



SAVE LIVES GLOBAL RESEARCH

Research Paper No. 001

Beyond Paperwork – Today's Must-Have Elements of Resilient Contractor Management

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January 2026

Save Lives Global Research

Research Paper No. 001 – SLG-RP-001

Version 1.0

First Edition

Publication Date: January 2026

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Suggested citation

Goncharenko, S. (2026). *Beyond Paperwork – Today's Must-Have Elements of Resilient Contractor Management*. Save Lives Global.

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Save Lives Global Research publishes practitioner-focused papers advancing human performance, Serious Incidents and Fatalities (SIF) prevention, contractor management, organizational resilience, and emerging safety challenges

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1. Introduction

Though this project was among the most important investments that BP, as a corporation, was making for the future, some felt like the Macondo, one of the deepest wells drilled at the time, had been a cursed endeavor from the start. The well was a three-mile-long tube of cement and steel that had been burrowed into subsea rock in the weeks before. It was one of the industry's most important new efforts to find oil in the deep waters off the southern coast of the United States.

As is characteristic of the industry, of the 126 personnel on the rig, only six were BP employees. The remainder were contractors from Halliburton, MI-SWACO, Transocean, and others. So, from the personnel perspective, it was a typical project, the progress of which largely depended on the ability of the contractors to do their part. This is the reality of how business is done today.

Together these contractors had battled for weeks to control wild kicks of gas and to adapt to a series of setbacks doled out by the complicated and unpredictable well. Stress and conflicting mandates to drill as quickly, safely, and cheaply as possible resulted in many wrong decisions. These decisions, combined with failed sensors, automatic shutoffs, and other equipment malfunction resulted in the Deepwater Horizon explosion at 9:56pm on April 20, 2010.

Known today as one of the most significant modern industrial incidents, the long lasting and far-reaching consequences of the Deepwater Horizon catastrophe were truly devastating. The full costs of this dreadful explosion are hard to measure, though it immediately claimed 11 lives, injured 17 more, spewed 134 million gallons of oil into the Gulf of America over the course of 87 days nearly a mile below the surface, and amassed a hefty \$70+ billion price tag, including spill response and clean up, fines and penalties, and litigation. In the ensuing days and years following this disaster, there have been numerous investigations, finger pointing, and reports that identified issues in the areas of corporate responsibility, business ethics, leadership, decision-making, communication, and contractor management.

And while the point of this paper is not to get to the bottom of all the contributory causes of the Deepwater Horizon incident, the significance of the interplay between British Petroleum (BP) as a hiring client and its respective contractors cannot be overestimated. Aside from all other significant triggers of this event, the backstory of BP culture and how that culture impacted their interactions with all the contractors around the world cannot be ignored because long before that fateful day it set the tone for what took place on April 10, 2010. After all, even at the time of the event BP contractors made up 95% of the workforce on the rig. So, contractor management played perhaps one of the key parts in what many consider today the most significant industrial disaster of the century.

It is clear that proactive management of contractor safety is paramount to the success of many if not most organizations today. Contractors can make you or break you. Modern contractor management must evolve beyond compliance and paperwork into a system of continuous risk

governance built around resilience, human performance, real-time operational intelligence, and Serious Incident and Fatality (SIF) prevention. Thus, the reason for this paper.

FIGURE 1. THE CONTRACTOR RESILIENCE MODEL

Moving Beyond Compliance to Continuous Risk Governance



2. Contractor Selection

Traditional contractor prequalification focuses primarily on documentation and historical performance. Increasingly, resilient organizations supplement those lagging indicators with leading indicators and real-time operational data. Each company that relies on contracting work for its success must prequalify and vet those contractors on the basis of some clear and defined parameters, like cost, quality, safety, scheduling availability, insurance, etc. Sometimes the vendor selection criteria are clear cut, and it is easy to award or reject contractors based on their risk levels. At other times, however, due to a wide range of reasons, such as remoteness of the work, or the highly specialized nature of the contract, special insurance requirements, or many other criteria, a riskier contractor has to be selected and the hiring client better be prepared for conducting deeper scrutiny.

So, contractors need to be evaluated and vetted thoroughly based on any or all of the following, depending on your particular circumstances:

1. Financial risks - are they able to fund the operations through the project completion?
2. Subcontracting risks - how do they vet the various tiers of their respective contractors?
3. Design risks - is their work suitable for purpose?
4. Supply chain risks - what are their contingency plans for disruptions and damage to single point of failure equipment?
5. Security risks - how are they planning to prevent theft and vandalism?
6. Quality risks - what is their validation process, rework arrangements and warranty cost protocols?
7. Schedule risks - what is their process for preventing and managing delays and conflicts?
8. Safety risks - what is their history of injury prevention, case management, and safety culture?

Although much has been done on the subject of contractor evaluation, two things have historically been validated in the past: key performance indicators (KPIs) and systems and programs in place. There is another element, however, that is rapidly gaining momentum especially with the rise of technology, namely real-time data from the field. This third element is still fairly new and not consistent as of yet. It depends largely on the level of adoption of new and upcoming technological tools utilizing artificial intelligence (AI), such as computer vision, wearables, and other monitoring, tracking, and computing solutions. Together these tools can begin to provide data feeds live from the field that can supplement traditional criteria used in contractor selection and evaluation.

