1) What is your industry segment?

1. Operator
2. Drilling Contractor
3. Equipment Manufacturer
4. Service Company
5. Other

Bar chart showing:
- Operator: 30, 18%
- Drilling Contractor: 28, 17%
- Equipment Manufacturer: 64, 39%
- Service Company: 16, 10%
- Other: 26, 16%

Total: 164
2) How old are you?

1. Under 30
2. 31-40
3. 41-50
4. 51-60
5. Above 60

Total: 169
3) Do you think there is a business case for drilling automation?

1. Yes
2. No
3. Unsure

95% Yes
1% No
4% Unsure

Total: 169
4) When will the big crew change end?

1. 5 years
2. 10 years
3. More than 15 years
4. Negligible effect – We will adapt and not see a big effect.

- 11% (18)
- 55% (89)
- 20% (33)
- 14% (23)

Total: 163
5) When will fully autonomous drilling be commercialized with 50% market penetration?

1. 10 years - 24% (41)
2. 20 years - 47% (80)
3. 20+ years - 23% (39)
4. Autonomous drilling is not a practical end game - 6% (11)
6) What are the primary causes of NPT

1. Controls
2. Dropped objects
3. Electrical failures
4. Mechanical failures
5. Human error

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<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
<th>Quantity</th>
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<tr>
<td>Controls</td>
<td>13%</td>
<td>22</td>
</tr>
<tr>
<td>Dropped objects</td>
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<td>1</td>
</tr>
<tr>
<td>Electrical failures</td>
<td>8%</td>
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<tr>
<td>Mechanical failures</td>
<td>26%</td>
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<td>Human error</td>
<td>52%</td>
<td>87</td>
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Total: 168
7) Which aspect of Well Construction deserves the larger investment in technology innovation and development?

1. Directional Drilling
2. Completions
3. Well Testing
4. Well Control

- Directional Drilling: 18%
- Completions: 18%
- Well Testing: 3%
- Well Control: 60%

Total: 163
8) Without respect to ‘cost to repair’, what is the most frequent interruption to well construction?

1. Weather
2. Logistics of personnel, material or equipment
3. Equipment Maintenance/Repair
4. Regulatory inspection
5. Other

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<th>Category</th>
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<tr>
<td>1</td>
<td>Weather</td>
<td>6% (10)</td>
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<td>2</td>
<td>Logistics of personnel, material or equipment</td>
<td>32% (52)</td>
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<td>3</td>
<td>Equipment Maintenance/Repair</td>
<td>53% (86)</td>
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<td>4</td>
<td>Regulatory inspection</td>
<td>2% (3)</td>
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<tr>
<td>5</td>
<td>Other</td>
<td>7% (11)</td>
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</table>

Total: 162
9) Without respect to ‘cost to repair’, which piece of drilling equipment creates the most frequent interruption?

1. Drawworks
2. Top Drive/Rotary
3. Compensator
4. Pipe Handling
5. BOP
6. Other

- Drawworks: 31% (49 responses)
- Top Drive/Rotary: 22% (35 responses)
- Compensator: 33% (52 responses)
- Pipe Handling: 9% (14 responses)
- BOP: 1% (2 responses)
- Other: 5% (8 responses)

Total: 160 responses
10) Recognizing the fact that Safety for both personnel and the environment is foremost in our industry conscious, which of the following do you feel provides the most universal benefit for the industry?

1. Reduced manpower
2. Reduced downtime
3. Reduced cost
4. It is technology for its own sake

- Reduced manpower: 26% (41 votes)
- Reduced downtime: 45% (72 votes)
- Reduced cost: 20% (32 votes)
- It is technology for its own sake: 9% (14 votes)

Total: 159 votes
11) What is the MOST important factor for successfully commercializing an oilfield technology?

1. Validating market size
2. Field testing the product
3. The people commercializing the tech
4. Showing the tech’s ‘monetary’ benefit
5. Enabling future technologies

Total: 161
12) Do you think we will ever effectively drill the Arctic?

1. Definitely
2. Possibly, but severe challenges exist
3. Odds are against it
4. No way

Total: 167
13) Where is the biggest need for technology development?

1. Control Systems 35% (56)
2. MPD 17% (27)
3. Plug and Play controls / Modular Machine Control 25% (40)
4. Ultra HPHT (20K psi) 14% (23)
5. Dual Gradient Drilling 10% (16)

Total: 162
14) What workshop topic should the IADC Future Tech Subcommittee host next?

1. BOP Control System Technologies 34% (55)
2. Drilling Technology Commercialization 56% (92)
3. Completion Technologies 4% (6)
4. Casing Drilling Technologies 6% (10)

Total: 163
15) With respect to Blowout Preventers (BOP), which aspect is most in need of improvement and/or innovation?

1. Weight
2. Size
3. Numbers of RAMS
4. Shearing Capacity
5. Controls

Total: 156
16) Which of the following BOP Control System attributes merits the most need for improvement and/or innovation?

1. Communications (32%)
2. Hydraulic/Mechanical (22%)
3. Electronic/Electrical (24%)
4. Modularity (21%)

Total: 147
17) Do you believe there is a need for an “open system” architecture for BOP control systems?

1. Yes 1 86% (130)
2. No 2 14% (21)

Total: 151
18) How secure is your control system digital security?

1. Extremely 1 2% (3)
2. Very 2 25% (39)
3. Somewhat 3 31% (48)
4. Don’t know 4 42% (66)

Total: 156
19) Do you understand the benefits of hardware in the loop (HiL) testing?

1. Yes, we always use it  
2. Have heard about it but don’t really understand it  
3. Yes, but it costs too much  
4. Never heard of it

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<td>4</td>
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<td>26% (39)</td>
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Total: 152
20) What project should the Drilling Controls Subcommittee work on next?

1. HiL Testing guidelines
2. Well Construction Steps
3. Digital Security
4. Certification – instrumentation
5. Knowledge Skills & Abilities

Total: 149