Slickline Firing Systems
Safety and Training

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Review of Systems

- GEODynamics conducted a review for Marathon in 2003.
- Marathon is now releasing some of this information to this group
Slickline Firing Heads

- Trigger Type
  - Mechanical
  - Electronic
  - Electro-Mechanical

- Safety Issues

- Operational Issues

- Tool Specifications
System Safety Features

Detonators

– Recommended Detonator
– Some do not adhere to RP API 67
– RF Safe Detonator Option
System Safety Features

- **Electronic Trigger Parameters**
  - Mechanical Pressure Switch / Lockout
  - Electronic Pressure Switch / Lockout
  - Accelerometer Motion Detection
    - Sequenced to Arm, Fire and Disarm
  - Pressure Motion Detection
    - Sequenced to Arm, Fire and Disarm
  - Temperature Threshold
  - Time Threshold
  - Time Disarm Threshold
System Safety Features

- Mechanical Trigger Parameters
  - Drop Safe?
  - Pressure required to fire?
  - Fluid required to fire?
  - Minimum Energy (ft-lb) required to fire?
  - Not as many safety parameters as Electronic Systems
Operational Issues

- Training
  - Formal course?
  - Internal Certification program?
  - Documented Training Procedures and Policies?

- Field Operator’s Manual?

- Field Failures Documented and Reported?

- Personal Injuries Documented and Reported?

- Field Run History Documented?
Closing Thoughts

- Ask if system has been reviewed and certified by a third party agency
- Ask to see Training Certifications of field personnel
- Ask to see field history and failure reports
- Ask – Could this system fire at the surface under circumstances that are likely to occur (expected human error, malfunction of system, etc…)?
- Generally speaking - The more “in-series” parameters that are required to fire, the better. Of course…