2025 GAS LIFT WORKSHOP

Revolutionizing Gas Lift Valve Change-Outs: Single-Run Efficiency with the Dual Advanced Kick-Over Tool

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Agenda

- What is a GLV
- Traditional Kick Over Tool
- Dual Advanced Kick Over Tool
- Key Features
- Norway Operations
- Summary

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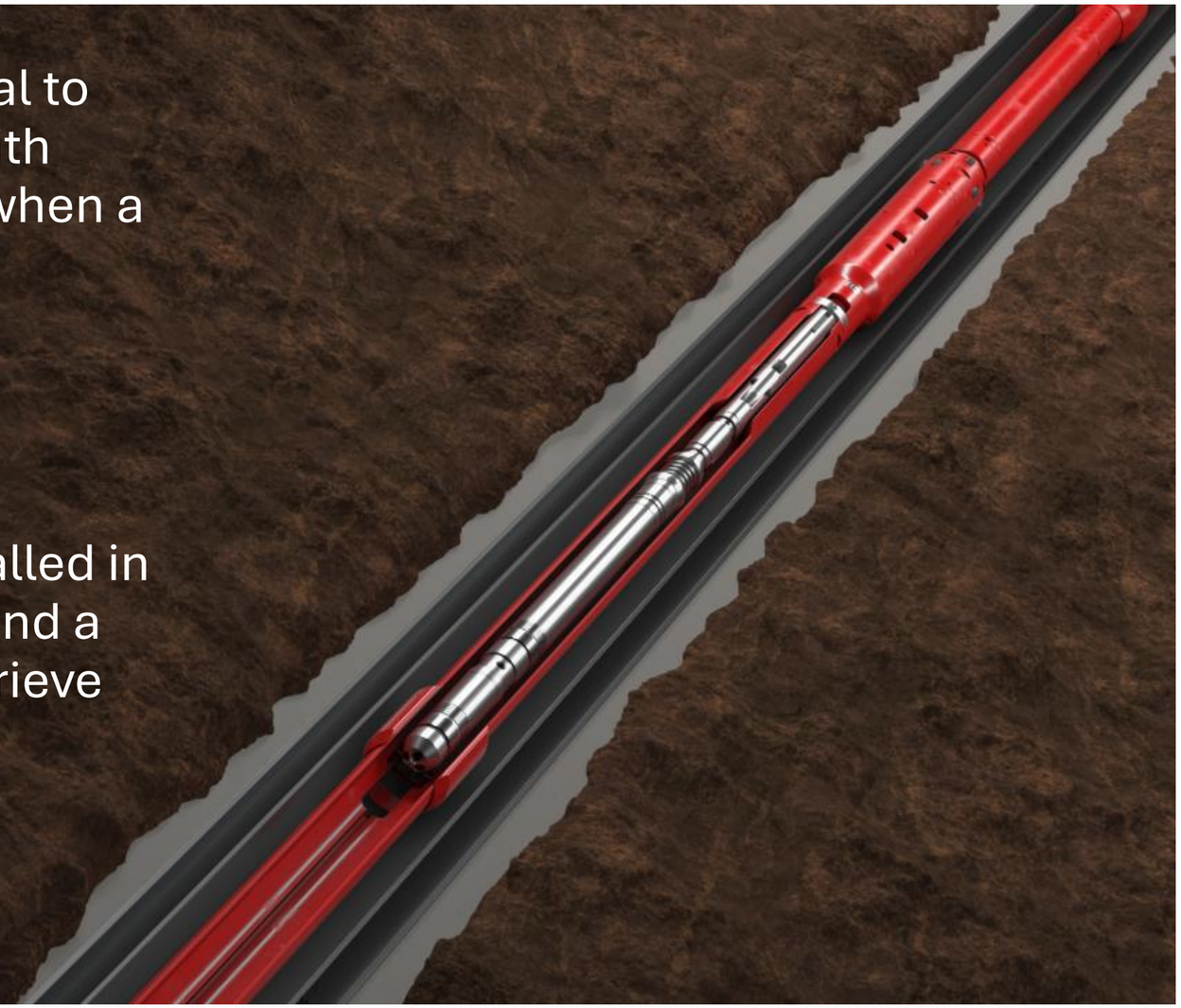
Gas lift Valves (GLV) are critical to increase production in wells with lower production volumes, or when a well needs additional force to produce.

Gas Lift Valves (GLV) are installed in Side Pocket Mandrels (SPM), and a Kickover Tool is required to retrieve and install GLV's.