These elements are important because a contractor's historical performance provides a view into their ability to complete required work in the future. While the list above is by no means comprehensive, it needs to be emphasized that no single standalone indicator should be relied upon as the sole determinant of contractor's readiness. Instead, these and other relevant factors that are applicable to your specific context and situation should be used in concert to paint an overall idea of contractor's risk profile.

Figure 2. Most Commonly Utilized Contractor Selection KPIs

	Serious Incident and Fatality Rate (SIF)		Lawsuits and legal disputes
	High Energy Control Assessment Rate (HECA)		Schedule adherence (liquidated damages history)
	Experience Modifier Rate (EMR)		Budget adherence (change orders and cost overruns)
	Total Recordable Incident Rate (TRIR)		Warranty claims and rework history
	Lost Time Injury Rate (LTIR)		Employee training records
	Regulatory or legal violations (OSHA, EPA, permits, etc.)		Skills verification records, etc.

To be clear

There are no perfect contractors out there. Just like there are no perfect hiring clients. Each has their own challenges, and each is in a different place on their path to perfection. So, your choice of a contractor will depend on not only where the contractor is on their journey, but also where you are on that same journey to perfection.

In addition to the KPIs, contractor's current key programs and processes is another way of ascertaining their commitment to consistency, progress, and safety. What programs should you review? Start with the below and expand this list based on your individual needs and circumstances:

- Employee and contractor safety manuals – are they aligned and integrated with project requirements?
- Onboarding and offboarding programs for employees and contractors – aligned with your culture?
- Training programs for skills development – validated and verified?
- Competency verification programs – tested and reviewed?
- Formal mentoring programs with progress tracking – this is becoming more pertinent with the expanding talent gap due to the generational shift in the workforce.

- Lessons learned documentation and integration process – is it paper only or actually implemented in the field?
- Continuous improvement and innovation initiatives – is this current?
- Corrective and Preventive Action (CAPA) systems – are they learning from unforeseen events (this is even more important than whether they're having those events)?
- Leadership development programs for all staff levels – this is also gaining traction today.

Of course, the prequalification and the risk-based vetting is only the beginning of contractor selection journey. Once that step has been completed, the next element is defining and agreeing on clear scopes of work, roles, and limits of authority. Crossing this bridge early can prevent unnecessary conflict and unpleasant future conversations on scope creep and other related matters. This is where the importance of alignment and collaboration with procurement is key.

At this stage of the journey, it is also important to verify that contractors have qualified personnel for the specific tasks, jobs, and hazards involved. If generic experience will not do in your case, vet your contractors against the specialized background, training, qualifications, and certifications. The more of this work you do at the front end of the contract, or before it, the easier you make your life for after the signing of the contract.

3. Contractors as Strategic Partners

Why do you hire contractors? Because they are uniquely qualified to do what you cannot do at the same cost, schedule, or with the same accuracy, precision, quality, and etc. Yet, in hiring contractors, you incur a level of risk by attempting to merge your culture with theirs while still maintaining the legal separation that will steer you clear of co-employment clauses and such.

So, how do you do all that and do it successfully? The simple answer to a complicated question above is partnership. If you partner with your contractors, treating them with respect, honesty, and openness, they will do their utmost to satisfy your requirements. But partnership is easier said than done. So, what are the keys to a successful partnership?

Like in marriage, listening to your contractors is key to a productive partnership. Being fair in your expectations and taking responsibility for the challenges that you create is also important. When contractors share their challenges and issues with you, it takes a certain level of maturity and vulnerability for them to do so. Do not punish them by requiring extra root cause analyses for the near misses they told you about or placing them into a caution category because they reported more potential serious incidents and fatalities. In doing so, you are actually taking a step back in your trust building and the creation of a positive culture.

4. Culture, Culture, Culture

Another extremely consequential element of contractor selection is gauging the level of alignment on safety culture. Though it came up earlier in this work already, this concept is important enough to where additional consideration must be given to it. This term and the concept it represents may be new to some, while others may take issue with it due to the semantics. This latter category of individuals believes that there is no such thing as safety culture. There is just culture and safety is one of the components of this overall organizational culture. This makes sense to a point. After all, we don't have a finance culture or HR culture, so how can we possibly attempt to capture the absence of unwanted events as this made-up social construct, called safety culture? However, our constructs are as dynamic as our languages.

The term safety culture, while perhaps somewhat non-sensical in and of itself, may be the easiest way to identify the sum of what an organization is and does in the pursuit of safety. Safety culture is a broad umbrella that incorporates a wide range of items, such as policies, procedures, SOPs, leadership engagement, values, communications, training, psychosocial considerations, incident management, drug and alcohol expectations, and a whole host of other elements.

And, for the reasons above, it is extremely important for the hiring client and contractor to align on safety culture expectations. If they don't, people die. And no one dies if there is no alignment on finance or HR culture.

But there is also a commercial reason why safety culture must absolutely be considered in the process of selecting the right contractor. As was mentioned earlier, your associations with contractors bring a degree of shared legal and reputational liabilities that come with the territory. So, proper vetting on the front end can result in saving much grief, litigious pain, and reputational catastrophe on the back end.

Ok, we established the importance of alignment on culture, specifically related to safety here. What we have not really mentioned or discussed is how you ascertain that there is an alignment. Clearly, there is more to it than simply asking about the trade partner's culture and taking their word for it.

