

accenture



September 24, 2001

Agenda

I. History of Risk Management during the 70's, 80's, and 90's

II. Evolving role of CRO in Energy Companies

III. Next Stage of Energy Risk Management: Optimization

IV. Insurance Industry Response

The first stage of modern risk management had its beginnings in the 1970s.

Market	Disruptions	Resulting Losses
Foreign Exchange Markets	<ul style="list-style-type: none">■ Removal of the gold standard	<ul style="list-style-type: none">■ Laker Airlines unable to manage revenue in pounds versus buying planes in dollars
Bond Markets	<ul style="list-style-type: none">■ Wild swings in interest rates from 1970 to mid 1980's	<ul style="list-style-type: none">■ Savings and Loan Associations unable to manage interest rates they had to pay depositors versus income they received on fixed rate mortgage loans
Commodity Markets	<ul style="list-style-type: none">■ Oil price spikes 1973, 1979■ Electricity restructuring, 1978 to current	<ul style="list-style-type: none">■ Continental Airlines unable to manage oil price spikes during the Gulf War.■ Illinova unable to meet generation needs of long term obligations with purchases of power on the spot market

In the first stage, active and liquid markets emerged and exchange traded contracts provided a venue for risk management.

Key Characteristics

- Active and liquid spot market
- Active and liquid futures and options markets where hedges can be placed
- Price transparency or market driven sales, purchases, and prices
- Cash market indices

Exchange Trades (Futures Contracts)

- Agriculture
- Financial Markets (1972)
- Crude Oil (1983)
- Natural Gas (1990)
- Electricity (1996)

OTC Financial Instruments

- Foreign Exchange (1981)
- Crude Oil (1986)
- Natural Gas (1990)
- Electricity (1994)

Financial engineers created solutions for corporations attempting to deal with uncertainty and risk, providing innovative, customized solutions that go beyond that of standardized futures contracts.

Market	Demand for Managing Exposure to Market Uncertainties	Solution
Foreign Exchange Markets	<ul style="list-style-type: none">■ Need to manage exposure to exchange rate volatility, e.g., revenue generation in pounds, expenditures in dollars	<ul style="list-style-type: none">■ Major banks and insurance companies established new units of traders and financial engineers to design tailor-made risk management products for corporate customers
Bond Markets	<ul style="list-style-type: none">■ Need to manage exposure to interest rate volatility, e.g., fixed rate obligations with capital earning interest in a floating rate market	<ul style="list-style-type: none">■ Innovation designed to meet demand in foreign exchange, interest rate and commodity risk management spurred the development of financial and commodity exchanges
Commodity Markets	<ul style="list-style-type: none">■ Need to manage exposure to commodity price fluctuations, e.g., volatile input fuel prices, with fixed output price	<ul style="list-style-type: none">■ Traders and financial engineers matched producers together with end-users in back-to-back arrangements

Markets for selected financial derivative instruments have grown substantially.

YE Notional Amounts Outstanding US\$Billion, 1986-96

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Exchange-traded											
Interest rate products	517	610	1,175	1,589	2,054	3,229	4,298	7,321	8,401	8,605	9,209
Foreign exchange Products	49	74	60	66	74	81	98	110	96	82	97
Equity products	52	46	70	112	163	209	238	340	366	502	579
Over the counter*											
Interest rate swaps	--	683	1,010	1,503	2,312	3,065	3,851	6,177	8,816	12,811	--
Currency swaps**	--	184	320	449	578	807	860	900	915	1,197	--

