Integrated HSE Governance in Engineering Consultancy: A Strategic Approach to Safer and More Efficient Infrastructure Projects in Saudi Arabia

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Abstract

Saudi Arabia's continued investment in infrastructure, transportation, urban development and public services has increased the need for Health, Safety and Environment management to operate as an integrated component of project governance.

In complex engineering and construction projects, HSE can no longer be treated as a stand-alone compliance activity limited to site inspections, personal protective equipment or incident reporting. It must function as a structured management framework that supports early risk identification, clear accountability, effective contractor control, workforce competency, reliable performance monitoring and informed decision-making throughout the project lifecycle.

Engineering consultants have a particularly important role in this process. Their responsibilities may include planning, design coordination, technical review, construction supervision, contractor monitoring and reporting to clients and regulatory stakeholders. This position enables the consultant to influence HSE performance from the earliest project stages and to verify that risks are managed systematically during execution.

This technical paper examines how integrated HSE governance can be embedded within engineering-consultancy and project-supervision activities. It outlines the relationship between leadership, risk-based planning, operational control, assurance, performance measurement and organizational learning. It also presents Euro Group for Engineering Consultancy's approach to HSE management, supported by verified corporate performance highlights and a project-experience example involving the supervision of road and municipal asset maintenance activities for Madinah Municipality.

When HSE is integrated into project decisions and technical controls, it contributes not only to the prevention of injuries and environmental impacts, but also to stronger contractor performance, reduced disruption, improved accountability and safer, more efficient and resilient infrastructure delivery.

1. Introduction

Infrastructure projects involve multiple stakeholders, contractors, work activities, technical disciplines and operational interfaces. These projects may be delivered within live roads, public areas, existing facilities or densely populated urban environments. As a result, project risks may affect not only employees and contractors, but also road users, pedestrians, surrounding communities, public assets and the environment.

The traditional approach of addressing HSE primarily during construction is no longer sufficient for complex projects. Many significant risks originate much earlier through planning decisions, design choices, procurement arrangements, unclear contractual responsibilities or inadequate contractor selection. Once construction begins, correcting these weaknesses may become difficult, disruptive and costly.

Integrated HSE governance addresses this challenge by linking safety, occupational-health and environmental requirements with project-management processes. It ensures that HSE considerations are included in leadership decisions, design coordination, contractor evaluation, mobilization readiness, technical reviews, site supervision, performance reporting and project closeout.

This approach does not remove the need for inspections, permits, procedures or personal protective equipment. Instead, it places these controls within a wider governance structure that defines who is responsible, how risks are assessed, how performance is verified, how concerns are escalated and how lessons are incorporated into future decisions.

For engineering-consultancy organizations, HSE governance is especially important. Consultants often act on behalf of the client, review contractor submissions, coordinate between technical disciplines, monitor construction activities and report on project performance. Their role gives them a strategic position between the client's expectations and the contractor's implementation.

An effective consultant therefore does more than identify unsafe acts or issue observations. The consultant helps establish the HSE framework, evaluates the adequacy of contractor arrangements, verifies the implementation of controls, reports critical risks to management and follows corrective actions through to closure.

The purpose of integrated HSE governance is ultimately to protect people and the environment while supporting reliable project delivery. It enables HSE risks to be considered alongside cost, programme, quality, technical performance and stakeholder expectations.

2. Compliance to Integrated HSE Governance

Traditional HSE systems often focus on regulatory compliance, inspections, permits, incident statistics and corrective actions. These activities remain essential, but they are most effective when supported by a governance framework that connects leadership, risk management, operational control, assurance and continual improvement.

Integrated HSE governance changes the way HSE is positioned within an organization. Instead of operating as a separate support function, HSE becomes part of project planning, decision-making and performance management.

The framework should establish clear relationships between:

- Leadership commitment and accountability.
- Legal, regulatory, contractual and client requirements.
- Project-specific hazard identification and risk assessment.
- Contractor and subcontractor management.
- Operational controls and safe systems of work.
- Inspection, audit and assurance activities.
- Training, competency and workforce engagement.
- Incident reporting, investigation and learning.
- Emergency preparedness and response.
- Performance measurement and management review.
- Occupational-health and environmental controls.
- Corrective-action management and continual improvement.

