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*Clarity in a World of Uncertainty*

# Regulation of Utility Hedging Practices

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# Where's The Disconnect?

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| **Objective** | **Action** |
|---|---|
| Manage Customer Satisfaction | Measure Customer Satisfaction |
| Manage Service Reliability | Measure Service Reliability |
| Manage Return on Equity | Measure Return on Equity |
| Manage Administrative Costs | Measure Administrative Costs |
| Manage Outage Rates | Measure Outage Rates |
| Manage Response Time | Measure Response Time |
| Manage Power Plant Efficiency | Measure Power Plant Efficiency |
| Manage Fuel Cost Risk | Measure . . . . . Uh? |

*Just Hedge 50% . . . Uh . . .60%; no 30%*

## What is the Impact?

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What is the impact of executing multi-billion-dollar hedges without using risk metrics?

- Exaggerated hedge losses in low-price markets
- Unnecessary cost increases in high-cost markets

In just two States where I have recently worked with Regulators,

Hedge losses aggregated to almost $10 billion since the last price peak

*The presentation will use natural gas as an illustration, but all principles can be applied to any fuel or purchased power.*

*Or any volatile financial asset/liability with price transparency.*

## Why The Disconnect?

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With respect to hedging, IOUs usually follow the "KISS" principle.

- Complexity in decision making breeds prudence risk
- A simple plan is easy to execute "prudently"

- If an IOU measures risk and then responds as needed it gets complicated . . .
  - How was risk measured?
  - How were responses planned?
  - Why were hedges made . . .

    At that price? . . . At that time? . . . For that volume?

Prudence fears can only be addressed with more explicit regulatory compacts!

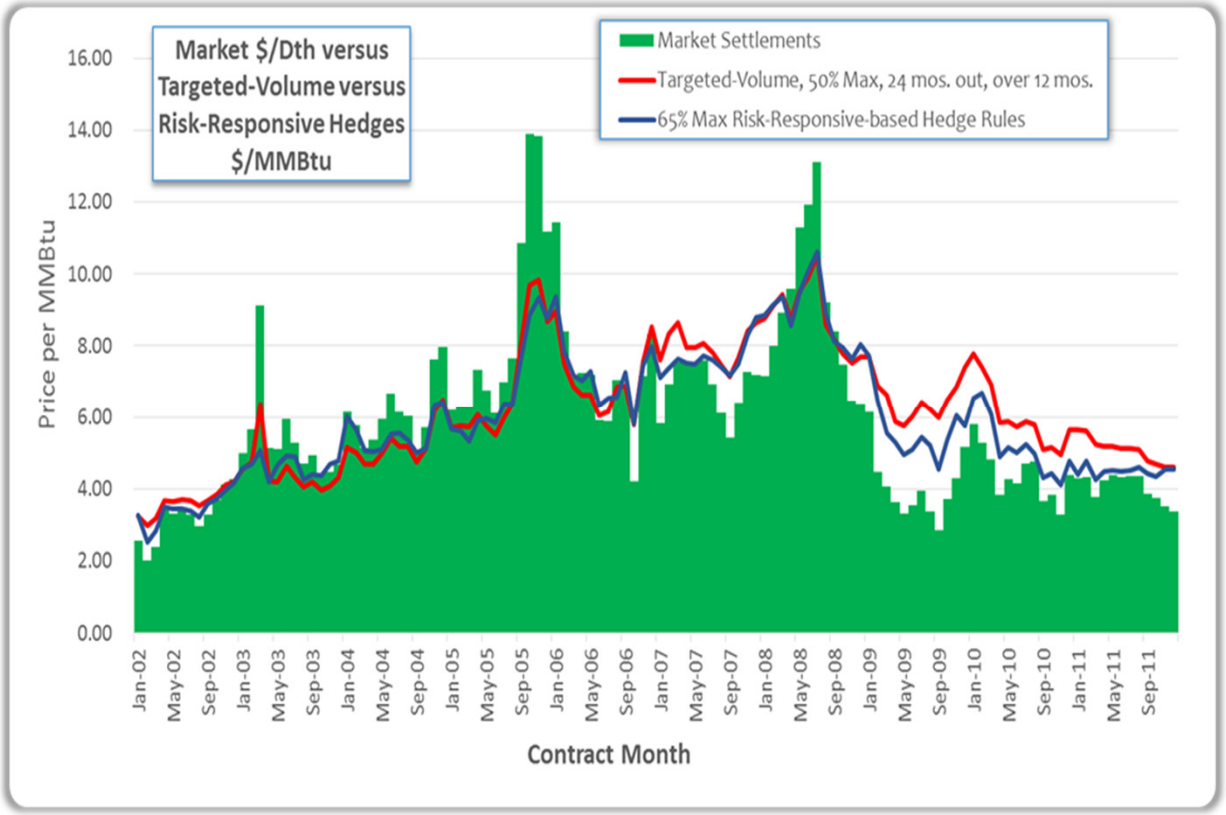
# Can We Do Better?

