

Risk Engineering in the Energy Sector

Managing, Eliminating and Mitigating Risks in a World of Uncertainty





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Managing, Eliminating, and Mitigating Risks in a World of Uncertainty

Risk Engineering Industry Insights

What is Risk Engineering?

Risk Management is the most crucial aspect of any business's activities. Effective risk management protects every aspect of your business, from your employees to your clients to your assets & income to your bottom line.

Risk management, however, is only one portion of the overall risk strategy; risk management is about identifying possible risks, creating a plan to eliminate and/or mitigate those risks, and how to improve risk management's overall efforts.

Risk Engineering, on the other hand, is the technical, hands-on portion of risk management. Specialized risk engineers go even further than identifying and planning; they look at the data, they perform audits, they assess all present risk mitigation strategies, they get right down to the nitty-gritty.

While risk management focuses on the business's overall risk environment, risk engineering focuses on the risks that could lead to significant physical, personnel, business interruption, and/or financial loss.

The core principals of effective risk engineering include:

- Minimizing frequency and severity of incidents should they happen
- Implementing sustainable risk control procedures
- Significantly improving the organization's safety operations
- Analyzing data and insights to determine the best course of action

There are 8 crucial steps to effective risk engineering:

- 1. Risk Identification:**
Conducting on-site surveys, reviewing processes, and analyzing operations to identify potential hazards - either physical, operational, environmental, or financial.
- 2. Risk Assessment & Analyses:**
Utilizing data, modelling, and industry benchmarks, they will evaluate the potential frequency of the risk, the possible severity, and the potential impact.
- 3. Risk Management Auditing:**
A systematic evaluation of an organization's operations, facilities, processes, and management practices to assess exposures to loss and identify opportunities to reduce risk to aid in managing the client's risk profile.
- 4. Loss Prevention & Mitigation:**
Improving the risk profile of the site or corporation by developing risk control measures and proposing recommendations for either new initiatives or in the maintenance of existing measures.
- 5. Evaluate Existing Control Measures:**
Determines whether the safeguards, procedures, and systems a company has in place are effective in preventing or reducing incidents and help both the client, as well as the risk engineer, in understanding how well risks are presently being managed. This will, inevitably, help identify gaps and weaknesses, which can then be improved upon.

6. Recommend, Advise, Educate:

Following steps 1 to 4, the risk engineer will provide recommendations on additional improvements, advise the client on how and why certain areas can be improved upon, and providing risk management/engineer education to ensure the client understands the overall picture.

7. Monitor:

Focus on tracking the performance and effectiveness of risk controls, compliance with procedures, and changes in risk exposures, so that weaknesses can be corrected and risk reduction remains continuous.

8. Make Adjustments:

Conducting on-site surveys, review processes, and analyze operations to identify potential hazards - either physical, operational, environmental, or financial.

An underwriter's job is to assess and evaluate existing risks to determine whether to provide insurance coverage, under what terms, and at what cost.

Thus, providing the underwriter with a risk engineering report provides the underwriter with detailed insight into the client's risk and control measures, which further enables the underwriter in making informed decisions on coverage, pricing, and loss prevention.

Six ways that the risk engineering report can benefit the underwriter:

1. In-Depth Risk Assessment:

A risk engineer's survey or audit of the facilities, processes, and operations to identify hazards and exposures, providing the underwriter data to accurately gauge the likelihood and severity of potential incidents.

2. Informed Coverage Decisions:

Knowing the effectiveness of risk controls allows underwriters to tailor policy terms, limits, and exclusions.

3. Risk Control Strengths and Weaknesses:

Highlights areas where the client is well-protected and where vulnerabilities exist. This allows underwriters to price policies appropriately and suggest or require improvements before issuing or continuing coverage.

4. Facilities Loss Prevention:

Recommendations from risk engineering audits or assessments can reduce the frequency or severity of losses. Underwriters value clients who actively manage risks, which can lead to better terms and longer client retention.

5. Regulatory & Standards Compliance:

Effectively confirms that the client meets legal, safety, and industry requirements and reduces potential liability for the insurer and supports underwriting decisions.

6. Strategic Risk Selection:

Helps underwriters decide which risks align with the insurer's appetite and which may require adjustments, exclusions, or declined coverage

Risk Engineering & The Underwriter

As it is with the insurance industry, there are two main areas in which risk engineering can benefit: the client and the underwriter.

The main goal of risk engineering is to help businesses and corporations reduce, improve upon, or eliminate risk in order to reduce expensive and costly incidents, which - ultimately - will also help improve your overall coverage options as well as reduce premiums.

WMB's Risk Engineering Report sets the industry standard. By thoroughly surveying each site, capturing extensive photographs, and closely observing company assets and operations, we produce a comprehensive and highly detailed risk engineering report.

This report serves as a crucial component of the underwriting submission, providing underwriters with such rich insight that it's as if they have personally visited the site.





Why Risk Engineering is Crucial for Your Business

Risk Engineering Industry Insights

How WMB Can Engineer an Environment of Minimal Risk and Maximum Return

The main goal of risk engineering is to protect businesses, people, assets, operations, and reputation by:

1. Preventing incidents and losses
2. Minimizing the severity of losses when they occur
3. Supporting sustainable, cost-effective risk management
4. Enabling organizations to operate safely and efficiently

From an insurance perspective, risk engineering is a win-win:

For insurers → It reduces claim frequency and severity, improving profitability .