You can begin the assessment of alignment with a few simple questions and key field observations. Questions like, "What are you doing to improve your safety culture?" The answer to this simple question can tell you a lot about:

- the contractor's understanding of the concept,
- knowledge of the components of the culture,
- level of engagement,
- progress in the culture journey,

- and so much more.

You just have to pay attention to what they are saying and what they are not saying in responding to this question. In addition to that, matching their answers to your observations of their operations on the field can truly paint a solid picture of where they are. To build on that, you can continue the assessment with more formal evaluations, questionnaires, and independent verifications. All of these will either confirm your initial evaluation or provide you with more areas for investigation.

5. Cultural Alignment is Critical

What does it actually mean to have an alignment on culture on a practical level? And what if there is no alignment on the culture but you must hire the contractor because there are no alternatives? Those are all good questions, and they have good answers.

In fact, both of the questions above can really be answered together. Here's a practical implication – whether you do have an alignment or you don't, as a hiring client you can set the expectations for the right culture for all your contractors. As such, those whose internal cultures are aligned with yours can enjoy a mutually beneficial relationship that encourages growth, sharpening, and improvement. Those contractors, however, who are not aligned, can still be expected to adhere to your standards. Here a specific and detailed plan will need to be worked out on what your expectations are and how this contractor can meet them.

Your expectations may be for your employees and contractors to meet the minimum regulatory requirements of the appropriate federal, state, and local jurisdictions. If this is you, you are not alone. Many clients share these expectations.

Or your expectations may go above the minimum regulatory requirements, incorporating industry's best practices, ISO standards, and other local, regional, or global codes, procedures, and methods (ANSI, ASSP, ASTM, NFPA, API, VPP, ILO, etc.). Many forward-looking and proactive organizations are on this path today. They look at risk in a more holistic and comprehensive way than what is only required by current regulations.

It is worth mentioning here that many organizations today have decided to add significant injuries and fatalities (SIFs) to recordable rates and other traditional safety KPIs. Some are tracking both SIF and TRIR rates equally and others are choosing to focus on SIFs primarily and allow TRIR to fade into the background. As a hiring client, it is important for you to take a serious consideration of where you are, what you are measuring, and how you are progressing. In considering these questions, the answer will materialize, as to which

indicator you should focus on. As a contractor, you are often at the mercy of the hiring clients and at least need to be aware of the SIF conversation, so you can engage intelligently with the clients.

So, as a hiring client having expectations for your contractors, there is nothing wrong with that. Whatever your expectations may be, there is nothing abnormal about requiring your contractors to meet your expectations. It is your prerogative and if they want to do work for you, they will need to choose whether this relationship is worth the additional costs of compliance.

Another practical element in the area of the alignment on safety culture is the expectation that your contractors have for you. What do they expect from you? To provide onboarding for their personnel, site-specific orientations, and confirm understanding of the above. You may think that it does not matter what they expect from you, as long as they do their job. But, in the interest of real partnership, described above, it is important to be on the same page here.

6. Contractor Induction and Training Requirements

The next element of successful partnership between clients and contractors is proper induction of your contractors. When you conduct the induction of your trade partners, you have the opportunity to impart to them what separates you from all the other hiring clients. Below is just a small sample of the types of questions and issues that you may want to consider including in your contractor induction:

- What makes you you?
- Is there something unique about your culture? Introduce them to it.
- What are the most important elements of your culture? And which parts of it do you expect your contractors to embrace?
- How are your sites different, unique, or specialized?
- What else do you contractors need to know about your sites?
- What do contractor employees need to bring or not to bring to your sites?
- What are your non-negotiables?
- List your expectations especially if they are above the minimal regulatory requirements.

Contractor induction is followed by contractor training expectations. Contractor training is an indispensable element for a successful partnership. In the training expectations of your contractors, you will start with the induction described above and build on that foundation.

Your organization undoubtedly has a training matrix for your own personnel. Which elements of that curriculum do you think should be applicable to your contractor employees?

Setting the minimum training expectations for your contractors is only half of the battle. The other half is verifying that the content and the delivery of the training chosen by your contractors actually meets your expectations. Otherwise, how would you know if their fire extinguisher user training is fully online and never touches a fire extinguisher? Or that their Control of Hazardous Energy or Lock Out Tag Out (LOTO) training is 2 minutes and 45 seconds long and delivered in an e-learning format? You must remember here that the reason you require training from your contractors in the first place is not for the sake of them having a checkmark for training but for the sake of them learning and understanding what to do and not to do, in order to go home safe primarily and in order not to damage the property or equipment secondarily.

7. Managing Hazards and Emergencies

The next important element of partnering with your contractors is ensuring that they share your understanding of what constitutes hazards across your sites, facilities, and locations. This is related to the previous subject of training, as you will need to make sure that your vendors understand, share, and are aligned with your identification of hazards, mitigation of the same, and erection of robust systems and protocols that will prevent these hazards from hurting or killing people, damaging facilities, or destroying equipment.

In addition to training on hazard identification, you will also need to educate, empower, and encourage robust and consistent assessment of risk on your jobs. This area includes pre-job risk assessments which go by different names, like Job Safety Analysis (JSA), Job Hazard Analysis (JHA), Pre-Task Plan (PTP), and etc. Everyone expects them to be done but, as someone who often sees the execution of this simple task in the field, I can tell you that there is still a lot of confusion on the part of the workforce and frontline supervisors on what exactly to do it, when to do it, and how to do it effectively.