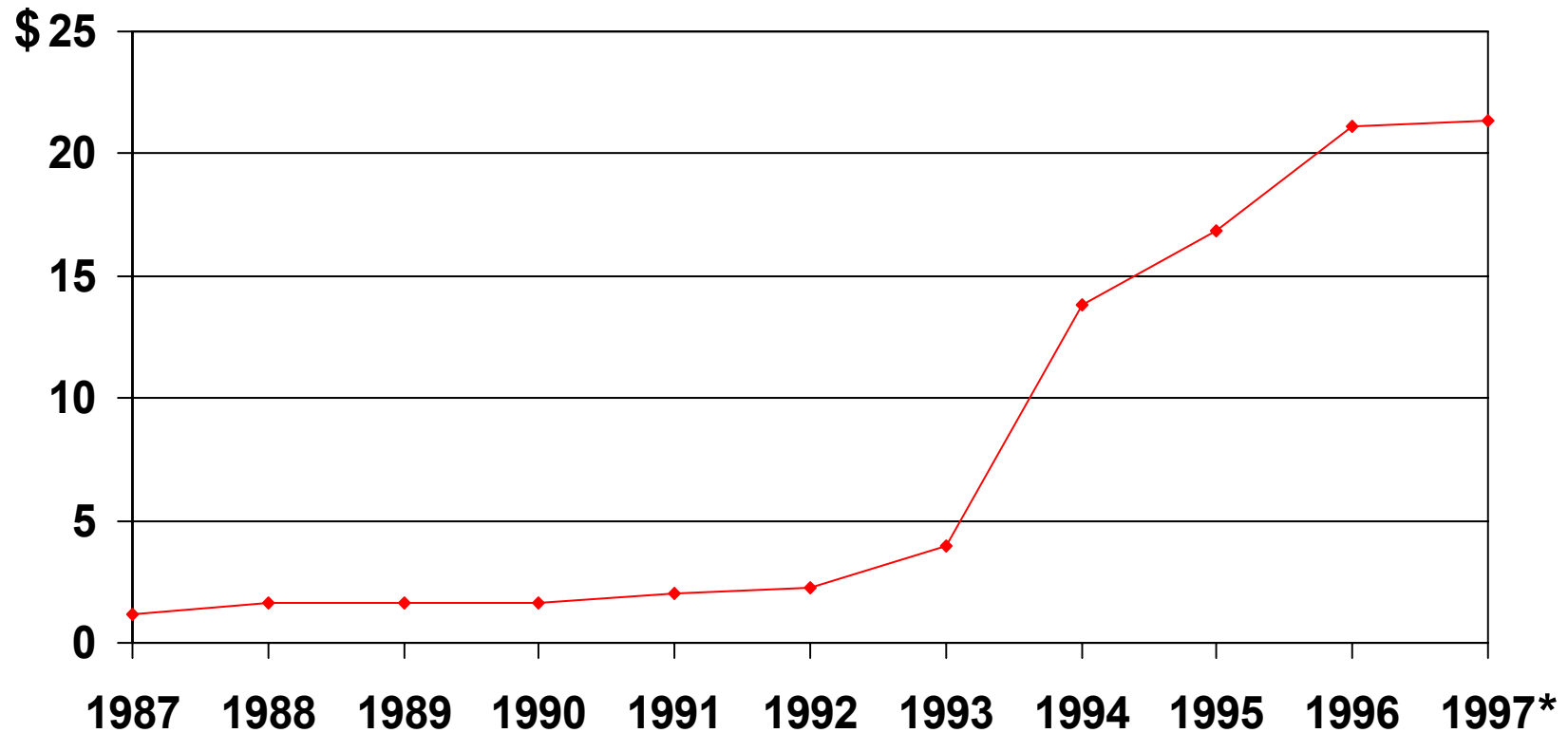
* Data collected by ISDA only; the two sides of contracts between ISDA members are reported once only; excluding instruments such as forward foreign exchange contracts, currency options, forward interest rate agreements, and equity and commodity-related derivatives.

**Adjusted for reporting of both currencies; including cross-currency interest rate swaps.

Source: Capital Market Risk Advisors, Inc.

Derivatives losses have also increased along with the usage of such instruments.

Publicly Disclosed Derivatives Losses
(US\$Billion)



*1997 represents data through August 1997.
Source: Capital Market Risk Advisors, Inc.

Lack of operational controls allowed one rogue trader to accumulate enough losses to bring down Barings Bank.

Details Leading to the Debacle

Losses ■ \$1 billion, firm bankruptcy

Key Players ■ Barings Bank, a mid-sized bank with traditional lines of business and a novice to trading operations

■ Nick Leeson, reputation as a “whiz kid” trader, head of trading and settlements, Singapore office

Strategy ■ Arbitrage; low risk, high return

Product ■ Simple exchanged traded derivative, a straddle option on a futures index

■ Historically profitable

■ Bet on volatility to stay within a specified band

Complication ■ Volatility did not stay within the band

■ Took huge counter-positions to offset large initial loss

Failed Safeguards

- **Minimal senior management awareness and involvement of trading activities**
 - Focus on profitability, not on trading operations
 - Implicit trust in one trader
- **No Risk Manager in place**
 - Nonexistent limit monitoring
 - Lax limit enforcement
 - Manipulation of settlements and marking the book by Head Trader
- **Conflict of interest**
 - Responsibility for P/L and for marking the books fell to the same individual
- **Misalignment of cash requirements and risk appetite**
 - Cash requirement limits were set very high, exceeding the Barings’ risk capital

It is important to distinguish between trading and risk management to understand how to develop the key structural attributes needed to be successful in a deregulated marketplace.