For clients → It lowers premiums, prevents costly downtime, and protects people and assets.

Effective risk engineering allows organizations to proactively identify, assess, and mitigate risks before they result in financial loss, operational disruption, regulatory penalties, or harm to people. In industries like commercial fleets, manufacturing, or construction, where hazards are inherent, risk engineering is the backbone of safety, efficiency, and sustainability.

With **41%** of organizations reporting that they experienced three or more critical risk events since 2023 and 35% of risk executives blaming compliance and

regulatory risks as their greatest threat, can your business really afford not to invest in a risk engineer?

Why WMB is the Right Choice

At WMB, we recognize the critical importance of proactive risk management in today's complex business environment. To this end, we have a dedicated risk engineer on staff, ensuring that our operations are continuously assessed and optimized for safety and efficiency.

By integrating advanced risk engineering practices, WMB is adept at identifying potential hazards, implementing preventive measures, and fostering a culture of safety across all levels of the organization.

This strategic approach not only minimizes potential risks but also enhances operational performance, leading to sustainable growth and long-term success.





Risk Engineering for the the Auto Fleet Industry

Risk Engineering Industry Insights

Key Risk Factors

Whether it's delivering goods and services or transporting employees, the use of company vehicles is undeniably essential. However, along with the benefits of fleet operation come certain risks that businesses must confront.

In 2023, 8,622 of the 77,076 (11%) collisions investigated by the OPP involved commercial vehicles. In 2024, it was reported that 1 in 5 (20%) of OPP-investigated collisions involved transport trucks. And in the first 9 months of 2025, 3 transport trucks collided on highway 7 in Ontario while, in June, a fuel tanker collided with two personal vehicles, killing one and severely injuring the other.

There's no way around it: Commercial fleet vehicles are exposed to significant risk. To help safeguard your personnel, assets, and bottom line, consider taking a strategic approach to fleet risk management.

Some risks existing within the fleet industry are:

Vehicle-Related Risks

- Mechanical failures
- Aging fleet
- Collisions
- Cargo damage
- Inadequate vehicle for task

Driver-Related Risks

- Driver error
- Inadequate training
- Regulation non-compliance
- Policy violations

Operational Risks

- Route hazards
- Weather exposure
- Fuel management
- Logistical failures

Technology & Cyber Risks

- Telematics failures
- Cyber attacks
- Systems maintenance

Risk Engineering Analyses

To properly assess existing risks and create a strategy that aligns with your business goals, your risk engineer will assess:

- Vehicle fleet composition & condition
- Driver Selection Management & Safety
- Operational practices
- Safety policies and programs
- Regulatory compliance
- Environmental & external risks
- Emergency Preparedness & incident response
- Data & Technology

Benefits of Risk Engineering for Fleet

Following the successful implementation of your risk engineering strategy, you may likely experience:

- Enhanced driver safety
- Decreased operational costs
- Achieve regulatory compliance
- Improve productivity and efficiency
- Reduce liability
- Safeguard reputation and business goals
- Reduced frequency & severity of losses

WMB Risk Engineering Services For Fleets

Risk engineers play a strategic role in helping businesses reduce both the frequency and severity of fleet-related losses. By combining data-driven insights, proactive safety measures, and operational assessments, they work closely with organizations to protect drivers, vehicles, cargo, and reputations with an aim to prevent losses before they happen and optimize fleet performance.

Driver Training & Safety Programs

Risk engineers evaluate customized driver training initiatives that focus on:

- **Defensive Driving Techniques:** Teaching drivers how to anticipate hazards and make safer, quicker decisions on the road.
- **Fatigue Management:** Identifying risk factors associated with driver fatigue and implementing scheduling practices that promote alertness.
- **Regulatory Compliance Training:** Ensuring drivers understand and adhere to transportation laws, such as Hours of Service (HOS) rules, licensing requirements, and road safety standards.

Telematics & GPS Monitoring

Modern fleets are increasingly reliant on technology to monitor vehicle and driver performance. Risk engineers leverage telematics data to:

- Track speeding incidents, harsh braking, sudden acceleration, and idling time.
- Identify high-risk driving behaviors before they lead to collisions.
- Provide real-time alerts and post-incident analytics to improve accountability.
- Audit adherence to planned routes.

Loss Trend Analyses

By analyzing historical data and incident patterns, risk engineers help organizations identify recurring risks and systemic weaknesses:

- Evaluate accident reports, maintenance records, and driver data to uncover hidden trends.
- Pinpoint high-frequency loss locations, times of day, or environmental factors.
- Recommend targeted mitigation strategies, such as route adjustments, policy updates, additional training for specific drivers, or vehicle changes.

Regulatory Compliance Support

Commercial fleets face a highly regulated environment, and non-compliance can result in fines, reputational harm, and operational downtime. Risk engineers help businesses:

- Prepare for inspections and audits by regulatory bodies.
- Implement systems to ensure adherence to vehicle weight restrictions, hazardous materials handling, and other relevant rules.
- Develop compliance reporting tools and documentation procedures to demonstrate alignment with industry standards.

WMB Commercial Fleet Coverage

For commercial fleets, risk engineering focuses on minimizing the likelihood of accidents, reducing repair and liability costs, and improving overall driver and vehicle safety. Insurers typically bundle coverage options with tailored risk engineering services designed to manage exposures tied to vehicle operations, cargo transport, and driver behaviour. Here are the key lines of coverage commonly offered for commercial fleets

Automobile Liability Coverage

- **Commercial Auto Liability:** Covers bodily injury and property damage caused to others in accidents involving company vehicles.
- **Excess / Umbrella Liability:** Extends coverage limits beyond

standard auto liability to address severe or catastrophic losses.

