

**Cuanza-Namibe, Assessment Unit 72030401
Assessment Results Summary**

[MMBO, million barrels of oil. BCFG, billion cubic feet of gas. MMBNGL, million barrels of natural gas liquids. MFS, minimum field size assessed (MMBO or BCFG). Prob., probability (including both geologic and accessibility probabilities) of at least one field equal to or greater than the MFS. Results shown are fully risked estimates. For gas fields, all liquids are included under the NGL (natural gas liquids) category. F95 represents a 95 percent chance of at least the amount tabulated. Other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. Shading indicates not applicable]

| Field Type | MFS | Prob. (0-1) | Undiscovered Resources | | | | | | | | | | | | Largest Undiscovered Field (MMBO or BCFG) | | | |
|------------|-----|-------------|------------------------|-----|-------|------|------------|-------|-------|-------|--------------|-----|-----|------|---|-----|-------|------|
| | | | Oil (MMBO) | | | | Gas (BCFG) | | | | NGL (MMBNGL) | | | | F95 | F50 | F5 | Mean |
| | | | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean | F95 | F50 | F5 | Mean | | | | |
| Oil Fields | 1 | 1.00 | 84 | 608 | 2,138 | 790 | 80 | 590 | 2,205 | 790 | 4 | 29 | 113 | 39 | 28 | 190 | 1,088 | 315 |
| Gas Fields | 6 | | | | | | 67 | 472 | 2,507 | 768 | 3 | 20 | 112 | 34 | 28 | 212 | 1,730 | 450 |
| Total | | 1.00 | 84 | 608 | 2,138 | 790 | 147 | 1,062 | 4,712 | 1,558 | 7 | 49 | 225 | 73 | | | | |

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Forecast: Oil in Oil Fields

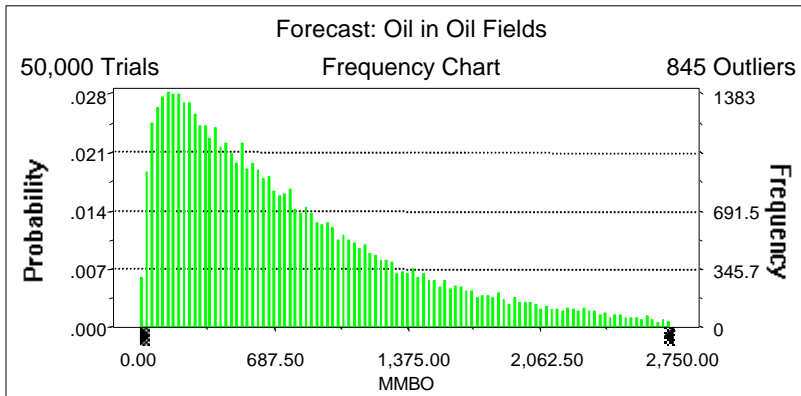
Summary:

Display range is from 0.00 to 2,750.00 MMBO

Entire range is from 4.02 to 6,852.98 MMBO

After 50,000 trials, the standard error of the mean is 2.99

| Statistics: | Value |
|----------------------------|------------|
| Trials | 50000 |
| Mean | 790.08 |
| Median | 607.78 |
| Mode | --- |
| Standard Deviation | 668.65 |
| Variance | 447,093.87 |
| Skewness | 1.55 |
| Kurtosis | 6.21 |
| Coefficient of Variability | 0.85 |
| Range Minimum | 4.02 |
| Range Maximum | 6,852.98 |
| Range Width | 6,848.96 |
| Mean Standard Error | 2.99 |



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Forecast: Oil in Oil Fields (cont'd)

Percentiles:

| <u>Percentile</u> | <u>MMBO</u> |
|-------------------|-------------|
| 100% | 4.02 |
| 95% | 84.28 |
| 90% | 135.94 |
| 85% | 185.86 |
| 80% | 236.56 |
| 75% | 288.14 |
| 70% | 345.37 |
| 65% | 406.19 |
| 60% | 468.91 |
| 55% | 536.66 |
| 50% | 607.78 |
| 45% | 684.75 |
| 40% | 772.05 |
| 35% | 866.77 |
| 30% | 972.81 |
| 25% | 1,096.74 |
| 20% | 1,244.97 |
| 15% | 1,441.16 |
| 10% | 1,706.42 |
| 5% | 2,138.04 |
| 0% | 6,852.98 |