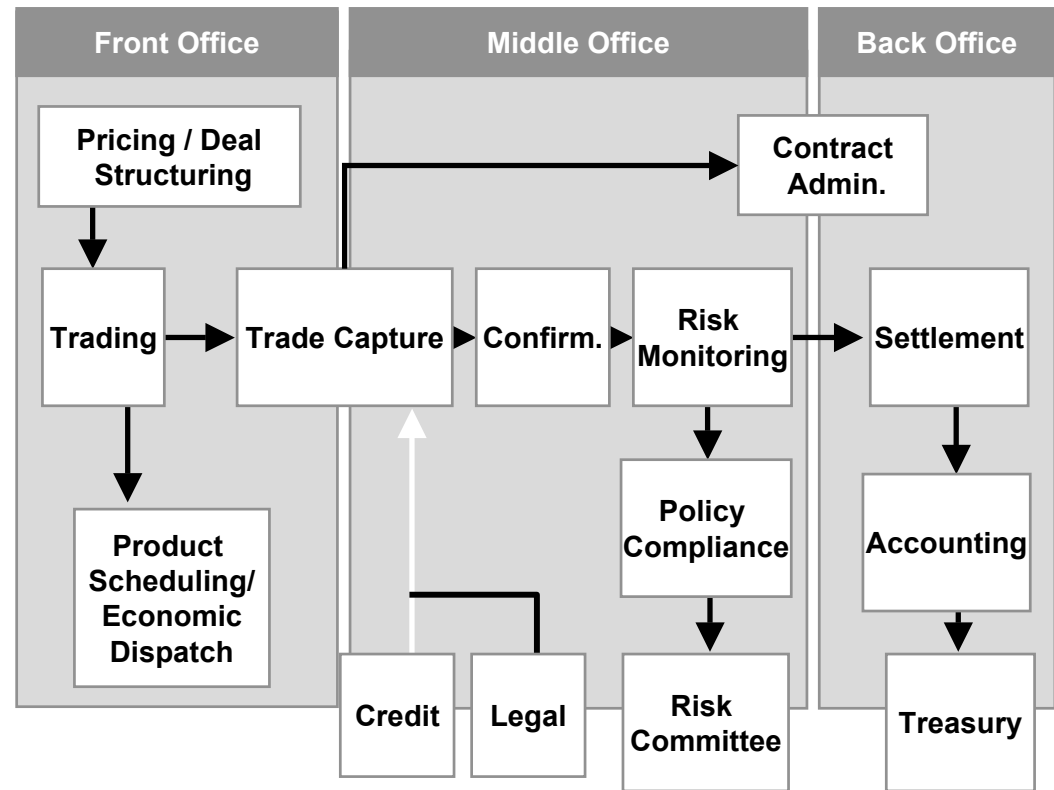
Trading versus Risk Management

Trading

- The use of physical, financial, exchange-traded, and over-the-counter derivative instruments (e.g., futures, forwards, swaps, options)
- The **transactional interface** between the energy supply and demand areas of the firm

Risk Management

- The **capture, measurement, monitoring, and reporting** of physical and financial positions tied to core business operations and proprietary trading operations
- Best practices and industry standards also require risk management to be performed at both the corporate and enterprise level



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Risk management is now recognized as a core competency for players in the energy markets.

Example: Entergy and Koch

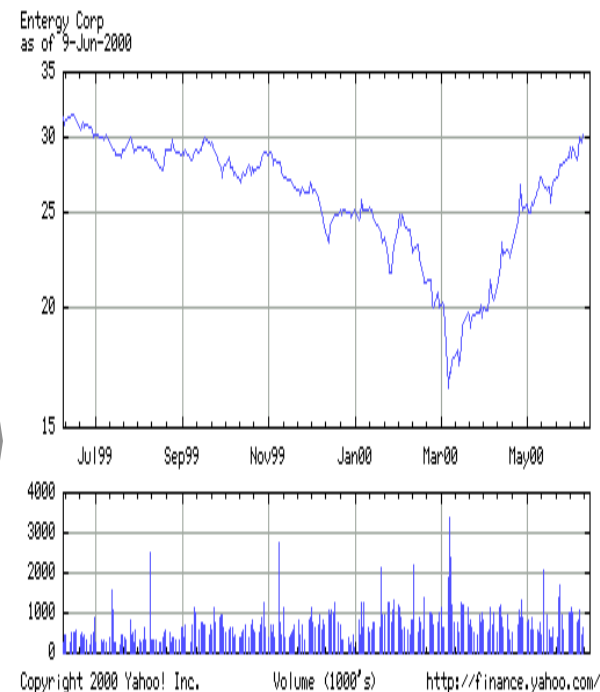
Prior to Entergy-Koch JV Announcement

- Entergy had a negative credit outlook due to weak credit protection measures
- S&P's had concern over Entergy's strategic plan to:
 - Become a significant player in relatively high-risk non-regulated national and international power markets
 - Increase its investments in non-regulated, commodity-based businesses and maintain stringent financial measures