Physical Damage Coverage

- **Collision Coverage:** Covers repair or replacement costs if a vehicle is damaged in an accident.
- **Comprehensive Coverage:** Protects against non-collision events like theft, vandalism, fire, or severe weather damage.
- **Specified Perils Coverage:** Targets specific risks such as hail, floods, or falling objects when comprehensive coverage isn't required.

Cargo & Equipment Coverage

- **Motor Truck Cargo Insurance:** Covers the value of goods being hauled in case of damage or loss.
- **Trailer Interchange Coverage:** Protects trailers owned by others while they are in the insured's possession.
- **Onboard Equipment Coverage:** Insures specialized machinery, tools, or electronics carried within fleet vehicles.

Professional & Financial Lines

- **Directors & Officers (D&O) Liability:** Protects leadership from claims of mismanagement or fiduciary breaches.
- **Errors & Omissions (E&O) / Professional Liability:** Covers consulting and engineering services tied to energy projects.
- **Cyber Risk Coverage:** Increasingly critical to protect SCADA systems, IoT-enabled infrastructure, and operational technology from cyberattacks.

Keep your fleet moving safely and efficiently with WMB's tailored commercial fleet coverage and proactive risk management — protecting your vehicles, your drivers, and your operations every mile of the way.



Risk Engineering for the Oil & Gas Industry

Risk Engineering Industry Insights

Key Risk Factors

The oil and gas industry is one of the highest-risk industries, with exposures across multiple areas and risks spanning several key domains. This makes for securing appropriate and extensive insurance coverage challenging.

Key risks include:

Operational & Safety Risks

- Explosions and/or fire
- Leaks & Spills
- Blowouts
- Equipment Failures

Financial & Technology Risks

- Price & Premium Volatility
- Labour shortages
- Cyber security threats
- New technologies & vulnerabilities

Legal & Social Risks

- Regulatory/Policy changes
- Indigenous rights & land disputes
- Political and Geopolitical tensions

Environmental & Climate Risks

- Environmental Liabilities
- Gas emissions & climate change
- Spills & contamination
- Natural disasters

Risk Engineering Analyses

In the oil and gas industry, a risk engineer conducts a comprehensive assessment of operations, equipment, and processes to identify hazards to assess current risk control measures. Here are the key areas typically assessed:

- Natural Catastrophes
- Process and operational safety
- Infrastructure & mechanical integrity
- Environmental & Regulatory Compliance
- Human Factors & Workplace Safety
- Logistics & Transportation
- Technology & Cyber Risks
- Financial & Business Continuity

Benefits of Risk Engineering for Oil & Gas

Risk engineering for the oil & gas industry offers significant benefits by proactively managing hazards, ensuring regulatory compliance, and protecting business assets. Some key benefits include:

- Reduces likelihood of incidents, injuries, and fatalities.
- Prevents costly incidents such as fires, explosions, spills, equipment failures, or environmental damage.
- Ensures critical systems (pipelines, pumps, compressors) operate efficiently and with minimal downtime.
- Prevents spills, leaks, and emissions through better monitoring and containment systems.

WMB Risk Engineering Services For Oil & Gas

Risk engineers work closely with operators, contractors, and insurers to assess, mitigate, and manage risks across the entire oil and gas value chain — from upstream exploration to downstream refining and distribution. Since the exposures in this industry are multifaceted, risk engineering focuses on operational

safety, environmental stewardship, equipment reliability, and business continuity.

Fire Protection & Explosion Risk Assessments

- Assess fire suppression systems, detectors, and emergency shutdown procedures.
- Conduct explosion modeling and evaluate safe distances between critical infrastructure.
- Ensure maintenance and adequacy of pressure relief systems.
- Provide recommendations for improved firewater systems, foam suppression, and chemical-based extinguishing systems.
- Monitor training activity for fire response protocols to reduce damage and improve life safety.

Monitor Client's Process Hazard Analyses (PHA) & Safety Assessments

During the implementation process, your risk engineer will monitor, assess, and collect results as the client performs:

- Hazard and Operability Studies (HAZOPs) and Layer of Protection Analysis (LOPAs) to uncover process-related risks.
- An evaluation of the high-risk operations which could include drilling, refining, gas processing, and exothermic reactions to identify vulnerabilities.
- The adequacy of Process Safety Management (PSM) systems to evaluate long-term operational integrity.

Monitor Client's Equipment Integrity & Reliability Program

Throughout this process, your risk engineer will monitor and report on the existence of programs that pertain to equipment integrity and reliability. This could include:

- Performing inspections and assessments of pipelines, pressure vessels, heat exchangers, and rotating equipment.
- Utilizing non-destructive testing (NDT) methods to detect early signs of wear, corrosion, or fatigue.
- Establishing guidelines for equipment lifecycle management to avoid unexpected failures.

Emergency Response Auditing

- Audit site-specific emergency response plans tailored to drilling rigs, production facilities, and refineries, and petrochemical plants
- Evaluate tabletop exercises, live drills, and incident simulations to test readiness.
- Assess the training of employees and contractors on evacuation procedures, hazard isolation, and communication protocols.