The graphic below was prepared for a Florida docket re natural gas hedging; it compares market prices in green with . . .

- Typical targeted-volume hedging (red line)

versus

- A Risk-Responsive hedge program (blue line)



# What Is A Risk-Responsive Hedge Program?

Compare This Menu of Hedge Decision Types . . .

- Programmatic Hedges (Sole method for many or even most IOUs)
  - Calendar-based accumulation
- Discretionary Hedges (Opportunity focused, not risk focused)
  - Hedge when prices offer target values consistent with goals

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- Defensive Hedges (Risk-Responsive)
  - Hedge to defend upside cost tolerance using forward risk metrics
- Contingent Response (Risk-Responsive)
  - In some circumstances, adjust hedges to constrain losses using forward risk metrics

## What Are "Forward Risk Metrics"

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The most widely used risk metric is Value at Risk; it is a function of transient volatility, and is commonly abbreviated as "VaR"

VaR is a key concept in the field of Quantitative Finance

- Almost 30 years ago in 1989, JP Morgan developed risk metrics and quantitative methods to manage its own financial risk, and in 1992 it published the methodology to the marketplace
- Key concepts from that work have become risk-industry standards
- In the mid 1990's, after the advent of the NYMEX natural gas futures contract, these methods were adopted by the energy industry to deal with the deregulated markets and newfound price volatility

So these methods are long-standing and well tested.

# Who Uses VaR Metrics?

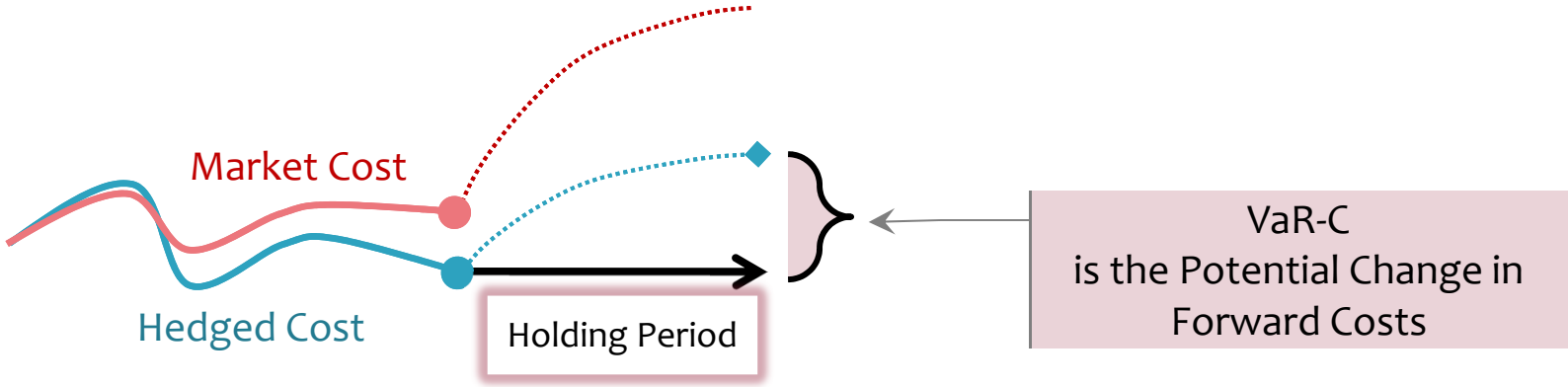
VaR methods are widely accepted by many industries . . .

