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# PERSPECTIVES

USING CRACK SPREAD DATA  
IN REFINERY BUSINESS  
INTERRUPTION CLAIMS

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Our perspectives feature the viewpoints of our subject matter experts on current topics and emerging trends.

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Insurance professionals in the oil and gas refining industry should read this article to understand:

- “Crack spread” is an estimate of refinery gross margin on a barrel of crude oil – it compares prices of crude oil and the refined products derived from “cracking”<sup>1</sup> crude oil.
- How a crack spread can be used to estimate business interruption (BI) exposure before an Insured’s financials are made available
- How relatively small crack spread movements can signal large swings in business interruption loss severity during extended outages
- Ways geopolitical disruption and rising oil prices can influence U.S. refinery margins and business interruption loss exposure
- Why losses occurring during or immediately after planned refinery outages may present heightened complexity

## Executive Summary

A crack spread is a critical, real-time indicator for estimating refinery and petrochemical business interruption exposure. By comparing crude oil input prices with refined product values, a crack spread provides a market-based proxy for gross refining margin.

For insurance professionals, an analysis of crack spread data is particularly valuable early in a claim—when detailed financials may be unavailable—but also throughout the claim as market conditions evolve. Even modest movements in a crack spread can materially alter business interruption loss exposure.

## EXPERT VOICES

### Tiffany Drane, CPA



Tiffany applies her deep expertise in quantifying lost profits and margin shifts to demonstrate how changes in crack spread can materially alter business interruption values over the life of an energy claim. She uniquely connects U.S. refining economics to real-world exposure considerations for insurance professionals by highlighting ways risk measured at the beginning of a policy period can vary significantly from exposure on the date of an event.

### Katie Brown, CPA, CFF



Katie draws on her forensic accounting experience in complex refinery and petrochemical claims to help explain how a crack spread functions as an early-stage indicator for estimating refinery business interruption exposure when claim-specific financial data is limited. In this paper, she focuses on translating margin volatility into practical reserve setting considerations for insurers navigating rapidly changing market conditions.

Because a crack spread is driven by volatile global supply and demand factors, exposure at policy inception can differ substantially from exposure at the date of loss. Monitoring crack spreads helps ensure that business interruption estimates, reserve levels, and client expectations reflect current market reality rather than historical performance.

## Understanding Crack Spreads in Energy Insurance Claims

A crack spread approximates a refinery’s gross margin by comparing crude oil prices to refined product prices such as gasoline and diesel. The most widely referenced benchmark is the “3:2:1” crack spread, which assumes that three (3)

<sup>1</sup> Cracking generally refers to the process by which crude oil is broken down or refined into various higher-value products.

barrels of crude oil input yield two (2) barrels of gasoline and one (1) barrel of diesel.

When refined product prices rise relative to crude, the crack spread widens and margins strengthen. When crude costs rise faster than product prices, margins compress.

For insurance professionals, a crack spread offers a timely and objective way to understand margin conditions at the time of loss.

## Crack Spreads – A Tool for Estimating Business Interruption Exposure

A crack spread can be a vital tool in estimating exposure for refinery and petrochemical business interruption (BI) claims. Changes in this metric can influence:

- » Daily gross margin estimates.
- » Initial and ongoing reserve levels.
- » How exposure evolves during a prolonged claim.

For large refineries, shifts of even \$1–2 per barrel can translate into tens of millions of dollars in additional BI exposure.

Unlike an Insured's financial statements, which may lag by months, daily crack spread data is publicly available, making it especially valuable for:

- » Early reserve-setting.
- » Mid-claim reassessment.
- » Explaining exposure changes to insurance professionals.

## Example: Translating Crack Spread Data into Exposure

*An incident occurs at a refinery with a crude capacity of 138,000 barrels per day, resulting in a 120-day shutdown.*

### Step 1: Throughput

138,000 barrels per day (BPD)

### Step 2: Crack Spread Calculation (3-2-1)

*Gasoline – U.S. Gulf Coast Gasoline Spot Price: \$2 per gallon (\$84 per barrel)*

*Diesel – U.S. Gulf Coast ULSD Spot Price: \$2.50 per gallon (\$105 per barrel)*

*Crude – WTI Spot Price: \$77 per barrel*

$$\begin{array}{ccccccc} \text{ULSD} & & \text{GASOLINE} & & & \text{CRUDE OIL} & \\ \$105 & + & \$84 & + & \$84 & - & \$77 & - & \$77 & - & \$77 & = & \$42 / 3 = & \$14 \text{ per barrel} \end{array}$$

At \$14 per barrel and 138,000 barrels per day, the daily refining margin estimate is approximately \$1.9 million

### Step 3: Outage Duration

Over 120 days, a potential gross margin loss can be estimated at \$232 million

### Step 4: Margin Sensitivity

Diesel spot prices increase \$0.15 per gallon (\$6.30 per barrel of diesel)

The 3-2-1 crack spread increases by \$2.10 per barrel (\$6.30 per barrel of diesel / 3 barrels of crude)

- » ~ \$290,000 in additional exposure per day
- » ~ \$35 million in additional exposure over 120 days

This sensitivity illustrates how crack spread volatility can signal material changes in business interruption risk exposure.

## Crack Spread Volatility and Why It Matters

Crack spreads are influenced by global market dynamics that can shift rapidly:

### Geopolitical Disruptions

International conflicts and supply disruptions can affect the spread between refined product prices and crude costs. U.S. refiners can uniquely benefit due to:

- » Widening of the Brent crude vs WTI crude pricing spread.
- » Global increases in refined products pricing combined with export capabilities.

For beneficially positioned refiners, these dynamics can significantly strengthen margins during such crises and, in the event of a loss incident, amplify business interruption exposure.

### Seasonal Demand Cycles

Summer gasoline demand and winter diesel demand affect pricing, margins, and crack spreads. Claims occurring during peak seasonal demand periods can result in short-term increases in business interruption loss values.

### Heightened Complexity: Losses During or After Planned Refinery Outages

Planned maintenance outages are typically scheduled during periods of lower seasonal

demand. However, these periods may introduce non-obvious exposure risks:

- » Simultaneous industry-wide maintenance can tighten supply and strengthen crack spreads.
- » Startup and restart phases involve non-routine conditions and heightened operational complexity.
- » Mechanical failures or delays during restart can significantly extend downtime.

A range of complexities can accompany losses occurring during or immediately following a planned outage:

- » Some repair activity may overlap scheduled downtime, partially mitigating losses.
- » BI exposure may coincide with stronger-than-expected margins.
- » Downtime may extend beyond the planned window.

For insurance professionals, these scenarios require careful consideration of current market and operational conditions.

## Looking Ahead

We expect continued advancement in tools that automate crack spread monitoring and initial business interruption exposure estimates, making these capabilities increasingly standard across the industry.

As automation handles more of the mechanics, the value of insurance professionals will lie less in performing calculations and more in interpreting them. Applying professional judgment in ambiguous situations will remain essential.

Crack spread data will inform the analysis, but experienced practitioners will continue to determine what those market signals mean in the context of a specific loss.

## Conclusion

A crack spread is a foundational metric for understanding the financial impact of refinery and petrochemical outages. For insurance professionals, it provides a timely lens into BI exposure when traditional financial data is delayed or incomplete.

Understanding how a crack spread behaves, particularly around geopolitical events, seasonal demand, and planned outages, enables more accurate reserve setting, clearer client communication, and stronger risk management throughout the life of a claim.

## Acknowledgments

We would like to thank our colleagues Tiffany Drane and Katie Brown for their insights and expertise.

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