Under this approach, responsibility for HSE is not assigned exclusively to the HSE department. Senior management, project directors, project managers, discipline engineers, supervisors, contractors and HSE professionals all have defined responsibilities.

Leadership establishes expectations and provides resources. Project managers integrate HSE into planning and coordination. Engineers identify technical risks and verify compliance within their disciplines. Contractors implement the required controls. HSE professionals provide specialist support, assurance, monitoring and reporting.

The engineering consultant occupies a critical position within the HSE governance structure. Although the contractor remains responsible for the safe execution of its activities, the consultant is responsible for verifying that contractual and project HSE requirements are adequately established and implemented within the scope of its appointment.

The consultant's role normally begins before physical work starts. During planning and procurement, the consultant may support the development of HSE requirements, contractor-prequalification criteria, reporting arrangements and minimum competency expectations.

3. The Consultant's Role in HSE Governance

At the design stage, consultants can influence risk by identifying foreseeable hazards and supporting the elimination or reduction of those hazards before construction. Relevant considerations may include safe access, maintainability, traffic movement, emergency access, fall prevention, lifting requirements, temporary works, fire and life safety, environmental protection and public interfaces.

During mobilization, the consultant verifies that the contractor is ready to begin work. This may include reviewing the project HSE plan, risk assessments, method statements, emergency arrangements, competency records, equipment certification, welfare facilities and site-control systems.

During construction and maintenance activities, the consultant monitors whether approved arrangements are being implemented. This responsibility is not limited to observing workers. It includes evaluating supervision, planning, communication, documentation, equipment, traffic management, environmental controls and management response.

Where nonconformities are identified, the consultant should ensure that they are clearly documented, assigned to responsible parties and followed until verified closure. Repeated findings should be escalated because they may indicate a weakness in contractor management rather than an isolated site issue.

The consultant also supports the client by providing reliable HSE information. Reports should identify significant risks, emerging trends, contractor performance, overdue actions and areas requiring management intervention.

A strong consultant therefore acts as an assurance partner. It does not replace the contractor's responsibilities, but it verifies that the project's HSE governance framework is functioning effectively.

