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Managing Regulatory Risk in Today's Offshore Industry

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Simply complying with environmental regulations is no longer enough. Building defensible environmental studies, strengthening regulatory and stakeholder credibility, and moving from project-level compliance to portfolio-level resilience are requirements for success in today's offshore industry.

For many offshore companies, the largest environmental risks are not scientific or engineering problems. Technical risks determine whether a project can be designed, built, and operated safely: whether the design is robust, equipment and materials are available, resources are sufficiently characterized, data and models are reliable, hardware and software perform as intended, and teams can work safely and effectively in the proposed environment. Nontechnical risks sit outside of engineering and project management but can still determine whether a project succeeds. They include permitting, environmental and social concerns, socioeconomic effects, stakeholder relationships, and regulatory credibility.

Both kinds of risks require robust scientific analysis. Nontechnical risk management also requires stakeholder engagement, relationship-building, careful communication, and a clear understanding of regulatory requirements and decision-making. Technical risk analysis answers the question: can it be done? Addressing nontechnical risk answers an equally important one: should it be done, and under what conditions?

Offshore companies are well acquainted with risk management. Capital expenditure, construction, market volatility, and operational safety are built into planning from the outset. These risks are not always easy to manage, but they are often visible enough to predict. Financial margins can be tested against changing market conditions; construction schedules can account for material availability; and safety risks can be evaluated against prior incidents and near-misses.

Nontechnical risk is less predictable. It can surface through a permit challenge, court decision, supplemental environmental review, change in agency interpretation, stakeholder campaign, or surge in public attention. The consequences may range from minor disruption to complete suspension of a project that has already absorbed significant capital. Yet most companies still treat environmental, social, stakeholder, and regulatory risk as project-specific compliance issues rather than as business risks to be managed across a portfolio.

Historically, nontechnical risk was a hurdle to clear on the way to a permit or authorization. As offshore operations expand into more complex regulatory, ecological, social, and socioeconomic contexts, it has become a business challenge. Schedule uncertainty, unplanned data collection, litigation exposure, delayed investment, portfolio reprioritization, stakeholder opposition, and reputational impacts are hard to predict and harder to price. Without an early look at whether a project should proceed, and under what conditions, companies are vulnerable to delays, added costs, and reputational damage with direct business implications.

Invisible Until Expensive

The cost of nontechnical risk is often measured only after it becomes visible: a missed construction window, an extended survey program, an unexpected additional mitigation, a delayed investment decision, or a legal challenge that requires agencies to revisit assumptions or findings. By then, the issue is no longer environmental compliance alone; it is a question of schedule, capital, stakeholder relationships, public reputation, or several of these at once.

Mitigation requirements that emerge late can be especially costly. In Humboldt Bay, a proposed land-based fish farm designed screening for its seawater intake, which would draw 12 million gallons per day, to meet National Marine Fisheries Service (NMFS) criteria for salmonids. Regulators remained concerned about entrainment, in which smaller organisms such as zooplankton and the eggs and larvae of fish and invertebrates are drawn into the intake. The State of California required the applicant to purchase and restore tidal marsh as mitigation, an unanticipated cost with direct project implications. The applicant then proposed finer screening to reduce entrainment further, but the additional design cost did not eliminate the mitigation expectation. Uncertainty cannot always be eliminated. Unresolved or poorly messaged uncertainty, however, can become a costly obligation.

Thoughtfully considered adaptive management can help minimize nontechnical risk. At a wave energy test center, deployment of novel technology where various types of wave energy converted would be tested triggered concerns due to high uncertainty around electromagnetic fields (EMF). This uncertainty was addressed with models that estimated EMF emissions, followed by targeted magnetic-field monitoring for up to eight converter types to validate and improve those models. This approach gave NMFS a credible way to address uncertainty while giving project proponents a clear pathway to reduce expensive monitoring over time. While more expensive to conduct this modeling and monitoring up front, this adaptive approach likely resulted in substantial cost savings over the life of the project.

The Credibility Gap

Decision-makers must determine not only whether the technical work is sound, but also whether it is sufficient to support decisions that regulators, courts, investors, communities, and other stakeholders can understand and trust. When studies do not connect technical analysis to regulatory requirements and stakeholder concerns, they create a credibility gap even when the underlying work is rigorous.

These gaps commonly stem from shortcomings in communication, engagement, and implementation rather than from just the scientific analysis. Examples:

- When findings are technically accurate but not clearly connected to regulatory decisions or stakeholder concerns, communication issues between project proponents, regulators, communities, and other stakeholders are created.
- When limitations, assumptions, or data gaps are acknowledged but not translated into their practical implications, this can lead to unfounded or unmerited concern.
- When the analytical record is hard for reviewers outside the original team to understand, test, and defend, the rigor of the underlying work fails to translate to the audiences who need this information.

Regulatory credibility is established from connecting technical analysis, engagement, and decision-making in a way that can be understood and defended. That requires the underlying science itself to be strong and the communication of that information to be clear, concise, appropriately translated for the audience, and responsive to the concerns and processes that shape the decision.