End of Forecast

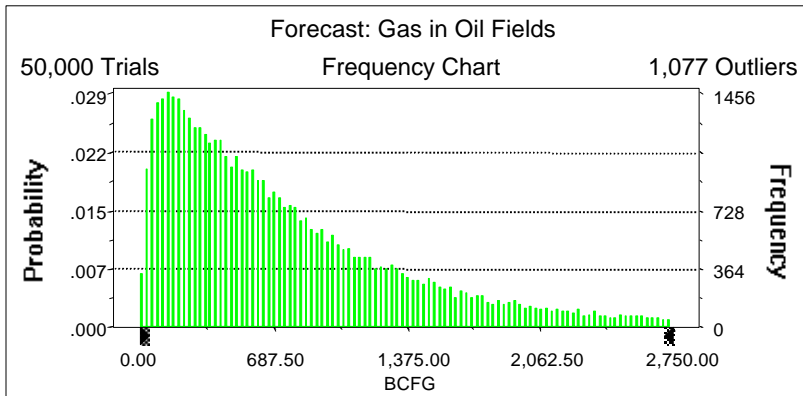
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Forecast: Gas in Oil Fields

Summary:

Display range is from 0.00 to 2,750.00 BCFG
Entire range is from 3.54 to 7,323.90 BCFG
After 50,000 trials, the standard error of the mean is 3.15

| Statistics: | Value |
|----------------------------|------------|
| Trials | 50000 |
| Mean | 790.24 |
| Median | 589.94 |
| Mode | --- |
| Standard Deviation | 703.78 |
| Variance | 495,300.98 |
| Skewness | 1.77 |
| Kurtosis | 7.49 |
| Coefficient of Variability | 0.89 |
| Range Minimum | 3.54 |
| Range Maximum | 7,323.90 |
| Range Width | 7,320.35 |
| Mean Standard Error | 3.15 |



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Forecast: Gas in Oil Fields (cont'd)

Percentiles:

| <u>Percentile</u> | <u>BCFG</u> |
|-------------------|-------------|
| 100% | 3.54 |
| 95% | 80.29 |
| 90% | 130.32 |
| 85% | 177.13 |
| 80% | 225.53 |
| 75% | 278.20 |
| 70% | 333.96 |
| 65% | 392.44 |
| 60% | 453.73 |
| 55% | 519.91 |
| 50% | 589.94 |
| 45% | 665.50 |
| 40% | 751.53 |
| 35% | 845.22 |
| 30% | 953.73 |
| 25% | 1,083.72 |
| 20% | 1,243.64 |
| 15% | 1,443.98 |
| 10% | 1,724.30 |
| 5% | 2,205.43 |
| 0% | 7,323.90 |

End of Forecast

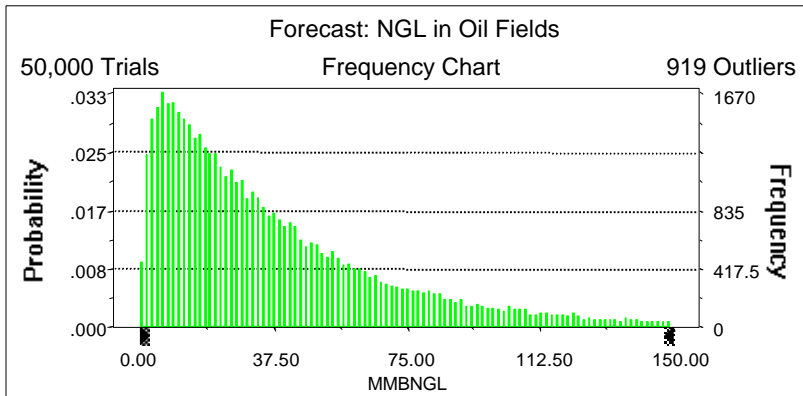
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Forecast: NGL in Oil Fields