- VaR metrics are a regulatory mandate for banks and major financial institutions
- They have been adopted by numerous segments in the energy industry
  - Large public-entity utility companies,
  - Large oil & gas producers,
  - Marketing and trading companies,
  - Independent power generators
  - Some IOUs, especially when operating in competitive environments

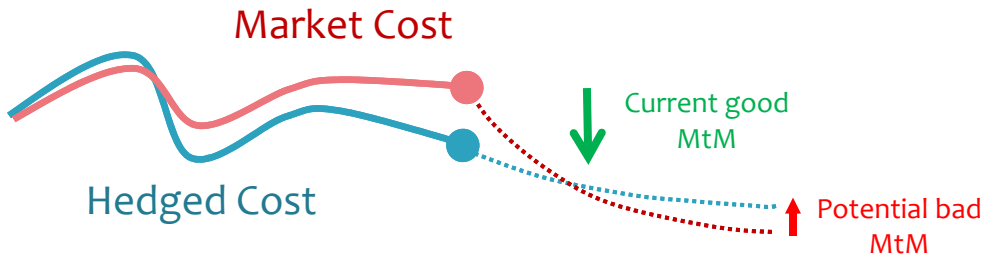
*But a broad segment of utilities ignore risk metrics for regulated operations*

# Volatility Translates to 2-Sided VaR

## Upside Risk (Potential High Cost of Service)




## Downside Risk (Potential Foregone Participation in Cost Declines, i.e., Hedge Losses)




VaR-L
is the Potential Change in MtM;
(In this case from a favorable to an unfavorable MtM)