Contractor & Workforce Safety Programs

- Audit contractor safety programs to ensure compliance with company and regulatory standards.
- Assess behaviour-based safety (BBS) training to foster a culture of awareness and accountability.
- Implement competency verification programs to confirm that personnel are qualified for high-risk tasks.

- Monitor and/or audit on-site adherence to permit-to-work systems and other operational safety protocols.

Business Continuity & Supply Chain Risk Assessments

- Assessments of critical suppliers and evaluate the resilience of distribution networks.
- Develop strategies to mitigate downtime caused by equipment failure, natural disasters, or geopolitical risks.
- Support contingent business interruption (CBI) coverage by quantifying potential financial impacts.
- Review risk engineering insights with underwriting to set appropriate coverage levels and limits.

Regulatory Compliance & Standards Alignment

- Provide guidance on compliance with local building codes, OSHA, API, ISO, NFPA, CSA, and local safety regulations.
- Assist with audit preparation and post-audit remediation strategies.
- Support the creation of documentation and reporting systems to demonstrate adherence.
- Offer updates on evolving safety, environmental, and operational regulations.



WMB Oil & Gas Coverage Offerings

Every business is different which means every business's insurance needs are different. Allow WMB's Risk Engineers to assess your risks and propose coverage that is right for you, your business, and your risks.

Some lines of coverage offered by WMB that your risk engineer may recommend:

- **Property Coverage**

Covers physical assets such as rigs, pipelines, storage tanks, compressor plants, gas plants, refineries, and equipment. Protects against fire, explosion, natural disasters, and accidental damage. Can also include all-risk coverage for broader protection.

- **Business Interruption**

Covers lost income due to a shutdown caused by a covered peril (e.g., explosion, natural disaster). May also include contingent coverage for suppliers or contractors whose failure impacts operations.

- **General Liability**

Covers third-party bodily injury, property damage, and legal defense costs. Essential for onshore and offshore operations with public exposure or contractors.

- **Environmental / Pollution Liability**

Covers costs associated with accidental spills, leaks, or environmental contamination. Includes cleanup, remediation, and third-party claims. Especially important for pipeline, offshore, and storage operations.

- **Equipment Breakdown / Boiler & Machinery**

Covers critical equipment such as compressors, turbines, pumps, and generators. Can include repair, replacement, and loss of income due to equipment failure.

- **Contractors / Subcontractor Liability**

Provides coverage for work performed by third parties on behalf of the operator.

Essential for minimizing gaps in responsibility for accidents or environmental damage.

- **Surety Bonds / Performance Bonds**

Guarantees completion of projects or compliance with environmental or regulatory obligations. Often required for government contracts or large infrastructure projects.

At WMB, we safeguard your oil and gas operations from every angle. Our risk engineering expertise and customized coverage solutions work together to protect your assets, ensure regulatory compliance, and strengthen operational resilience — so you can focus on driving performance and growth with confidence.





Risk Engineering for the Chemical & Petrochemical Industry

Risk Engineering Industry Insights

Key Risk Factors

The chemical and petrochemical industry operates within a complex, high-risk environment where exposures span multiple areas and critical domains. Securing comprehensive and effective insurance coverage can be challenging, given the unique hazards and regulatory demands. Key risks include:

Operational & Process Risks

- Equipment Failures
- Aging Machinery
- Human Errors
- Production Down Time

Health, Safety & Environmental

- Fire, explosions and toxic exposure
- Chemical spills, leaks, and improper waste management
- Regulatory non-compliance and associated fines or shutdowns

Supply Chain & Market Risks

- Raw Material Shortages
- Logistical Disruptions
- Commodity Price Volatility
- Bulk transportation issues

Cyber, Data & Reputational Risks

- Vulnerabilities in industrial control systems and cyberattacks
- Theft of intellectual property or proprietary formulas

Risk Engineer Analyses

In the chemical & petrochemical industry, a risk engineer conducts a comprehensive assessment whereby every link in the

chain is assessed. Typical areas that will be assessed:

- Process and operational safety
- Fire, explosion & Hazardous Materials
- Environmental & Regulatory Compliance
- Supply Chain & Logistics
- Cybersecurity & Technology Systems
- Human Factors
- Natural Catastrophes

Benefits of Risk Engineering for the Chemical Industry

Risk engineering delivers substantial benefits to this industry as it proactively addresses the high-hazard, high-value nature of these operations. Some benefits include:

- Reduces likelihood of incidents, fires, explosions, and toxic releases.
- Protects employees, contractors, and nearby communities.
- Ensures adherence to environmental, safety, and chemical regulations.
- Minimizes fines, penalties, and operational shutdowns.
- Identifies vulnerabilities in processes, equipment, and systems before failures occur.
- Lowers risk of catastrophic losses and insurance claims.
- Can reduce insurance premiums due to demonstrated proactive risk management.
- Protects capital investments by mitigating potential financial exposures.

WMB Risk Engineering Services For Chemical & Petrochemical

Since this industry involves hazardous materials, high-value assets, and intricate and frequently high temperature and/or high pressure processes, risk engineers play a critical role in mitigating potential threats. Their focus is on preventing catastrophic events, safeguarding employees and surrounding communities, while ensuring strict regulatory compliance, and minimizing operational disruptions to protect both people and profitability.

Monitor Client's Process Hazard Analyses (PHA) & Safety Assessments

During the implementation process, your risk engineer will monitor, assess, and collect results as the client performs:

- Hazard and Operability Studies (HAZOPs) and Layer of Protection Analysis (LOPAs) to uncover process-related risks.
- An evaluation of the high-risk operations which could include drilling, refining, chemical processing, and gas processing, to identify vulnerabilities.
- The development of Process Safety Management (PSM) systems to evaluate long-term operational integrity.

