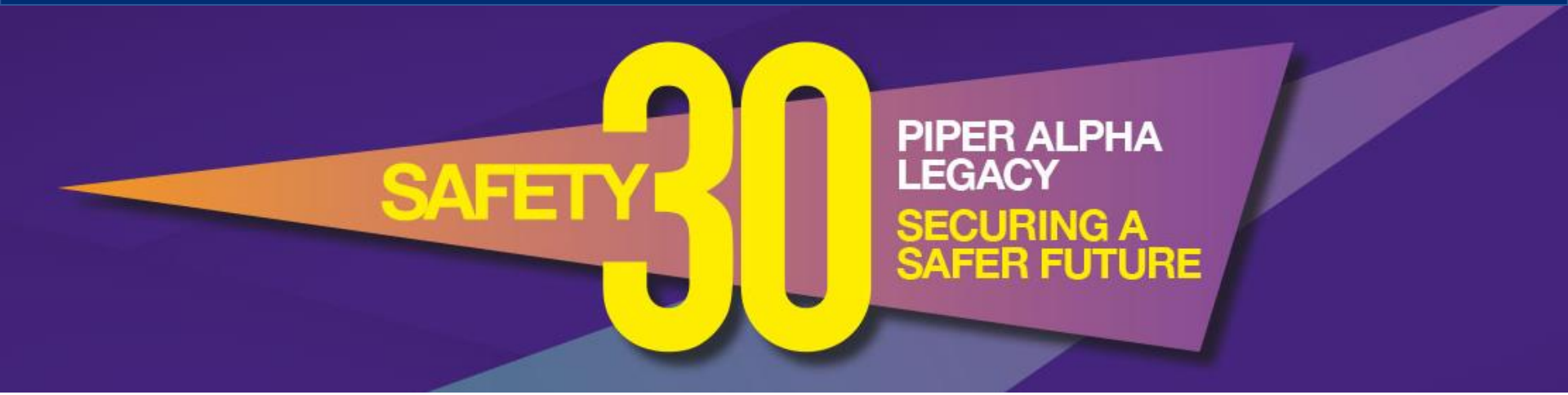
Safer Operations Through Evidence Based Training



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ROBERT GORDON UNIVERSITY ABERDEEN

"A Simple Truth"

"You are free to choose but you are not free from the consequences of your choice"

Causal effects, supported by independent research

Commitment (absence of intellectual and, or, emotional buy-in)

Change Management (failure to recognize and or respond to change)

Control of Work (ineffective process discipline, and poor task assurance)

Competence (lack of knowledge, skill and, or, ability to complete task)

Complacency (lack of task focus and, or, conscious engagement)

Communication (inadequate sharing of critical information at worksite)

Culture (impacted by organizational, team, site & individual beliefs and values)

27 + years ago

THIS WEEK 17 November 1990

Piper Alpha rewrites the rules on offshore safety

By **HELEN GAVAGHAN**

Sweeping changes needed in the way that safety in the offshore industry is assessed. This is the conclusion of the Cullen report into the explosion on the oil rig Piper Alpha that killed 167 men on 6 July 1988. The report also proposes that responsibility for overseeing safety should be moved from the Department of Energy to the Health and Safety Executive.