4. Integrating HSE Throughout the Project Lifecycle

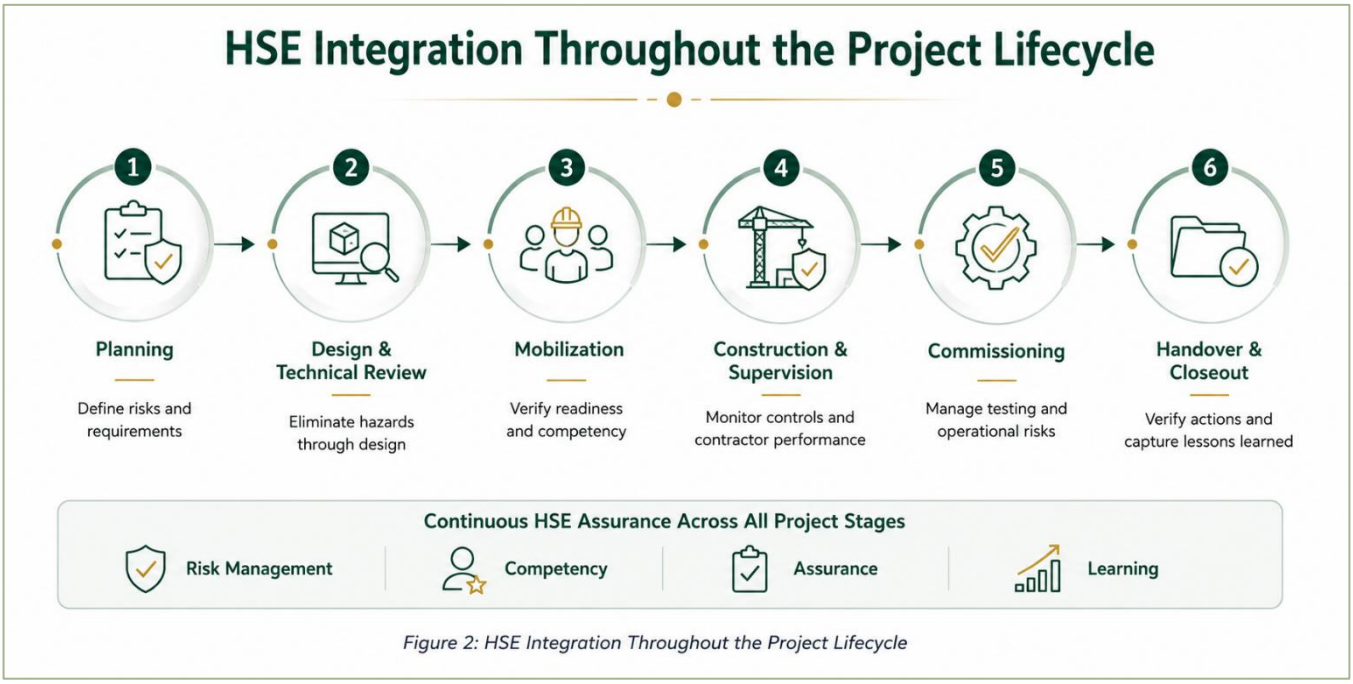

Figure 2: HSE Integration Throughout the Project Lifecycle

4.1 Planning and Pre-Construction

During planning and pre-construction, the project team should identify applicable legal, regulatory, contractual and client requirements. Preliminary hazards, public interfaces, environmental sensitivities and emergency scenarios should be considered.

Project HSE objectives, reporting lines, contractor expectations, inspection requirements and performance measures should also be established.

Early planning helps prevent unclear responsibilities, inadequate resources and late changes that may affect safety, cost or programme

4.2 Design and Technical Review

Design decisions can significantly influence construction, operation and maintenance risks. HSE considerations should therefore form part of design coordination and technical review.

The design process should consider safe access and egress, constructability, maintainability, emergency access, traffic movement, lifting arrangements, work at height, fire and life safety, environmental protection and temporary works.

Where foreseeable hazards cannot be eliminated, the design should reduce the level of risk and provide clear information for later project stages.

4.3 Mobilization

Before mobilization, the contractor should demonstrate that the required systems, personnel and resources are in place.

1. The consultant may review:

- Project HSE plans.
- Activity risk assessments.
- Method statements.
- Competency and training records.
- Emergency-response arrangements.
- Plant and equipment certification.
- Welfare and occupational-health arrangements.
- Environmental-control measures.
- Traffic-management arrangements.
- Communication and reporting procedures.

Mobilization approval should reflect actual readiness rather than the submission of documents alone.

4.4 Construction and Supervision

During execution, project risks may change due to work progress, new activities, changing locations or interfaces with other contractors and the public.

Field monitoring should therefore confirm that approved controls remain suitable and effective. Inspections should focus not only on visible conditions, but also on the adequacy of supervision, planning, competency and contractor management.

High-risk activities should receive enhanced monitoring. These may include lifting operations, excavation, work at height, electrical work, confined spaces, temporary works, hot work, mobile plant and activities within live traffic.

4.5 Commissioning, Handover and Closeout

Commissioning and handover introduce different risks associated with testing, energization, operational interfaces and transfer of responsibility.

HSE closeout should include verification of outstanding actions, review of commissioning risks, completion of environmental obligations, final performance reporting, archiving of records and transfer of relevant safety information to the client or operator.

Lessons learned should also be documented and communicated to improve future projects.