As Matt Hallowell writes in his *Energy-Based Safety*, research shows time and again that without knowledge, understanding, and external helps, most of us do well to identify only about 45% of the hazards inherent in the tasks we are about to perform. That's a pretty low number and one that does not inspire much confidence in the ability to perform the job safely. Nor should it.

When you combine the above statistic with the fact that about 80% of SIFs originate from some change in work, the prognosis is even bleaker.

So, you would do well here, whether you are a hiring client or a contractor, to ensure that your personnel is trained on how to assess risks, when to do it, who should participate, and what external aids, like Energy Wheel, STKY Wheel (Stuff That Kills You), etc, should be utilized in the process.

Being prepared for emergencies is another important part of doing business. Whether it is violent thunderstorms, hurricanes, tornadoes, workplace violence, or terrorism, knowing what to do, how to mitigate, and seek help can make a difference between life and death.

8. Monitoring Your Contractors

What comes next? After qualifying, selecting, onboarding, and verifying all the right programs and protocols for your contractors, do you just release them to work on your locations? Not exactly. Next comes contractor monitoring, in order to validate that the work on your sites is performed as planned and as safely as promised.

Trust but Verify is a well-known concept and it is certainly applicable here. There is quite a bit that can be verified in this area, from auditing the contractor's programs, be they safety, environmental, security, insurance, risk management, and etc., to assessing the implementation of these programs, to examining the adherence to their programs and regulatory requirements at work locations, to measuring their internal climate via perception surveys, etc. There are many ways that contractors can and should be monitored.

In the process, below is just a small sample of the questions that should be considered by all hiring clients at some point:

- How do you audit or assess your trade partners?
- What do you look for in audits?
- How often do you conduct assessments?
- How do you track the closure of gap findings from these audits?
- Do you trend the audit findings by year, region, business unit, etc., in order to inform your mitigation strategies and preventative actions?

These and many other questions like them must all be answered, in order to establish a flourishing and productive contractor assessment strategy.

9. Contractor Fit-for-Duty Programs

Continuing along the lines of the Trust but Verify principle, all hiring clients rightfully expect their contractor employees to show up to their job locations unimpaired by the effects of drugs and alcohol. Part of that expectation is aligning with your contractors on their drug and alcohol programs. When and how do you expect them to verify their employees' fit-for-duty status?

Pre-employment? Most include this.

Post-incident? Most include this also.

Random testing? Most programs require this element as well.

Reasonable suspicion? This also happens to be a common element in most programs.

There is another aspect to the Fit-for-Duty programs and expectations that needs to be addressed here. This element, referred to as Case Management or a more updated concept of Care Management, addresses how contractors manage the injury response and treatment of their personnel. While in theory this may seem like more of a personal issue for the contractors and one that should perhaps be outside of the scope of the hiring clients, in practice, however, a different picture emerges.

There is much more to responsible Care Management than how quickly the employee returns to work after the incident. This is certainly at the center of Care Management but a robust program:

- begins way before the injury takes place
- manages the organizational response to injury,
- promotes employee morale,
- and is beneficial for the workers and their employers at the same time.

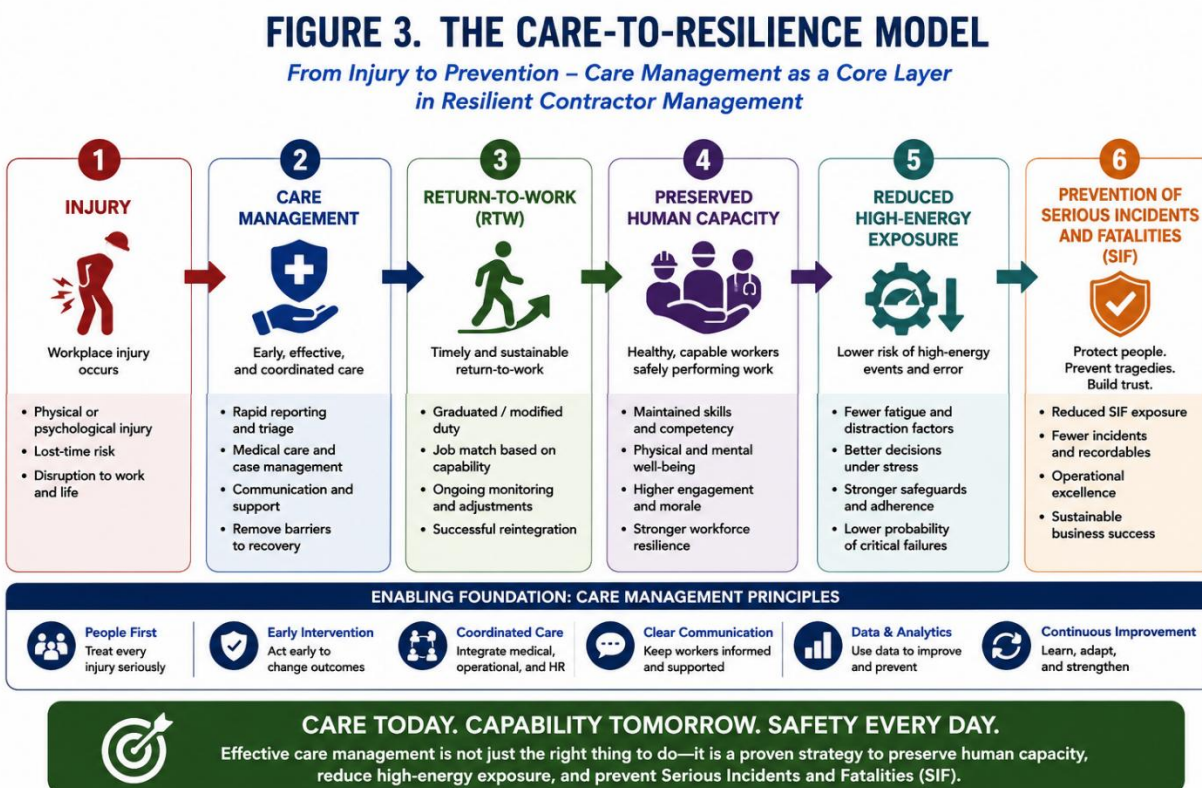
At the center of it is the idea that work is restorative and promotes quicker healing physically, emotionally, and psychologically. In his book *Accelerated Recovery*, Dr. Howard B Cotler has a chapter on the Science of Post Surgery Recovery, in which he states that, "In order to return you back to health as soon as possible after your operation, it is important to get you out of bed, walking, eating, and drinking, and off of prescribed narcotics as soon as possible" (Cotler, 40). Dr. Cotler, backed by strong medical research, says that getting back to normal life quickly is the best way to recover faster. It is true in the medical field and should be considered in any holistic care management program. A proactive return-to-work focus helps employees heal faster—physically and mentally—by getting them back to

