

Human Factors Health Check: An approach to assessing compliance with the Human Factors Operational Delivery Guide



Julie Bell & Pippa Brockington Directors of **Human Factors Expertise Ltd**
Neil Kirk EHS Manager for **Dr Reddy's Laboratories Ltd.**

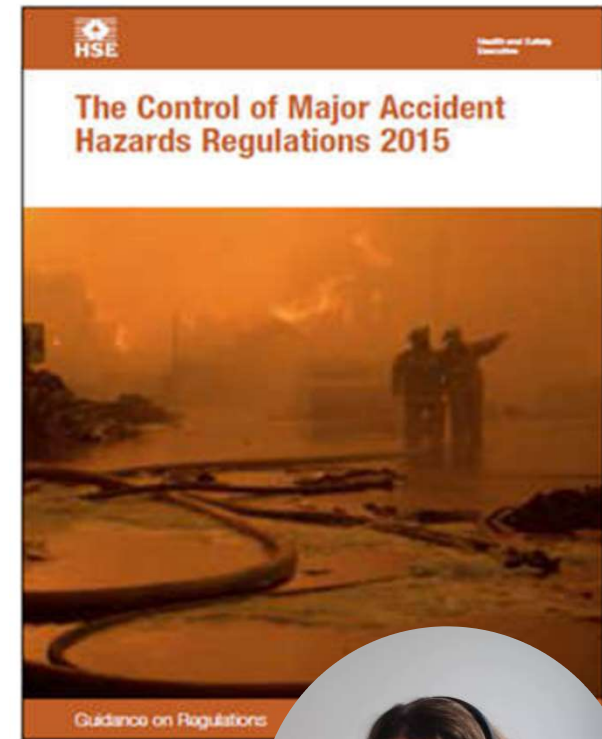


Where COMAH applies

Every operator must take **all measures necessary** to prevent major accidents and to limit their consequences for human health and the environment

AND

Demonstrate that it has done so.