MtM = Mark to Market

# In a Risk-Responsive Program
# The Hedge Ratio is Driven By Volatility

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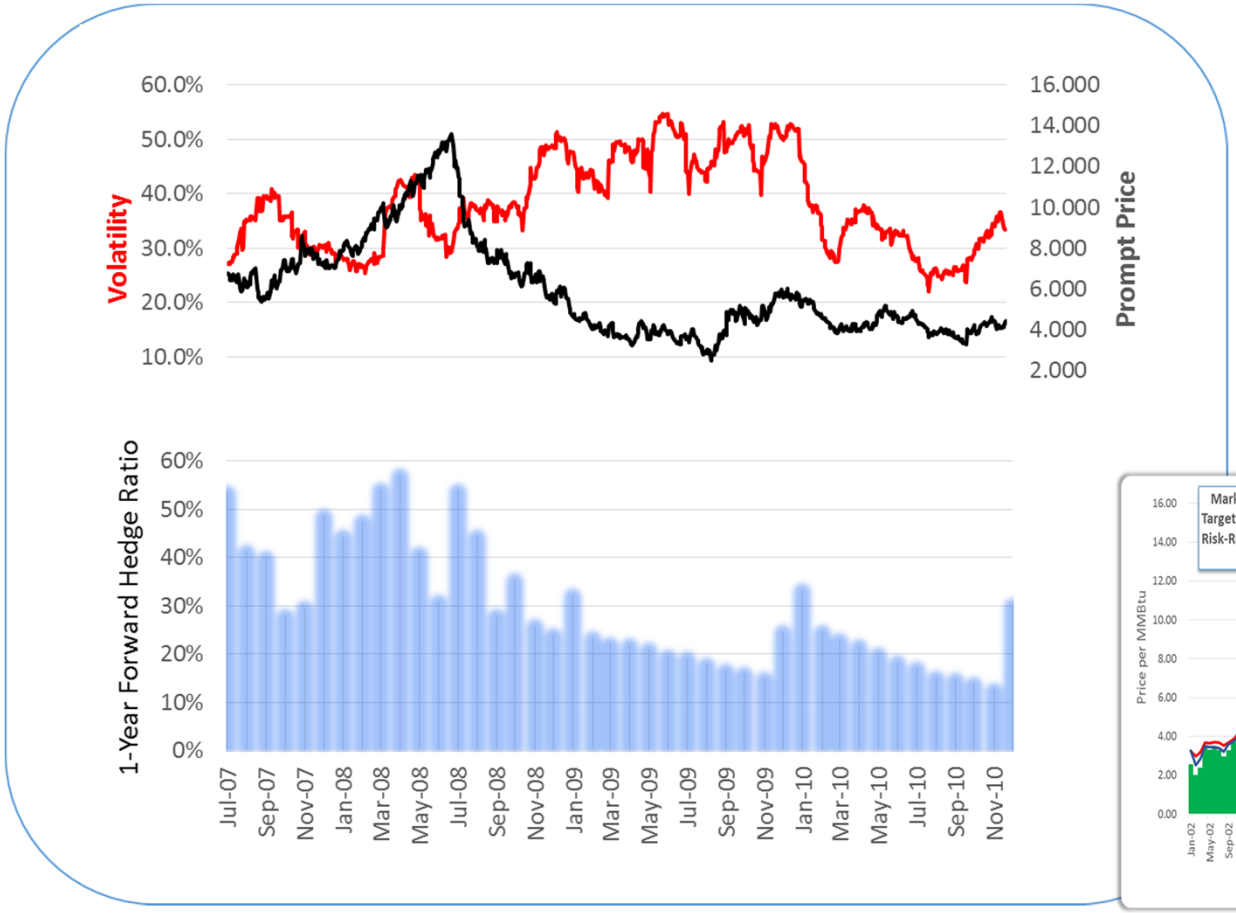
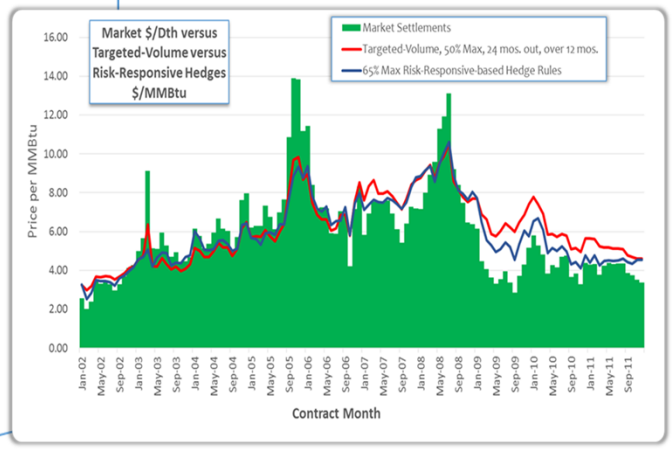
High volatility can result in "Cost Risk" as in 2007 & 2008 (Hedge More),
or Mark-to-Market Risk as in 2009 and following (Hedge Less; Use Options)




The detail (left) yields the results shown earlier



# What Constitutes a Robust Hedge Strategy?

**Typical:**

- Hedge 50% of requirements regardless of risk conditions.

**Risk Responsive:**

- Defend cost tolerances by measuring volatility and related VaR every week;
- Place incremental hedges only as necessary to mitigate excess risk v. tolerances
- Monitor MtM risk and use near-term options to mitigate excess MtM risk