routine sooner. It also benefits employers by improving business operations in several different ways.

10. Proactive Care Management and SIFs

It has been established, both scientifically and experientially, that most serious incidents and fatalities do not come from minor injuries.

Thus, the renewed focus on SIFs. Most serious incidents and fatalities originate from high-energy exposures (Hallowell, Energy-Based Safety, 2025). Moreover, these SIFs often happen after fatigue, pain, reduced mobility, cognitive distraction, or rushed or modified work. Thus, medical status and work capacity are upstream SIF risk factors.



Proactive care management, as mentioned above and will be detailed later in this research, is essentially early clinical engagement before injury severity escalates. Untreated or poorly managed injuries increase reaction-time delay, compensatory movement patterns, and loss of situational awareness. These factors, in turn, increase probability of catastrophic outcomes when workers are exposed to mobile equipment, heights, confined spaces, and energized systems for example. Thus, proactive care

management is an upstream SIF control because it preserves functional and cognitive capacity in high-risk work.

When treated purely as an instrument of controlling claims, legacy case management rightly received a fairly negative grade. But when utilized as risk governance, proactive care management can and does contribute to rolling back SIFs. How so?

Poorly managed injuries can often lead to premature return to unrestricted duties, informal task modification, hidden limitations not visible to supervisors, and sometimes even worker self-accommodation, which is the most dangerous of all. All of the conditions described above increase SIF likelihood, not TRIR, but structured oversight and visibility of care as well as robust return-to-work protocols clear functional limits, which enables more controlled task exposure. This, in turn, results in reduced high-energy mismatch. To put it another way, proactive care management prevents SIFs by ensuring task demands never exceed verified worker capacity.

Similarly, improper or insufficient return-to-work protocols is where many organizations unintentionally create SIF risk. It happens when uninformed but well-meaning personnel return to work tired, on pain medication, with partial mobility, or a whole host of other unresolved issues. These return-to-work failures often precede falls, caught-between events, vehicle incidents and line-of-fire exposures.

Conversely, organizations with robust return-to-work protocols ensure that task design is intentional and exposure to high-energy hazards for example is phased. Here, the supervisors and frontline leaders understand why restrictions exist and do not try to ignore them. And, by extension, the workers then do not attempt to self-modify or hide pain. Thus, structured and robust return-to-work becomes a SIF prevention process, not a disability process. As such, proactive care management and robust return-to-work are SIF controls because they manage human capacity during periods of elevated vulnerability, when exposure to high-energy hazards carries disproportionate fatal risk.

11. Incident and Near-Miss Investigations

Incidents and injuries happen in our workplaces because they are staffed with fallible people. What does it mean? It means that our employees, their managers, and the executives make mistakes. We all do. We are all fallible people. To err is human.

What's worse is that we can't exactly predict the next time that we are going to make an error. If we could, we wouldn't make that error. So, if we can't predict every error with 100% certainty, we can't prevent all incidents with a 100% success rate.

What's the next best thing then? Preventing what we can and building controls in place that can help us to recover by failing safe for what we cannot prevent. So, this way, when incidents do happen, they do not kill or seriously injure our people. Then, we do our due diligence by carefully investigating every single incident, in order to identify any potential systemic gaps that need to be addressed.

Do your contractors conduct incident investigations with the purpose of learning and sharing the learnings across your locations and their larger team? Are their investigations up to par and do they satisfy your expectations? How do you know?

12. Technology and Real Time Signals

We live in the age of technology, and it can and should certainly be leveraged in your contractor management practice if you want to stay relevant, competitive, and profitable. The list of options and tools in this space is rapidly growing and expanding. The general principle here is that both hiring clients and contractors can choose from the existing range of apps and tech or create their own internal solutions that align more closely with their intended purposes and processes.

