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Impact of Project Production Management on FGP-WPMP

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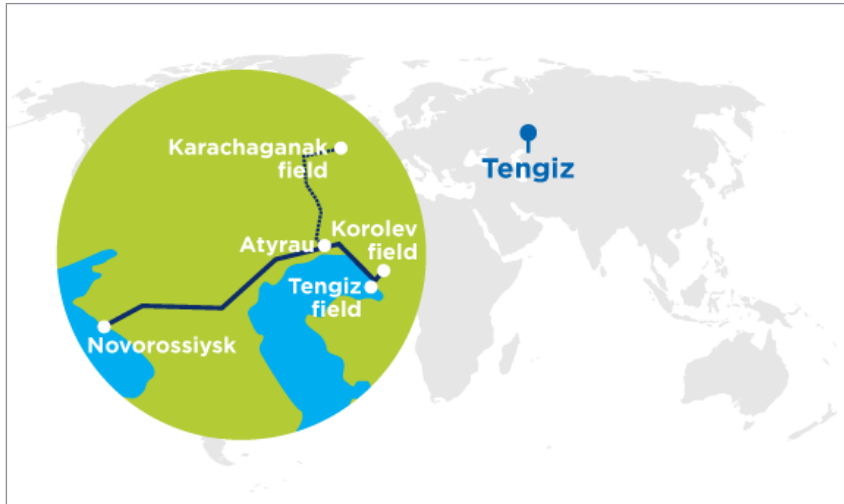
An opening thought

**“Science is the art of looking at the evidence
and removing your prejudice.”**

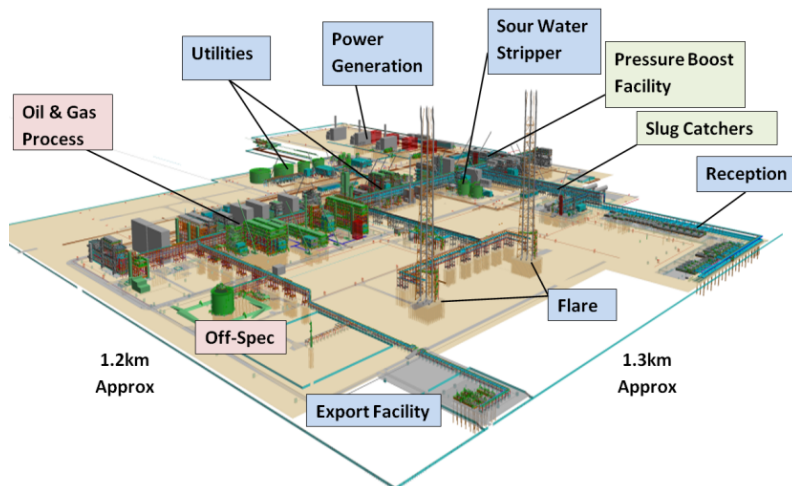
Professor Brian Cox OBE, FRS



Future Growth Project and Well Head Pressure Maintenance Project



- FGP-WPMP is designed to increase daily production from the Tengiz reservoir by 260,000 barrels per day and maximize the ultimate recovery of resources.
- Construction methodology is to use large, fabricated equipment blocks called modules.
- Modules are being fabricated in South Korea, Kazakhstan and Italy, then transported to Tengiz for final assembly and hook-up.
- Construction stick built man-hours remain very high after module integration.