Announcement of Entergy-Koch JV

- 50/50 joint venture of Entergy and Koch Industries
- S&P viewed the Entergy and Koch Venture as a “favorable” credit development:
 - Partners Entergy with a successful operating record in high-risk commodity-based businesses
 - Koch possesses disciplined commodity trading controls, policies, procedures, systems, and infrastructure
 - Business profile of the trading and marketing venture will be enhanced through management focus and the creation of significant critical mass
 - Shared risk structure better protects both Koch and Entergy from volatile markets

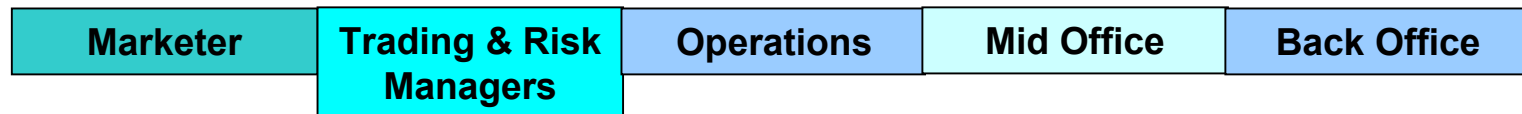
Share Price



Initially risk management activities were focused on trading activities as a reaction to high profile trading losses.

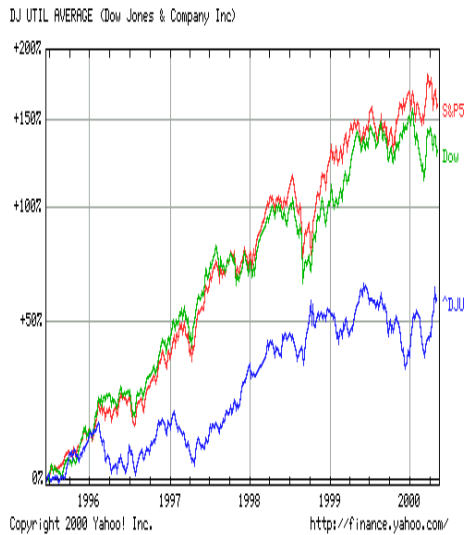
	Derivatives Debacle	Magnitude of Loss	Cause of Debacle
Historical Debacles	Barings Bank	Lost \$1 billion, declared bankruptcy	Lack of independent risk oversight
	Metallgesellschaft	Lost \$1.3 billion in maintenance margin calls	Mismatched physical and financial book
Utilities Debacles	First Energy	Lost over \$25 million due to counterparty default and replacement power purchases	Inadequate credit risk management
	PacifiCorp	Lost at least \$13 million due to poor management of extreme price volatility	Inadequate market risk management
	Illinova (Illinois Power)	Purchased \$98 million replacement power due to deliberate strategy of buying on spot market	Lack of market risk management
	LG&E	Lost \$225 million in Midwest power price spikes in 1998, exited the trading business	Misinterpretation of forward price curve-Lack of market risk management
	Cinergy	Lost over \$74 million in Summer 1999, may exit the supply business	Inadequate market risk management, also associated with legal risk

In an effort to address the risks associated with trading, trading centric risk management solutions were implemented.



Industry analysts, credit rating agencies and shareholders are sending a strong message to energy companies regarding the risks associated with core business activities.

DJ Utility vs. Equity Indices



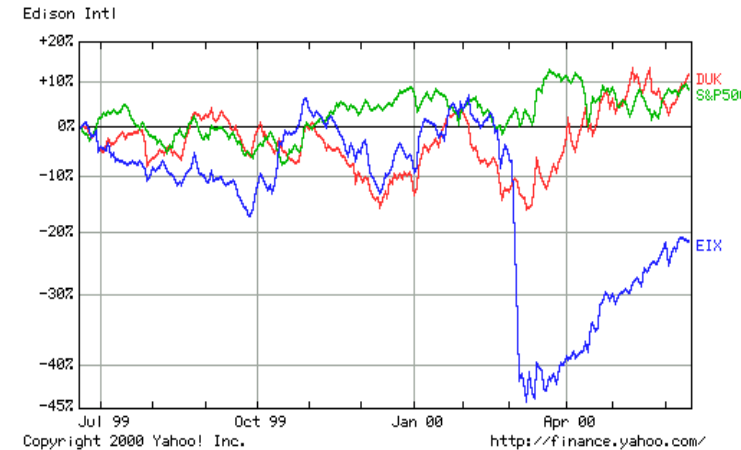
“Despite solid earnings growth, stock performance was dismal at best (for electric utilities). In 1999, average stocks were down 23% and relative under-performance was at 42.8%”