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Kickover Tools

- Traditional Kickover Tools are notorious for not reliably retrieving the Gas Lift Valve on the first run. One run is required to retrieve, and another run to install. Mis runs are the norm, and this problem was addressed in 2015 with the introduction of the AKT – Advanced Kickover Tool
- An SPM allows GLV's and other devices to be installed and retrieved without pulling the entire tubing string from the wellbore.
- The SPM acts as a side compartment within the tubing string to house GLV's and other flow control devices, while maintaining a clear production flow path.
- The “side pocket” is offset from the center line of the well bore, so the slickline retrieval tool has to “kick over” to access the valve.

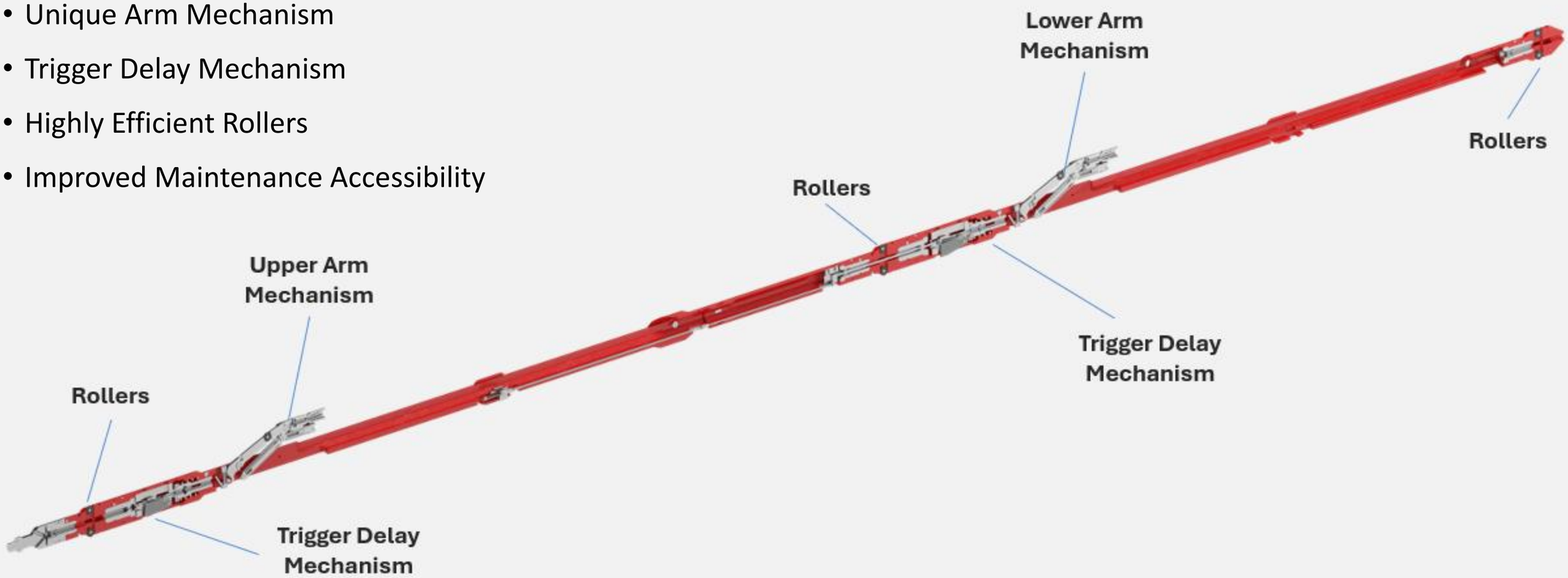
DUAL ADVANCED KICKOVER TOOL (DAKT)

Enables efficient installation and retrieval of GLV in a single run with one tool, resulting in:

- Time savings downhole by reducing the number of runs needed for valve changeout.
- Time savings at surface due to improved maintenance accessibility and elimination of unnecessary features.
- Reduction in the risk of misruns and NPT by incorporating highly efficient rollers that improves access to downhole mandrels.
- Improved maintenance and reduced downtime at surface leading to additional cost savings as well as lower likelihood of a misrun.
- Improved accessibility to difficult to reach mandrels leading to production optimized mandrel placement in complex well profiles.