*MtM = Mark to Market*

*More detailed strategy discussion is available at riskcentrix.com/papers*

# Simulations Are Valuable Setting Objectives

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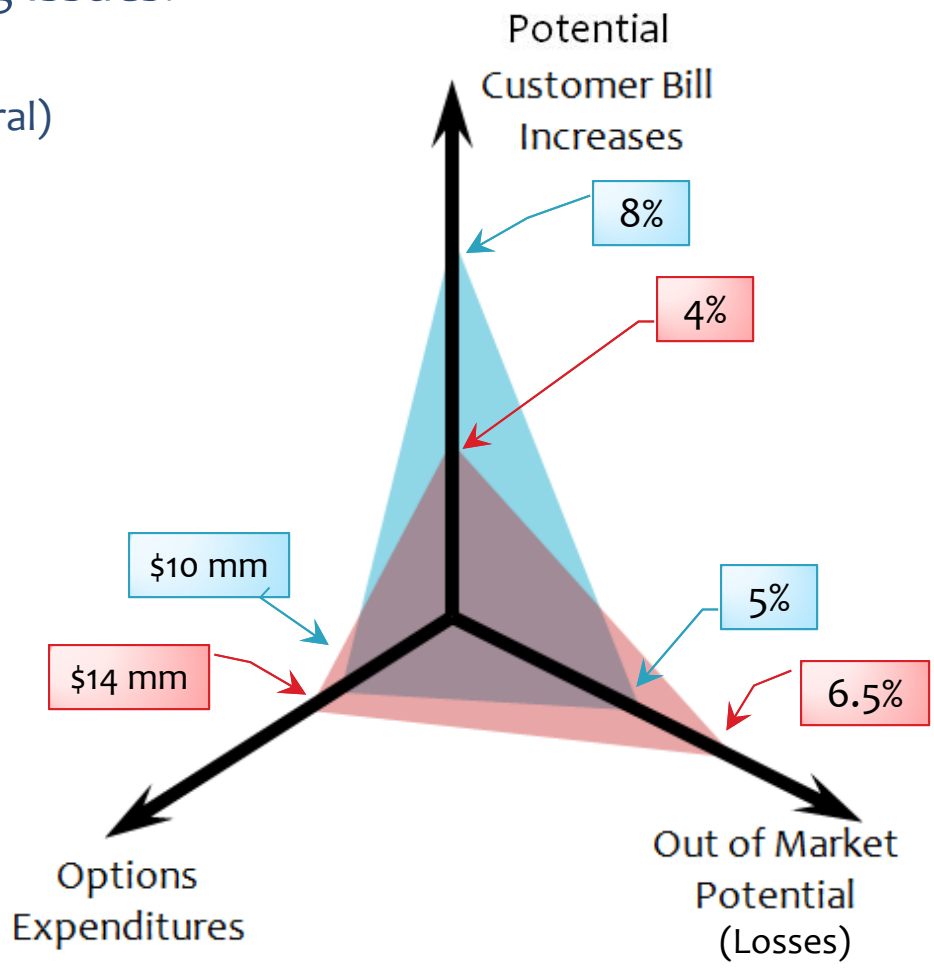
## Objectives must balance 3 competing Issues:

- Customer Bill Increase Tolerance
- Out of Market Tolerance (Losses/Collateral)
- Option Expenditures

- The Blue and Red Triangles (right) are alternative sets of tolerances for an assumed volatility level.

Note that the higher the design volatility, the larger the triangle must be!



# After Simulating Numerous Strategies Identify an Efficient Frontier

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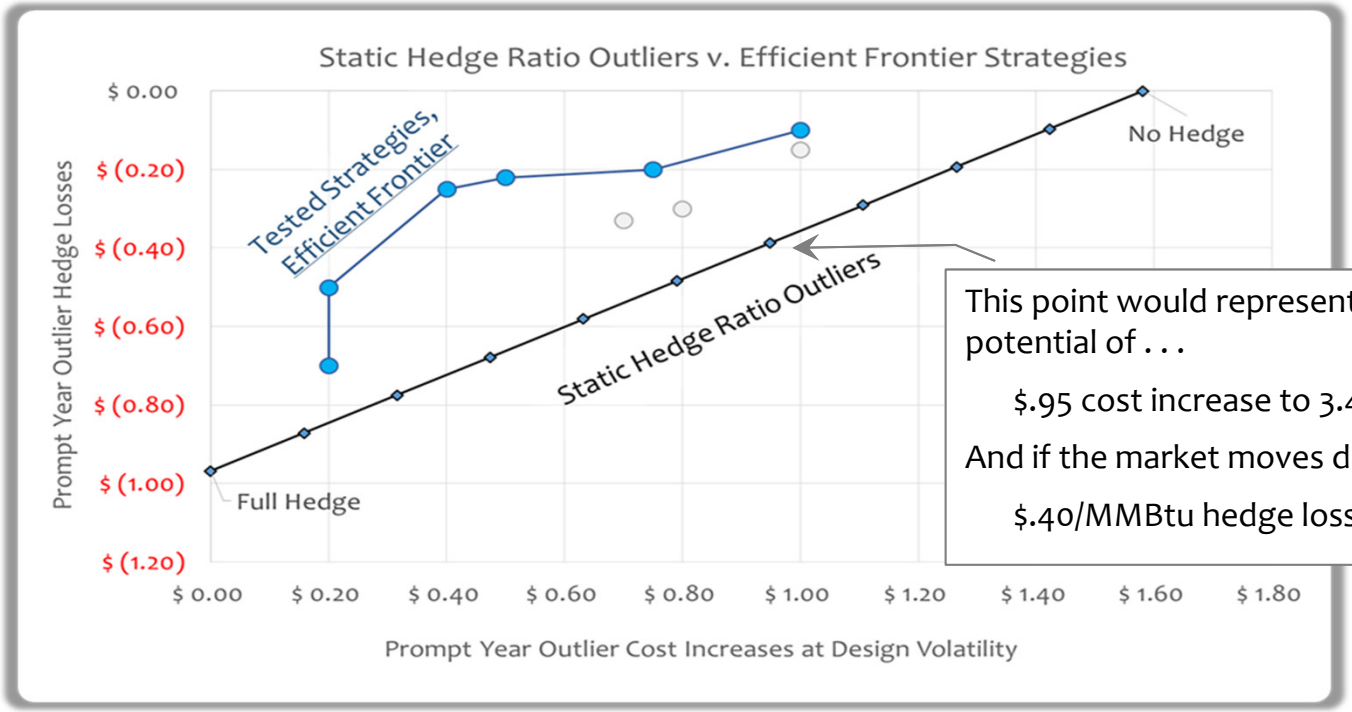
Illustrative Results