Safety Case Regulations Introduced

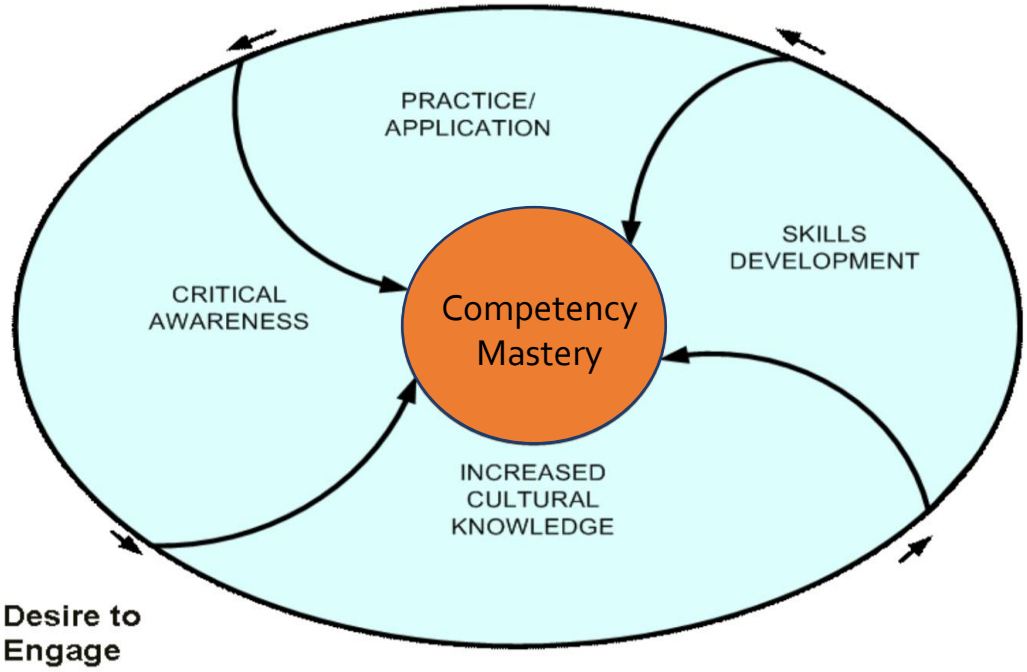
Training & Competence

Training is the structured approach to enhance someone's knowledge which often involves the undertaking of **specific taught courses** or on the job training where a person is given the **knowledge** needed to apply **theory** into **practice**.

"Competence" seen as a combination of practical and theoretical **knowledge**, cognitive **skills**, **behaviours** and **values** used to improve performance.

Competence development

Competency consists of a number of aspects, of which training is only one. Others aspects include:
Skills, knowledge, experience appreciation and understanding of the task at hand, the **surrounding environment**, and a **range of human factors**.



Current training systems situation

- Since the early 1990's we have only seen limited incremental change
- In most cases traditional theory and practice methods
- Renewal periods can be rigid with the assessed content being fixed
- Requires attendance and delivering to generic standards
- Feedback is limited to questionnaires, or basic assessment forms
- Very little use of field collected data
- Little effort to assess and develop cognitive and soft skills

Crew resource management aviation

Crew Resource Management can be defined as a management systems which makes optimum use of all available human factor and other resources to promote safety and enhance the efficiency of **flight** operations

Module 1: Information processing
Module 2: Human error, reliability and error management
Module 3: Fatigue and workload management
Module 4: Situational awareness
Module 5: Communication and management
Module 6: Automation
Module 7: CRM for Single Pilots

Crew resource management drilling

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Module 2: Human error, reliability and error management
Module 3: Fatigue and workload management
Module 4: Situational awareness
Module 5: Communication and management
Module 6: Automation
Module 7: CRM for Well engineers and Drillers

Requires feedback from the field to calibrate the training

Maintenance resource management aviation

Maintenance Resource Management essential for all first line supervisors, technicians, and support personnel. Designed to assist **aviation technicians** with the development of leadership, management, and other interpersonal skills not commonly provided within aviation operations.