Summary:

Display range is from 0.00 to 150.00 MMBNGL
Entire range is from 0.11 to 402.43 MMBNGL
After 50,000 trials, the standard error of the mean is 0.16

| Statistics: | Value |
|----------------------------|----------|
| Trials | 50000 |
| Mean | 39.49 |
| Median | 28.67 |
| Mode | --- |
| Standard Deviation | 36.82 |
| Variance | 1,355.77 |
| Skewness | 1.98 |
| Kurtosis | 8.86 |
| Coefficient of Variability | 0.93 |
| Range Minimum | 0.11 |
| Range Maximum | 402.43 |
| Range Width | 402.31 |
| Mean Standard Error | 0.16 |



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Forecast: NGL in Oil Fields (cont'd)

Percentiles:

| <u>Percentile</u> | <u>MMBNGL</u> |
|-------------------|---------------|
| 100% | 0.11 |
| 95% | 3.82 |
| 90% | 6.22 |
| 85% | 8.54 |
| 80% | 10.90 |
| 75% | 13.39 |
| 70% | 16.07 |
| 65% | 18.85 |
| 60% | 21.85 |
| 55% | 25.16 |
| 50% | 28.67 |
| 45% | 32.53 |
| 40% | 36.76 |
| 35% | 41.55 |
| 30% | 46.95 |
| 25% | 53.64 |
| 20% | 61.59 |
| 15% | 72.23 |
| 10% | 86.96 |
| 5% | 113.00 |
| 0% | 402.43 |

End of Forecast

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Forecast: Largest Oil Field

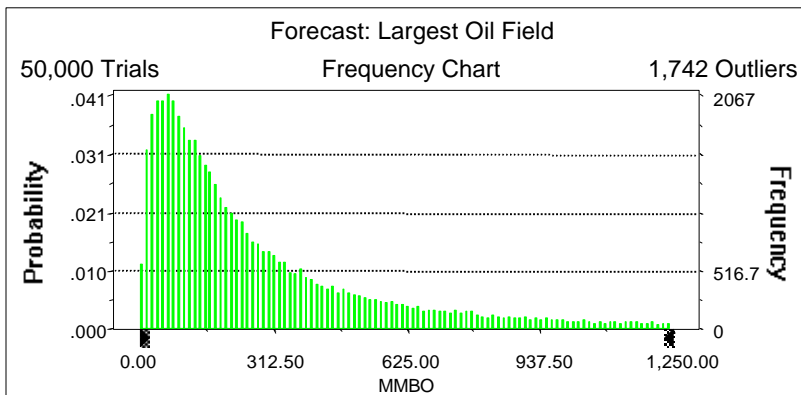
Summary:

Display range is from 0.00 to 1,250.00 MMBO

Entire range is from 1.64 to 1,999.65 MMBO

After 50,000 trials, the standard error of the mean is 1.55

| Statistics: | Value |
|----------------------------|------------|
| Trials | 50000 |
| Mean | 314.84 |
| Median | 189.77 |
| Mode | --- |
| Standard Deviation | 346.68 |
| Variance | 120,187.60 |
| Skewness | 2.13 |
| Kurtosis | 7.91 |
| Coefficient of Variability | 1.10 |
| Range Minimum | 1.64 |
| Range Maximum | 1,999.65 |
| Range Width | 1,998.01 |
| Mean Standard Error | 1.55 |



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Forecast: Largest Oil Field (cont'd)

Percentiles:

| <u>Percentile</u> | <u>MMBO</u> |
|-------------------|-------------|
| 100% | 1.64 |
| 95% | 27.68 |
| 90% | 43.74 |
| 85% | 58.95 |
| 80% | 74.14 |
| 75% | 89.83 |
| 70% | 106.64 |
| 65% | 125.19 |
| 60% | 144.35 |
| 55% | 165.46 |
| 50% | 189.77 |
| 45% | 218.09 |
| 40% | 250.16 |
| 35% | 289.70 |
| 30% | 337.33 |
| 25% | 397.68 |
| 20% | 479.89 |
| 15% | 591.45 |
| 10% | 764.94 |
| 5% | 1,088.33 |
| 0% | 1,999.65 |