Take the overhyped artificial intelligence (AI) as an example. Per research and findings provided by Trivedi P and, Alqahtani FM (see Bibliography reference below), AI encompasses the capabilities of computer systems or robots to execute tasks like language comprehension, image identification, decision-making, and problem-solving, with conventionally mandating human intellect. AI-enabled devices, like robots or drones, are increasingly used for inspection, maintenance, or repair operations in perilous settings such as mines, power plants, telecom towers, refineries, and constructions sites, enhancing safety and efficiency.

But before discussing individual tools, perhaps a more general question of how AI can be incorporated into contractor management should be answered first. AI tools and technologies can be integrated into streamlining contractor vetting, managing contractor training, and monitoring contractor compliance as a starting point. Drilling down further, AI tools could be leveraged to identify and analyze patterns in contractor performance, such as common safety violations, injury precursors, and etc. Additionally, AI could offer predictive analytics to flag potential compliance issues and risks. It can also proactively manage risks and track contractor accountability.

13. Use-Cases of AI in Contractor Management

If you are still unclear about how these AI and tech tools can help you, here are some specific examples of contractors adopting these solutions, as originally outlined in Trivedi P and, Alqahtani FM's 2024 article, "The Advancement of Artificial Intelligence:"

- AI-enabled devices, like robots or drones, can be used for inspection, maintenance, or repair operations in perilous settings such as mines, power plants, telecom towers, refineries, and construction applications.
- AI can support extensive collection and analysis of workers' data concerning their physical situation, mental stability, and emotional well-being, thereby facilitating enhanced monitoring and performance improvement. With this data, AI systems can provide early warnings and interventions to help prevent conditions like burnout, depression, or anxiety.
- AI can play a pivotal role in Occupational Health and Safety (OHS) training by crafting realistic, immersive simulation scenarios, particularly for emergency responders. Such simulations allow workers to better visualize and effectively manage various emergency situations at work.
- AI can facilitate the automation of dangerous or physically demanding tasks by using robots or collaborative robots (cobots), which can significantly reduce the exposure of workers to hazardous conditions.
- AI can be leveraged to analyze vast quantities of occupational data, which facilitates the identification of patterns, trends, and potential OHS risks. You can have it sift all your incidents in order to identify recurring gaps, detect SIF potential, and pinpoint deficiencies in your accident investigations and such. This gives you the ability to forecast potential hazards before they can become imminent threats. This predictive capability not only helps in preempting accidents and injuries but also supports proactive measures in managing workplace safety.
- Another potential computer vision application can analyze real-time video footage from cameras and drones on installation sites where their contractors are working. The system continuously verifies that contractor employees are using proper PPE and following established safety protocols. Non-compliant behaviors are flagged immediately, enabling rapid corrective actions, which in turn ensures proactive incident prevention and culture improvement. This is a great example of the types of real time signals that can and should start supplementing the traditional paperwork-only contractor management protocols.
- Additionally, computer vision can also be deployed via the incorporation of thermal cameras that detect heat stress among workers. This allows continuous monitoring

of body temperatures, enabling timely interventions like cooling breaks or the provision of suitable PPE.

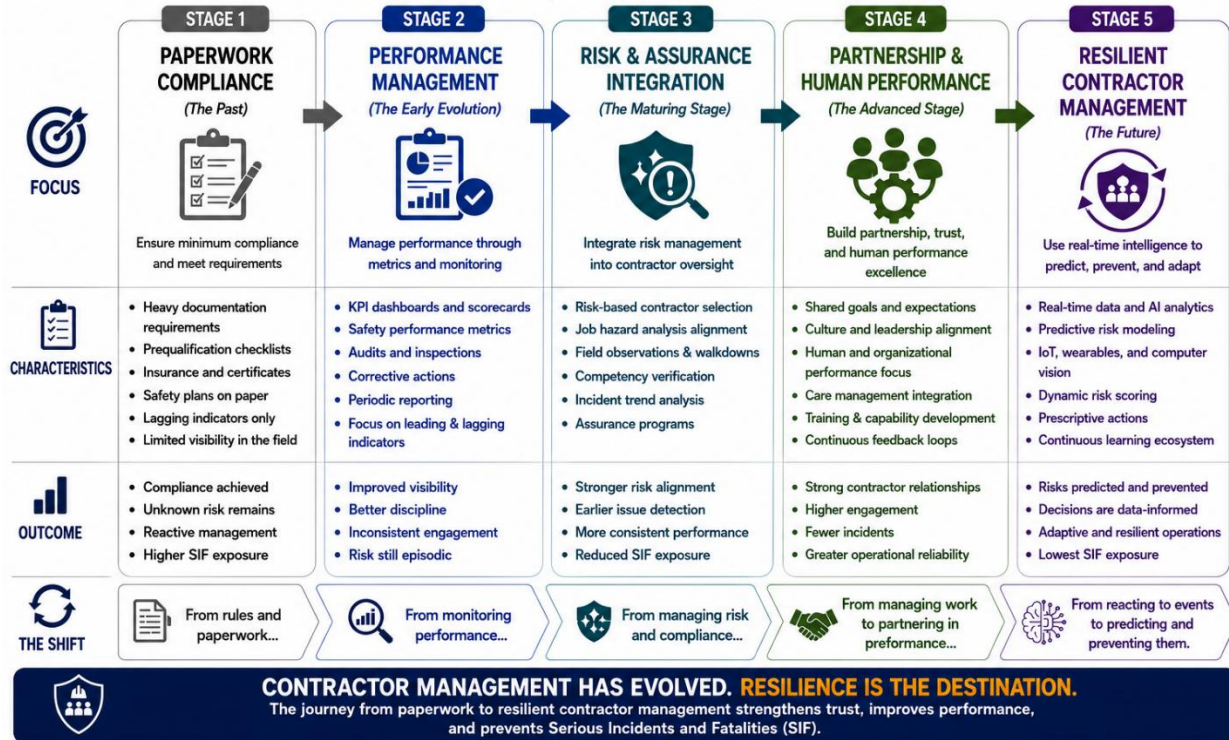
- Then there is an option to leverage predictive scores by integrating AI algorithms into your contractor management system, which aggregates data from multiple sources, including training records, certifications, incident logs, financial data, insurance certificates, and performance metrics. The AI system can then evaluate historical and real-time data to generate risk scores for each contractor, highlighting potential areas of non-compliance. High-risk contractors can be scheduled for additional training or audits, minimizing the likelihood of safety incidents and improving operational efficiency.