This point would represent outlier potential of . . .

$.95 cost increase to 3.45/MMBtu

And if the market moves down,

$.40/MMBtu hedge losses

Assuming $2.50/MMBtu starting prices . . .

- The vertical axis shows 97.5% confidence hedge loss outcomes per MMBtu (Outlier losses)
- The horizontal axis shows 97.5% confidence gas cost increases per MMBtu (Outlier cost increases)
- Static strategies result in "outlier pairs" that fall on a straight line for any given design volatility
- Responsive strategies will push the outlier pairs toward the top left yielding a spectrum of customized choices. Some strategies will be superior to others on their face; they form the efficient frontier.

# Toward Better Regulatory Compacts

What to do as a regulator?

- Change the balance of prudence risk

**Phase 1**

- Establish a common risk language and define metrics so that communications between IOUs and regulators can be clear and meaningful.
  - A common language and metrics can reduce ambiguities surrounding prudence
- Insist that risk be quantified, monitored, and reported; it will change behavior
  - Anyone required to record a doubling of cost risk will find it prudent to do something about it;
  - Anyone required to record a doubling of MtM risk will find it prudent to do something about it;

**Phase 2**

- Require a risk management plan that specifies how companies will respond to risk metrics as they unfold.

# Recent Progress - Washington State

Excerpt from Washington State Policy Statement in Docket UG-132019

"It is the Commission's explicit policy preference that Companies employ risk-responsive hedge strategies. The singular programmatic hedging approach employed by many utilities fails to balance upside price risk with hedge loss risk in any meaningful way. An inflexible plan makes a utility's hedging less adaptable to changing conditions. Utilities must find a way to manage, simultaneously and continuously, upside price risk and downside hedging loss, and evaluate whether the "insurance" benefit justifies the cost.

The Companies should develop a framework for risk mitigation informed by quantitative metrics. Quantitative metrics allow utilities to measure, monitor market risk conditions and facilitate identification of meaningful hedging responses. While we stop short of requiring use of the specific value-at-risk (VaR) methodology described in the White Paper, it is clear to us that each utility must develop robust analytical methods and incorporate these methods in their risk management frameworks.

Finally, the Companies should document data-driven decisions either in response to changing conditions or staying the course in compliance with their hedging plan. This documentation is vital to demonstrate strategic adaptation, allow for evaluation of objectives and outcomes, and provide confirmation of prudent costs."

# More Detailed Discussion

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*More detailed discussion is available in the form of testimony and white papers at*

*www.riskcentrix.com/papers*

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