GARP: Creating A Culture of Risk Awareness

**Mission:** To advance the risk profession through education, training and the promotion of best practices globally.

- Founded 1996
- Not-for profit
- 150,000 members
- 195 Countries
- Non-partisan industry connection

- Globally recognized certification
- Quality oversight
- Immediate application

Administers the Financial Risk Manager (FRM®) and Energy Risk Professional (ERP®) exams; certifications **recognized and valued** by risk professionals worldwide.
Driving Forces Behind Growth in Energy Risk Management

- **Government Influence**
  - New mega-project investments
  - Reserves and production growth
  - Transport and storage infrastructure

- **Supply Fundamentals**
  - Growth in National Oil Companies
  - Energy policy and regulatory initiatives
  - Environmental considerations

- **Market Complexity**
  - Link between physical and financial assets
  - Pricing hubs and market illiquidity
  - Larger and more complex datasets
  - Quantitative finance skills are transferable
Basic Risk Typology

• Market
  ✓ What are the internal and external factors I need to be concerned about?
  ✓ What is my potential exposure and how do I protect value?

• Credit
  ✓ Will I get paid back and what is my recourse?
  ✓ What is my potential loss if my counterparty defaults?

• Operational
  ✓ What is the economic impact of a plant outage?
  ✓ Have I implemented a safety culture that protects human lives?
Modeling Potential Outcomes

95% Confidence Level

- Protect against tail risk
- High Impact, Low Frequency
- No Surprises!

5% Probability

Gain

Normal Return Distribution

Loss
Quantifying Market Risk

• Value-at-Risk (VaR) Quantifies Potential Loss
  ✓ Loss at a predetermined probability level over a specific time frame
  ✓ Does not quantify the expected loss when VaR is exceeded

• Stress Testing, Reverse Stress Testing and Scenario Analysis
  ✓ Tools used to simulate extreme (tail risk) events and measure their impact
  ✓ Non-statistical tool → “what if” scenarios
  ✓ Complements other risk modeling efforts – VaR
MTM Valuation Creates Potential Counterparty Risk
Human Error and Safety in Complex Operating Systems
Top Ten Risk Management Tasks

1. Risk Governance – Communicate risk to stakeholders
2. Modeling – Estimate, interpret, and report VaR
3. Financial Markets – Assess counterparty risk
4. Risk Governance – Ensure compliance with regulatory updates
5. Credit Risk – Calculate PD, EAD, and LGD
6. Financial Markets – Identify and measure risks in individual assets and asset classes
7. Modeling – Communicate and report deficiencies of VaR
9. Modeling – Select appropriate VaR model
10. Credit Risk – Calculate regulatory capital for credit risk

- Results from 2015 GARP FRM Job Task Analysis
Top Ten Knowledge Areas or Risk Skill Sets

- Risk Governance – Basic risk types
- Modeling – Value-at-risk (VaR)
- Enterprise Risk Management – Liquidity risk
- Market Risk – Stress scenarios
- Financial Markets – Interest rates and measures of interest rate sensitivity
- Risk Governance – Role of risk management in corporate governance
- Financial Markets – Bonds, loans, equities, commodities, and FX
- Financial Markets – Risk management strategies
- Financial Markets – Forwards, futures, swaps and options
- Modeling – Stress testing and scenario analysis

- Results from 2015 GARP FRM Job Task Analysis
Building an Effective Risk Management Process

• High level support is necessary
• Integration is essential
• All employees should be in the loop
• Risk education is important for everyone

---“Everyone in the Organization is a Risk Manager”
GARP Energy Risk Professional (ERP®)

Growth in GARP ERP® Exam registration

- 734 in 2010
- 1,060 in 2012
- 1,392 in 2014

17.5% annual registration growth

More than 900 ERP's worldwide

Countries with the Highest % of Certified ERPS

- United States 33%
- Canada 9%
- Germany 5%
- Switzerland 6%
- UK 10%
- India 7%
- Singapore 6%

In 2014 candidates came from 70 different countries

Exams are offered in over 90 different locations
Creating a culture of risk awareness*

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About GARP / The Global Association of Risk Professionals (GARP) is a not-for-profit global membership organization dedicated to preparing professionals and organizations to make better informed risk decisions. Membership represents over 150,000 risk management practitioners and researchers from banks, investment management firms, government agencies, academic institutions, and corporations from more than 195 countries and territories. GARP administers the Financial Risk Manager (FRM®) and the Energy Risk Professional (ERP®) Exams; certifications recognized by risk professionals worldwide. GARP also helps advance the role of risk management via comprehensive professional education and training for professionals of all levels. www.garp.org.
Risk Assessment

• Outward looking
  ✓ Define external opportunities and threats
  ✓ Establish a baseline for evaluating performance against benchmarks
  ✓ Identify key stakeholders and communication links

• Internal driven
  ✓ Identify intern risk drivers
  ✓ Adopt measures to quantify risk and performance
  ✓ Develop a risk appetite framework
Monitor, Review and Communicate Risk

• Communication is key to creating a positive feedback-loop
  ✓ Instills confidence
  ✓ Creates organizational “buy-in”
  ✓ Helps to achieve objectives
<table>
<thead>
<tr>
<th>GARP’s Risk Certification Programs</th>
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<tbody>
<tr>
<td><strong>Financial Risk Manager (FRM®)</strong></td>
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<tr>
<td>Leading global professional designation program for risk management</td>
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<td>Administered by GARP since 1997</td>
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<td>Program objective — assess an individual’s ability to measure and manage risk in a real-world environment</td>
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<tr>
<td>FRM Committee comprised of senior risk managers and researchers</td>
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<tr>
<td><strong>Energy Risk Professional (ERP®)</strong></td>
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<tr>
<td>Launched in 2009 to address the growing importance of energy</td>
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<tr>
<td>Program objective — assess an individual’s ability to measure and manage physical and financial risk in the energy industry</td>
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<tr>
<td>EOC Committee comprised of senior risk managers, commodity traders, and quantitative analysts</td>
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Evolution of Best Practices in Risk Management

From

• A decentralized, non-strategic, compartmentalized process
  ✓ “Silo-by-silo” approach primarily used by organizations until recently

To

• A centralized approach with defined strategic goals
  ✓ Successful implementation can create a long-run competitive advantage
  ✓ Central tenet of Enterprise Risk Management (ERM)

- *Enterprise Risk Management: Theory and Practice*, Brian W. Nocco and Rene M. Stultz
Survey Conclusions

• Observations
  ✓ Communication skill is very important
  ✓ Governance and ERM have grown in importance
  ✓ Sophisticated quantitative skills may be needed by some but not required generally

• Risk management continues to evolve towards the governance of risk and the "smart application" of quantitative skills
  ✓ Regulators are signaling this and banks have largely tuned in as well
  ✓ This is a movement "up the food chain" and is positive for the profession

• Considerations for the future
  ✓ Regulation and Compliance
  ✓ Liquidity risk
  ✓ Cybersecurity
Mitigation vs. Exploitation

• Portfolio Optimization
  ✓ Asset allocation models
  ✓ Derive the “efficient frontier” risk-return profile

• Capital Management
  ✓ Capital adequacy, structure, attribution and allocation