Contributing factors:

- Negative reaction to M&A activity
- Rising interest rates/Fed tightening
- Deregulation uncertainty
- Market price volatility and risk management capabilities

-Merrill Lynch 3/22/2000

Utility Share Prices



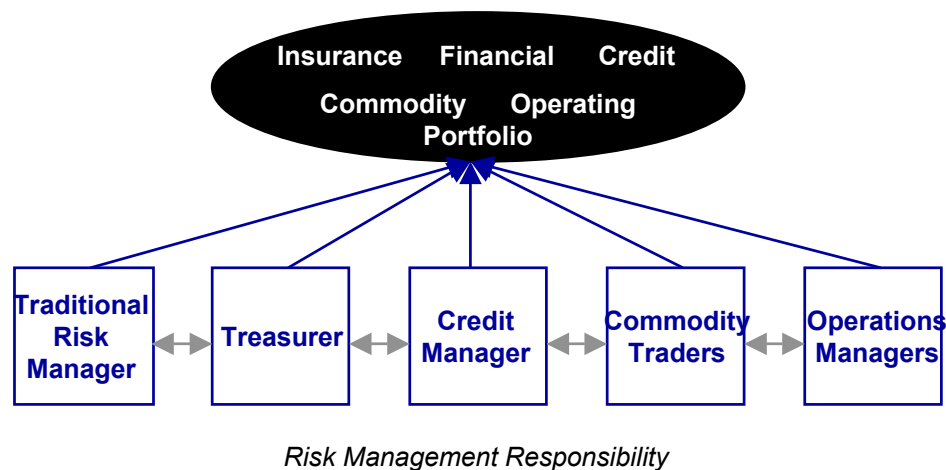
Volatility of Share Price

	Duke	SO	REI	EIX
1996-2000	5.86%	6.30%	6.49%	9.82%
1999-2000	8.07%	8.36%	7.77%	14.95%

The bar has been raised to enable a holistic enterprise risk management framework that integrates current trading centric solutions with solutions for the balance of the core business.

Enterprise Risk Management

High Level Approach



Enterprise risk management is the systematic approach to identifying, categorizing, quantifying, and proactively dealing with all risk in a corporation in order to preserve and enhance value.

Benefits

- **Improves senior management strategic decision making**
 - Heightens awareness of corporate risk position
 - Increases focus on making explicit risk vs. return decisions
 - Drives allocation of risks among investments to earn best overall returns (risk-adjusted RORs)
- **Increases management accuracy of key stakeholders**
 - Board of Directors – governance, management transparency
 - Equity Analysts – equity valuation accuracy
 - Rating Agencies – creditworthiness accuracy
 - Regulators – risk transparency
- **Reduces costs and creates efficiencies in mitigating risks**

Firms must possess the supporting risk management infrastructure required to integrate the business information and activities across both regulated and unregulated businesses.

Dimensions of Corporate Risk Management Infrastructure



Strategy

- Articulated strategic vision and approach towards risk taking activities
- Risk based capital allocation processes
- Investment analysis performed within the portfolio (and on a stand alone basis)

Process

- Clearly defined corporate level and business unit risk management policies and procedures
- Effective controls and risk limits

Organization

- Strong, risk centric governance structure
- Chief Risk Officer

Technology

- External and internal data feeds/interfaces
- Data warehousing and middleware capabilities
- Risk measurement engines
- Data visualization tools

Comprehensive enterprise risk management policies must exist which identify the key responsibilities and processes across the organization.

Data Collection and Aggregation

- Specific Data requirements (content, frequency, format) for:
 - Trading Operations
 - Merchant Plant Management
 - Retail
 - Generation
 - Treasury
 - Transco./ Distco.
 - Corporate Planning
 - Corporate M&A
 - Other
- New transaction information
- Counterparty information
- Definition of risk disaggregation and re-aggregation techniques
- Process designs for data feeds
- Data storage specifications processes

Risk Measurement/ Valuation

- Specific market risk measurement techniques and valuation frequency (IT risk measurement documentation)
 - VaR, CVaR, EaR
 - MTM
 - RAROC
 - Sensitivities
- Specific credit risk management techniques:
 - Counterparty netting
 - Counterparty assessment
 - Default and recovery rate calculations/ sources
 - Credit limits
- Asset, new project, operational, regulatory and other risk valuation techniques