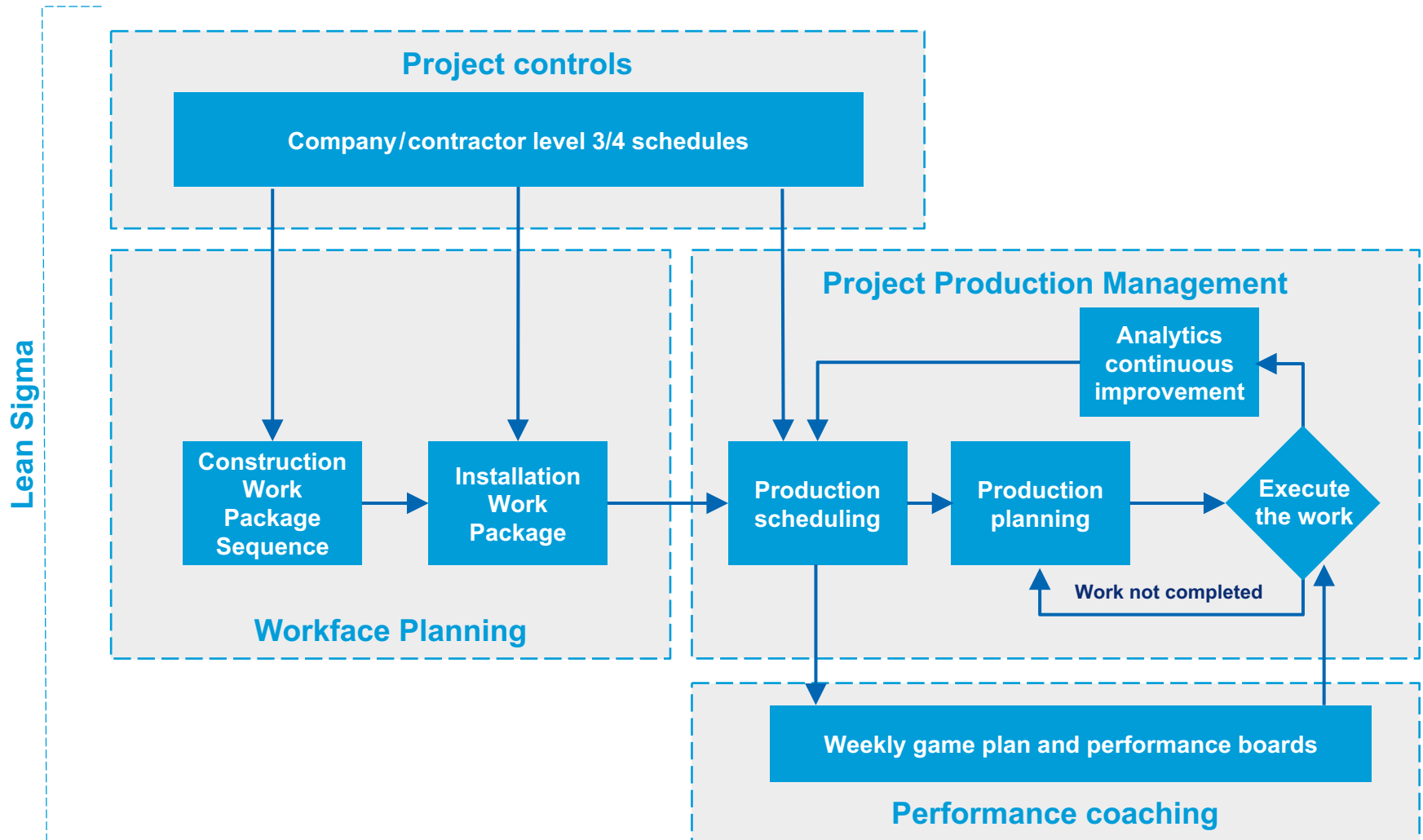


Why Project Production Management?

- Similar to Industry performance, Chevron Major Capital Project historical performance is unacceptable.
- The project has adopted a holistic approach to productivity management, including Project Production Management.
- The project's focus areas are Workface Planning, Production Control, Performance Coaching and Lean Sigma to drive improved performance.



