CUTTING DOWN ON DOWNTIME

COVER STORY

TROY KEHOE, CHECK-6 INTERNATIONAL INC., USA, SHOWS HOW OPERATORS CAN REDUCE UNPLANNED DOWNTIME WITH CHECKLISTS.

With the great crew change looming, the oil and gas industry's safety record is deteriorating. Work-related deaths in oil and gas extraction reached a record high in 2012[1] (since data compilation began in 2003). As new people expand and fill in the gaps in the work force, they are unknowingly joining a broken, experience-based culture, where critical tasks are too often performed according to an 'I think' mentality rather than an 'I know' certitude.

Supervisors and crew members who (rely on experience alone to) perform high-risk tasks, whether in normal operations or emergencies, often find themselves 'getting the job done', far removed from the complexities of their procedures manuals. At moments like these, critical tasks are alarmingly susceptible to errors. The result is lost-time incidents, higher total reportable incident rates, downtime, extended flat time and unacceptable rates of non-productive time.

Table 1. Human error rates	
Task	**Error rate**
Identify discrepancies	10%
Notice configuration error	10%
Perform non-routine operation	25%
Perform under high stress	25%
Notice value	50%
Respond correctly after 1 minute during an emergency	90%

Figure 2. *Would a checklist save this derrick hand from falling? Yes. By implementing a simple checklist step that embodies mutual support and crosschecks.*

Figure 3. *A simple checklist solved the problem of the above RCD being improperly assembled.*

In fact, independent research on reliability, maintainability and risk in oil and gas has quantified the human-error rate as shown in Table 1.

Fail early and fail often?

Knowledge is learned. And since humans are not perfect, failure plays an important role in the learning curve. Most of the time, trial-and-error exercises, collaboration, brainstorming and creative endeavours actually encourage and embrace failure. That is because failure conversely spawns progress, productivity and maturation. In fact, tribe building encourages a principle of 'fail early and often' because that is how people improve.

However, in some industries, failure is not an option; procedural discipline is absolutely essential for keeping people safe. Commercial aviation and nuclear power are the most widely known examples. Exploration and production could stand to benefit from the same level of reliability. Furthermore, as drilling moves into extremes of heat, depth and speed, the potential for error and loss of life is skyrocketing.

This error-producing trend has to be stopped.

Preventing human error by instilling a checklist culture

Checklists have proven essential to preventing human error not only in commercial aviation and nuclear power, but also in medicine. A checklist culture will do the same for petroleum exploration and production.

But it is not merely a checklist that makes the difference. The heartbeat of any mature 'checklist culture' is disciplined human behaviour, which relies heavily on verifiable compliance. Over time, a checklist culture shapes standardised behaviours, which ultimately builds trust among colleagues.

When supervisors and crewmembers follow a simple, consistent set of procedure-based checklists written by boots-on-the-ground experts, they learn that they can communicate efficiently, in familiar language, across the entire enterprise. The result is a near-perfect task rhythm that is executed calmly, safely and with repeatable precision. Contrast this with the typical experience-based culture that relies on human memory and good intentions passed down from one generation to the next.

No substitute for procedures or JSAs

Checklists are not intended to replace written procedures or job-safety analyses (JSAs). Procedures contain the detail needed for training, planning and reference materials, and JSAs pinpoint hazards, risks and mitigation actions, although usually in the past tense.

Checklists bring the critical components of procedures and JSAs into the present, assisting users in executing tasks that are derived from approved procedures. Checklists directly link critical hazards and risk controls with specific job steps using notes, cautions and warnings that are embedded in the checklist itself.

Checklists prevent the most common sources of human error, such as:

- Step omission errors.
- Sequence errors.
- Risk/hazard recognition errors.

Successful checklists also include specific notes, cautions and warnings that alert users before they perform a particular step. These notes may highlight an operating or maintenance limitation, technique, condition or statement that – if not strictly observed – could harm people, equipment or data.

That is not a checklist

Checklists are not needed for every single task on a work site. They are only written for the most critical, high-risk tasks where failure is not an option.

Unlike the typical grocery-store list – used by a shopper who checks off items as he or she walks the aisles – aviation-quality checklists use a

challenge-and-response mechanism to ensure that each task is executed with diligence and in a predetermined sequence. Airline/NASA quality checklists are strictly designed with an item-action format. This noun-verb relationship is critical to the rhythmic nature that spawns precision among teams.

Using a digital checklist platform, management is able to easily verify compliance, record outcomes and provide cross-checks, mutual support and persistent supervision.

