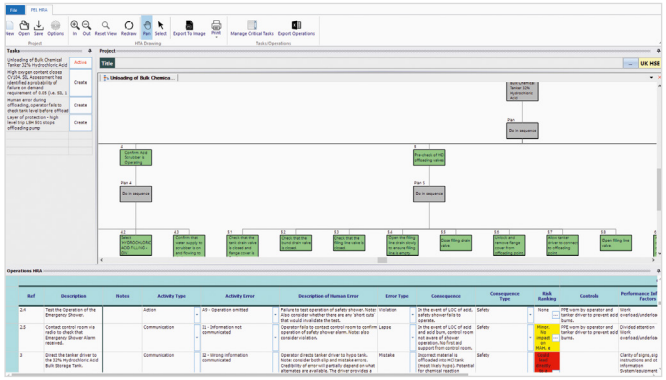
PEL Human Reliability Analysis (HRA) tool



Human failures are responsible for up to 80% of accidents, and feature in almost all major incidents. It is therefore important that companies do as much as they can to consider 'human factors', in order to prevent major accidents occurring.

A key part of the Control of Major Accident Hazards (COMAH) safety report is a demonstration for how human factors are identified and managed for all high hazard sites.

An important element of demonstrating compliance with the COMAH requirements is the management of Safety Critical Tasks (SCTs) using a structured and documented process, often referred to as Human Reliability Analysis (HRA) also known as Safety Critical Task Analysis.

PEL-HRA is a software tool to support you when completing Human Reliability Assessments (HRAs). The tool has been developed using recognised methodologies (†) and from practical experience to enable you to follow the HSE Roadmap for Human Factors.

1. List and assess critical tasks

Once companies have identified Major Accident Hazards (MAHs), SCTs associated with MAHs are gathered and assessed. These can be tasks where a person could initiate or fail to mitigate a MAH, or where maintenance, inspection and testing is relied on to maintain the integrity of a physical barrier.

pel software

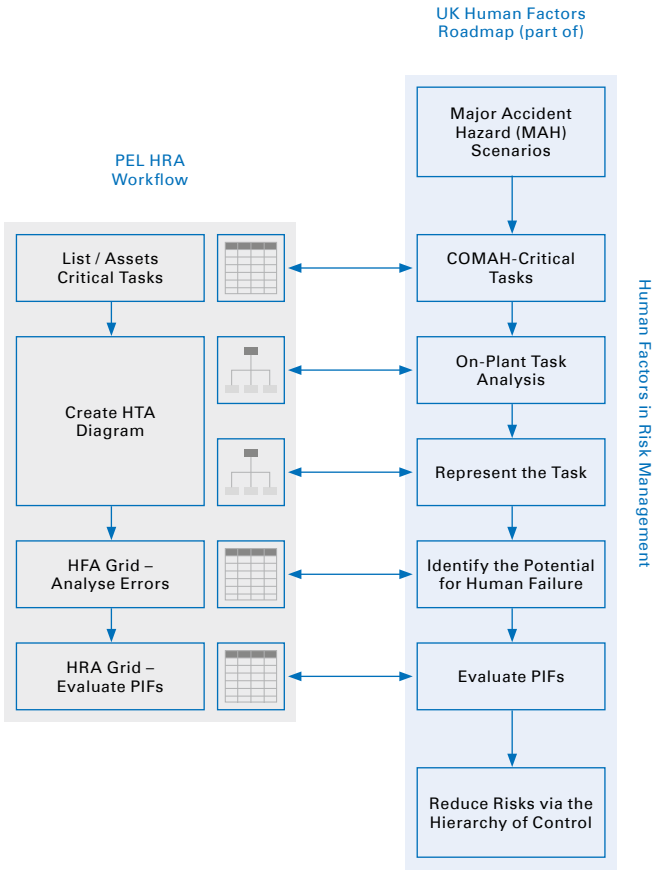
These SCTs can be easily imported into the PEL-HRA management tool and assessed using the built-in scoring tool (which can be customised / calibrated to suit your company standard) to give a risk score for each task and allow a prioritised programme to be developed for further analysis.

The software allows the user to demonstrate that a thorough approach has been taken to identification & prioritisation of safety critical tasks on their site. The appropriate choice of human factors assessment can be selected and justified for each task. This tool efficiently helps to demonstrate compliance.

2. Hierarchical Task Analysis (HTA)

The aim of HTA is to understand the task. Tasks are broken down into 'operations' and detail is added to develop the sequence of the task. The activity is completed by a team with appropriate expertise and knowledge of the task.

† *Guidance on human factors safety critical task analysis, 2nd Ed and CIEHF*



Human factors roadmap

A tree diagram is used in PEL-HRA to allow the team to build up individual 'operations' or steps into an overall task. Functionality includes the ability to add sub-operations, to build detail where required, drag-and-drop ability to easily manipulate the sequence of the task and adding groups of operations to develop the tree efficiently. Visualisation of the task in a tree structure aids group input to build up individual 'operations' or steps into an overall task.

3. Human Failure Analysis (HFA)

The task analysis is used as the basis for the HFA. This technique is used to identify the opportunities for error in each step, along with the types of error and consequences. Identification of the error types is important as performance-influencing factors and improvements for each type may be different. Recovery paths, i.e. opportunities to identify and correct an error, can also be identified.

The operations of the task are auto-populated in the PEL-HRA grid in the software from the HTA tree diagram. Depending on the type of task; operation, maintenance or testing, the severity of the errors identified can be recorded and the steps prioritised, e.g. leaving a safety instrumented system inactive.

4. Evaluate Performance Influencing Factors (PIFs)

PIFs are also identified, and opportunities for improvement discussed and recorded. This forms an important element of the eventual ALARP judgement for the task.

OUTPUT

The HRA enables the team to determine the requirements of the task with regards to competence, tools and procedures and to review the feasibility of the task. The process identifies error vulnerable and/or safety-critical steps within the task and to determine if it is realistic for a person to consistently perform the task successfully.

WHAT TÜV RHEINLAND OFFER

Key features include:

- Manage site list of SCTs - customise prioritisation
- All SCTs and HRAs contained in one tool - keeping track of progress
- Criticality scoring of tasks
- Easy to update / review
- Developed by experienced safety and HRA practitioners with understanding of COMAH requirements and all high-hazard operations
- Recognised methodology

BENEFITS

- Supports demonstration of compliance with COMAH safety standards for the requirements of the safety report
- Provides a structured approach which increases documentation consistency, reducing the risk of human error
- Identification of error types allows each one to be mitigated appropriately improving performance
- The software is auditable, strengthening internal control and highlighting areas of improvement
- Easy to use functionality
- The tool can be customised to suit your company standards allowing easy integration
- Provides files which are easy to edit, therefore supporting review and continuous improvement of Safety Critical Tasks

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