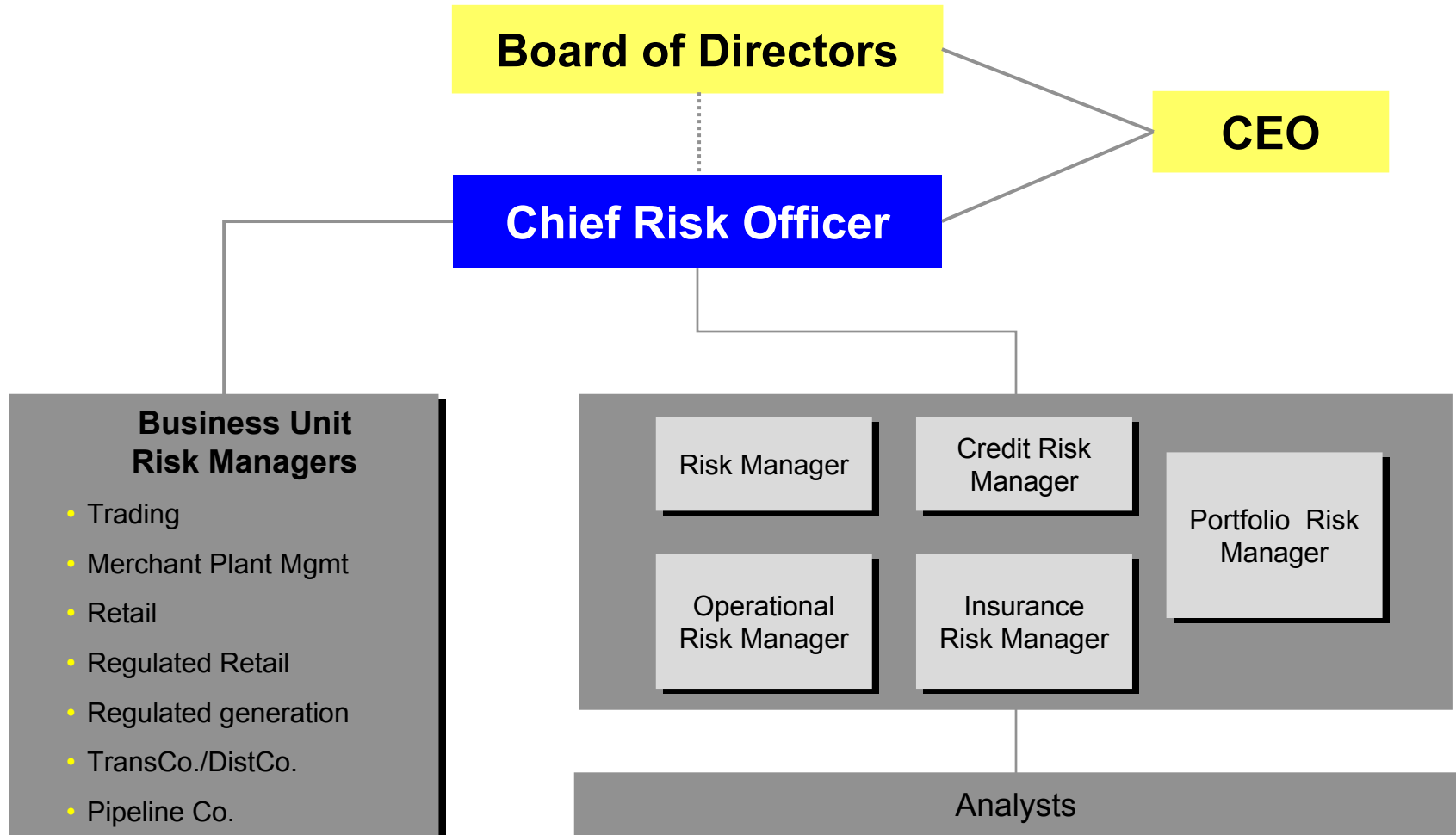
Risk Analysis and Monitoring

- Frequency of limit and overall exposure verification
- Processes for managing excesses/ shortfalls
- Active vs. passive limit violations procedures
- Penalties for active variances
- Stress testing and scenario analysis
- Updating data, limits, and information responsibilities

Risk Reporting

- Frequency and content of risk reports
- Responsibilities concerning report review and communication
- Responsibilities for acting upon information
- Additional documentation/ explanatory data processes

The Chief Risk Officer must report directly and independently to senior management and have responsibility for corporate and business unit risk managers.



The Chief Risk Officer's role is to oversee risk management activities across the entire organization.

Chief Risk Officer Roles & Responsibilities



- Chairs and manages Corporate Risk Management Committee
- Oversees risk management across entire corporation
- Assists in optimizing performance of core corporate assets
- Develops and maintains all enterprise risk policies and procedures
- Approves trading strategies
- Potentially values merger and acquisition opportunities
- Reports directly to the Board of Directors

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The uniqueness and complexity of risks inherent In Energy Markets support the need for an enterprise risk management role in the Energy company.