During the course, you will build upon your knowledge and skills to:

- Become a more productive team member
- Successfully manage yourself and others
- Become more efficient and safety-conscious
- Become an effective communicator
- Develop improved conflict resolution tools
- Positively motivate your team members
- Inspire others by your leadership

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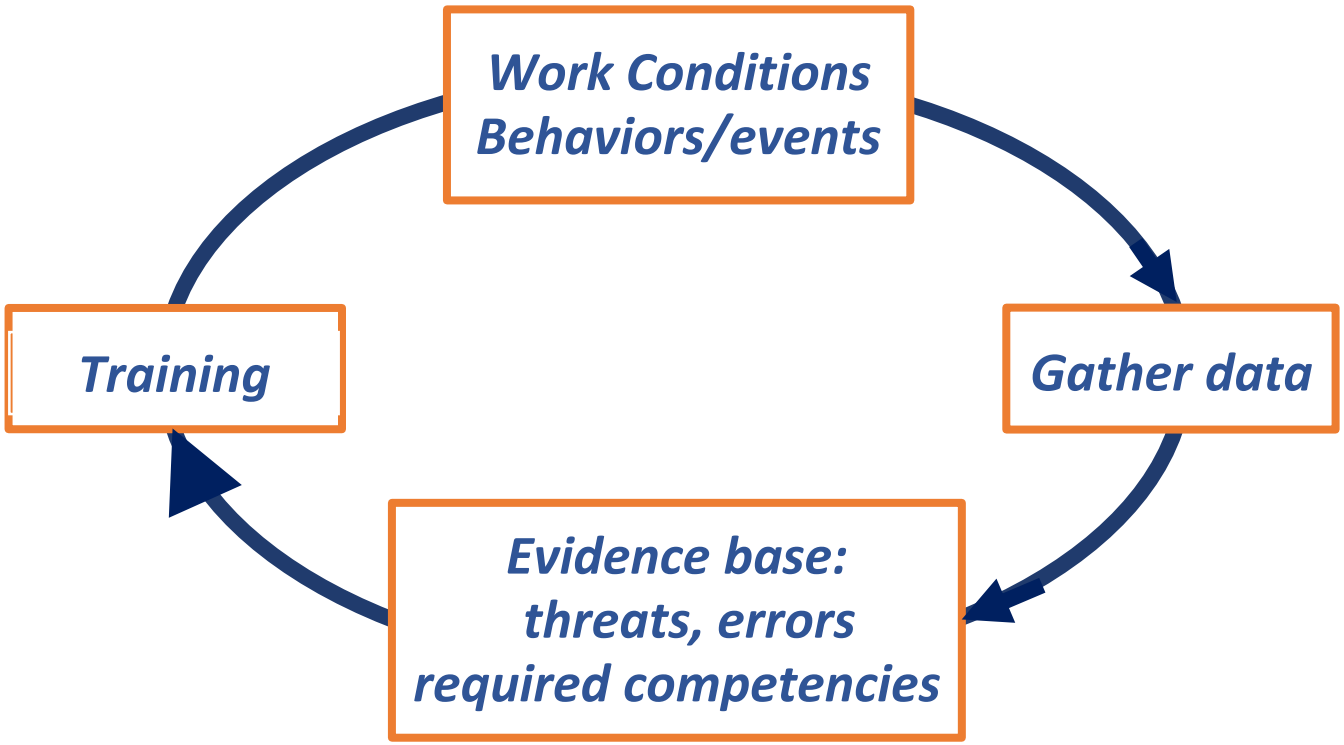
Is it time for a different approach?

- The labour force is changing, they expect technology to be available
- Do they learn differently, how do we assess their learning needs
- How do we develop their soft skills and cognitive ability
- The use of technology in our business is increasing we need to adapt, leverage what exists, capture more
- Feedback, analysis and trending drives system improvements
- Technology can reduce personal risk, mob costs and response times
- What are other industries doing around evidence-based training?