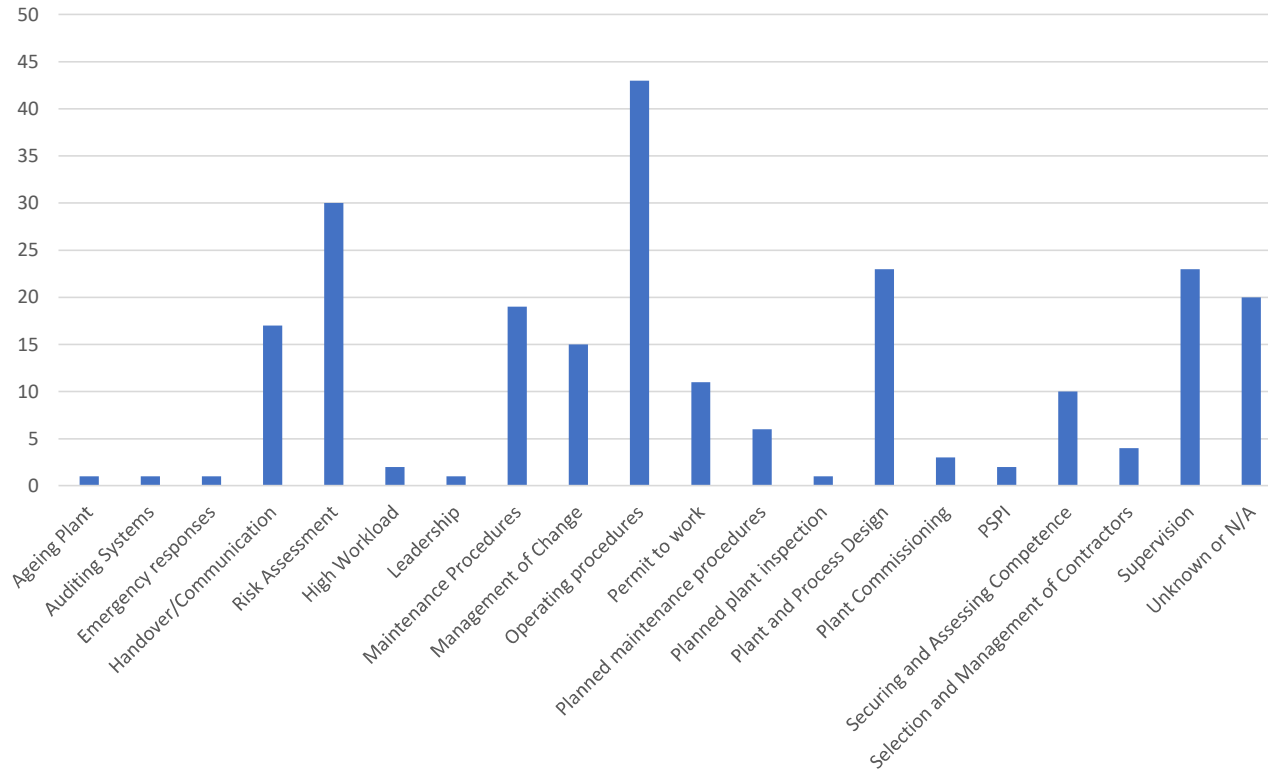


And for Human Factors?

Where **reliance is placed on people** as part of the necessary measures, human factor issues should be addressed with **the same rigour** as technical and engineering measures.

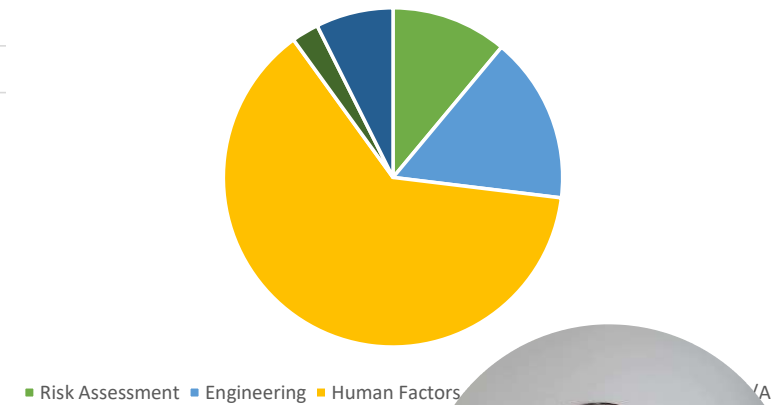


Recorded as Cause of LOCs 2009-14



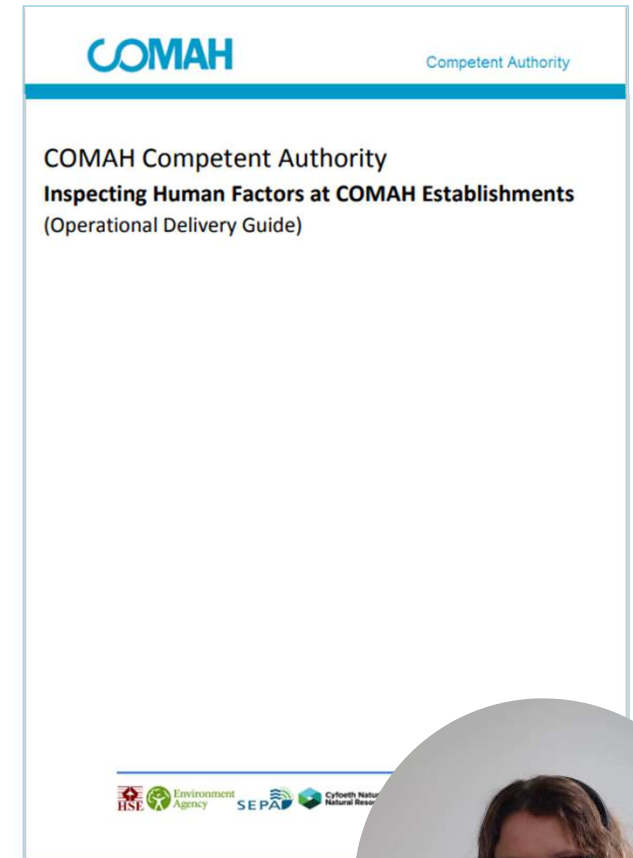
Competent Authority Intelligence Review Group (CAIRG) Report 2014