Fire, Explosion & Toxic Release Risk Assessments

- Model potential blast zones and flammable vapor cloud dispersions to define safety distances and damage zones.
- Assess the adequacy of fire detection, sprinkler systems, water supplies, suppression systems, and emergency shutdown procedures.
- Recommend improvements to water supplies & emergency

equipment, foam deluge systems, water curtains, and chemical extinguishing systems.

- Containment strategies to minimize the impact of toxic gas releases on employees and surrounding communities.

Equipment Reliability & Mechanical Integrity Programs

- Assess inspection and maintenance of pressure vessels, piping systems, storage tanks, and critical rotating equipment for wear and degradation.
- Audit non-destructive testing (NDT), ultrasonic testing, and corrosion mapping to detect vulnerabilities.
- Audit predictive maintenance strategies using sensor data and real-time condition monitoring.
- Evaluate the development of asset lifecycle management programs to reduce downtime and extend equipment life.

Chemical Storage & Handling Safety

- Review bulk storage tank designs, spill containment systems, and transfer operations.
- Assess segregation strategies to prevent incompatible chemical reactions.
- Recommend ventilation and temperature-control measures to reduce vapor buildup and auto-ignition risks.
- Audit control measures, inspections, alarm testing, protection systems, and control systems testing.

Environmental Risk Management

- Evaluate secondary containment, leak detection systems, and spill mitigation plans.

- Assess compliance with environmental standards such as EPA, ISO 14001, and local jurisdictional regulations.
- Audit response strategies for accidental releases, wastewater contamination, and air emissions.
- Audit adequacy of environmental monitoring programs to track emissions and prevent regulatory breaches.

Emergency Response Planning & Crisis Management

- Audit site-specific emergency response plans addressing potential fire, explosion, and toxic release scenarios.
- Review tabletop drills and live simulations to test readiness under realistic conditions.
- Evaluate the training of employees and contractors on evacuation protocols, hazard isolation, and shelter-in-place procedures.
- Examine coordination strategies with local emergency responders and municipal authorities.

Audit of Human Factor & Workforce Safety Programs

- Behaviour-based safety (BBS) training to reinforce hazard awareness and personal accountability.
- Evaluate competency verification programs for employees handling hazardous materials.
- Review permit-to-work systems and lockout/tagout (LOTO) procedures critical by-passes for high-risk operations.
- Foster safety leadership among supervisors and shift managers to reduce near-miss incidents.

Supply Chain, Business Continuity & Resilience Planning

- Evaluate vulnerabilities in raw material sourcing, storage, and distribution networks.
- Assess contingency plans to minimize disruptions caused by supplier failures, natural disasters, or regulatory shutdowns.
- Support Contingent Business Interruption (CBI) coverage by quantifying potential financial impacts of operational downtime.
- Evaluate recovery strategies to resume critical operations after major incidents. 2025

Regulatory Compliance & Standards Alignment

- Ensure alignment with standards such as OSHA PSM, API, NFPA, ISO, CSA, EPA, and regional environmental regulations.
- Support companies through audits, inspections, and corrective action planning.
- Assess systems for documentation, reporting, and continuous compliance monitoring.
- Provide ongoing updates on emerging regulatory requirements affecting chemical and petrochemical operations.

WMB CHEMICAL & PETROCHEMICAL COVERAGE OFFERINGS

WMB's risk engineering transforms uncertainty into controlled, manageable risk, helping chemical and petrochemical operations be safer, more efficient, and more financially secure. Some of our product offerings include:

Property & Equipment

- All-risk property insurance: Covers physical damage to plants, equipment, storage tanks, and buildings.
- Boiler & Machinery/Equipment Breakdown: Covers mechanical or electrical failures of critical equipment.
- Business interruption/Contingent Business interruption: Compensates for lost income due to covered physical damage or supply chain disruptions.

Liability Coverage

- General liability: Protects against third-party bodily injury or property damage.
- Product liability: Covers claims arising from defective or hazardous chemical products.
- Environmental Liability/Pollution: Addresses accidental releases, contamination, or regulatory cleanup costs.

- Employer's Liability/Workers' Compensation: Covers employee injuries or occupational illnesses.

Specialty / High-Hazard Coverages

- Marine/Transit insurance: For chemicals transported by land, sea, or rail.
- Terrorism/Sabotage: Protects against intentional attacks targeting facilities or products.
- Cyber Liability: Covers losses from cyberattacks on industrial control systems or sensitive data breaches.
- Business interruption from Supply Chain Failure: Covers disruptions caused by supplier or logistics issues.

Risk Engineering-Linked Programs

- Loss Prevention Credits/Premium Discounts: For companies with strong risk engineering programs in place.
- Performance Guarantees/Engineering Warranties: For new plant designs or high-value expansions.

Protect your operations with WMB's expert risk engineering and customized coverage while safeguarding your assets, your people, and the continuity of your business.





Risk Engineering for Property & Casualty Lines

Risk Engineering Industry Insights

Key Risk Factors

As with any commercial enterprise, there are inherent risks that must be managed to leverage financial gains. Some of the most crucial risks include:

- Fires & explosions
- Natural Catastrophes
- Security & Theft
- Building Integrity and Maintenance
- Business Interruption & Continuity Planning

That said, risks are not made to scale. Every business, its property, and its assets are unique which means that to attain insurance coverage that covers all the bases, the insurance policy must be unique, as well.