Evidence-based training



Evidence-based training aviation 2017

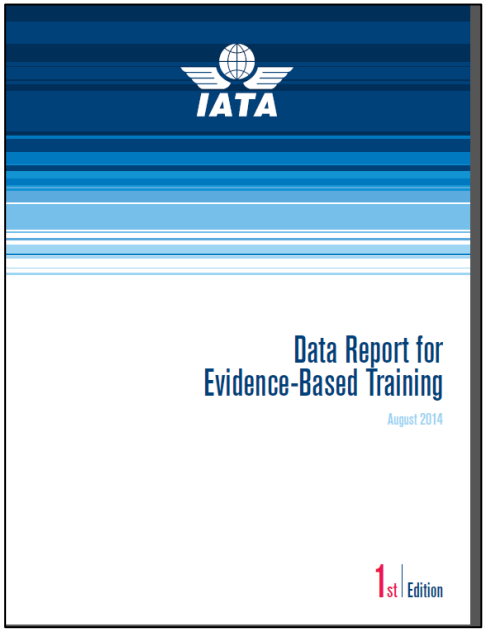
- ***Large evidence base compiled by the industry body (IATA, 2014) – 700 pages.***
- ***More focus on operational needs, emerging and unknown threats, link to Safety Management Systems***
- ***Core competencies - building resilience***
- ***Training customised by operators to meet specific demands/ requirements from their own evidence base***

Source of evidence aviation 2017

- *Accident/ incident analyses*
- *Observations/ audits of flight operations*
  - *Measuring threats and errors (LOSA)*
- *Survey data from pilots*
  - *EASA survey of helicopter pilots (June 2017)*

IATA data report for evidence-based training

The report reveals the significance of certain non-technical competencies in reducing risk in operations. The challenge of maintaining Situation Awareness in a highly automated and highly reliable system needs to be addressed through more effective training and exposure to rapidly developing and dynamic situations



Competencies of Leadership and Communication are revealed as key risk reducing countermeasures and should be a primary area of focus in training.

IATA 2014 Data report for evidence based training. pii

IATA data report (2014)

Data indicate a need for pilots to be exposed to the unexpected in a learning environment, and be more challenged and immersed in dealing with complex situations, rather than repetitively being tested in the execution of maneuvers. pii

..flights with outstanding leadership and communication environment have on average 2.3 errors per flight versus an average 7.0 errors per flight for those with poor leadership and communication. p15

“As the rate of intentional non-compliance increases, the rate of errors detected and acted on decreases.”p17

Nine competencies

- Situation Awareness
- Problem Solving and Decision Making
- Workload Management
- Leadership and Teamwork
- Communication
- Flight Management (automation)
- Flight Management (manual)
- Knowledge of Procedures
- Application of Procedures

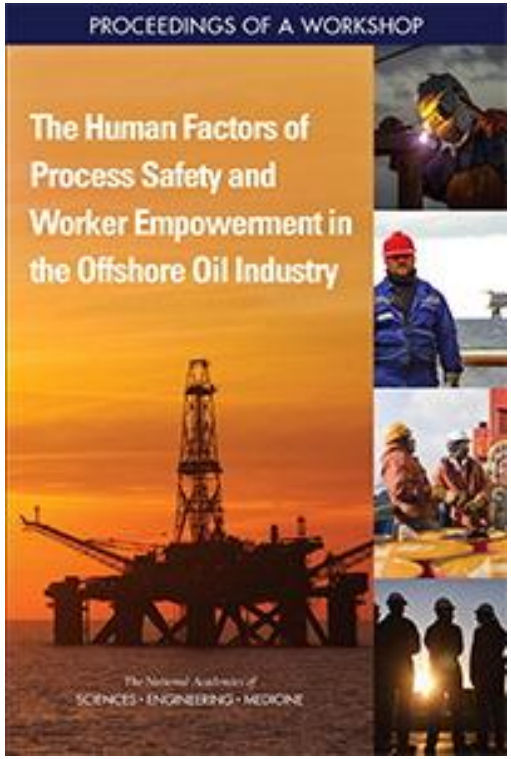
Lacombe, Air France, 2017, EASA workshop

- ICAO, IATA, EASA (+ airlines may have their own versions)