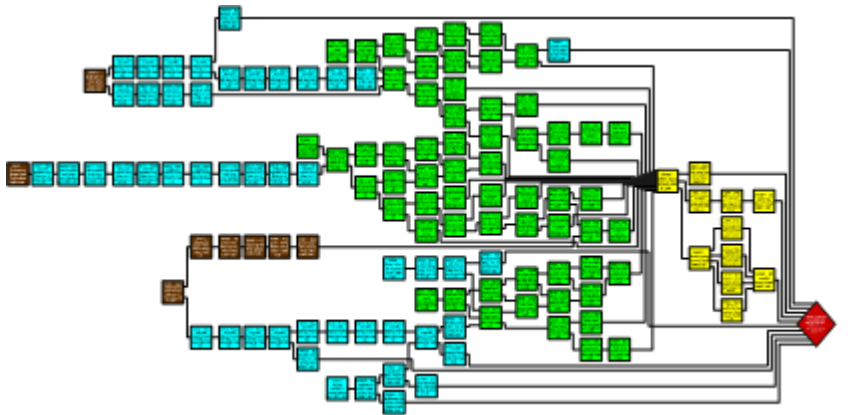
Project Production Management is an integral part of the overall system



Implementation of Project Production Control

Project Production Control (PPC) has been implemented as the Project Production Management solution using three business processes:

- Production Scheduling
- Production Planning
- Continuous Improvement



Project Production Control approach

- Build upon robust Workface Planning
- Assess the problem you are trying to solve
- Learn by doing
- Train the trainer



Project Production Control deployment

Using Project Production Control, the principles of Project Production Management are maturing to be fully deployed.

Types of works

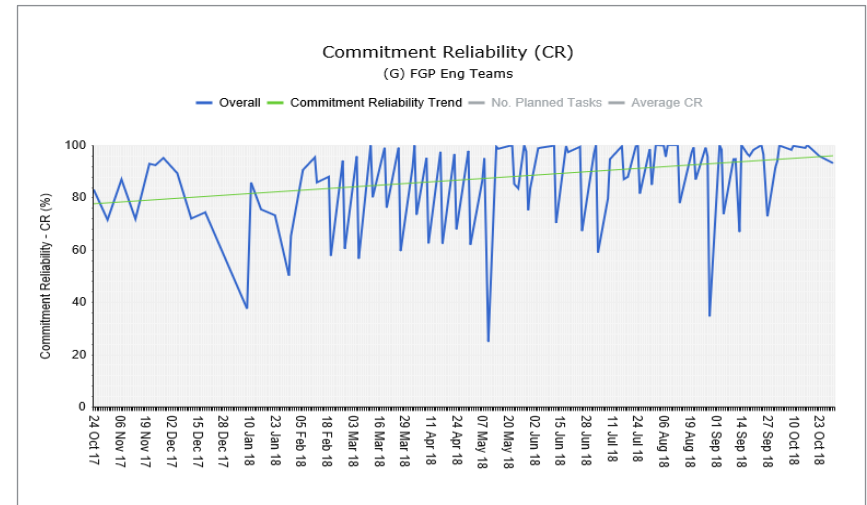
- Civils (earthworks and concrete)
- Structural steel
- Underground piping
- Pre assembled rack setting
- Mechanical, electrical and instrumentation
- Pipeline crossings
- Pipeline anchor blocks
- Substation installation
- Fiber optic installation
- Buildings
- Engineering
- Module fabrication
- Systems completion

In 2019 we plan to expand to 100% in most areas.