For this reason, commercial enterprises should be as concerned about their property & casualty risks as they are with their operational risks.

Risk Engineer Analyses

When a risk engineer completes a thorough risk analysis, they will assess specific portions of the business using COPE method:

- Evaluate Construction & Occupancy
- Sprinkler & fire protection systems
- Fire protection water supplies
- Review of existing security measures
- Analysis of business interruption, continuity, and supply chain
- Evaluate exposures
- On-site risk evaluations with benchmarking
- Natural catastrophe mapping

- Property risk training
- Management Systems
- Mechanical Integrity

Our risk engineers go beyond standard property risk inspections. Not only do they identify, quantify, and evaluate potential hazards, but they also develop practical, results-driven solutions to strengthen your risk profile. Leveraging their specialized expertise, they provide a wide range of value-added services — from comprehensive gap analyses of corporate property risk standards to business interruption assessments, supply chain evaluations, and natural catastrophe (NAT CAT) analyses.

Depending on your needs, WMB can also deliver property-related benchmarking programs and reports to help you build and foster risk management awareness across your organization. Benchmarking can be used to compare global risk performance across properties or operating units, set cost-effective priorities, and guide premium allocation strategies — all aimed at driving continuous risk improvement.

WMB Risk Engineering Services For Property & Casualty for the Energy Sector

The energy industry — spanning oil & gas, power generation, renewables, chemicals and petrochemicals — involves high-value assets, operational hazards, environmental exposures, and significant liability risks. Risk engineering focuses on reducing loss frequency, loss severity, and business interruption, while supporting more favourable insurance placement and pricing.

Property Risk Assessments & Asset Protection

- Perform comprehensive site risk surveys to assess vulnerabilities in refineries, plants, and power stations.
- Evaluate exposure to fire, explosion, flooding, windstorm, and seismic activity.
- Review inspections on critical infrastructure like transformers, turbines, pipelines, and storage tanks for design adequacy and operational safety.
- Recommend improvements to fire suppression systems, detectors, and emergency shutdown mechanisms.
- Provide asset valuation data to ensure proper coverage under property damage and business interruption policies.

Business Interruption & Contingency Planning

- Quantify potential losses from downtime, equipment failure, and third-party supply interruptions.
- Evaluate business continuity plans to minimize operational and financial impacts following an incident.
- Map interdependencies between upstream, midstream, and downstream assets to assess knock-on risks.
- Provide underwriters with accurate exposure data for business interruption and contingent business interruption coverage.

Fire, Explosion & Natural Catastrophe Risk Management

- Model blast zones, thermal radiation impacts, and flammable vapor dispersion for refineries and chemical facilities.
- Assess and optimize firewater systems, foam deluge systems, and emergency venting procedures, detection & alarm systems, and ESDs.
- Conduct natural hazard analyses to evaluate exposure to

hurricanes, floods, wildfires, and earthquakes.

- Recommend engineered safeguards to limit property loss and liability exposure in catastrophic scenarios.
- Evaluate control measures, siting, and asset evaluations in NAT CAT high-risk zones.

Equipment Integrity & Reliability Programs

- Evaluate mechanical integrity assessments for turbines, boilers, compressors, and pipelines.
- Review non-destructive testing (NDT), vibration analysis, and real-time monitoring tools.
- Assess predictive maintenance programs to detect early failure indicators and avoid unplanned downtime.
- Support underwriting for equipment breakdown coverage by providing reliability metrics and inspection reports.

Environmental & Pollution Risk Control

- Assess risks of spills, leaks, emissions, and groundwater contamination.
- Review detection and alarm systems.
- Develop strategies to mitigate long-term liability from environmental incidents.
- Provide supporting data for pollution liability and environmental impairment liability insurance programs.

Health, Safety & Workforce Risk Management

- Audit occupational health and safety programs to identify gaps and hazards.
- Evaluate behaviour-based safety (BBS) training to minimize workplace incidents.
- Assess permit-to-work, lockout/tag-out (LOTO), and confined space entry protocols.
- Assist organizations meet

regulatory requirements for workers' compensation and employer's liability coverage.

Supply Chain & Third-Party Liability Risk Assessments

- Assess risks associated with critical suppliers, contractors, and logistics providers.
- Evaluate transportation routes for hazardous materials and assess marine cargo and transit insurance requirements.
- Develop protocols to mitigate liabilities related to third-party property damage and bodily injury claims.
- Provide tailored recommendations to optimize general liability and umbrella liability coverage limits.

Regulatory Compliance & Standards Alignment

- Provide guidance on compliance with OSHA, API, NFPA, ISO, and local regulatory bodies.
- Support audit preparation and assist in closing compliance gaps.
- Help develop documentation systems to demonstrate alignment with industry best practices.
- Offer ongoing monitoring of evolving regulations affecting property and liability exposures.

“Our risk engineers go beyond standard property risk inspections. Not only do they identify, quantify, and evaluate potential hazards, but they also develop practical, results-driven solutions to strengthen your risk profile”

WMB Property & Casualty Coverage

For property and casualty (P&C) risk engineering, insurance coverage is designed to protect organizations from physical loss, liability, and business interruption, while complementing proactive risk management efforts. Key lines of coverage include:

Property Coverage

- **All-Risk Property Insurance:**
Covers physical damage or loss to energy facilities, refineries, plants, and equipment.
- **Business Interruption (BI)/ Contingent BI:**
Covers income losses due to operational downtime caused by property damage or supply chain disruption.
- **Equipment Breakdown / Machinery Coverage:**
Protects turbines, compressors, and other specialized equipment from sudden mechanical or electrical failure.
- **Construction & Erection All-Risk (CAR/EAR):**
Covers risks during the construction or expansion of energy infrastructure.