End of Forecast

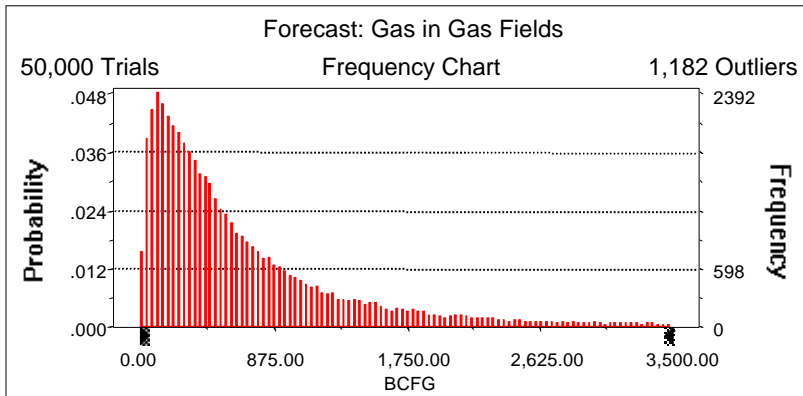
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Forecast: Gas in Gas Fields

Summary:

Display range is from 0.00 to 3,500.00 BCFG
Entire range is from 6.04 to 14,397.83 BCFG
After 50,000 trials, the standard error of the mean is 4.08

| Statistics: | Value |
|----------------------------|------------|
| Trials | 50000 |
| Mean | 767.69 |
| Median | 472.44 |
| Mode | --- |
| Standard Deviation | 911.23 |
| Variance | 830,337.35 |
| Skewness | 3.07 |
| Kurtosis | 16.67 |
| Coefficient of Variability | 1.19 |
| Range Minimum | 6.04 |
| Range Maximum | 14,397.83 |
| Range Width | 14,391.79 |
| Mean Standard Error | 4.08 |



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Forecast: Gas in Gas Fields (cont'd)

Percentiles:

| <u>Percentile</u> | <u>BCFG</u> |
|-------------------|-------------|
| 100% | 6.04 |
| 95% | 66.79 |
| 90% | 105.79 |
| 85% | 142.93 |
| 80% | 181.43 |
| 75% | 221.35 |
| 70% | 265.85 |
| 65% | 311.95 |
| 60% | 360.88 |
| 55% | 414.66 |
| 50% | 472.44 |
| 45% | 538.25 |
| 40% | 615.11 |
| 35% | 705.98 |
| 30% | 813.76 |
| 25% | 943.12 |
| 20% | 1,113.87 |
| 15% | 1,359.19 |
| 10% | 1,738.66 |
| 5% | 2,506.91 |
| 0% | 14,397.83 |

End of Forecast

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Forecast: NGL in Gas Fields

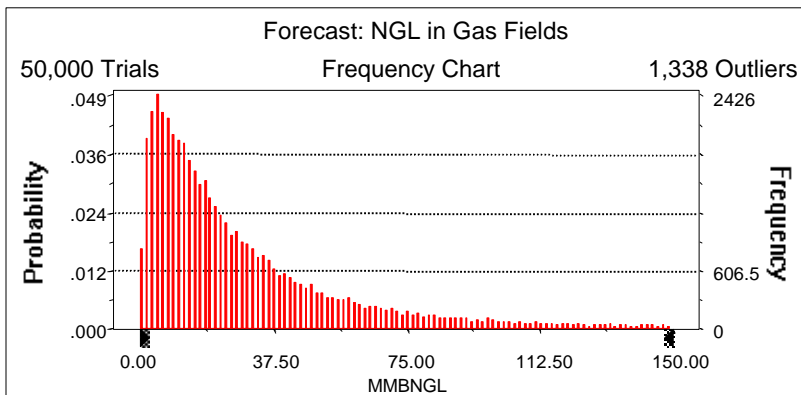
Summary:

Display range is from 0.00 to 150.00 MMBNGL

Entire range is from 0.20 to 662.19 MMBNGL

After 50,000 trials, the standard error of the mean is 0.19

| Statistics: | Value |
|----------------------------|----------|
| Trials | 50000 |
| Mean | 33.77 |
| Median | 20.37 |
| Mode | --- |
| Standard Deviation | 41.55 |
| Variance | 1,726.51 |
| Skewness | 3.30 |
| Kurtosis | 19.17 |
| Coefficient of Variability | 1.23 |
| Range Minimum | 0.20 |
| Range Maximum | 662.19 |
| Range Width | 661.98 |
| Mean Standard Error | 0.19 |



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Forecast: NGL in Gas Fields (cont'd)

Percentiles:

| <u>Percentile</u> | <u>MMBNGL</u> |
|-------------------|---------------|
| 100% | 0.20 |
| 95% | 2.78 |
| 90% | 4.46 |
| 85% | 6.00 |
| 80% | 7.68 |
| 75% | 9.40 |
| 70% | 11.30 |
| 65% | 13.26 |
| 60% | 15.41 |
| 55% | 17.76 |
| 50% | 20.37 |
| 45% | 23.25 |
| 40% | 26.76 |
| 35% | 30.71 |
| 30% | 35.28 |
| 25% | 41.14 |
| 20% | 48.82 |
| 15% | 59.56 |
| 10% | 76.28 |
| 5% | 111.76 |
| 0% | 662.19 |

End of Forecast

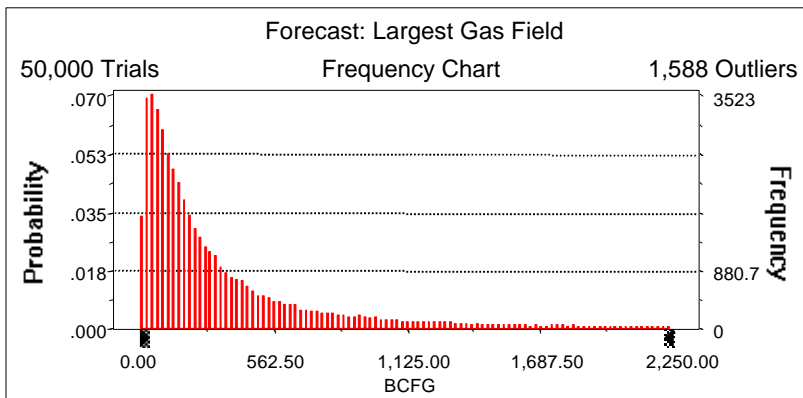
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Forecast: Largest Gas Field

Summary:

Display range is from 0.00 to 2,250.00 BCFG
Entire range is from 6.04 to 5,988.54 BCFG
After 50,000 trials, the standard error of the mean is 3.10

| Statistics: | Value |
|----------------------------|------------|
| Trials | 50000 |
| Mean | 450.38 |
| Median | 211.77 |
| Mode | --- |
| Standard Deviation | 692.11 |
| Variance | 479,010.70 |
| Skewness | 3.69 |
| Kurtosis | 20.26 |
| Coefficient of Variability | 1.54 |
| Range Minimum | 6.04 |
| Range Maximum | 5,988.54 |
| Range Width | 5,982.50 |
| Mean Standard Error | 3.10 |



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Forecast: Largest Gas Field (cont'd)

Percentiles:

| <u>Percentile</u> | <u>BCFG</u> |
|-------------------|-------------|
| 100% | 6.04 |
| 95% | 28.02 |
| 90% | 43.88 |
| 85% | 59.45 |
| 80% | 75.78 |
| 75% | 93.67 |
| 70% | 112.28 |
| 65% | 133.62 |
| 60% | 156.70 |
| 55% | 182.83 |
| 50% | 211.77 |
| 45% | 248.22 |
| 40% | 290.60 |
| 35% | 339.75 |
| 30% | 404.77 |
| 25% | 485.93 |
| 20% | 604.86 |
| 15% | 783.58 |
| 10% | 1,070.34 |
| 5% | 1,730.40 |
| 0% | 5,988.54 |

