



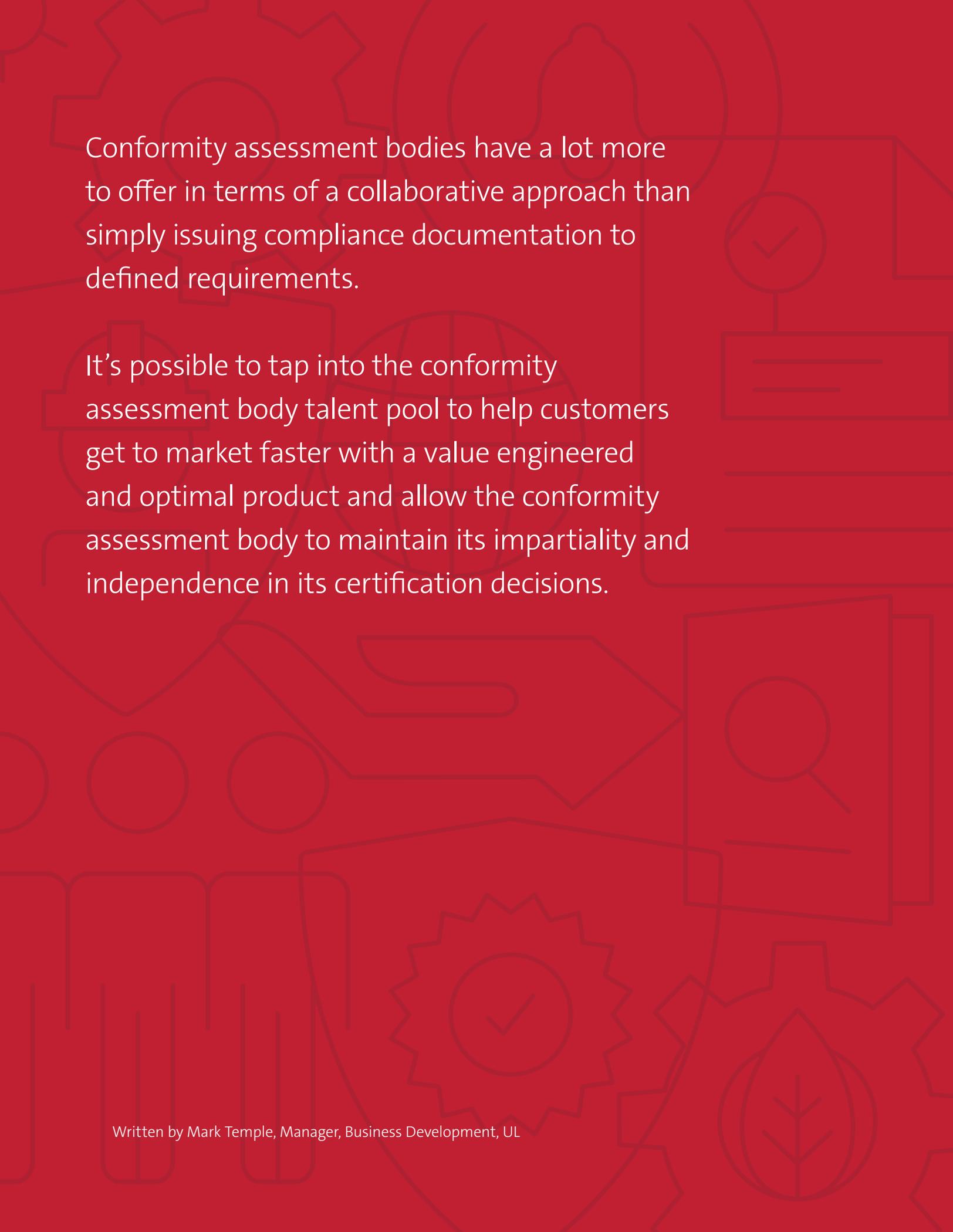
WHITE PAPER

# Advisory Services for Hazardous Locations

Demonstrating technical compliance regarding testing, inspection and certification from a collaborative perspective



Empowering Trust®



Conformity assessment bodies have a lot more to offer in terms of a collaborative approach than simply issuing compliance documentation to defined requirements.

It's possible to tap into the conformity assessment body talent pool to help customers get to market faster with a value engineered and optimal product and allow the conformity assessment body to maintain its impartiality and independence in its certification decisions.