Impact of Project Production Control Engineering*

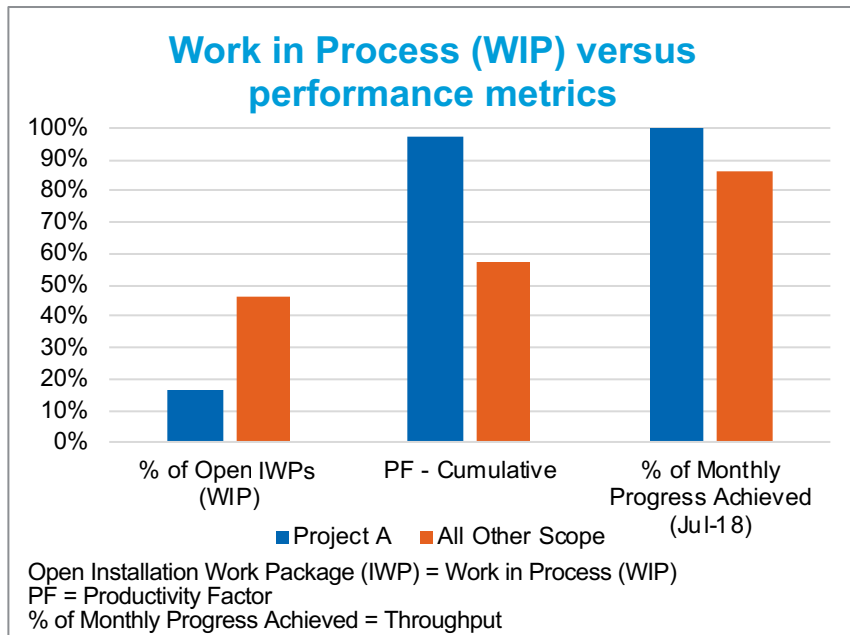
- Improvements to resource planning
- Standard work processes that were predictable and able to absorb short term variability, resulting in schedule recovery
- Identification workflow interfaces that were not previously identified



* Note: The following engineering deliverables scopes introduced and applied PPC: 1) Loop diagrams, HVAC I&C and Process Safety Layouts

Applying Project Production Management Construction

The application of Workface Planning, Production Control, Performance Coaching and Lean Sigma resulted in improved production efficiency by controlling Work in Process (WIP).



Project A demonstrated the full benefits of creating an inventory of IWPs through Workface Planning to leverage PPC.

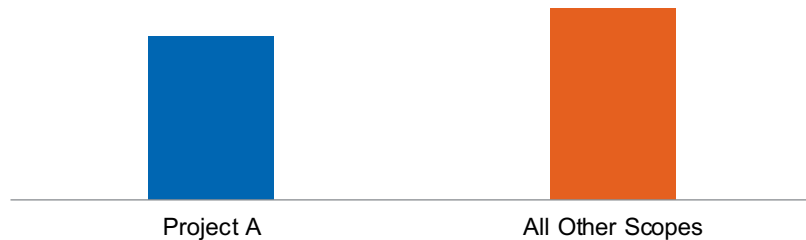


July 2018 data	Project A	Others
Base IWP inventory	100%	100%
% of open IWPs (WIP)	17%	46%
PF – cumulative to date	97%	57%
PF – July incremental	150%	79%
% of planned progress achieved	100%	86%

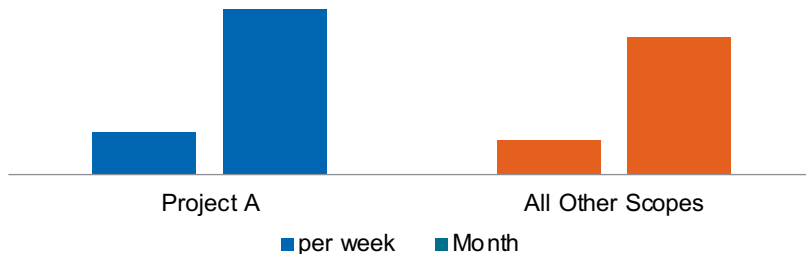
Applying Project Production Management Construction

The Project A applied Workface Planning discipline, Project Production Management processes and Performance Coaching to exceed their target cumulative productivity. Project A applied the proven principles of optimizing IWP size (batch) and driving work to completion (WIP).