End of Forecast

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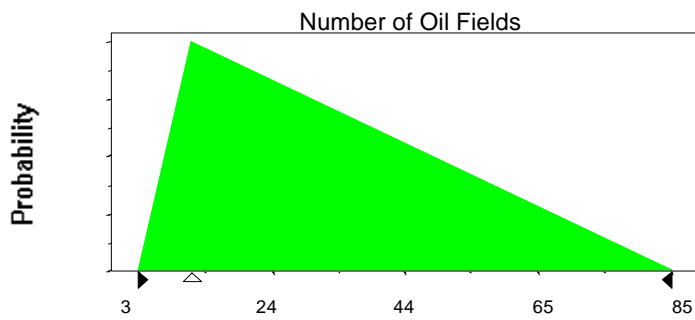
Assumptions

Assumption: Number of Oil Fields

Triangular distribution with parameters:

| | |
|-----------|----|
| Minimum | 3 |
| Likeliest | 11 |
| Maximum | 85 |

Selected range is from 3 to 85
Mean value in simulation was 33



Assumption: Sizes of Oil Fields

Lognormal distribution with parameters:

| | |
|--------------------|--------|
| Mean | 27.45 |
| Standard Deviation | 249.64 |

Shifted parameters

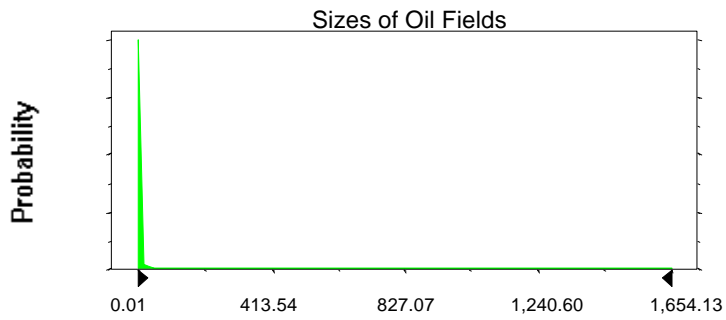
| |
|--------|
| 28.45 |
| 249.64 |

Selected range is from 0.00 to 1,999.00
Mean value in simulation was 22.82

1.00 to 2,000.00
23.82

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Assumption: Sizes of Oil Fields (cont'd)

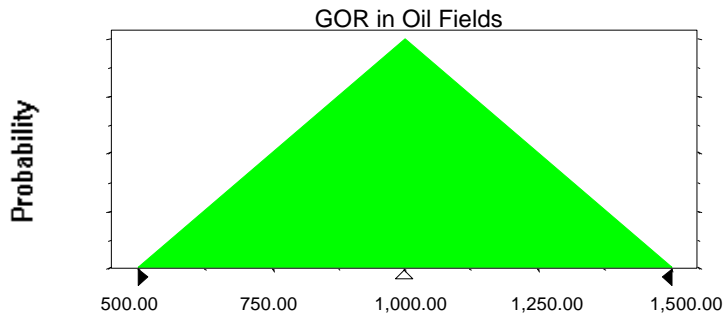


Assumption: GOR in Oil Fields

Triangular distribution with parameters:

| | |
|-----------|----------|
| Minimum | 500.00 |
| Likeliest | 1,000.00 |
| Maximum | 1,500.00 |

Selected range is from 500.00 to 1,500.00
Mean value in simulation was 999.17



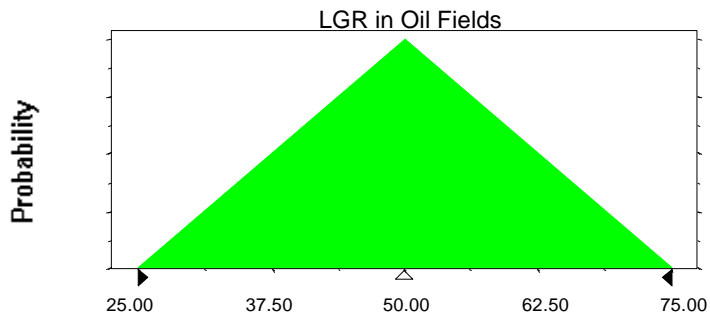
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Assumption: LGR in Oil Fields