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Human Factors Delivery Guide

- Managing Human Performance
 - Human Factors in MAH Risk Assessment and Accident Investigation
 - Human Reliability during Maintenance, Inspection and Testing (MIT)
- Human Factors in Process Design
 - Design of process control (Control Rooms)
 - Managing process upsets (Alarm Management)
 - HF integration (new projects & major mods)
- COMAH-Critical Communications
 - Shift Handover
 - PTW
- Design and Management of Procedures
- Competence Management Systems
- Organisational Factors
 - Managing Organisational Change
 - Managing Shift Work and Fatigue
 - Managing Resources



Scoring System

Rating	Description	Indicative action	Score
Exemplary	All success criteria met; evidence of best practice	No further action	10
Fully compliant	Most success criteria fully met; achieving good practice in most respects	Advice only	20
Broadly compliant	A number of success criteria not fully met; key criteria not met	Consider action + follow up inspection	30
Poor	At least half of the success criteria are not met or only partly met.	Consider IN Action + follow up inspection	40
Very poor	Most success criteria not fully met. Very few examples of good practice.	IN + follow up inspection	50
Unacceptable	No success criteria are met. No attempt to achieve RGP.	IN. Consider PN. Consider Prosecution. Urgent follow up inspection	60



Human Factors Health Check

- Approach mimics the HSE inspection process as closely as possible:
 - Review of documentation
 - Site visit (six days carried out by two people over three days)
 - DRL provided access to personnel and plant.
- Site visit included:
 - Assessment of the human computer interface in control rooms with the EC&I Technical Lead; and with process operators.
 - Task analysis of a critical task to evaluate the SCTA approach.
 - Assessment of maintenance tasks, maintenance stores and workshops and interviews with maintenance staff on resources and maintenance procedures.
 - Observation of the shift-handover.



Scoring against the topics

Topic	DRL Score	Rating
Topic 1: Managing Human Performance	40	Poor
Topic 2: Design of Process Control Systems	50	Very Poor
Topic 3: Safety Critical Communications	40	Poor
Topic 4: Design and Management of Procedures	50	Very Poor
Topic 5: Competence Management Systems	50	Very Poor
Topic 6a: Managing Organisational Change	50	Very Poor
Topic 6b: Managing Shiftwork and Fatigue	50	Very Poor
Topic 6c: Managing Resources	40	Poor



Managing Human Performance	Human Factors in Design	Critical Communications	Procedures	Competence	Managing Organisational Change	Fatigue and Shiftwork	Managing Resources
Human Factors Integration standard	Policies for process control design and alarm management.	Used risk assessment to identify and evaluate aspects of communication	Clear written standard	The operator has established a CMS	Management of Organisational Change policy	A policy on fatigue and shift work	Has a policy for maintaining staffing levels and optimising workload
Structured methodology for HRA	Benchmarked design / alarm management against relevant good practice	Developed local policies and procedures for shift handover and PTW	Established clear links between procedures and local MAH scenarios.	The operator has taken steps to ensure that the CMS is clearly linked to local MAHs	A procedure detailing the type of studies and risk assessments to be carried out at each stage of the change	A shift pattern that has been devised based on good practice.	Completed an assessment of staffing levels using a recognised method
The Operator has identified the full range of COMAH-critical tasks	Informed design with TA and HRA	Shift Handover	Used on-plant task analysis to inform the content / critical steps clearly identified	The operator has developed a structured framework for on-the-job training and assessment	Implemented their procedure when a change is being considered.	A statement of working hours and overtime limits	Completed an assessment of workload using a recognised method
The Operator has prioritised COMAH-critical tasks	Design for managing upset conditions	PTW	Established a framework to optimise usability.	The operator has developed arrangements to allow for consolidation of training	Used a risk assessment methodology and carried out appropriate Human Factors studies	Procedures to be followed when employees are required to work beyond standard hours,	Identified workload as a relevant PIF in HRA.
The Operator has developed & actively implemented a programme of HRA	Well-designed control room	Competence in safety-critical communication	Developed arrangements to ensure day-to-day compliance	periodically monitor and re-assess the performance of COMAH-critical personnel.	Carried out a realistic assessment of how management changes could impact ER	Promoted the importance of fatigue management	Evidence that staffing levels are optimised
HRA used to evaluate and optimise 'MIT-specific' PIFs	KPIs on alarms	Established arrangements to monitor, audit and review	Established a structured framework to train and assess personnel	The operator has actively implemented the CMS.	Consulted with and encouraged employee participation in the change process.	Committed to working with employees to encourage self-reported fatigue	Involved operators in assessments of activities for which they are responsible.
Action plans	HF integration into design			The operator has established a framework to audit and review CMS implementation.	Demonstrated competence assurance,	Committed to considering fatigue as part of incident investigations	Operators can raise workload concerns
Effective intelligent customer capability	Effective training for changes to DCS				A "Go / No-go" mechanism for reviewing decisions	Has ongoing monitoring of shift working and fatigue risk issues	A means of audit and review.
HF in accident and incident investigations	Changes to HMI and DCS included in MOC				On-going monitoring such as KPIs, review periods etc.		
	Design for situational awareness						
	HMI available and accessible relative to functional roles						
	Optimised console design to support and enhance performance						
	HMI design follows good practice in relation to graphics, symbols, text, navigation.						
	Suitable input devices						