Throughput of planned hours



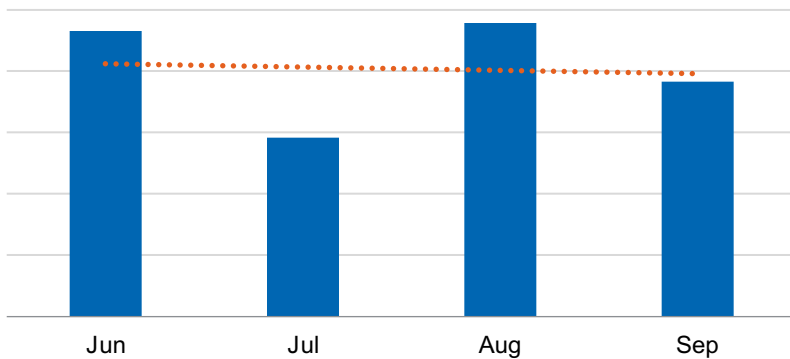
Average IWPs completed



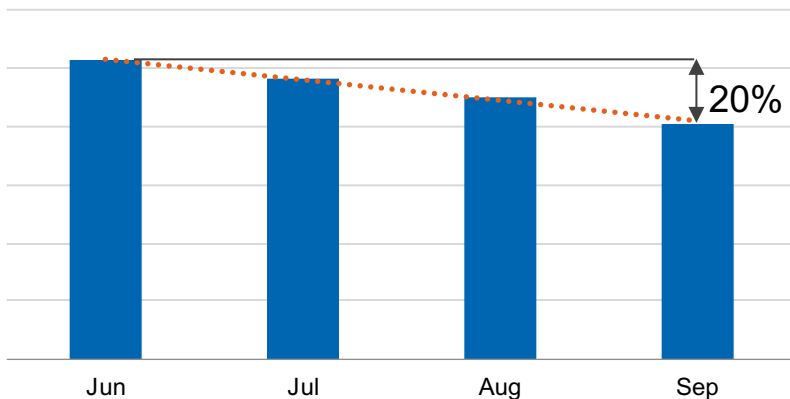
Last 90 days	Project A	Others
Avg. available IWP size (batch)	1,111hrs	1,590hrs
Avg. estimated IWP duration	13 days	22 days
PF – Cumulative to date	97%	57%
PF – July incremental	150%	79%
% of planned progress achieved	100%	86%

Applying Project Production Control Construction

Actual linear meters (lm) of Pipe
Installed



Direct Hours Expended (Capacity)