## Technical and regulatory compliance

A first-time certification attempt for a customer on a product intended for use in hazardous locations (HazLoc) has a very high chance of failing to comply with the specified requirements. For an example, the non-conformance could be related to a document issue, the wording on a proposed label or instruction or even a fault in the casting of an enclosure that failed a destructive test. If the compliance aspects of a project are handled by resources not fully involved in the world of testing and certification, the requirements can be undershot or overshot (i.e., too little or too much focus in one or more areas) which can create avoidable delays. Overshooting can be as critical to a business as undershooting as the expense apportioned to technical and regulatory compliance makes the project unviable or worse: a commercial disaster.

With fewer skilled resources in the Testing, Inspection and Certification (TIC) industry than ever before, companies are looking at a more collaborative approach by expanding their access to staff, allowing their customers to concentrate on the most important business task: developing new, safer and more secure products without having to worry about keeping up with the complex global compliance landscape.

Without having someone with this in-depth knowledge on staff, elevated commercial concerns regarding compliance aspects can end a project at the ideation stage.

Recently, the certification phase of a project was seen as a variable cost and timeline milestone on a project because the belief was TIC companies should not be engaged until the relevant time in the project just before launch. The feeling was that early engagement of a TIC company might create more problems than it solved. In the past, companies may have brought the conformity assessment staff in-house so they could understand, mitigate and control the challenges through tribal knowledge. Today, TIC companies like UL are working toward a goal-oriented package of solutions to help the customers meet the defined requirements in a value engineered collaborative package.

In this whitepaper, we will take a deep dive into how advisory services may be leveraged earlier in a project value chain to reduce bottlenecks.





## What are advisory services?

According to ISO/IEC 17065: *The value of certification is the degree of confidence and trust that is established by an impartial and competent demonstration of fulfillment of specified requirements by a third party.*

This description suggests impartiality to the point of not being involved in substantive decisions for a project can alter the process in favor of passing a series of mandated tests for a certification. The key word that we will use to differentiate the offering of advisory services is the word “advice.” The decision based on advice relies 100% on the party seeking certification.

*The certification body shall identify risks to its impartiality on an ongoing basis. This shall include those risks that arise from its activities, from its relationships of its personnel. However, such relationships may not necessarily present a certification body with a risk to impartiality.*

Impartiality is key to the whole certification business. It’s a healthy and needed discussion that the certification providers need to have to help ensure that their engineers and reviewers base their decisions only on the evidence of compliance. It’s in an engineer’s nature to help: they are wired to demonstrate extra value from a project. To avoid crossing a line, the line needs to be in the same place for every engineer, manager, salesperson and business development manager all the way through a TIC company.

This risk management methodology is a key aspect of impartiality defined in ISO/IEC 17065. It involves active and ongoing identification of risks to impartiality, thorough analysis and mitigation, and review of these activities by a mechanism consisting of external stakeholders charged with safeguarding the conformity assessment body’s impartiality.

*The certification body and any part of the same legal entity and entities under its organizational control shall not:*

- a. Be the designer, manufacturer, installed, distributor or maintainer of the certified product*
- b. Be the designer, implementer, operator or maintainer of the certified process*
- c. Be the designer, implementer, operator or maintainer of the certified service*
- d. Offer or provide consultancy to its clients*
- e. Offer or provide management system consultancy or internal auditing to its clients where the certification scheme requires evaluation of the client’s management system*



## The do's and don'ts of advisory

The simplest way to set up advisory services is for all parties to be clear from the first meeting on the need to collaborate to let all stakeholders know the boundaries of the certification body (or the TIC company). Questions from the first interaction include:

- Where is the product in the timeline? (such as, ideation, design, first sample, or production ready)
- What can and can't be modified before certification? (risk versus cost assessment)
- How can a compliance company help if the item was to produce a nonconformance through the project?

This is critical because the customer's time-to-market pressures must not affect the integrity of this process. The more visibility the TIC company has to the customer's value chain, the greater the understanding of where the conformity assessment body can and cannot help.

In the past, some companies have been hesitant to engage a TIC company early in fear of the certification engineers being able to see "under the hood" and spot any issues before it hits the laboratory. This was especially true when manufacturers had resources on staff who were stakeholders, champions of the processes, and very knowledgeable on regulatory compliance. Today, industry wants outcomes faster and the luxury of companies being able to afford the time for someone to become knowledgeable about regulations and compliance may have passed.

Product lifecycles today can be very short and the old way of achieving compliance might not work. As industry evolves with new faces and new work cultures, in certain situations conventional certification processes may be seen as providing too much financial risk to a project and that risk may be mitigated out in the design phase.