As with all other tools, AI incorporation is not without its challenges. Below is just a small sample of the potential challenges of AI implementation, some of which is derived from a study conducted by the UK's Health and Safety Executive:

- a) Over-dependence on AI safety systems could reduce worker attention, prevent personnel from trusting their own instincts, atrophy their judgment, decrease situational awareness, and in turn weaken the overall safety culture
- b) Deskilling of the workforce in areas where work is performed by AI, which leads workers to lose essential knowledge
- c) Increased worker stress and decreased mental wellbeing at the realization of being continually monitored through algorithmic AI management
- d) Data privacy risks where personal data is collected from worker monitoring and incident investigations
- e) Dehumanization of decisions – people are viewed as data points and the dignity of human life is lost in the process
- f) When AI is given more decision-making ability, it could lead to the replacement of human accountability in an almost moral outsourcing type of a scenario. This could be especially problematic when ethical decisions are relegated to algorithms
- g) AI lacks human intuition or fear, or empathy, or hesitation in risky situations. Although they may seem as weakness, in reality these aspects of human decision making serve as safety mechanisms and slow down the riskier decisions
- h) Near-misses could get treated as noise, while normalization of deviance takes place at machine speed, which is a scary thought
- i) AI has speed but it cannot gain wisdom
- j) AI is context blind, unable to replicate what humans sense instantly especially in rapidly changing dynamic environments, situations where fatigue or stress dominate, or reading non-verbal cues, such as tone, urgency, fear, etc.

FIGURE 4. THE EVOLUTION OF CONTRACTOR MANAGEMENT

From Paperwork Compliance to Resilient Contractor Management



These issues not only complicate the incorporation of technology, but they may also introduce new risks, such as cyber threats and psychosocial stress, associated with human—machine interactions. To overcome these challenges, your organization must exercise an interdisciplinary approach that includes your safety, human resources, legal, operational, financial, and other relevant stakeholders. Additionally, if you, like the vast majority of companies are investing into the future of AI in various parts of your business, make sure that you consider thoughtfully the following questions, with regard to your people and their safety.

- Who has final decision rights in high-risk situations—the human or the model?
- Do you explicitly define “AI is advisory, not authoritative” in critical controls?
- Will this AI system or application strengthen or erode frontline decision-making skills over time?
- Are you still teaching your workers to assess risk independently of AI or are you just allowing them to atrophy their critical thinking by merely confirming the machine output?
- Are we unintentionally replacing human connection with system interaction? And are we OK with that?
- Does the system remove the emotional weight of decisions?

- g) How does the system treat near-misses – noise or signal?
- h) Does the speed of decision-making outpace reflection?
- i) Do we have a defined “unknown = stop” rule?
- j) Where must we intentionally slow decision-making down?
- k) Do workers understand where AI is strong (pattern recognition) and where it is weak (context, ambiguity, ethics)?

Conclusion

Contractor management is undergoing one of the most significant transformations in its history. For decades, organizations measured contractor performance primarily through documentation, historical injury rates, insurance certificates, and regulatory compliance. While these elements remain necessary, they are no longer sufficient for managing the complexity of modern operations. Today's organizations operate in environments characterized by specialized workforces, complex supply chains, rapidly changing technologies, and increasingly severe operational risks. In this environment, contractor management must evolve beyond paperwork into a system of continuous risk governance.

The organizations leading this transformation recognize that resilience cannot be audited into existence. It must be intentionally built through deliberate investment in contractor selection, cultural alignment, competency development, human performance, proactive care management, real-time operational assurance, and continuous organizational learning. Documentation may demonstrate compliance with minimum requirements, but resilience is demonstrated through consistent execution in the field, especially when conditions change unexpectedly.

One of the most significant opportunities for advancement lies in recognizing care management as a critical risk-control strategy rather than simply an administrative workers' compensation process. Workers who receive timely medical attention, structured return-to-work planning, and coordinated support preserve the physical, cognitive, and emotional capacity necessary to perform high-risk work safely. In this sense, proactive care management is not merely a humanitarian practice—it is an upstream control that reduces exposure to high-energy hazards and contributes directly to the prevention of Serious Incidents and Fatalities (SIF).

Emerging technologies will continue to reshape contractor management over the coming decade. Artificial intelligence, computer vision, wearable technologies, predictive analytics, and real-time operational data provide organizations with unprecedented visibility into contractor performance and risk. These technologies should not replace

professional judgment or human leadership; rather, they should strengthen decision making, improve situational awareness, and allow organizations to identify deteriorating conditions before they result in catastrophic outcomes. Technology is most effective when it augments human capability rather than substitutes for it.