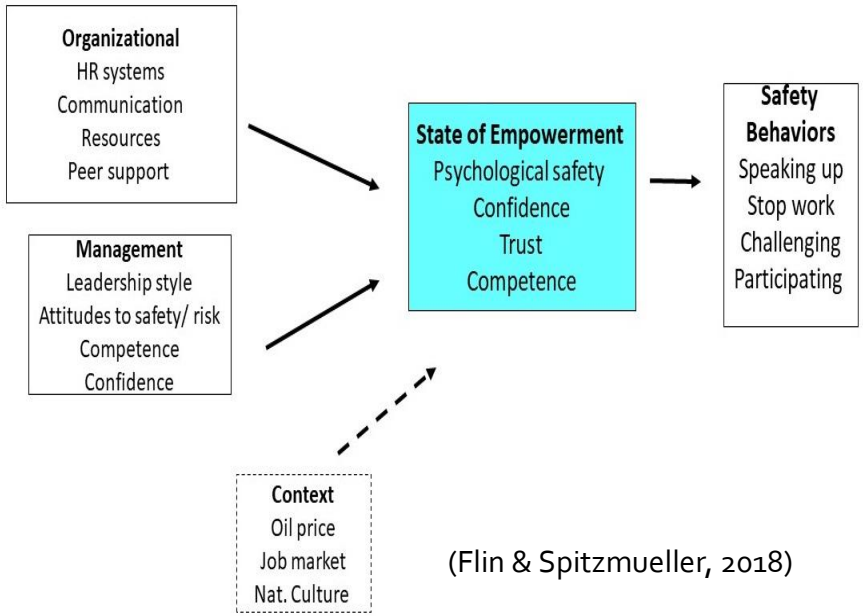
Offshore safety evidence base?

- Build a shared evidence base of current risks (threats) and the skills needed to deal with them
- From the evidence, design competency frameworks and training methods
- i.e. Evidence-Based Training

State of empowerment for safety on UKCS?



National Academies of Sciences April, 2018



(Flin & Spitzmueller, 2018)

'Lack of understanding of the current status of worker empowerment [on OCS]' (p7)