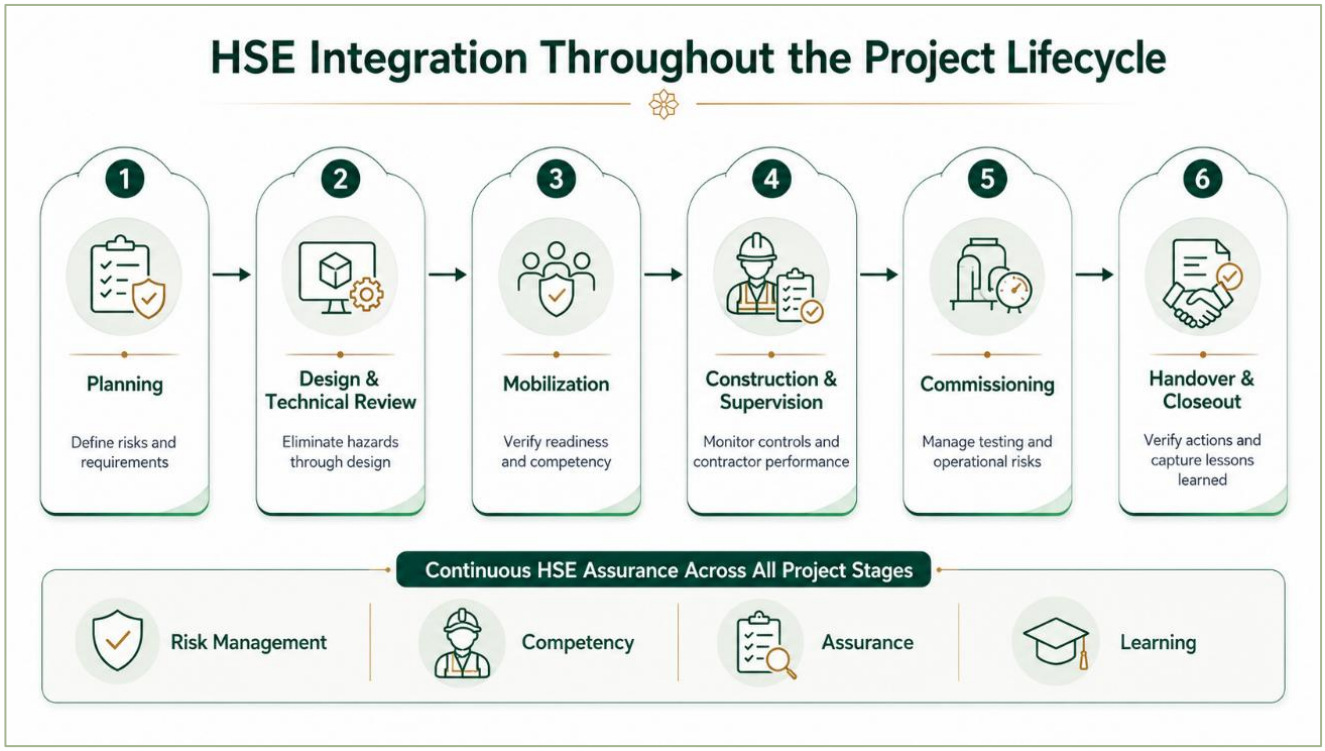

Figure 2: HSE Integration Throughout the Project Lifecycle

The lifecycle model demonstrates that HSE is most effective when it begins during planning and continues through design, mobilization, construction, commissioning and final closeout.

5. Core HSE Assurance Mechanisms

Integrated governance requires practical mechanisms that allow the consultant and client to verify that planned controls are functioning.

5.1 Contractor HSE Assurance

Contractors and subcontractors undertake many of the activities that present the highest project risks. Their HSE performance must therefore be managed through a structured assurance process.

This process may include prequalification, review of previous performance, evaluation of competent personnel, assessment of resources, approval of documentation, mobilization inspections, routine monitoring and periodic performance reviews.

Contractor assurance should not rely only on incident statistics. A contractor may report no injuries while still having weak planning, supervision or corrective-action systems. Leading indicators and field verification are therefore essential.

5.2 Inspections, Audits and Corrective Actions

Inspections and audits provide different types of assurance.

Inspections evaluate site conditions, work practices and operational controls. Audits examine the management system, including planning, documentation, responsibilities, communication and implementation.