Casualty Coverage

- **General Liability (GL):**
Covers bodily injury and property damage to third parties on or near operational sites.
- **Excess/Umbrella Liability:**
Provides higher liability limits beyond standard GL policies.
- **Pollution & Environmental Liability:**
Protects against contamination, spills, and long-term environmental damage.
- **Employer's Liability/ Workers' Compensation:**
Covers employees in case of workplace accidents or occupational illnesses.

Specialty Energy-Specific Coverages

- **Control of Well / Operator's Extra Expense (OEE):**
Covers blowouts, well control, and costs related to regaining control of a well.
- **Offshore & Onshore Energy Packages:**
Comprehensive policies that combine property, liability, and pollution coverage for energy operations.

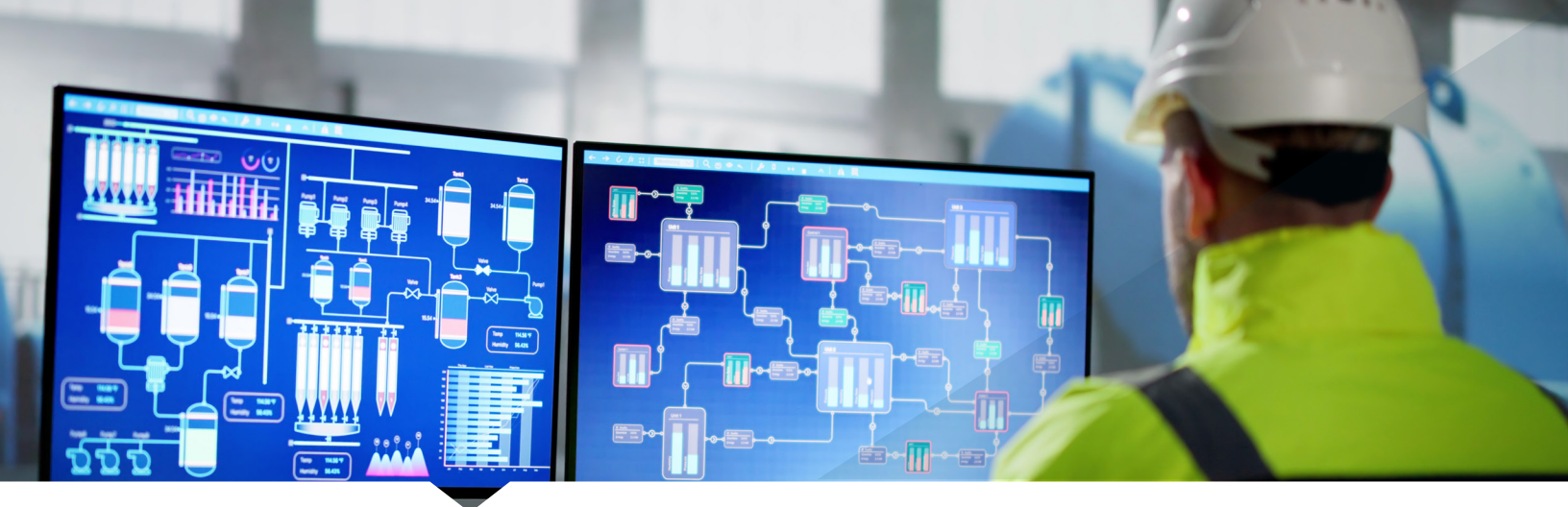
- **Marine Cargo & Transit Insurance:**
Covers the transportation of oil, gas, and energy equipment over land or sea.
- **Supply Chain & Contingent Business Interruption:**
Protects against disruptions caused by third-party supplier or customer failures.

Professional & Financial Lines

- **Directors & Officers (D&O) Liability:**
Protects leadership from claims of mismanagement or fiduciary breaches.
- **Errors & Omissions (E&O) / Professional Liability:**
Covers consulting and engineering services tied to energy projects.
- **Cyber Risk Coverage:**
Increasingly critical to protect SCADA systems, IoT-enabled infrastructure, and operational technology from cyberattacks.

Protect your operations with WMB's expert risk engineering and customized coverage while safeguarding your assets, your people, and the continuity of your business.





Computerized Maintenance Management System (CMMS)

Risk Engineering Industry Insights

Prevent Risks with a Computerized Maintenance Management System (CMMS)

A CMMS is software designed to help organizations manage, track, and optimize maintenance activities for equipment, vehicles, and facilities. It centralizes information on assets, work orders, inspections, and maintenance schedules to improve efficiency, reduce downtime, and extend the life of assets.

Key features of a CMMS include:

- Asset Tracking
- Work Order Management
- Preventive Maintenance Scheduling
- Reporting & Analytics
- Regulatory Compliance Support
- Maintenance Expense Management
- Supports risk-based maintenance programs

How a CMMS Supports Risk Engineering Efforts

Reduces Equipment Failure Risk:

Scheduled preventive maintenance ensures vehicles and equipment stay in good working order. Also helps avoid accidents caused by mechanical failures (e.g., brake or engine failure in a fleet, boiler, feed water, pump failure, compressor failure, etc.)