Key Features

- Unique Arm Mechanism
- Trigger Delay Mechanism
- Highly Efficient Rollers
- Improved Maintenance Accessibility



Highly Efficient Rollers

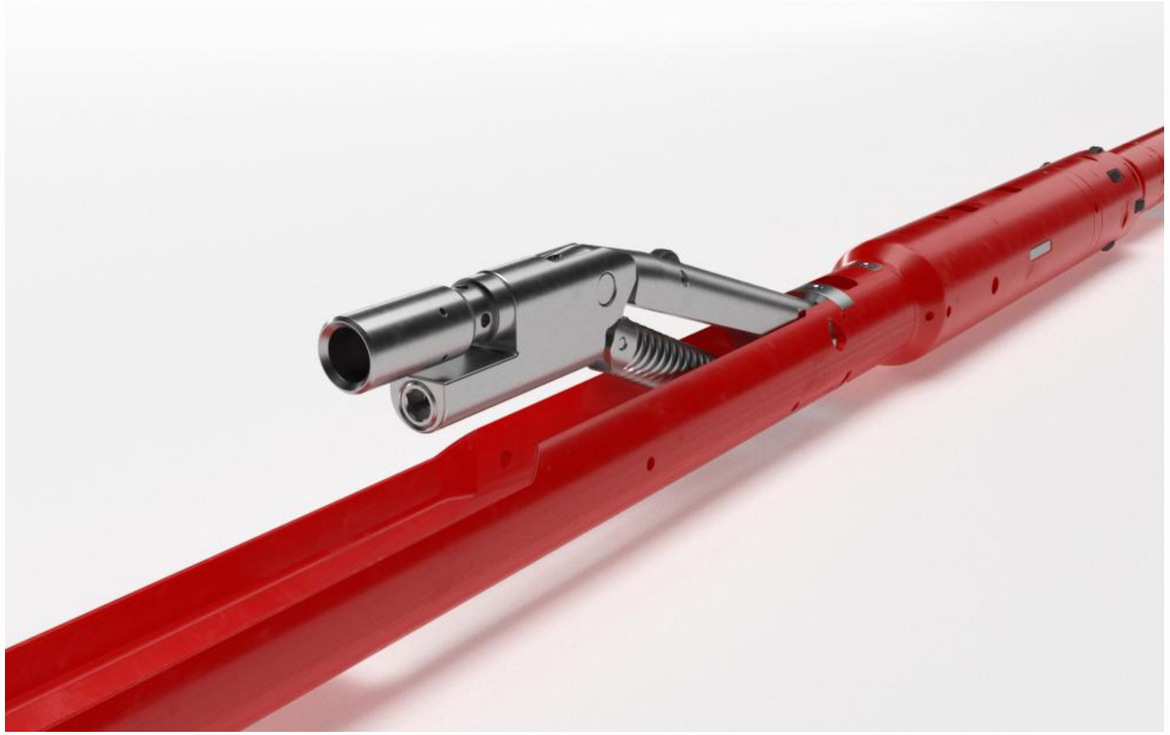
Aids conveyance by reducing friction in the well bore and enabling access in deviated well bores, reducing the risk of misruns

- Enables access to gas-lift mandrels at higher deviation and deeper wellbores
- Delivers more precise at-surface indications of toolstring load transfer

Unique Arm Mechanism

Minimizes the risk of initial latch failure and prevents mis-runs

- Avoids damage to the V-Packing seals when setting the GLV
- High-strength arms available to allow for heavier jarring with power jars.
- Engages GLV at the correct approach angle (straight - in line).