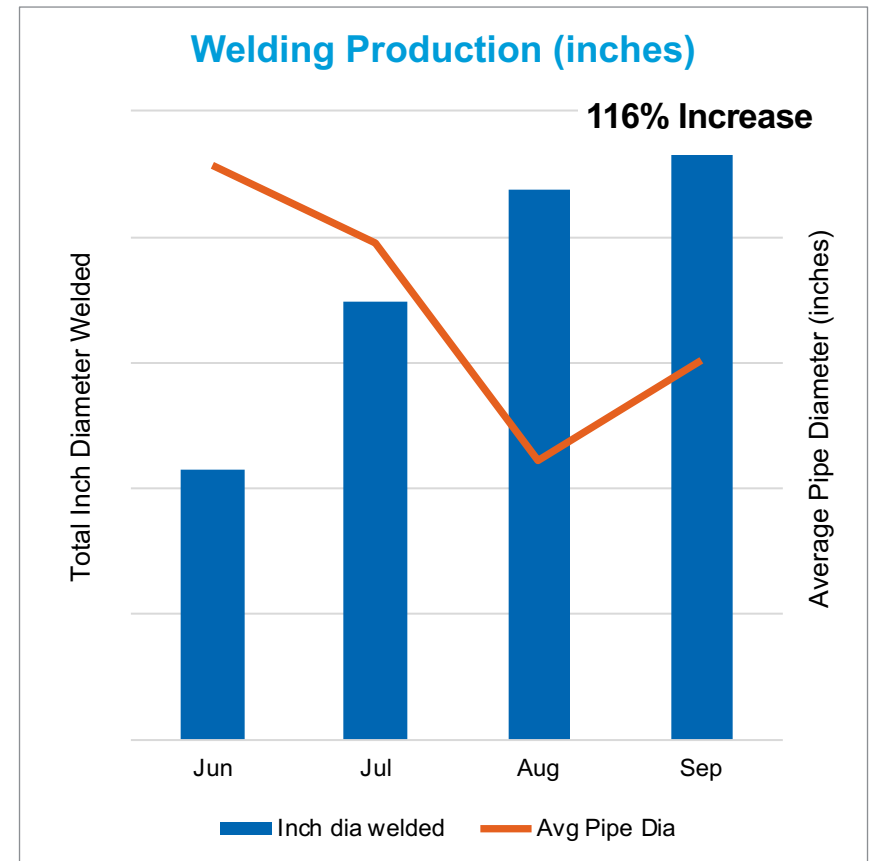
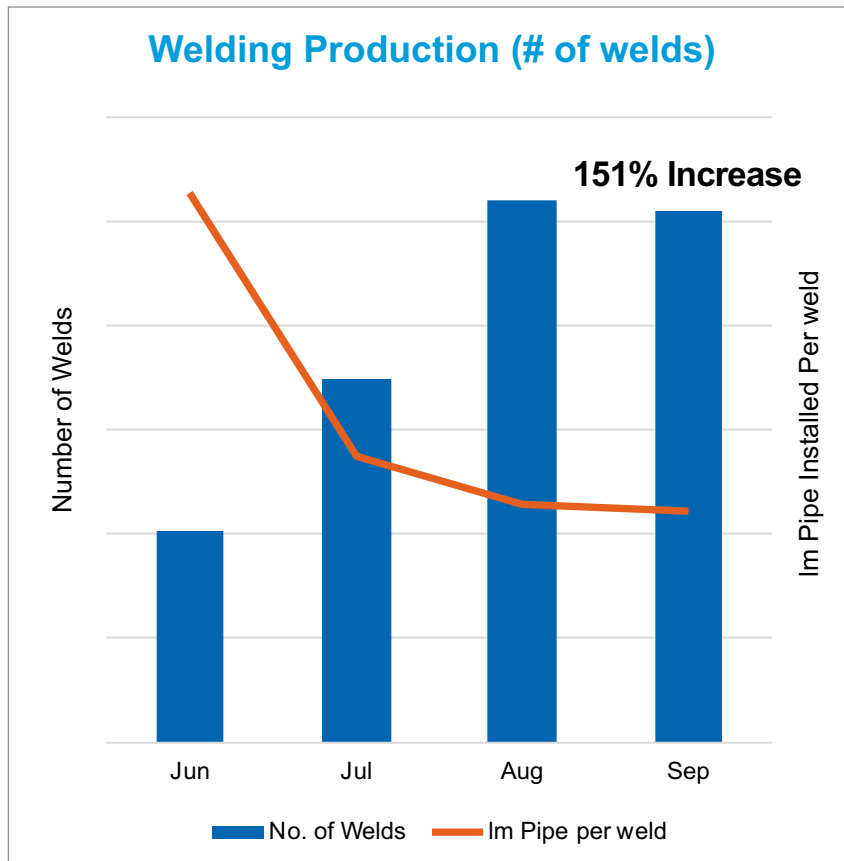


Sound Workface Planning enabled effective Project Production Control and Performance Coaching resulting in direct labor capacity being reduced while ensuring throughput remains stable.



Applying Project Production Control Construction

Coupled with Workface Planning and performance coaching, throughput increased, for HDPE pipe welding (fusion bonding).



Next steps

- Engineering; Red-lines > As-builts, Design Changes and Field Changes
- Project System Optimization
- Expansion to Mechanical, Electrical and Instrumentation installation Contracts
- Systems Completion and Handover
- Supply Flow Control



Closing

- **Implementing Project Production Management solution is not an insurmountable challenge**
- **Project Production Management integrates and works with other performance tools**
- **FGP-WPMP has proven the feasibility of Project Production Management as part of a total solution to close a significant performance gap in the industry**
- **Q&A Session**

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