Money Markets

- Markets are more mature
- Fewer price drivers
- No impact of storage & delivery
- High correlation between spot and long term pricing
- No seasonality
- Little regulation
- High liquidity
- Centralized Market
- Simple derivative contracts

Energy Markets

- Newer markets
- Complex price drivers
- High impact of storage & delivery
- Low correlation between spot and long term pricing
- High seasonality
- Little to very high regulation
- Low liquidity in some markets
- Regionalized Commodity Markets
- Complex derivative contracts

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Integrated energy and utility companies are moving towards an enterprise risk management approach of identifying, measuring, and managing firm-wide risks.

Representative list of leading energy companies investing in enterprise risk management infrastructure for managing risks

Enron

Dynegy

Duke

Koch

Entergy

Insurance Industry Response...

- Fully Integrated Insurance Programs
 - Property / Casualty / Specialty / FX / Commodity / Credit

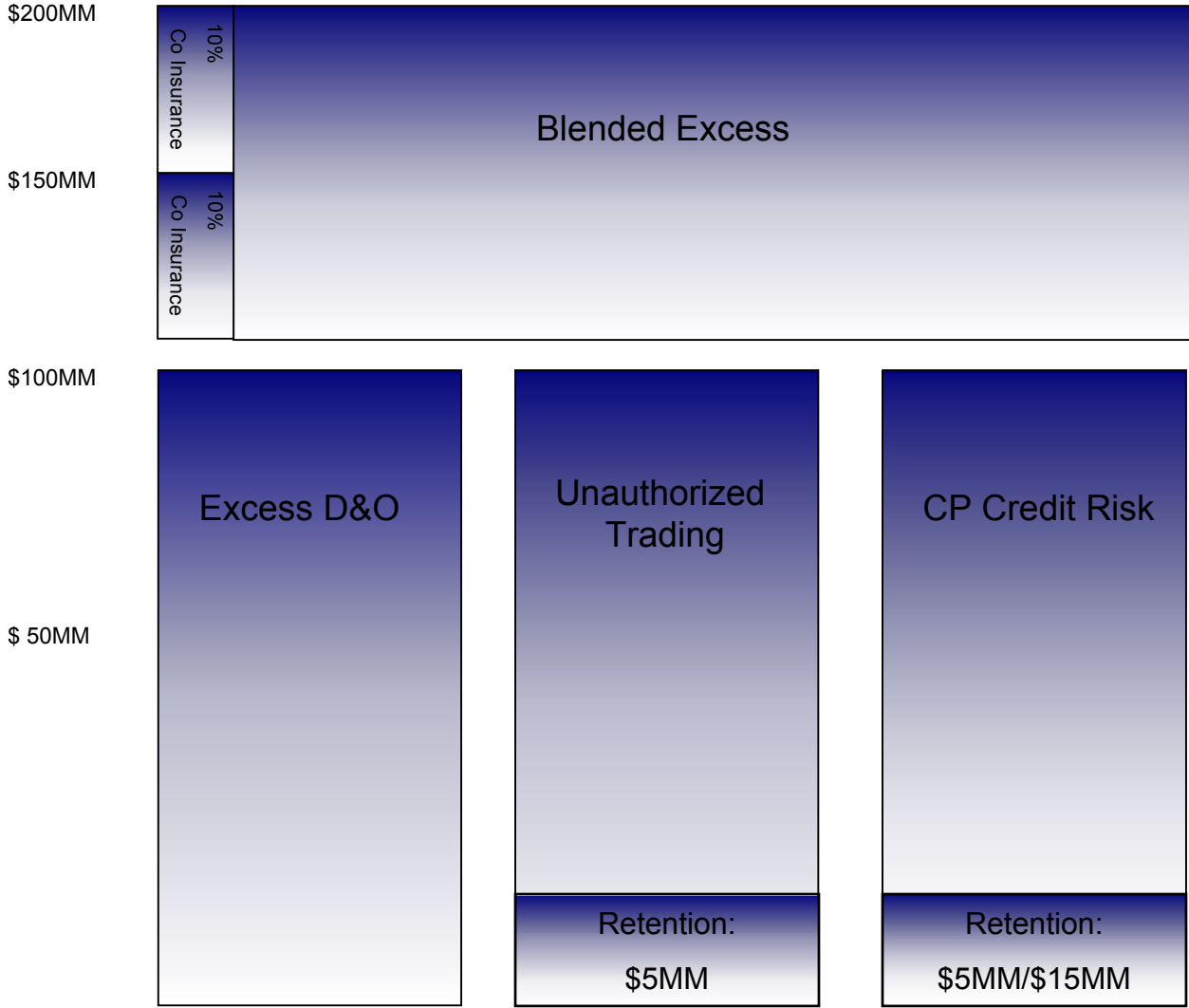
- Blended Programs
 - Property / Casualty / Specialty