Improves Safety Compliance:

Ensures inspections and maintenance meet regulatory requirements. Provides audit trails and documentation for insurance or regulatory purposes.

Supports Predictive Risk Management:

Historical maintenance data highlights patterns of wear or failure. Engineers can anticipate high-risk components before they fail.

Minimizes Operational Downtime:

Reduces unexpected breakdowns that can disrupt fleet production or increase exposure to risk.

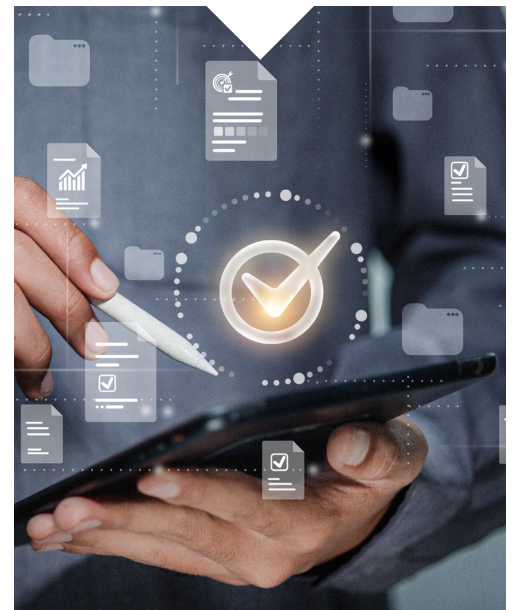
Enhances Resource Allocation:

Tracks spare parts inventory and maintenance staff availability and ensures the right resources are in place to respond quickly to issues.

Enables Data-Driven Decision Making:

Maintenance records and performance metrics help risk engineers identify high-risk areas. Allows prioritization of interventions based on likelihood and severity of failure.

Optimize reliability, minimize downtime, and safeguard your bottom line with a Computerized Maintenance Management System (CMMS). Smarter maintenance today drives stronger, more resilient operations tomorrow.





Management of Change (MOC)

Risk Engineering Industry Insights

How Management of Change (MOC) Can Further Improve Risk Management Efforts

Management of Change (MOC) is a structured approach to managing any changes in an organization—processes, systems, technologies, equipment, policies & procedures, or even workforce roles—to ensure that the change is implemented safely, efficiently, and with minimal disruption and that unforeseen risks are introduced unexpectedly.

In other words, it's about planning, communicating, and controlling change so that the organization can adapt without creating unnecessary risk or chaos.

Key Elements of MOC include:

- Definition of change
- Identification of change
- Risk assessments
- Approval process
- Documentation & Software
- Communication
- Training and support
- Monitoring & review

How An MOC Can Help Your Risk Efforts

Reduces Human Error Risks:

Changes in equipment, procedures, or technology can introduce new or unexpected risks if employees aren't properly trained or informed. An MOC ensures proper training, reducing accidents, mistakes, or unsafe behaviour.

Identifies New Hazards & Eliminates Risk:

Every change can create new risks (e.g., a new vehicle in a fleet may have different

handling characteristics). MOC requires risk assessment before implementation, helping engineers anticipate and mitigate these hazards. Also assists in eliminating risks of introducing any unforeseen physical risks.

Maintains Regulatory Compliance:

Changes often require updates to policies or adherence to new safety standards. MOC ensures changes meet legal and regulatory requirements, avoiding fines or operational shutdowns.

Supports Continuous Improvement:

MOC formalizes lessons learned from past changes and integrates them into new initiatives. This strengthens the organization's overall risk culture and reduces repeated incidents.

Enhances Operational Resilience:

By carefully planning and monitoring changes, the organization avoids unexpected disruptions or system failures. Risk engineers can be confident that changes won't undermine safety or performance.

Provides Documentation for Risk Audits:

MOC creates records of change approvals, risk assessments, and training. These records are invaluable for insurance audits, regulatory inspections, or incident investigations.

Navigate change confidently with WMB. Our expert guidance empowers your organization to adapt seamlessly, reduce risk, and drive sustainable operational success.

MORE THAN JUST AN INSURANCE GROUP

Watching our clients grow from a small business to an industry leader is why we come to work every day. From developing a risk management strategy to providing you with expertise managing a claim – our team is with you every step of the way.

We are here to help you develop a long-term risk management plan deeply rooted in the expertise and understanding of your industry. Our goal is to provide you with solutions that are custom-built for your business. Contact us today and meet your team of industry experts to start building your company's future.

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We Care. We Help.



Owen Kurin, Risk Engineering Consultant

Owen Kurin is a registered professional engineer and a Fellow Chartered Insurance Professional (FCIP) designation from the Insurance Institute of Canada. With over 40 years of experience in risk engineering, he has worked across a range of industries such as oil & gas, petrochemical, pharmaceutical, mining, steel, electronics, plastics, food, textiles, warehousing, forestry, fertilizer, explosives, resorts, and real estate.

Owen has conducted risk management surveys in eight countries, assessing over 800 industrial and commercial sites. He helps organizations safeguard assets, ensure workplace safety, maintain financial stability, and protect business continuity. Since 1986, Owen has been a recognized leader in risk management education, developing and delivering courses, seminars, and workshops for professional designations such as CIP, FCIP, and ARM/CRM, and serving as faculty at Seneca College, The RMS School of Loss Control Technology, and the University of Toronto.

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