

Independent IEC 61511 Functional Safety Audit – Major Hazard Facility

BACKGROUND AND CHALLENGES:

A major hazard facility engaged Equinox Automation to complete an independent audit of its functional safety management system and Safety Instrumented Functions (SIFs) against IEC 61511.

The client needed an independent auditor outside its day-to-day engineering and normal project support arrangements. The work also had to move quickly: an early view of the priority findings was required within a compressed timeframe, before the complete audit assessment could reasonably be finished.

The challenge was not simply to check documents. We needed to understand how functional safety was understood and applied across the business, including engineering, operations, maintenance teams and supporting consultants, and whether selected SIFs were implemented and supported in line with IEC 61511 and recognised functional safety practices for an operating major hazard facility.

SOLUTION:

Equinox applied a structured audit approach that combined IEC 61511 requirements with our operational and client-side engineering experience. The audit was completed by Equinox's competent functional safety certified engineers with practical experience across operating process facilities. This allowed us to work peer-to-peer with the client team and test documented processes against what was happening in practice.

The audit included a site kick-off, off-site review of functional safety procedures and records, and extensive interviews covering hazard and risk assessment, SIF design and implementation, operations, maintenance and proof testing.

We also inspected a selected group of critical SIFs to compare the documented lifecycle requirements with their implementation, operation and maintenance on site.

Because the full report could not be completed within the client's initial timeframe, we proposed a two-stage delivery. A preliminary report provided the priority findings from interviews, SIF inspections and the initial gap assessment. The detailed report followed after the evidence and full assessment had been completed.



**Independent
IEC 61511
Lifecycle Audit**



**Major Hazard
Facility
Assurance**



**Prioritised
Improvement
Roadmap**

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RESULTS:

The final audit assessed the IEC 61511 requirements relevant to the facility, focusing on higher-criticality areas. Each requirement included an assessment and supporting commentary.

Recommendations were prioritised using a risk-based method so the client could separate immediate functional safety priorities from longer-term process and documentation improvements. The report provided management with a clear improvement plan while retaining clause-level traceability for the engineers responsible for implementation.

The audit was deliberately collaborative. Findings were discussed openly with the technical team during the site work, followed by a close-out forum with engineering and management. This gave the client an early opportunity to test the conclusions, understand the basis for each recommendation and begin planning the response.

The value to the client was not in producing a compliance checklist. It was in adapting the audit to the client's needs and giving practical recommendations that could be implemented on an operating major hazard facility.

Following the audit, Equinox was asked to return and independently review progress against the recommendations, including improvements to functional safety processes, tools, templates and tracking arrangements.

OUTCOME:

The client received an independent audit assessment of its alignment with IEC 61511, a prioritised roadmap for improvement, and practical guidance grounded in the realities of operating plant. For the Equinox engineers involved, the project was a strong example of how operational experience and technical assurance can be combined to produce high quality outcomes for our clients.

CLIENT TESTIMONIAL: IEC 61511 FUNCTIONAL SAFETY AUDIT

"Equinox Automation carried out a professional and detailed IEC 61511 functional safety audit for our Major Hazard Facility. The audit provided us with clear, actionable insights into our functional safety systems and implementation practices, supported by a detailed report that clearly mapped compliance."

Through a combination of key staff interviews, documentation review, and on-site walkdowns, the process was thorough, well-structured, and practical, and was delivered within a very tight deadline."

Equinox engineers' collaborative approach made the audit efficient and effective, and has given us confidence in strengthening our functional safety processes across the IEC 61511 lifecycle."

Senior Engineer, Major Hazard Facility

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