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# Effective Controls for Energy Trading

ISACA Spring 2012 Conference  
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## Objectives

- Provide a quick overview of a business area
- Give you some ideas if you are asked to audit a marketing or trading group
- Different conditions

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MAY 11, 2012, 8:58 PM INVESTMENT BANKING

# The Bet That Blew Up for JPMorgan Chase

BY PETER EAVIS AND SUSANNE CRAIG




Brendan McDermid/Reuters

Traders work at the New York Stock Exchange post that deals in JP Morgan Chase stock.

When will Wall Street stop springing these types of nasty surprises?

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# Mark Perrin Biography

- ❑ 30 years of Information Technology, Engineering and Finance experience in upstream oil and gas
- ❑ Increases value clients receive from their investments in information technology
- ❑ Manages projects that arise from opportunities to leverage technology
- ❑ Risk Analyst and managed IT teams supporting marketing and risk management




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## Agenda

- ❑ Who is Corvelle?
- ❑ Why have controls for energy trading
- ❑ What's in scope
- ❑ What are the risks
- ❑ Controls to look for
- ❑ Different conditions

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## Corvelle Profile

- ❑ Consulting firm focused on the oil & gas industry
  - Experienced with oil & gas spanning more than 20 years
  - Implemented systems for field data capture, production accounting, financial accounting, marketing and risk management
  - Led development of EPAP for the ERCB
  - Leading EPAP implementation projects
- ❑ Management consulting, data management & IT
  - Project leadership
  - Process review & redesign
  - Data quality & integration
  - Facilitation

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## Why Have Controls?

- Management sets expectations
- Based on expected cash flow
- While participating in volatile markets

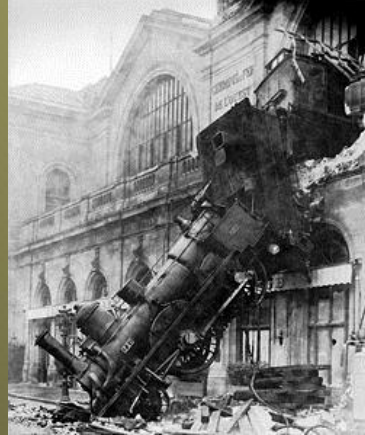
## What's in scope for energy trading?

- Physical deals
- Commodity hedging
- Foreign exchange hedging
- Interest rate hedging



## What are the risks?

- Portfolio goes out of bounds
- During normal operation
- During a system upgrade



## Portfolio Boundaries

- Risk tolerance is set by management based on portfolio metrics
  - Mark to Market
  - Price scenarios
  - Value at Risk
  - Hedgeable volumes



## What is rogue trading?

- Trades on the side
- Not capturing deals
- Trading beyond limits without reporting

### Why might this be a problem?

Portfolio being monitored does not reflect the company's true exposure in the market

## Deal capture systems reflect the actual portfolio

- All deals entered into deal capture system
- Interfaces between systems
- If the deal capture system isn't current, it doesn't reflect the true exposure

## Errors in estimating underlying position

- Cash flow protection vs. speculation
- Foreign exchange exposure
- Hedging

How would you audit to identify these errors?

## Controls

- Business processes have various types controls
- System-based controls support the business process controls



## Preventative Controls

- Data entry
- Interfaces
- Deal confirmation
- Commodity prices

Product	Hub	Strip	Unit	Qty	Bid	Offer	Qty	Buy	Last	Volume	Block	EF
Brent Crude Futures - North Sea	Jul09	+	5	62.00	62.01	10	62.00	9539	0			
Brent Crude Futures - North Sea	Aug09	+	5	62.75	62.78	10	62.75	2028	0			
Brent Crude Futures - North Sea	Sep09	+	5	63.52	63.53	10	63.53	1309	0			
Brent Crude Futures - North Sea	Oct09	+	1	63.53			64.12	898	0			
Brent Crude Futures - North Sea	Nov09	+	1				64.74	722	0			
Brent Crude Futures - North Sea	Dec09	+	1	65.22	65.42	1	65.35	1007	0			
Brent Crude Futures - North Sea	Jan10	+	1	65.33	67.99	5	65.97	209	0			
Brent Crude Futures - North Sea	Feb10	+	75	65.38			65.91	148	0			
Brent Crude Futures - North Sea	Mar10	+	1	65.39			66.01	33	0			
Brent Crude Futures - North Sea	Apr10	+	1				67.29	8	0			
Brent Crude Futures - North Sea	May10	+	1	68.80			67.62	8	0			
Brent Crude Futures - North Sea	Jun10	+	1	62.00	68.58	1	69.08	27	0			
Brent Crude Futures - North Sea	Jul10	+	1									
Brent Crude Futures - North Sea	Aug10	+	1									
Brent Crude Futures - North Sea	Sep10	+	1									

What would we audit around commodity prices?

## Detective Controls

- Interface error logs
- Periodic comparison of the data
- Logs of inappropriate access attempts
- Recorded conversations





# Compensating Controls

- ❑ Oversight
- ❑ Reconciliation

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# Calculation of Metrics



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## Mark to Market

- What is Mark to Market reporting?
- Issue is the day over day change
- Caused by volatile instruments

**What can you audit?**  
 Walk through a sample calculation  
 Instruments marked to the correct price curve

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## Price Scenarios

- A simple metric to look at impact of commodity prices on revenue
- Parameters set by management

**What can you audit?**  
 The parameters in the model

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## Value at Risk

- ❑ VaR is an estimate of the probable worst case decline in portfolio value over a certain time horizon
- ❑ Affected by instrument volatility
- ❑ What can you audit?
  - Horizon
  - Confidence interval

A normal distribution curve with the x-axis labeled from -4 to +4. The area under the curve is divided into sections with the following percentages: 0.5% (between -4 and -3.5), 2.0% (between -3.5 and -3), 13.5% (between -3 and -2), 34% (between -2 and -1), 34% (between -1 and 0), 13.5% (between 0 and 1), 2.0% (between 1 and 2), and 0.5% (between 2 and 2.5). Brackets below the x-axis indicate confidence intervals: 68% (between -1 and 1), 95% (between -2 and 2), and 99% (between -2.5 and 2.5).

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## Metric failed

... One of Wall Street's most widely used early-detection tools for losses is a computer model called **value-at-risk**, a measure of risk that JPMorgan bankers pioneered in the 1990s. The metric is supposed to give banks an estimate how much it could lose on average on a rough trading day ...

A photograph of a large cruise ship at night, illuminated with blue and white lights. In the foreground, a small rowing boat with several people is on the water. The scene is dark, suggesting a night or twilight setting.

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## Hedgeable Volumes

- Management sets volume to hedge
- Accuracy of volume forecast
- Accuracy of hedge portfolio

### How can you audit?

Ask how they know their calculations are accurate



## Various operating conditions

- Normal day-to-day operations
- When there is a cutover to a new system or system version



## Change in Methodology

... On Thursday, Mr. Dimon explained how JPMorgan was tripped up with its value-at-risk measure. In the first quarter, he said, **the bank deployed a new model** that underestimated losses on the hedges...



JPMorganChase 

## Summary

- Provided a quick overview of an area you may have little exposure to
- Gave you some ideas if you are asked to audit a marketing or trading group
- Under different conditions

Discussion



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