Findings should be classified based on risk and significance. Each action should have a responsible person, target date and verification requirement.

Closing an action administratively is not sufficient. The consultant should confirm that the corrective measure has been implemented and is effective.

Repeated findings should trigger a deeper review of root causes and management weaknesses.

5.3 Incident Learning and Root-Cause Analysis

Incident investigation should determine why an event occurred and what system weaknesses allowed it to happen.

Effective investigations consider direct causes, underlying causes and root causes. They review planning, supervision, competency, equipment, procedures, communication, workload and management controls.

The purpose is not simply to assign blame. It is to identify what must change to prevent recurrence.

Lessons should be communicated across relevant projects and incorporated into procedures, risk assessments, training and management reviews.

5.4 Emergency Preparedness and Workforce Competency

Emergency plans should reflect credible scenarios and actual project conditions. Possible scenarios may include fire, medical emergencies, vehicle incidents, structural collapse, spills, severe weather, utility strikes or evacuation failure.

Plans should define responsibilities, communication routes, equipment, assembly points and coordination with external services.

Training and competency are equally important. Workers and supervisors must understand the hazards associated with their tasks and the controls required.

Training should be based on identified needs and evaluated for effectiveness. Attendance alone does not demonstrate competency. Practical verification, observation and supervisor feedback may be required.

6. HSE Performance Measurement and Management Review

HSE performance should be evaluated using a balanced combination of leading and lagging indicators.

Lagging indicators show events and consequences that have already occurred, such as fatalities, injuries, environmental incidents, vehicle incidents and lost workdays.

Leading indicators provide information about preventive activities and control effectiveness. Examples include management inspections, training completion, risk-assessment reviews, corrective-action closure, audits, emergency drills and contractor-performance evaluations.

Lagging indicators remain important, but they should not be used as the sole measure of performance. A project may record no serious incidents while weaknesses remain in planning, supervision or operational control.

HSE reports should support decision-making rather than simply record completed activities. An effective report should communicate critical risks, key achievements, areas of concern, incident trends, contractor performance, audit findings, corrective-action status, competency activities and priorities for the next period.

Information should be clear, accurate and proportional to risk. Dashboards and visual reporting tools can improve communication and allow management to compare performance across projects.

Figure 3: Euro Group HSE Performance Highlights — 2023–2025

During the approved reporting period from 2023 to 2025, Euro Group monitored HSE performance across its engineering-consultancy and project-supervision activities through corporate oversight, project reporting, workforce training, audits and corrective-action management.

These results reflect Euro Group's commitment to proactive risk management, workforce competency, management assurance and continual improvement across its projects.

7. Project Experience Highlight

Engineering and Consultancy Services for the Supervision of Road and Asset Maintenance Projects — Contract No. 45027

Client: Madinah Municipality

The project involves the supervision of road and municipal asset maintenance activities across Madinah. The scope includes monitoring maintenance works, verifying compliance with approved technical specifications and safety requirements, overseeing contractor performance and supporting the delivery of safe, efficient and sustainable transportation infrastructure.

The activities are carried out within operational roads and public areas. This creates interfaces between workers, construction equipment, vehicles, pedestrians, residents, businesses and municipal assets.

Figure 4: Project Experience Highlight

Key HSE Challenges

The principal HSE challenges include:

- **Live traffic and public interfaces:** Maintenance activities may take place on or adjacent to operating roads, requiring effective separation between workers, equipment, vehicles and pedestrians.
- **Multiple and dispersed work locations:** Activities across different sites require consistent HSE expectations, communication and contractor monitoring.
- **Temporary Traffic Management:** Work zones require suitable diversions, warning signs, barriers, lighting and access controls to protect workers and road users.
- **Changing activities and work conditions:** Short-duration and mobile maintenance activities require regular review of risks and controls.
- **High-risk tasks:** Depending on the assignment, activities may include excavation, mobile plant, lifting operations, electrical hazards, hot work or work at height.
- **Environmental and occupational-health conditions:** Dust, noise, waste, high temperatures and prolonged outdoor work require suitable controls.