Unique Arm Mechanism

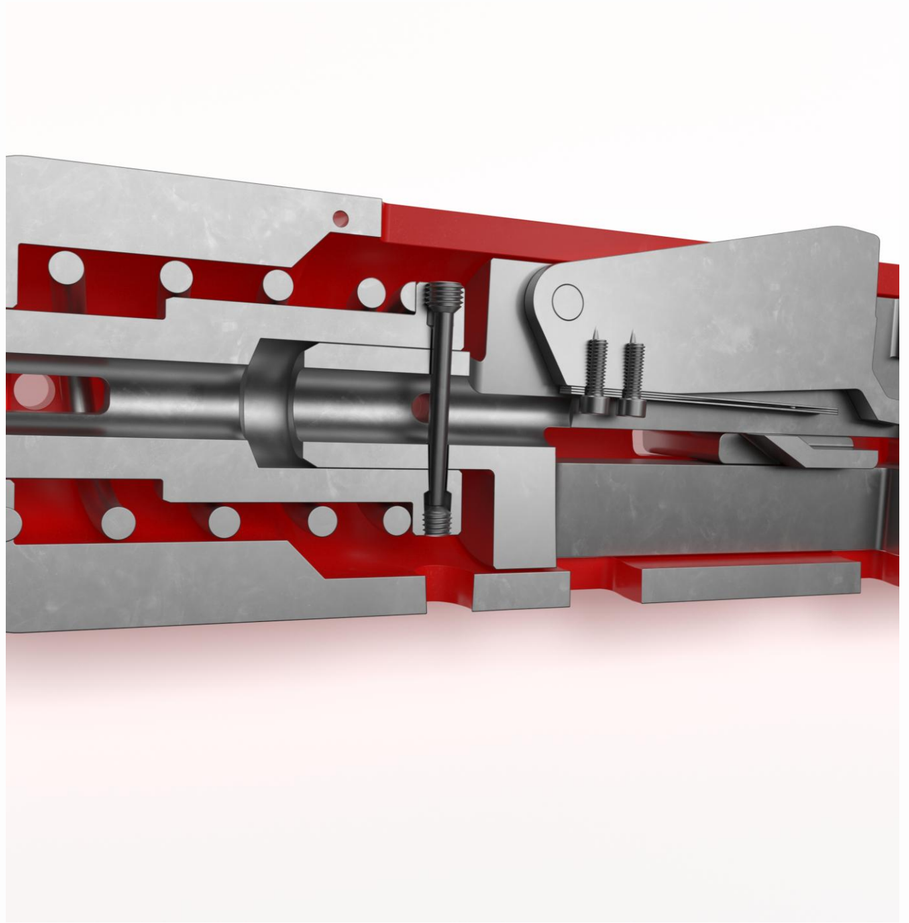
Increases reliability in gas lift valve operations

- Trigger-delay mechanism holds new GLV closed until the activation after the old valve is removed from the mandrel
- Precision engineered trigger – ultra reliable / field proven location, orientation and initiation mechanism to “kick out” the arm

Unique Arm Mechanism

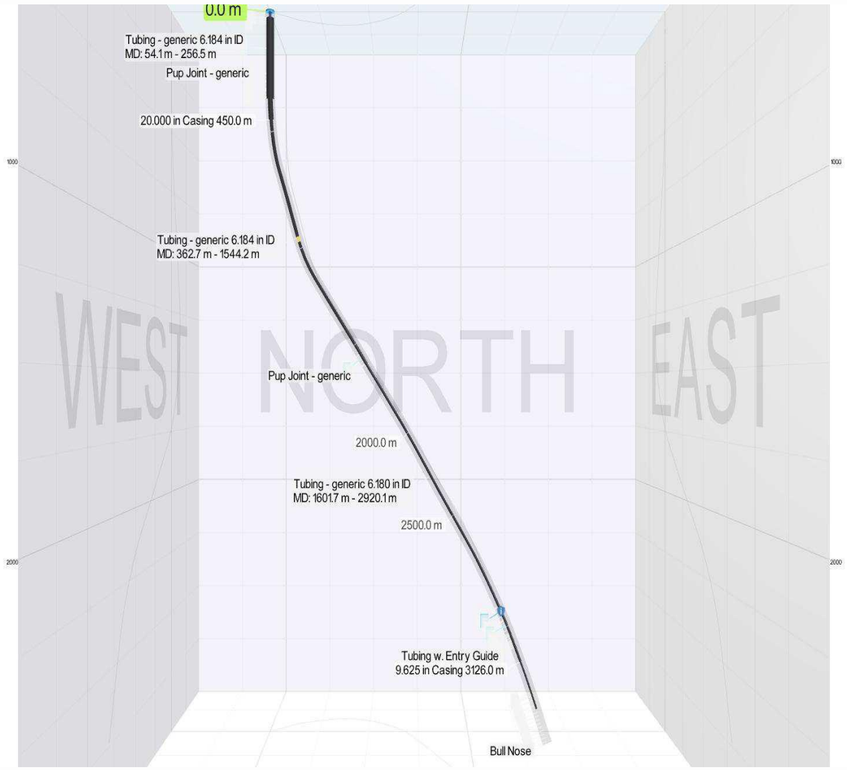
Improves maintenance accessibility

- Reduces operational downtime
- Improves access to shear pins that remain in the tool