- Non-traditional Products
 - Monoline / “Bolt-ons”

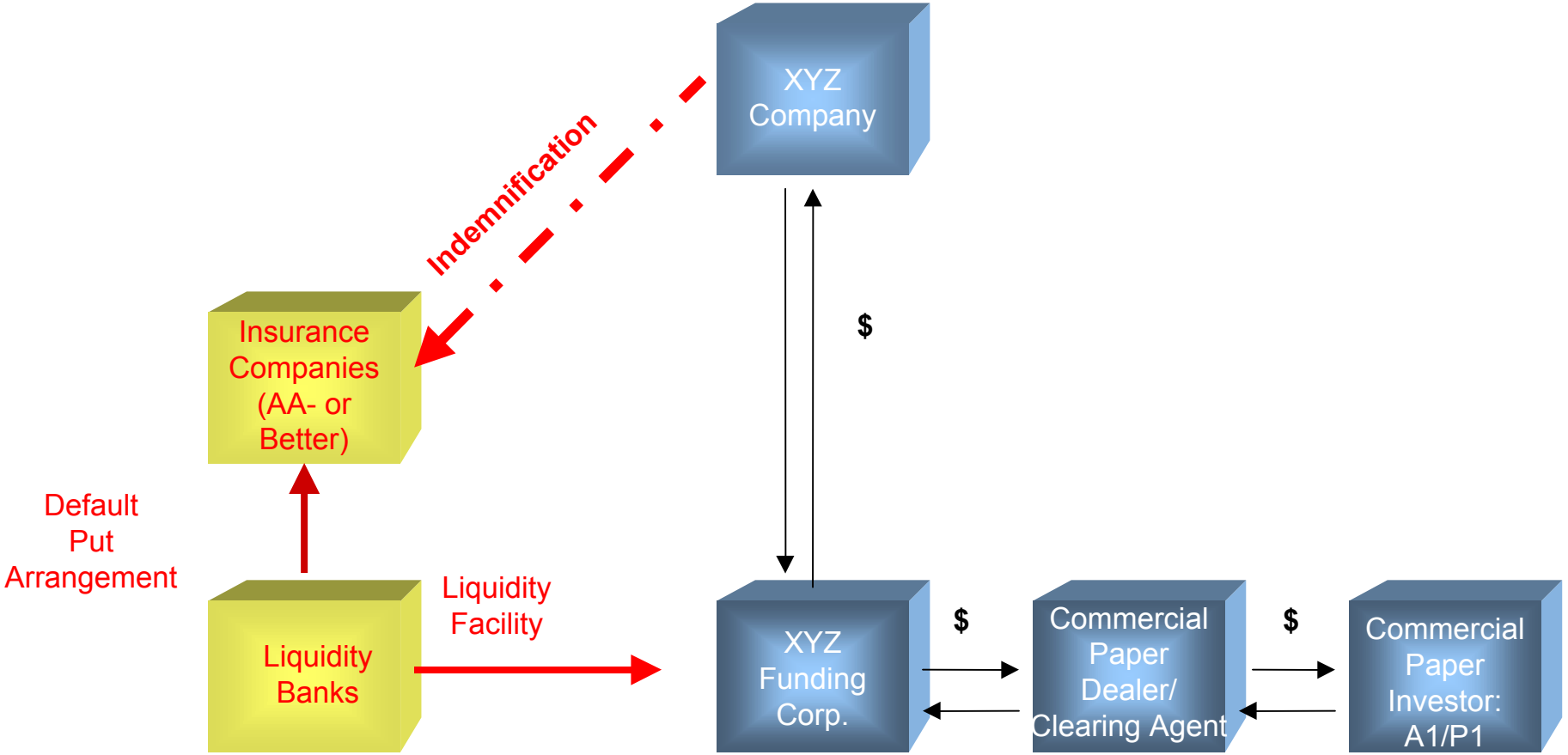
Emerging Products...

- Weather Insurance
- Forced Outage Coverage
- Counterparty Credit Risk
- Unauthorized Trading
- Tax Opinion Insurance
- Residual Value / Credit Enhancement

Emerging Products: Example 1 - Excess D&O / Unauthorized Trading / CP Credit Risk



Emerging Products: Example 2 - Commercial Paper Backstop



Emerging Products: Example 3 - Integrated Risk