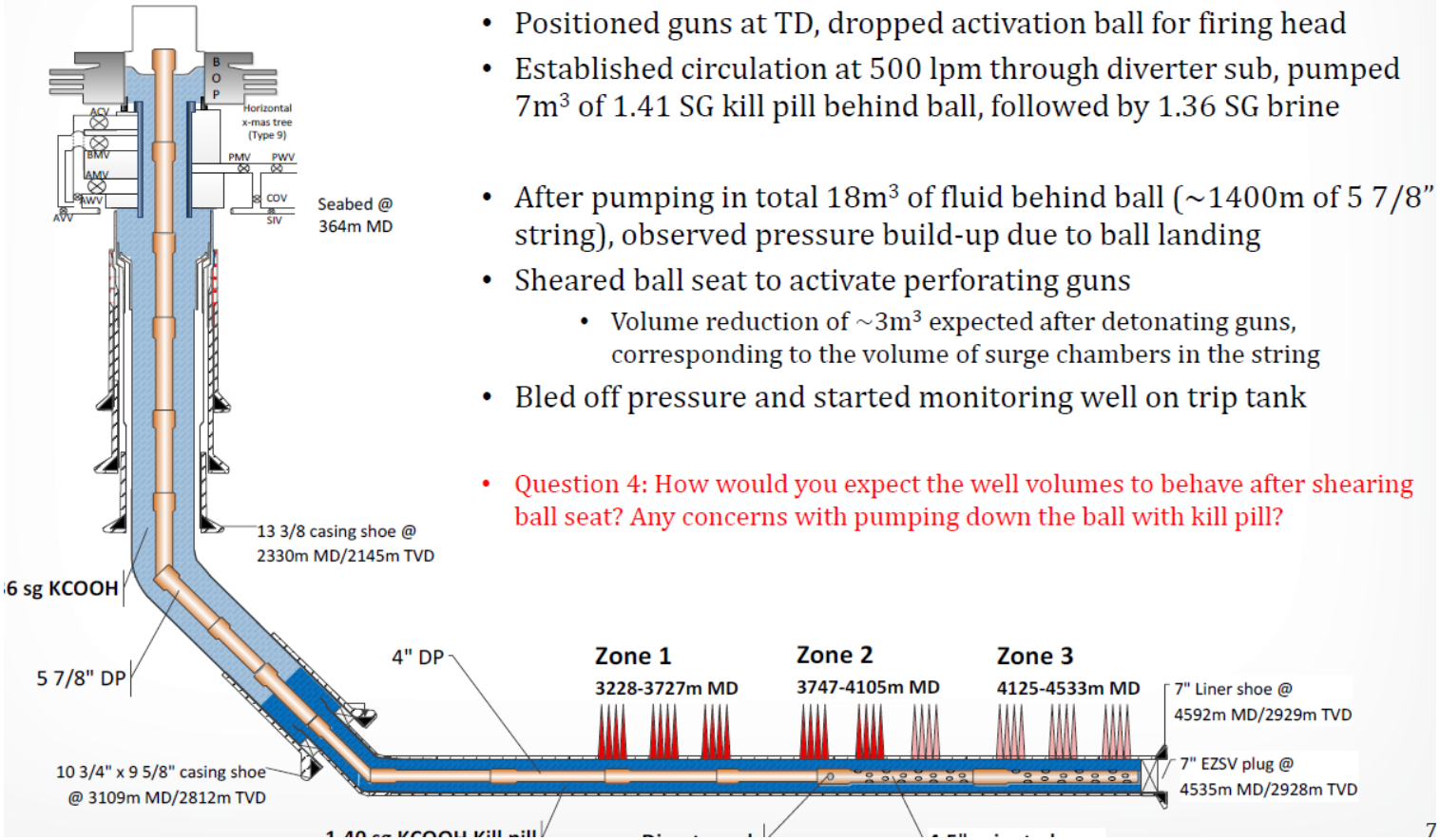
http://sites.nationalacademies.org/dbasse/bohsi/safety_in_offshore_oil_industry/index.htm

Sharing safety data OCS www.safeOCS.gov

First report by January 2019

Perforate remaining interval with TCP

Norsk olje&gass



- Positioned guns at TD, dropped activation ball for firing head
- Established circulation at 500 lpm through diverter sub, pumped 7m^3 of 1.41 SG kill pill behind ball, followed by 1.36 SG brine
- After pumping in total 18m^3 of fluid behind ball (~1400m of 5 7/8” string), observed pressure build-up due to ball landing
- Sheared ball seat to activate perforating guns
  - Volume reduction of ~3m^3 expected after detonating guns, corresponding to the volume of surge chambers in the string
- Bled off pressure and started monitoring well on trip tank
- Question 4: How would you expect the well volumes to behave after shearing ball seat? Any concerns with pumping down the ball with kill pill?

Opportunities for EBT ?

- Developing Elected Safety Rep's competence through involvement in MOC data review.
  - Record interaction of ESR, provide sharing capability.
- Machine diagnostics, condition based monitoring, direct access to the Technicians capture their feedback, incorporate into the data sites
- Provide access for Well Engineers & Drillers to well data, through head set, connectivity to shore base, real-time feedback
- Permit to work, isolations, record the operator interactions, display other permits, isolations etc
- Use of specialist, non routine task capture and monitoring, make prior interactions available at point of use.

Using technology to capture evidence

- Devices measuring crew member reaction times, stress levels, communication styles, leadership traits

- Ability to share data, video media immediately
- Review performance, coach & mentor
- Work the exercises/assessments during flat time, at site
- Use recorded data to build competence credits, extend validity
- Record special / non frequent tasks and activities
- Build a learning database, search from worksite

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