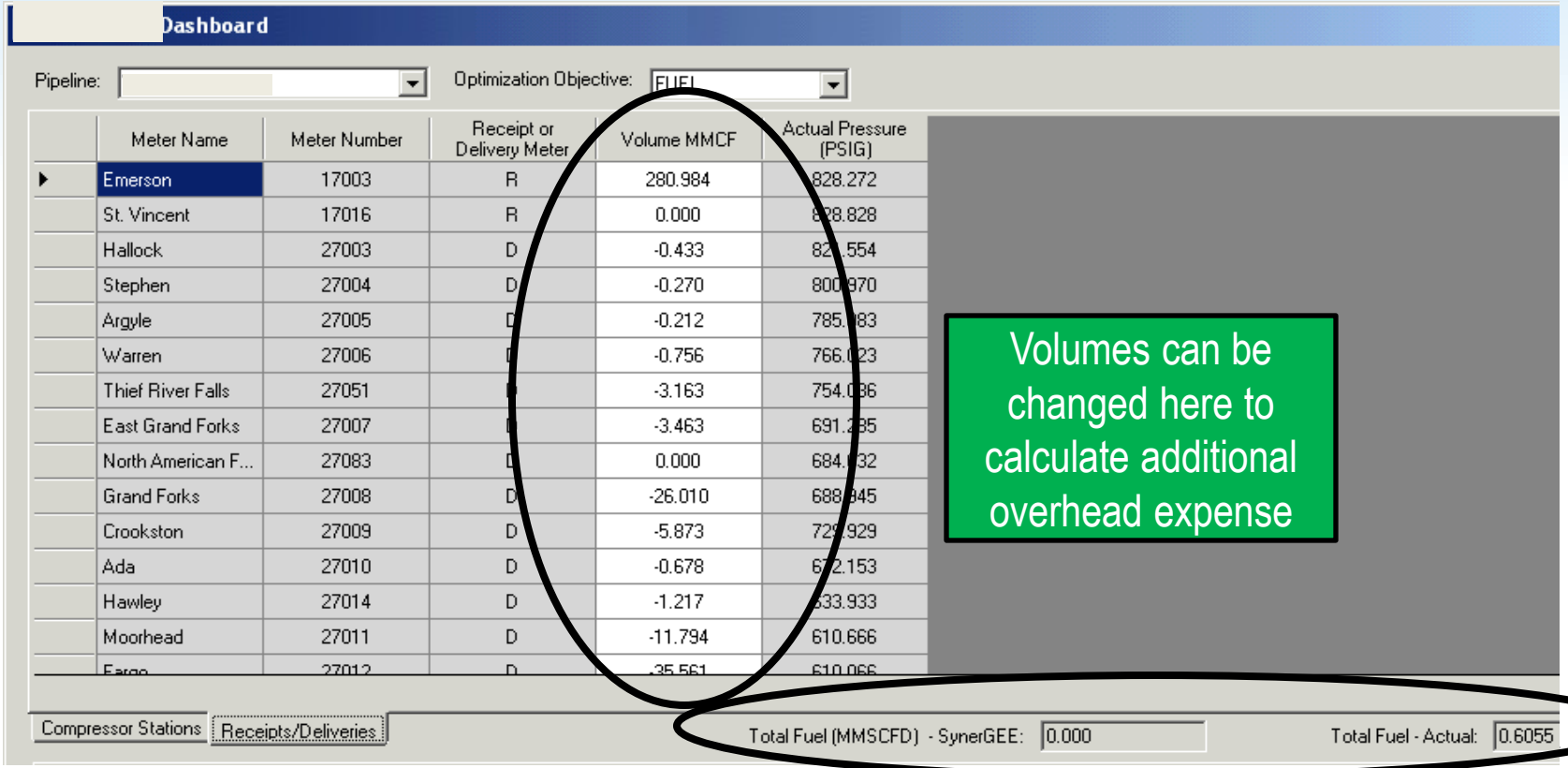
Main Screen

Quick picture of horsepower efficiency and fuel burn

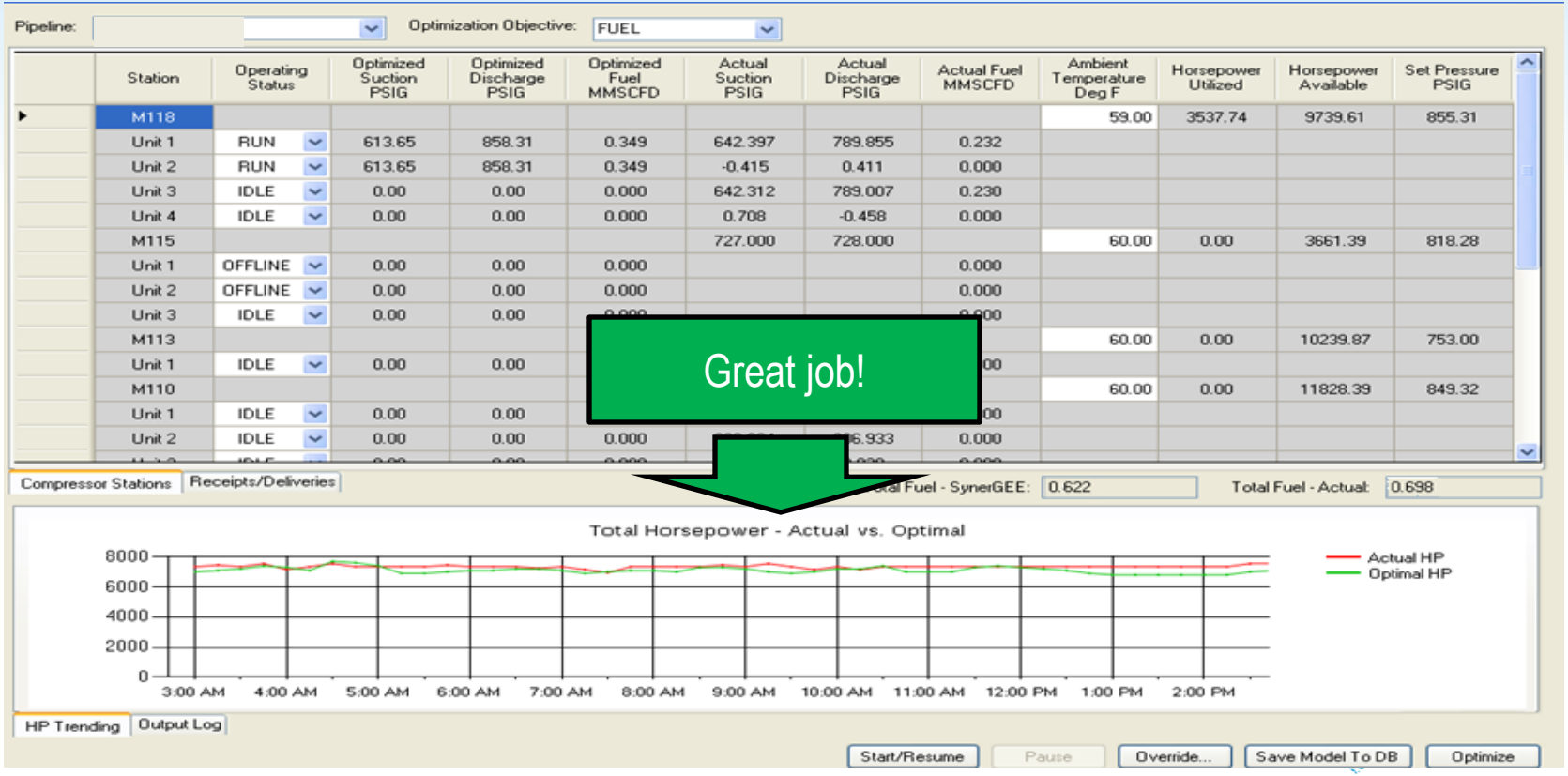


Auxiliary Screen

Performance vs Pipeline Capacity



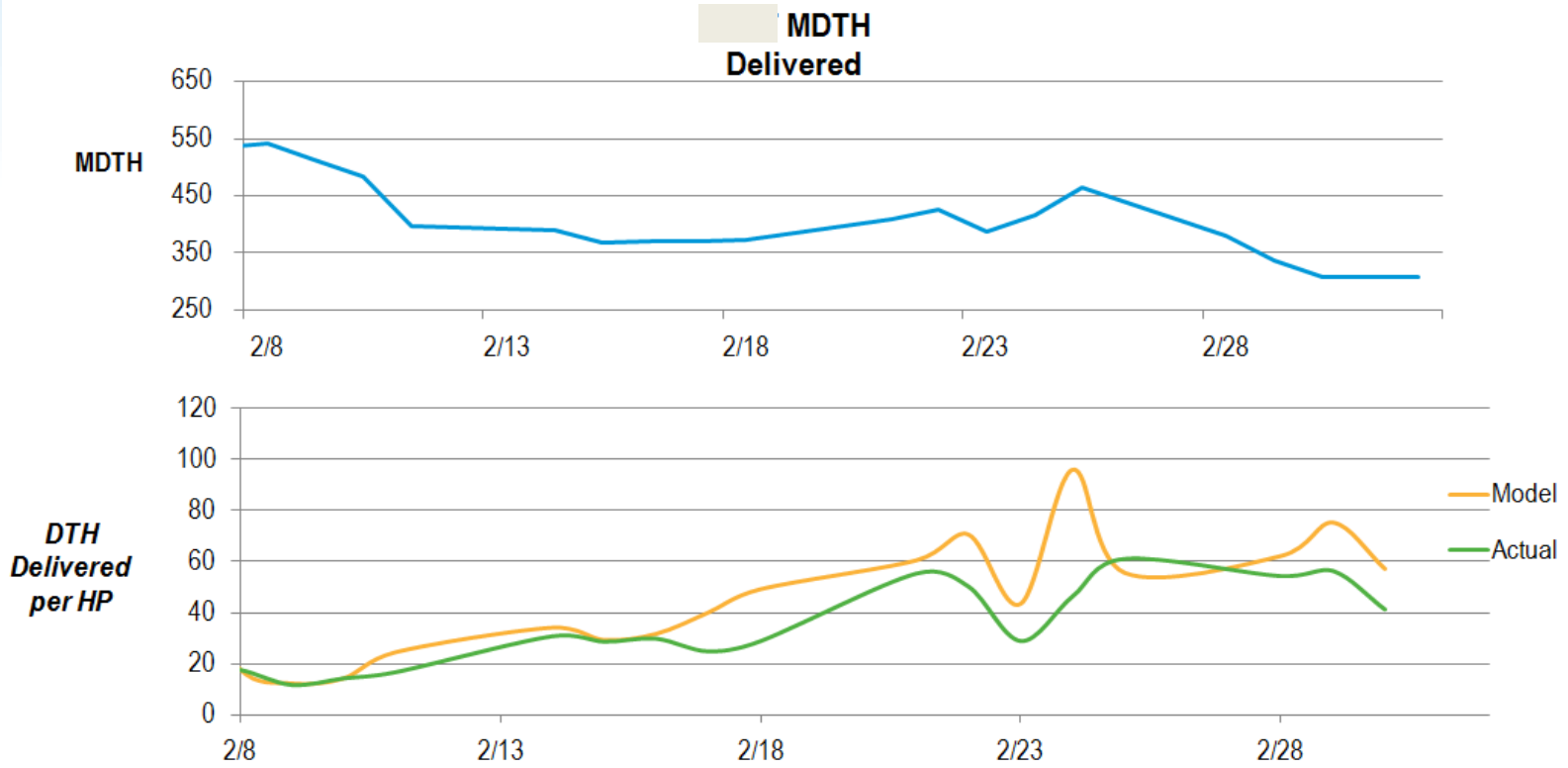
Actual vs. Optimal



Station	Operating Status	Optimized Suction PSIG	Optimized Discharge PSIG	Optimized Fuel MMSCFD	Actual Suction PSIG	Actual Discharge PSIG	Actual Fuel MMSCFD	Ambient Temperature Deg F	Horsepower Utilized	Horsepower Available	Set Pressure PSIG
M118								59.00	3537.74	9739.61	855.31
Unit 1	RUN	613.65	858.31	0.349	642.397	789.855	0.232				
Unit 2	RUN	613.65	858.31	0.349	-0.415	0.411	0.000				
Unit 3	IDLE	0.00	0.00	0.000	642.312	789.007	0.230				
Unit 4	IDLE	0.00	0.00	0.000	0.708	-0.458	0.000				
M115					727.000	728.000		60.00	0.00	3661.39	818.28
Unit 1	OFFLINE	0.00	0.00	0.000			0.000				
Unit 2	OFFLINE	0.00	0.00	0.000			0.000				
Unit 3	IDLE	0.00	0.00	0.000			0.000				
M113								60.00	0.00	10239.87	753.00
Unit 1	IDLE	0.00	0.00								
M110								60.00	0.00	11828.39	849.32
Unit 1	IDLE	0.00	0.00								
Unit 2	IDLE	0.00	0.00	0.000		6.933	0.000				

Output Analysis

Management Tool



Measurable Outcomes

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- Commercial optimization for daily capacity

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- Optimum fuel usage

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- Reduced compressor start up/blow downs

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Questions?

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