Euro Group's Role

As the engineering consultant responsible for supervision, Euro Group supports project HSE implementation through a structured assurance approach.

Its role includes:

- Reviewing contractor HSE plans, risk assessments and method statements.
- Monitoring compliance with contractual and approved requirements.
- Reviewing Temporary Traffic Management and work-zone controls.
- Conducting planned site inspections and assurance activities.
- Identifying unsafe conditions and required improvements.
- Following corrective actions through verification and closure.
- Providing technical HSE guidance to project teams and contractors.
- Supporting induction, awareness and competency-development activities.
- Monitoring high-risk activities and verifying critical controls.
- Supporting incident and near-miss reporting and investigation.
- Monitoring emergency preparedness and occupational-health controls.
- Preparing HSE reports and recommendations for project management.

8. Strategic Value of Integrated HSE Governance

Integrated HSE governance provides benefits that extend beyond regulatory compliance.

It protects workers, contractors and the public, but it also improves clarity, accountability and project control. Risks are identified earlier, responsibilities are better defined and management receives more reliable information.

Strong governance also improves contractor performance. When expectations are clear and performance is verified consistently, contractors are more likely to plan effectively, allocate competent resources and respond to corrective actions.

HSE governance can also reduce disruption and avoidable losses. Incidents, damaged assets, delayed work and repeated nonconformities all affect cost, programme and reputation.

Environmental and occupational-health performance also benefit from early planning and systematic monitoring.

For clients, the value of integrated governance lies in confidence. It provides assurance that project risks are being managed within an organized framework and that significant concerns are communicated to the appropriate level.

For engineering consultants, it demonstrates that HSE is not an isolated discipline. It is part of responsible technical and project-management practice.

Conclusion

The successful delivery of complex engineering and infrastructure projects requires Health, Safety and Environment management to function as an integrated part of project governance.

Leadership commitment, risk-based planning, consultant assurance, contractor management, operational control, workforce competency, performance monitoring and organizational learning form the foundation of an effective HSE system.

When these elements are applied throughout the project lifecycle, organizations can move beyond reactive compliance toward proactive risk management and continual improvement.

Engineering consultants have a particularly important role in this transformation. Through planning, design review, technical coordination, supervision, reporting and corrective-action management, they can help ensure that HSE requirements are translated into practical project controls.

Euro Group for Engineering Consultancy's multidisciplinary experience in engineering consultancy, construction supervision and HSE management provides a strong foundation for supporting clients in developing project-specific and performance-focused HSE arrangements.

The company's verified performance highlights and its experience in supervising road and municipal asset maintenance demonstrate the value of integrating corporate governance with practical project assurance.

Through structured governance, technical oversight, contractor monitoring and workforce development, HSE can contribute directly to safer workplaces, stronger project controls and more efficient and resilient infrastructure delivery in Saudi Arabia.

About the Author

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Ahmed Maher is the Corporate HSE Manager at Euro Group for Engineering Consultancy, with more than 19 years of professional experience across industrial operations, engineering, construction, infrastructure and Health, Safety and Environment management in Saudi Arabia, Bahrain and Egypt.

His professional experience includes the development and implementation of HSE management systems, project-specific HSE plans, policies and procedures, risk assessment, contractor HSE management, audits and inspections, incident investigation, root-cause analysis, emergency preparedness, performance monitoring and HSE reporting.

At Euro Group, he supports corporate and project-level HSE governance across engineering-consultancy and project-supervision activities. His responsibilities include providing technical guidance, supporting project teams, monitoring HSE performance and contributing to the continual improvement of HSE arrangements across the organization.

Ahmed also has extensive experience in professional training, competency development and mentoring. He has developed and delivered technical training programmes and workshops covering occupational safety, risk assessment, incident investigation, HSE documentation and reporting, emergency response and project HSE management.

He is a Member of the International Institute of Risk and Safety Management (MIIRSM), a Certified Member of IOSH (CertIOSH), an International Diploma in Safety Engineering (IDSE) and a Certified Safety Manager (CSM).