



SUMMARY

This course discusses wellbore integrity challenges, practices for ensuring wellbore integrity during drilling, how we evaluate casing and cement, how we prevent wellbore integrity issues, and how we repair and decommission wells. Most states and provinces have promulgated new regulations since the advent of shale fracturing. The status of regulatory developments will be reviewed.

LEARNING GOALS

Goals for participants include:

- Recognize how drilling, completion, production and P&A activities achieve wellbore integrity
- Define zonal isolation
- Collect data and review well files to identify candidate wells for remediation
- Describe how we achieve wellbore integrity
- Discuss the effect of overpressured, underpressured, and normally pressured reservoirs on drilling decisions
- Review well files and case studies from several areas, including examples from the DJ Basin, Eagle Ford, Haynesville, Wind River, Tulare, Clinton Sandstone, Joslyn Creek SAGD, Utica, Monterey and Alluvial Aquifers
- Discuss the role of drilling mud, and the importance of mud removal
- Recognize types of wellbore integrity evaluation, including traditional sonic cement bond logs, ultrasonic logs, caliper logs, pressure tests, Bradenhead tests, surface observations, video logs, and impression blocks
- List pros and cons of traditional sonic bond logs vs ultrasonic logs
- Describe traditional cement additives, as well as high performance systems such as sized particle distribution systems, expansive cement, and self-healing cement
- Describe challenges with sustained casing pressure (SCP), microannulus, and low top of cement
- Recognize equipment used in two-stage cementing
- Recognize equipment used in squeeze cementing, such as retainers, packers, and perforating guns

WHO SHOULD ATTEND?

- Production personnel who manage wellbore integrity over the life of the well
- Engineers, managers, and regulators who need to understand the physical processes that determine wellbore integrity
- Drilling and completions personnel
- Personnel responsible for plugging and abandonment
- Workover personnel responsible for cement squeezes and casing patches
- Environmental, health, and safety personnel who assess downhole operations



TYPICAL COURSE OUTLINE

Brief backgrounder on drilling processes

- Drilling, cementing, leak off tests, limit tests
- Role of mud and mud removal
- Casing depths: pore pressure and frac gradient
- Why we need well integrity

Cement: primary and remedial

- Lost circulation
- Hole cleaning, mud properties and conditioning
- Centralization, including horizontal holes, reciprocation/rotation of casing
- Water ahead, spacers, and turbulent flow
- Cement blends. Traditional and modern systems.
- Two stage cementing, external casing packers
- Do we want “strong” cement? Or flexible cement?
- Microannulus, sustained casing pressure, cracking, gas migration

Evaluating well integrity

- Bond logs, ultrasonic logs, video logs, other logs
- Casing inspection
- Pressure tests
- Review of well file reports

Repairs

- Different types of repairs are discussed

SCHEDULING

This class is scheduled as needed through EUCI. EUCI is accredited by IACET, and the course is 0.8 CEU's. A certificate can be issued to participants who want documentation of continuing education credit.

This class is scheduled periodically through www.EUCI.com. To schedule a course, contact Erin Burba at 303-770-8800 or eburba@euci.com.

INSTRUCTOR

Lee Denke started off by getting a bachelor's in electrical engineering from the University of Wyoming, then took a job cementing, acidizing and fracturing wells with Schlumberger in Worland, Wyoming, and has worked in California, North Dakota, and the Rocky Mountain area. Additional jobs included both subsurface and facilities engineering, as well as project management for Texaco, Aera and Berry. Lee understands the contract side of the business as well, having worked for the consulting firms TJ Cross, Ken Small, and Processes Unlimited. Lee currently works as a consultant in downhole and facilities operations and is licensed as a mechanical engineer in Wyoming and Colorado.