## Advisory guidelines

For example, advice provided through an advisory project could help a customer's engineer identify an area in a standard and work through the various interpretations and boundaries. This would allow them to make an informed design decision without undershooting or overshooting the intent of the requirement in the standard, the customer's requirement or any other technical compliance or regulatory deliverable.

This commodity is increasing in value year-over-year as industries see a continued net loss of what has been called domain expertise: Baby Boomer or even Generation X staff retire, go independent or transition industries. Employers either didn't worry enough about it when it was happening one-by-one without realizing the ultimate cumulative effect or didn't do their succession planning. This has left a knowledge gap in industries that can be filled by a trusted TIC company with extended knowledge of the global compliance arena.

The added benefit of advisory is that the certification engineer can be involved and engaged earlier in the process and partner through the entire project.

## The great crew change

Since the late 1980s, the number of workers entering the industry with science, technology, engineering or mathematics (STEM) backgrounds has been in major decline. The legacy of this phenomenon is that in the next industrial uptick in the age profile of the returners and lack of available labor will be a net loss versus demand, known as the great crew change. Crew change is a term coined by the energy industry to describe people finishing a residential trip abroad or a period offshore. The industrial sector has always recovered from downturns or recessions as the pool of labor coming up through the ranks or prepared to rejoin the industry has been enough to continue a workable level of competent staff.

Technology will fix some of these related issues as we quickly adopt Industry 4.0, but the gap will be around 10 million practical engineering roles.<sup>1</sup> The other effect is the loss of tribal knowledge that may be impossible to emulate in some applications.



# Mitigation of testing and certification challenges with loss of tribal knowledge

Missing a planned market launch date can result in a significant amount of lost potential revenue. For example, a two-month delay on a launch date for a new and innovative product could result in a significant missed market opportunity revenue. This happens when the project planning doesn't mitigate the risk from delays in the technical compliance phase of the project.

Manufacturers that engage their TIC company early can develop a risk mitigation plan and work with that trusted partner to know most of the risks up front. There may be issues down the line where a supplied piece of equipment fails a mandated test due to a manufacturing or material defect. A lot of the compliance work is a documentation review. If this is done earlier in the process, then precious time between final testing and product launch can be saved.

Here are some examples of activities allowed to be performed that will not affect a conformity assessment body's impartiality:

- Conducting a preliminary investigation
- Clarifying requirements
- Referencing the need to comply with a standard or similar
- Conducting testing and reporting results (interpreted as design validation or performance testing)
- Confirming compliance with the standard
- Explaining findings
- Discussions of product concepts and how the standard applied
- Discussion of new product concepts in order to develop new certification requirements (OOI or CRD)
- Evaluation of installation instructions and user manuals
- Providing general options — not a specific solution — to meet requirements
- Participating in design reviews with comments limited to compliance with certification requirements

From a major capital project level, e.g. engineering, procurement, construction management (EPCM), significant savings can be realized by having independent advisory services reviewing the engineering specifications for a globally based project helping our clients find the fastest and most value engineered solutions, even at the tendering stage.



## Adding more value to the compliance project

When advisory is proposed by a TIC company at the start of a project, there can be hesitation at an extra cost on top of the testing and certification phase. Additionally, some manufacturers develop products with other random variables that need to be considered. In particular, HazLoc projects can have a higher chance of failure than general purpose projects due to unforeseen costs with delays, re-design and re-submission. Continuing nonconformance can make a project become unfeasible.

This concern deters some manufacturers from expanding their product lines — especially into lucrative HazLoc products. For an original equipment manufacturer (OEM) of ordinary location or general purpose industrial equipment, the market size and product value could be 10 times the original opportunity. For instance, the cost of a first-to-market hazardous locations cell phone versus a similar general purpose item goes from \$300 to \$3,000.

If you roll up the value of expedited time to market, faster product development, potential for optimized products and the value engineering of the global marketplace across several sectors, the upfront investment looks a lot more enticing. The other benefit is that the advisory work will be coaching/teaching or strategy building and is a proactive investment in setting the project up for success from the start. Without it, you need to look at the potential cost of the entire project possibly being a total loss.

## Undershoot, overshoot or just right

If you don't live and breathe technical standards as your day job, keeping up is very difficult. One requirement of the CE marking for Europe has more than 20 directives that are implemented as various laws in the European Economic Area (EEA). These directives each have multiple standards that are harmonized and used to demonstrate the essential health and safety requirements for each regulation.