Ultimately, resilient contractor management is not defined by the sophistication of its software, the size of its documentation library, or the number of audits it performs. It is defined by its ability to consistently develop capable contractors, build trusted partnerships, preserve human performance, manage critical risks, and adapt to changing operational conditions without compromising safety.

The evolution described throughout this paper represents more than an improvement in contractor oversight; it reflects a broader shift in how organizations think about operational excellence. The future belongs to organizations that move beyond paperwork and compliance toward resilient systems that integrate governance, partnership, technology, and human performance into a unified approach to managing risk. Those organizations will not simply achieve better compliance metrics—they will build stronger partnerships, improve operational reliability, and, most importantly, prevent Serious Incidents and Fatalities.

References:

ANSI/ASSP. (2023). ANSI/ASSP A10.33-2023: Safety and health program requirements for multi-employer construction and demolition projects. American Society of Safety Professionals.

Awang, H., Shahabudin, S. M., & Mansor, N. (2016). Return-to-work program for injured workers: Factors of successful return to employment. *Asia Pacific Journal of Public Health*, 28(8), 694–702. <https://doi.org/10.1177/1010539516671423>

Conklin, T. (2017). Workplace fatalities: Failure to predict: A new safety discussion on fatality and serious event reduction. CreateSpace Independent Publishing Platform.

Cotler, H. B. (2016). Accelerated recovery of your health: How to recover your body after injury or surgery. Atlantic Publishing Group.

Couch, M. D., & Albert, J. R. (2016, April). Effective care management minimizes workplace injury severity. In SPE International Conference and Exhibition on Health, Safety, Security,

Environment, and Social Responsibility. Society of Petroleum Engineers.

<https://doi.org/10.2118/179229-MS>

DeLooff, K. (2026). Contractor selection. In S. Goncharenko (Ed.), *Resilient contractor safety management* (Chap. 2). CRC Press.

Durand, M.-J., Corbière, M., Coutu, M.-F., Reinharz, D., & Albert, V. (2014). *A review of best work-absence management and return-to-work practices for workers with musculoskeletal or common mental disorders*. *Work*, 48(4), 579–589. <https://doi.org/10.3233/WOR-141914>

U.S. Bureau of Labor Statistics. (2024). Employer-reported workplace injuries and illnesses, 2023. <https://www.bls.gov/news.release/osh.nr0.htm>

Gantt, R. (2026). Contractor partnership. In S. Goncharenko (Ed.), *Resilient contractor safety management* (Chap. 5). CRC Press.

Goncharenko, S. (2024). *Save lives: Pushing boundaries in human factors*. Kindle Direct Publishing.

Goncharenko, S. (2025). *Operationalizing twenty-first century safety: A human-centric practical guide*. CRC Press.

Goncharenko, S. (Ed.). (2026). *Resilient contractor safety management*. CRC Press.

Hallowell, M. R. (2025). *Energy-based safety: A scientific approach to preventing serious injuries and fatalities (SIFs)*. CRC Press.

Kristman, V. L., Boot, C. R. L., Sanderson, K., Sinden, K. E., & Williams-Whitt, K. (2020). Implementing best practice models of return to work. In U. Bültmann & J. Siegrist (Eds.), *Handbook of disability, work and health* (Handbook Series in Occupational Health Sciences, Vol. 1). Springer. https://doi.org/10.1007/978-3-319-75381-2_32-1

Leigh, J. P., Markowitz, S., Fahs, M., & Landrigan, P. (2000). *Costs of occupational injuries and illnesses*. University of Michigan Press.

McCrimmon, S., & Oddy, M. (2006). Return to work following moderate-to-severe traumatic brain injury. *Brain Injury*, 20(10), 1037–1046. <https://doi.org/10.1080/02699050600909656>

McLaren, C. F., Reville, R. T., & Seabury, S. A. (2010). How effective are employer return-to-work programs? RAND Institute for Civil Justice. Working paper prepared for the Commission on Health and Safety and Workers' Compensation.

Richey, A. (n.d.). Case management in a nutshell. RTWMatters. <https://www.rtwmatters.org/article/article.php?id=1903>

Sullivan, M. J. L., Adams, H., Thibault, P., Corbière, M., & Stanish, W. D. (2006). Initial depression severity and the trajectory of recovery following cognitive-behavioral intervention for work disability. *Journal of Occupational Rehabilitation*, 16, 63–74.

Trivedi, P., & Alqahtani, F. M. (2024). The advancement of artificial intelligence (AI) in occupational health and safety (OHS) across high-risk industries. *Journal of Infrastructure, Policy and Development*, 8(10), 6889.

UK Health and Safety Executive. (2025). Understanding how AI is used in HSE regulated sectors. Crown Copyright. <https://www.hse.gov.uk/news/assets/docs/understand-how-ai-is-used-in-hse-regulated-sectors.pdf>

U.S. Equal Employment Opportunity Commission. (2000). Enforcement guidance on disability-related inquiries and medical examinations of employees under the Americans with Disabilities Act (ADA) (EEOC-CVG-2000-4).

Van Horn, E. (2009). Loss and depression after traumatic injury: The importance of case management in the recovery process. *Professional Case Management*, 14(2), 66–73.

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