New Russian Classification – Approximation To The International Standards

Novosibirsk, Russia
New in classification

- Commercial
  - Reserves \( \text{NPV} > 0 \)
  - Resources \( \text{EMV} = \text{NPV} \times p - Z \times (1-p) > 0 \)

- Recoverable reserves
  - Recoverable resources \( \text{NPV} > 0 \)
  - Volume with \( \text{EMV} > 0 \)

- More precise quantity A, B, C1, C2

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**RF Classification of Reserves and Resources**

Geological reserves
- Groups of reserves by commercial producibility and economic efficiency
  - Commercial reserves
    - Economic reserves
    - Potential Economic reserves
  - Sub-commercial reserves
    - Recoverable reserves
  - Produced
  - Recovered reserves

Geological resources
- Groups of commercially attractive resources
  - Commercial resources
  - Contingent resources
  - Recoverable resources

Reserve categories by degree of geological exploration knowledge and maturity for production
  - A Reasonably assured
  - B Identified
  - C1 Estimated
  - C2 Inferred

Resources categories by degree of their geological exploration knowledge
  - D1 Localized
  - D2 Prospective
  - D3 Predicted

© Gabrielants G.A., Poroskan V.I., Krasilnikova T.B.
Eastern Siberia field.
Geological cross-section.

Eastern Siberia oil and gas field.
Comparison of estimated oil reserves by current and new RF classification

Legend:
- line of collector pinching out;
- given profitable influx in casing:
  - oil,
  - oil with gas,
  - oil with water,
  - oil with gas and water,
  - gas;
- given unprofitable influx
  - oil;
  - given water influx
- live RF classification:
  - reserves approved by SRC:
    - C category,
- oil;
- given water influx
- gas-oil:
  - external,
  - internal;
- gas-saturated thickness;
- wall number;
- gas-oil.

Contacts:
- water-oil:
  - external,
  - internal;
- gas-saturated thickness;
- well number;
- gas-oil.

Oil of reserves fields:
- C category,1
- C category,2
- B category.
- C category.
Classification comparison for oil object

NPV(@ 10%) = 68.45 $mm
IRR = 13.18%

Potential economic reserves
Commercial reserves

Eastern Siberia oil and gas field.
Comparison of estimated gas reserves by current and new RF classification

Legend:
- line of collector
- oil
- oil with gas, water
- gas
- given profitable influx
- given water influx

Contacts:
- water-oil:
- external, internal
- gas-oil:
- external, internal
- wall number

Oil of reserves fields:
- live RF classification:
- reserves, approved by SRC:
- new RF classification:
Сравнение запасов газовых объектов в старой и новой классификации

Comparison of gas objects in classifications

С1 С1 С2 С1 С2 С2 С2
Horizon 1 Horizon 2 Horizon 3

NPV (@10%), Mm$

Independent Development Joint Development

-25 25 75 125 175 225 275
Horizon 1 Horizon 2 Horizon 3

IRR

Commercial Potential Economic
Commercial Potential Economic
Commercial Potential Economic

Perspective trap.
Vanavara Horizon oil and gas accumulation
Perspective trap. Geological cross-section of sandstone horizon oil and gas accumulation

1 - argillaceous deposits of sandstone Formation, 2 - gas-saturated sandstone of sandstone Formation, 3 - oil-saturated sandstone of sandstone Formation, 4 - water-saturated sandstone of sandstone Formation.

Comparison of oil & gas objects of prospective trap

<table>
<thead>
<tr>
<th>Classification</th>
<th>Oil</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration cost (Z), $mm</td>
<td>22.11</td>
<td>0</td>
</tr>
<tr>
<td>NPV, $mm</td>
<td>72.4</td>
<td>-6.96</td>
</tr>
<tr>
<td>Probability of success (p), %</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Expected Monetary Value (EMV), $mm</td>
<td>25.15</td>
<td>-3.48</td>
</tr>
</tbody>
</table>

EMV = NPV * p - Z * (1 - p)

Net cash flow

Comparison of oil & gas objects of prospective trap
### Classification comparison

<table>
<thead>
<tr>
<th>Field reserves:</th>
<th>RF</th>
<th>UNFC</th>
<th>SPE\WPC\AAPG</th>
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</thead>
<tbody>
<tr>
<td><strong>Oil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial reserves</td>
<td>E2: potential economic</td>
<td></td>
<td>Undeveloped</td>
</tr>
<tr>
<td>Potential economic reserves</td>
<td>F2 - contingent development project</td>
<td></td>
<td>Justified for Development</td>
</tr>
<tr>
<td>C1+C2</td>
<td>B+C1+C2</td>
<td>G1+G2+G3</td>
<td>Proved + probable reserves</td>
</tr>
<tr>
<td><strong>Gas: Horizon 1</strong></td>
<td></td>
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<tr>
<td>Commercial reserves</td>
<td>E2: potential economic</td>
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</tr>
<tr>
<td>Potential economic reserves</td>
<td>F2 - contingent development project</td>
<td></td>
<td>Development Unclarified or on Hold</td>
</tr>
<tr>
<td>B+C1+C2</td>
<td>G1+G2+G3</td>
<td></td>
<td>Contingent resources</td>
</tr>
<tr>
<td><strong>Horizon 2</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Commercial reserves</td>
<td>E2: potential economic</td>
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<tr>
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<td>G1+G2+G3</td>
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<td>Contingent resources</td>
</tr>
<tr>
<td><strong>Horizon 3</strong></td>
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</tr>
<tr>
<td>Commercial reserves</td>
<td>E2: potential economic</td>
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</tr>
<tr>
<td>Potential economic reserves</td>
<td>F2 - contingent development project</td>
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<tr>
<td>C1+C2</td>
<td>G2+G3</td>
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<td>Contingent resources</td>
</tr>
<tr>
<td><strong>Resources:</strong></td>
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</tr>
<tr>
<td><strong>Oil</strong></td>
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<tr>
<td>Commercial resources</td>
<td>E3 - intrinsically economic</td>
<td></td>
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</tr>
<tr>
<td>C3 D1</td>
<td>F3 - project undefined</td>
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<td>Prospect</td>
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<tr>
<td>G4</td>
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</table>

- **Object**
- **Field reserves**
- **Oil**
- **Gas:**
  - **Horizon 1**
  - **Horizon 2**
  - **Horizon 3**
- **Resources**
  - **Oil**
  - **Gas**

**Thank you for your attention**

Спасибо за внимание