Triangular distribution with parameters:

| | |
|-----------|-------|
| Minimum | 25.00 |
| Likeliest | 50.00 |
| Maximum | 75.00 |

Selected range is from 25.00 to 75.00
Mean value in simulation was 49.99



Assumption: Number of Gas Fields

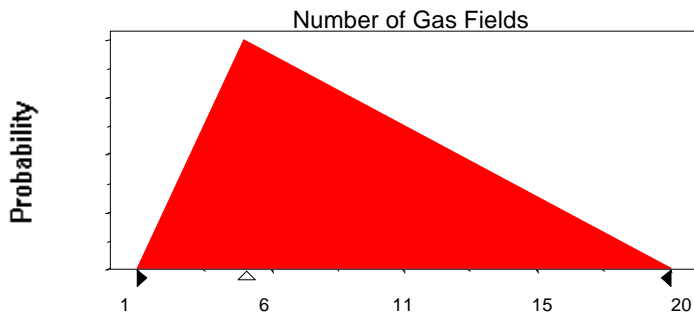
Triangular distribution with parameters:

| | |
|-----------|----|
| Minimum | 1 |
| Likeliest | 5 |
| Maximum | 20 |

Selected range is from 1 to 20
Mean value in simulation was 9

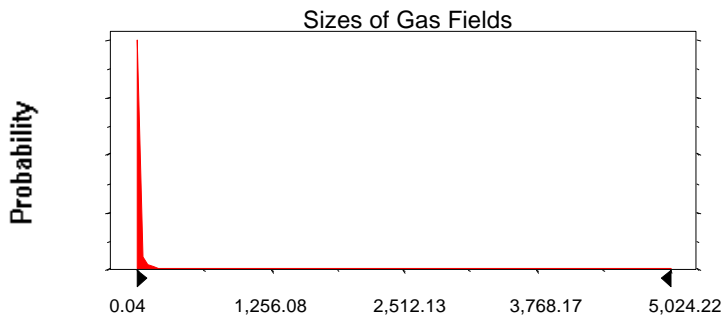
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Assumption: Number of Gas Fields (cont'd)



Assumption: Sizes of Gas Fields

| Lognormal distribution with parameters: | | Shifted parameters |
|---|--------|--------------------|
| Mean | 95.76 | 101.76 |
| Standard Deviation | 647.90 | 647.9 |
| Selected range is from 0.00 to 5,994.00 | | 6.00 to 6,000.00 |
| Mean value in simulation was 81.39 | | 87.39 |



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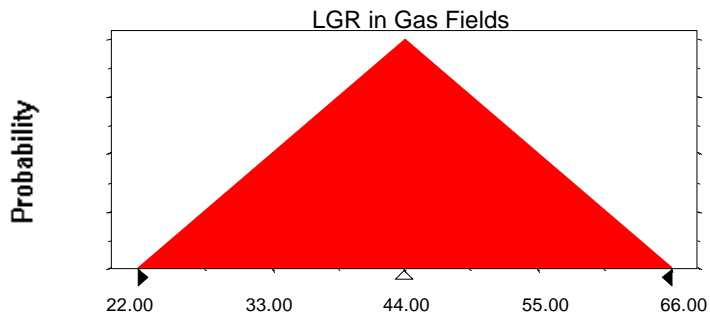
Assumption: LGR in Gas Fields

Triangular distribution with parameters:

| | |
|-----------|-------|
| Minimum | 22.00 |
| Likeliest | 44.00 |
| Maximum | 66.00 |

Selected range is from 22.00 to 66.00

Mean value in simulation was 44.01



End of Assumptions

Simulation started on 10/8/99 at 14:15:44
Simulation stopped on 10/8/99 at 14:44:43