Fully met

Partially met

Not Met



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Impact of the Health Check

- Highlighted deficiencies across site
- Clarity: no ambiguity, clearly assessed and identified the potential for enforcement action
- Gave Site Head a wakeup call
- Set off alarm bells at corporate levels – DRL take compliance very, very seriously
- Secured funding and backing from DRL corporate to address issues



Impact on leadership

- Raised awareness of importance of Human Factors in COMAH
- Awareness of the legal requirements
 - And how the issues have been implicated in major accidents
- What Human Factors are, what's needed to be compliant, the importance of being an intelligent customer
- Now a joined-up approach to getting it right because everyone recognises the need, not just me as EHS



So, what have we done?

- Topic 1
 - New process, procedures, training
 - Identified full range of critical tasks
 - Prioritised them (on-going)
- Topic 2
 - New process, procedures, training
 - Implemented in new DCS control room project
- Topic 4
 - To support Topic 1
 - Process, procedures and programme of work



Still to come

- Managing Organisational Change – project started
- Competence Management System
 - Dependent on procedures work, planned for 2024



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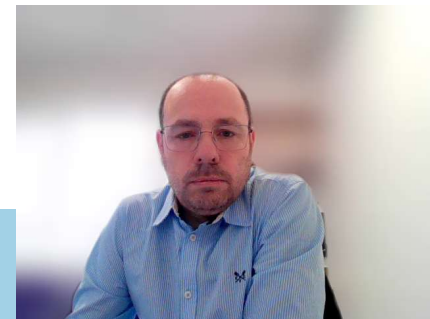
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Topic	Before	Rating	After	Rating
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Topic 2: Design of Process Control Systems	50	Very Poor	30	Broadly compliant
Topic 3: Safety Critical Communications	40	Poor	40	Poor
Topic 4: Design and Management of Procedures	50	Very Poor	30	Broadly compliant
Topic 5: Competence Management Systems	50	Very Poor	50	Very Poor
Topic 6a: Managing Organisational Change	50	Very Poor	50	Very Poor
Topic 6b: Managing Shiftwork and Fatigue	50	Very Poor	20	Fully compliant
Topic 6c: Managing Resources	40	Poor	40	Poor



Take away

- Great feedback from HSE Regulatory Inspector
- Remarkable what can be done in short space of time
- Regulator needing the prompt and spoon feed
- Now in control and telling the regulator how we're managing the risks,
- Intelligent customer capability is there
- And can see forward plans – not playing catch up anymore!
- And **no actions** from HSE after the last intervention.



Thank you for listening

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Any more questions
come talk to us: **Stand 19**