Dual Advanced Kick Over Tool – Norway Operation

Tool	OD (in)	Length (m)	Length (ft)	Weight (lbs)	Fish Neck (in)
1. WL Rope Socket 1.875" TDR	1.875	1.32	4.33	31.00	1.750
2. XO 1 7/8" QLS x 2 1/2" QLS	2.500	0.30	0.98	4.41	1.750
3. Swivel 2.5"	2.500	0.51	1.67	15.00	2.313
4. Stem 2.5" x 4ft	2.500	1.22	4.00	62.83	-
5. Jar Spang 2.5" x 30"	2.500	2.30	7.55	60.00	2.313
6. Jar Spang 2.5" x 20"	2.500	1.78	5.84	30.86	2.313
7. Knuckle Joint 2.5"	2.500	0.33	1.08	11.02	2.313
8. Dual AKT c/w PT / RT	4.500	6.05	19.85	225.00	2.313
		13.81	**45.31**	**440.12**	

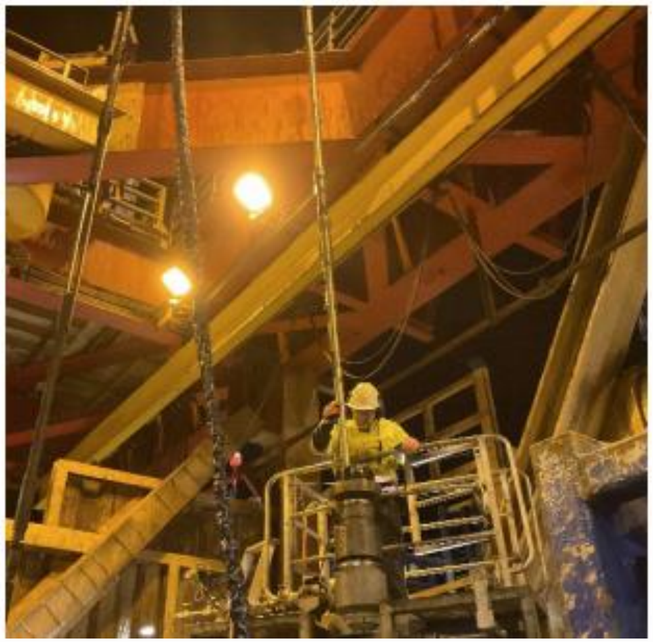


LOCATION
North Sea, Norwegian Sector
WELL TYPE
Oil and gas
HOLE ANGLE
37°
DEPTH OF GAS LIFT VALVES
12,000 ft (3,657 m)

Dual Advanced Kick Over Tool – Norway Operation

Objective:

Deploy the dual advanced kickover tool (DAKT) as a safe and cost-effective intervention solution to change out gas-lift valves more efficiently as compared to conventional methods.



- The DAKT is equipped with two triggers and two arms, allowed both valve pulling and setting to be performed in a single run. It provided a reliable solution for highly deviated well applications through its fully rollerized, friction-reduction package.
- Field personnel deployed the tool into the well with the active upper trigger controlling the upper-arm assembly to pull the existing valve. After the valve was pulled and the upper trigger was sheared, the valve was then stowed in the upper tray. This action activated the trigger-enabled mechanism and activated the lower trigger.
- The tool was then picked up to locate the orientation slot and jarred up to deploy the lower arm with the new valve. The new valve was set in place, and the tool was pulled out of the hole.

Dual Advanced Kick Over Tool – Norway Operation

Customer Value

- The customer improved operational efficiency, saving more than 12 hours of rig time per operation.
- Additionally, the weather window required to perform the scope of work was significantly shorter, enhancing operational efficiency and reliability.
- The DAKT facilitates deeper gas-lift valve interventions and deeper placement of mandrels, effectively removing limitations to well design and deviation and optimizing well completions that deliver significant production gains over the well's lifespan..

Summary

- **Increased Efficiency**: The dual arms and unique trigger delay mechanism reduce the number of runs needed for valve changeout, minimizing operational time and costs.
- **Enhanced Reliability**: Efficient rollers reduce misruns and improve access to downhole mandrels, ensuring smoother operations and less equipment failure.
- **Increased Safety**: Reduces misruns, improves toolstring visibility, eliminates contact friction, and ensures precise valve installation and retrieval.
- **Operational Efficiency**: Removing unnecessary shear pins and improving access to them streamlines operations, simplifies maintenance, reduces downtime, and boosts productivity.
- **Improved Performance**: A unique arm mechanism reduces the risk of damaging GLV components, ensuring equipment longevity, reliability, and lower repair costs.
- **Time Saved on Surface and Downhole**: Avoid multiple surface pressure control rig up / rig down due to mis runs downhole. Efficient installation and retrieval of GLV in a single run, eliminating the need for multiple setups and teardowns.

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Question Time

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