Building Defensible Environmental Studies

Closing the credibility gap starts with study design, but it does not end there. **The most effective environmental studies for offshore projects are organized around decisions.** This does not mean compromising scientific independence or tailoring conclusions to a desired outcome, but rather that every step of the process is informed by the decisions that must be made later, the concerns that decision-makers and stakeholders are likely to raise, and the implications of those decisions. Put plainly: **So what?**

A decision focus also gives project teams a basis for constructively pushing back on study protocols that may satisfy a baseline requirement but do not materially improve agency decision-making. Work that ends up in a binder on a shelf creates cost without reducing risk. Better study design starts with asking what information regulators need to make and defend a decision, then working with agencies to develop methods that produce it. Traditional seabird baseline protocols, for example, often rely on quarterly at-sea observer monitoring. Those surveys reveal little about bird activity in inclement weather, at nighttime, or about whether birds fly within the rotor-swept zone, the area swept by turbine blades. Observer data may be more valuable when used to support and validate remote methods that assess passage rates, flight height, and other decision-relevant metrics.

Before collecting data, project teams must identify regulatory triggers, decision criteria, agency expectations, likely challenges, the stakeholders whose concerns may affect the decision, and what those concerns are. Tailoring study design around these sensitivities keeps the scientific work focused on the most important questions. Uncertainty should be characterized, quantified where possible, and connected to its implications transparently. Conceptual models linking sources, stressors, exposure pathways, receptors, and outcomes can help readers follow the analytical process. Most importantly, project proponents must build a defensible record by documenting assumptions, alternatives considered, data limitations, analytical choices, engagement steps, and how concerns were heard and addressed.

Legal and regulatory challenges often focus less on whether the engineering can be completed or whether individual findings are technically valid, and more on whether the analysis was complete, transparent, responsive to relevant concerns, and properly connected to the decision. A record that explains not only the study and the findings, but also ***why* the study was appropriate to inform the specific regulatory decision** is critical to preempting confusion or challenges later in the regulatory process.

Project-Level Risk Management to Portfolio-Level Resilience

Most environmental risk management still happens on a project-by-project, or in some cases region-by-region basis, but the drivers of regulatory scrutiny rarely remain isolated. Similar assumptions, data gaps, stakeholder concerns, and agency interpretations often occur across assets, regions, and business lines. Regulators making similar decisions across jurisdictions communicate with each other; stakeholders can reach other stakeholders globally via both traditional and social media. Concerns that are ostensibly specific to one jurisdiction are likely to arise in another, perhaps in a slightly different form.

Companies benefit by considering nontechnical risk on a portfolio basis rather than a project one. Questions to inform this approach might include:

- What data gaps are we seeing across multiple projects?
- Which projects rely on similar permitting assumptions?
- Which regulations or agency interpretations are changing most rapidly?

- Which assets face similar stakeholder concerns?
- Where can we enhance monitoring, baseline studies, regulatory strategy, stakeholder engagement, or relationship-building to reduce risk across multiple projects rather than one permit application?

Closing the Gap

Four capabilities matter most for organizations working in this environment, and Integral's value lies in helping clients apply them before uncertainty becomes a project-level obstacle:

- **Risk anticipation:** Anticipating nontechnical risk and monitoring emerging scientific, regulatory, policy, social, and stakeholder developments allows project proponents to act before they become project constraints, rather than waiting for an unfavorable decision or court challenge.
- **Study defensibility:** Study designs that are tailored to directly informing regulatory decision-making, addressing relevant environmental and social concerns, and documenting how assumptions and uncertainties were considered hold up better against external scrutiny.
- **Stakeholder and regulatory engagement:** Early, deliberate engagement helps project teams understand concerns, build relationships, clarify regulatory expectations, and demonstrate that issues have been heard and addressed before they harden into opposition or litigation risk.
- **Portfolio-level intelligence:** Identifying common risk drivers across assets, programs, and investments can help companies prioritize the nontechnical risks most likely to pose threats to project success.

Integral helps clients navigate the intersection of science, permitting, stakeholder expectations, and agency decision-making. Our personnel bring practical experience anticipating regulatory and environmental challenges, developing study designs that support defensible decisions, engaging agencies and stakeholders before concerns harden into barriers, and translating uncertainty into clear options for project teams. This allows clients to address issues earlier, reduce late-stage surprises, and keep projects moving through complex permitting environments.

Conclusion

The primary question is no longer whether a study is technically rigorous, whether the project can be built, or whether minimum regulatory requirements have been met. Successful organizations must also ask whether the scientific work supports a defensible decision in the face of evolving policy, public perception, stakeholder concern, socioeconomic, and legal challenges. They build regulatory credibility by doing ***the right science for the decision***, engaging the right stakeholders proactively, and managing risk across the full portfolio.

Moving from compliance to defensibility to credibility builds portfolio-level resilience. Integral helps companies connect technical analysis, regulatory strategy, stakeholder engagement, and decision-making across portfolios so that environmental work supports both permits and project outcomes. By anticipating permitting, mitigation, and engagement challenges early, building robust science around the decisions that agencies must make, and managing uncertainty before it becomes expensive, clients can reduce the likelihood of late-stage challenges, avoid unnecessary or duplicative studies, manage mitigation expectations, and improve offshore project efficiency.