If you want your engineers to be thinking of the next big innovation or optimizing your latest project for success, understanding conformity assessment activities such as product certification for the global marketplace can be difficult to navigate. These directives, standards and codes are based on the interpretations of engineers at various stages: from the technical committees, to the designer, from the QA/QC in-house, to the person that signs your approval to put your authorized mark on the label. If interpretation is done in-house without advice from an expert, requirements may be undershot or not met or the item may be overshot or over-engineered to meet every single interpretation, and those costs may come straight off the bottom-line profit.

Advisory from a trusted partner with extensive expertise testing your project that also has members on various technical committees, as well as experience with many compliant projects each month, may help you navigate and understand the complex world of conformity assessment and associated requirements. This may help you save time and frustration and is another key aspect that needs to be included in your technical compliance plan.





## NRTL, CB, NB all under one roof

Whatever the type of project, from discrete project to offshore platform or data center, upfront advisory services from a trusted partner with the science-based foundational services of a conformity assessment body can add significant value to projects in several ways. To streamline projects and accelerate global market access, look for a partner that has hundreds of skilled engineering staff plus many accreditations for the global marketplace in one point of contact.

For North America, a conformity assessment body may hold accreditation from an International Accreditation Forum (IAF) member, may be an OSHA Nationally Recognized Testing Laboratory (NRTL), or hold additional recognitions from groups such as the Mining Safety Health Administration (MSHA) and U.S. Coast Guard (USCG). They may also be a Certified Body (CB) under the globally recognized International Electrotechnical Commission (IEC) scheme. Also, for products destined for the EEA, there is the NB (Notified Body) scheme, providing validation of equipment against requirements for EU directives.

Considering the fact that there has been a reduction in competent employable in-house staff, there is a lot of knowledge of standards and technical compliance within an experienced conformity assessment company you can rely on.

## Example advisory projects

Take a look at some typical successful advisory projects. These are just two of many success stories that have turned advisory customers stories of concern, pain and nonconformance into seamless technical compliance projects.

An aerospace company, based in Europe, did not have the in-house expertise to develop their project for U.S. technical compliance and move them into the hazardous location supply chain. The technical experts in the TIC company were engaged early to highlight the challenges and point out some project dead stops. The advisory scope included clarifying requirements, referencing the need to comply with the standard or similar, confirmed compliance with the standard, explained findings, discussed product concepts and how the standard applied and provided general options — not a specific solution — to meet requirements.

A U.S. manufacturer in Indiana was able to work with the TIC company to overcome a hurdle for a product headed for Australia that concerned the customer as they thought they were going to have delays due to having their whole system evaluated. Advisory services were engaged to guide the customer on a value-engineered route to help ensure a timely delivery of the initial project and also build that into pre-work to have their whole facility IECEx ready. The advisory scope included clarifying requirements, referencing the need to comply with the standard or similar, confirmed compliance with the standard, explained findings, discussed product concepts and how the standard applied, provided general options — not a specific solution — to meet requirements, and participated in design reviews with comments limited to compliance with certification requirements.

A large, complex offshore oil rig structure, primarily yellow and white, extending into the blue ocean under a clear blue sky. The rig features multiple levels of platforms, ladders, and piping. A red semi-transparent box is overlaid on the left side of the image, containing the word 'Summary' in white text.

# Summary

Early engagement of the conformity assessment body can reap financial rewards in many aspects of technical compliance projects or even projects not heading for a final certification. Performance testing of a project supported by literally thousands of years of combined standards and conformity assessment experience helping customers through the minefield of product compliance can yield surprising findings and opportunities to capitalize on the development spend.

The expertise within TIC companies can always be leveraged in place of in-house head count. A pool of hours can be utilized for many subject matter experts across several industry sectors. No matter how good your in-house compliance group overhead is, it would never match the expertise of a TIC company.

Engage early to get clear collaborative and expedited projects with your trusted partner and allow your staff to concentrate on getting new, innovative and optimized products to market. In summary, use the 1:10:100 rule: \$1 spent up front will save \$100 at the end, or maybe several million on a late capital project element holding up shipping of a production platform across the globe.

**For more information: [UL.com/HazLocAdvisory](https://www.ul.com/HazLocAdvisory)**

# Standard references

- ISO/IEC 17065:2012  
<https://www.iso.org/standard/46568.html>

# Endnotes

1. McKinsey Global Institute – Skill Shift – Automation and the future of the workforce  
<https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/Skill%20shift%20Automation%20and%20the%20future%20of%20the%20workforce/MGI-Skill-Shift-Automation-and-future-of-the-workforce-May-2018.pdf>





**For more information: [UL.com/HazLocAdvisory](https://www.ul.com/HazLocAdvisory)**

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