

# Remote Cutting in Hydraulic Decoking Systems

*The result of 80 years of steady evolution, remote coke cutting delivers increased safety, reliability and profitability.*

**AutoShift Cutting Tool**

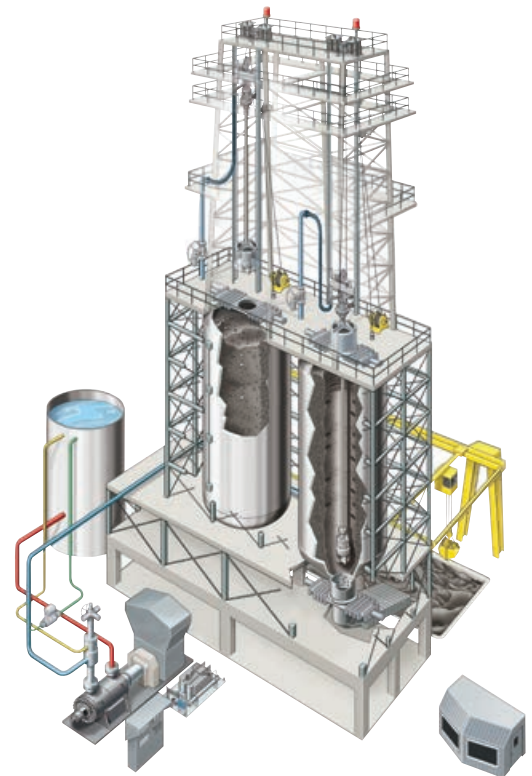


## A Leap in Safety

*Improving safety is the mutual objective of refiners and equipment manufacturers. One sure way to achieve this goal within the DCU is by removing the operator from the cutting deck. With remote cutting, personnel are no longer exposed to the dangers of high-pressure water discharge, H<sub>2</sub>S vapors and steam eruptions or to mechanical hazards. The AutoShift™ combination cutting tool along with remotely operated winch and rotary joint equipment and best available vibration, video and acoustic monitoring technologies make remote coke cutting a practical reality.*

### AutoShift Is the Key

The AutoShift combination cutting tool shifts between boring and cutting modes automatically and remotely in the drum through water pressurization and depressurization. In the event of cave-ins or slumped bed conditions, AutoShift provides the flexibility to remove stuck tools quickly and efficiently. Shifting between modes is accomplished by switching the decoking control valve into the bypass position or by slowing the jet pump to idle speed and then re-accelerating to rated speed in the case of variable speed drivers.



## Monitoring Provides Confidence

IPS APEX™ provides coke cutting personnel with positive confirmation of tool position and drum status. As the coke is removed from the drum, high-temperature accelerometers monitor the vibrations on the coke drum wall and relay the information to the IPS APEX module. The signals are processed and the tool location and the cutting status are displayed on a video screen for the operator's review.

In addition, feedback on cutting progress is enhanced by an audio and video system designed to help the operator determine when the section of the drum is clean. As the coke is removed from the drum, the sound of the impinging water changes, providing operators with aural confirmation of a clean section. Video monitoring allows the operator to view the cutting tool assembly and the coke chute.

Together, these devices assure the operator that the drum is completely cleaned of coke.

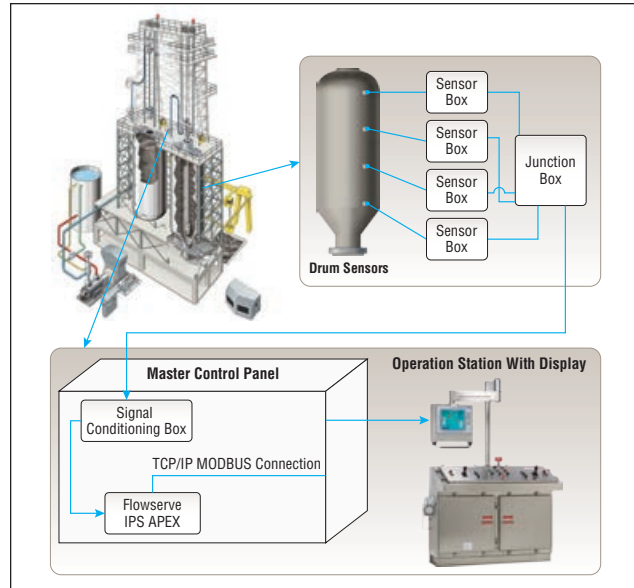


Diagram of a typical coke drum vibration monitoring system

## A System Solution

For successful remote operation and safety in coke cutting operations, several other best-in-class equipment and information solutions are needed in addition to AutoShift and monitoring technology, including:

- A remotely operated winch and rotary joint
- Remote drum unheading capability
- Automatic guide plate and tool enclosure
- Cutting equipment sensors to monitor tool rotational speed, wire rope system tension, etc.
- Interlocked safety systems for cutting water flow control

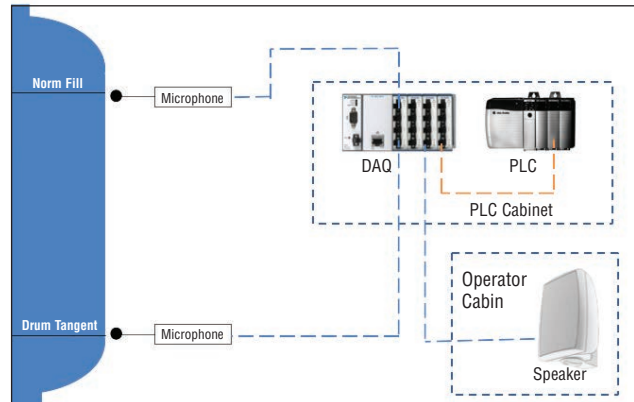


Diagram of a typical audio monitoring system

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