Senior leadership support is critical

Experience gathered from developing high-reliability organisations has demonstrated that developing a checklist culture of precisions operations must start with senior leadership. This is the time to establish a common understanding of checklist theory, design, usage and behavioural discipline that stems from a checklist culture. It is critical that a mutual understanding of corporate challenges and key performance indicators (KPIs) are correctly identified in order to accurately target the solutions and determine measures of success.

Crew ownership defines success

Next, checklist coaches work directly with the organisation's subject-matter-experts (SMEs). These are boots-on-the-ground employees with personal, real-world experience that have the tribal knowledge of the organisation. Together, the coaches and SMEs target the high-risk tasks and develop easy to use checklists designed exactly for the end user.

Together, they sort the checklists into normal, abnormal and emergency operations. Warnings, cautions and notes, long considered best practices in commercial aviation, provide 'just-in-time' hazard identification and awareness. Equipment limitations are included for ready reference and job planning purposes.

After coaches are deployed to the work site(s) to validate each checklist for content, accuracy and final operational approval, checklist coaches facilitate and help champion the programme to designated stakeholders; explaining checklist theory, design, usage, discipline and continuous improvement. Then, they travel to the work sites to teach and reinforce the philosophies of checklist discipline and further verify their design. They coach each crewmember in the proper use of checklists, procedures and behavioural discipline. The continuous-improvement process motivates crewmembers to take ownership in the quality and utility of their checklists.

Perpetual leadership and sustainment coaching are both essential to overcome the effects of turnover, complacency and a 'flavour of the month' mentality. Without both, the disciplined use of checklists will degrade over time. Sustainment coaching will maintain the value and ROI of a checklist culture initiative.

Solutions

Developed and written as aviation-style checklists, Checklist Ops with RIGOR allows crewmembers to perform with step-by-step precision during high-risk operations. The checklist designers and coaches are former military and commercial-aviation pilots who bring decades of experience to building checklist cultures and high-performance teams.

- A checklist culture helps crews do it right the first time, every time.
- A checklist culture ensures safe, repeatable and verifiable behaviour.
- A checklist culture improves productivity, maximising an operator's ROI.

Complementing Checklist Ops is RIGOR, a digital checklist and compliance system (hardware and software) that gives crews the tools to respond with methodical actions and reactions in both normal and emergency situations. RIGOR simplifies critical steps, ensures deliberate actions and captures and tracks all checklist-execution data for reporting purposes. RIGOR helps make it easy to:

- Comply with procedures.
- Automate place-keeping.
- Simplify enterprise-wide updates.
- Embed images and links to reference materials.
- Captures accurate data every time a job is performed (who, what and when).

Crewmembers no longer need to memorise complex procedures, and managers feel more confident in crew performance. Checklists are electronically executed in a predetermined, step-by-step sequence with a deliberate swipe from a stylus pen or finger.

The benefits of a checklist culture

Digital checklists ensure that each job is performed and recorded precisely, efficiently and without incident. Digital checklists:

- Simplify complex procedures that require methodical actions.
- Reduce human error.
- Enable crewmembers to prepare for a task with easily searchable and linkable references.
- Communicate clearly so everyone is aligned.
- Enable sound decision-making.
- Preserve information while eliminating unnecessary paperwork.
- Verify compliance and produce success metrics.
- Improve safety and performance KPIs by tracking metrics.
- Instantly disseminate updates across the enterprise.

Case study

Check-6 was tasked with facilitating a project for a major service company, as the service company's rotating control device (RCD) unit would be assembled, barged to the rig, installed and then would fail after tripping in a substantial number of stands. The crews would then have to trip out, rig down and then barge the unit back to shore. Unfortunately, the failure rate was unacceptably high and was happening frequently.

Observation proved that during the build up of the rotating control device (RCD) that it was very easy to install the packing gland upside down. After the tool was assembled, the packing gland was not visible, so final inspection could not verify the proper installation. As the solution, a simple checklist was compiled and included a quality assurance step to verify proper installation prior to final assembly.

The results are evident, as the service company has not had the failure since implementing the checklist. Given the day rate of offshore operations, what are the time and cost savings as a result of this simple checklist? How much crew exposure to risk was eliminated? It is hard to even estimate, but the value of that single checklist improvement has certainly saved millions, if not tens of millions of dollars. How long will those cost savings grow over time due to a single checklist?

Now is the time

With the great crew change rapidly approaching, the time is ripe for the exploration and production industry to leverage the experience of its seasoned crewmembers. A checklist culture will inspire future generations to push for the highest levels of reliability. Checklists are a simple solution that help make tasks easier, increase productivity and minimise human error, moving from mere safety awareness, to sound, precision operations – where crews get the job done right the first time, every time – and ultimately return home safely to loved ones.

Reference

1. Source: US Bureau of Labor Statistics.