

Finding Answers to How and Why

INCIDENT & ACCIDENT FORENSIC ANALYSIS

SIE's team are passionate problem solvers who excel at expert technical investigation, failure analysis, and forensic reports. Our expert evaluations help uncover the root causes of incidents or accidents, support legal proceedings, and provide guidance on remedial strategies to prevent recurrence.

EXPERT KNOWLEDGE & EXPERIENCE

Investigation of structural failures requires extensive and detailed knowledge of materials, structural mechanics, structural design, and failure theory to conduct investigations and arrive at correct conclusions.

A structured and disciplined approach is needed to determine root causes and any contributing factors.

SIE has the expertise and experience required, having assisted clients with various failure and incident circumstances, including:

- a) Prosecution expert witness, including failure analyses and reporting.
- b) Technical investigation, detailed structural failure analyses, and advice under legal professional privilege.
- c) Review, investigation and determination of root causes of numerous structural failure events.
- d) Investigation of significant storm impacts and damage to structures of various types.
- e) Compliance assessments and determination of required rectification measures.
- f) Commercial risk associated with engineering outcomes, as well as preliminary technical opinion on proposed court actions.

FORENSIC ENGINEERING & INCIDENT INVESTIGATION

SIE's forensic engineering considers structural, environmental and workplace conditions in detail. Forensic investigation requires extensive consideration, assessments, calculations, and checking to obtain causes and contributing factors.

- a) SIE's technical specialisation and experience in structural behaviour, analysis, assessment, and risk and mitigation serves as a strong foundation for structural failure investigations.
- b) SIE takes a structured approach to an investigation. Steps include obtaining available evidence, establishing uncertainties and gaps; determining timelines; and assessing why certain actions occurred; followed by developing and testing theories for key causation and contributing factors.
- c) Interviews with key personnel involved in incidents require a direct yet sympathetic approach.

“SIE are a team of passionate problem solvers with the technical expertise to find the causation of incidents.”



d) SIE's extensive site experience translates to an understanding of the environmental contributors that lead to incidents, such as wind forces, weather events, tides, temporary supports, or other works taking place.

DOING THINGS RIGHT WHEN THINGS GO WRONG

The right response is imperative when things go wrong. Rapid response to make an incident site safe and preserve it from interference or external factors will ensure that evidence is not lost, whether on purpose or by accident. This is important if the correct insight to the root causes is to be gained.

Preservation of an incident site often requires frank and direct communications with management on timing and requirements for evidence capture. Mine/port/asset managers are usually under pressure to return a structure to business as usual as soon as possible. However, adequate time must be allowed for an investigation. If evidence is unavailable or incomplete, a forensic investigation will take longer and be less certain.

SIE's depth of knowledge of structures, understanding of site conditions, and expert incident investigation experience mitigate unnecessary time loss. Our strategies assist clients in responding promptly and correctly to incidents, including make safe engineering requirements; securing the site and protection for evidence collection; and gathering necessary information before a site is handed back to operations.

It is crucial that the causes of an incident are correctly established. This allows asset owners to understand what happened and how they can mitigate both existing risk and future risk.

APPROACH & PROCESS

SIE takes a structured and staged approach to structural incident or failure investigations. We also assist legal counsel with establishing the technical questions that need to be answered to address the legal issues at hand.

Data collection is thorough and is followed by extensive analysis until structural root causes and contributing factors of incidents are identified. Failure investigations are not design exercises, and a specialised approach is required.

ADVANCED ANALYSIS

SIE's advanced knowledge of structural behaviour is coupled with contemporary and effective tools, such as structural analysis simulation software.

SIE use a variety of structural analysis software tools for geometric modelling, frame analysis, and advanced finite element analysis.

Effective use of these tools achieves accurate re-creation of failure conditions of structures, enabling identification or confirmation of root causes and various contributors to structural failures, including sensitivity and testing of failure hypotheses.

This allows us to ascertain and test theoretical behaviour versus actual structural reaction to external inputs, component failure or loading forces for multiple failure hypotheses.

CONFIDENTIALITY

Incident and accident investigations require the highest level of confidentiality. SIE investigations are performed under the supervision of Principal Structural Engineer Doug Hawkes, who also holds a Bachelor of Laws, and understands the legal and ethical boundaries for confidentiality and privilege.

REPORTING

Clear and concise reports are produced for the relevant audience, whether they are legal, technical or management personnel. SIE recognise that it is not the technical complexity that is important, but rather the causes of the incident.

Expert witness reports for the Court are prepared as well as joint reports after expert conferrals, when necessary.

About SIE

SIE is a leading Australian consulting firm with structural engineers in Perth, Brisbane, and Newcastle. We specialise in structural engineering; it is what sets us apart. Our senior engineers are highly experienced, state registered and Chartered in the structural field.

Since 2000, we have managed critical, complex, and challenging structural projects in Australia and overseas.

We are proud of our technical team. Their expertise and experience mean we are well equipped to manage and advise on your structural project or business critical asset.

Place your next enquiry with a Specialist Structural Engineer at SIE at info@siepl.com.au