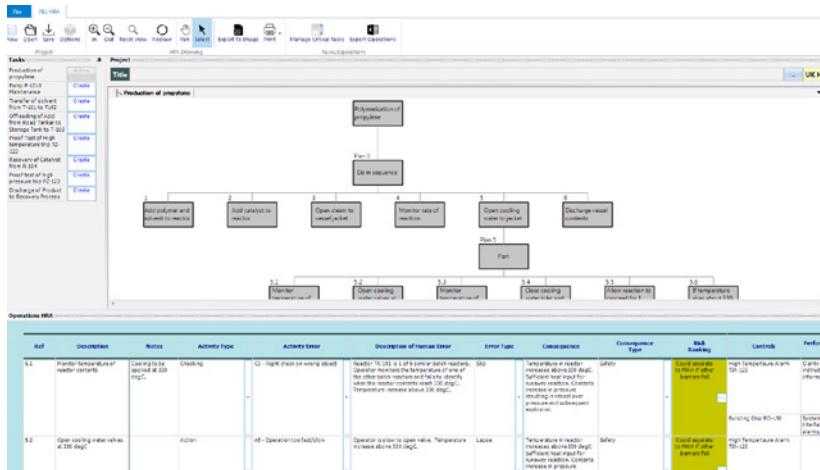


PEL Human Reliability Analysis (HRA) tool



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.¹

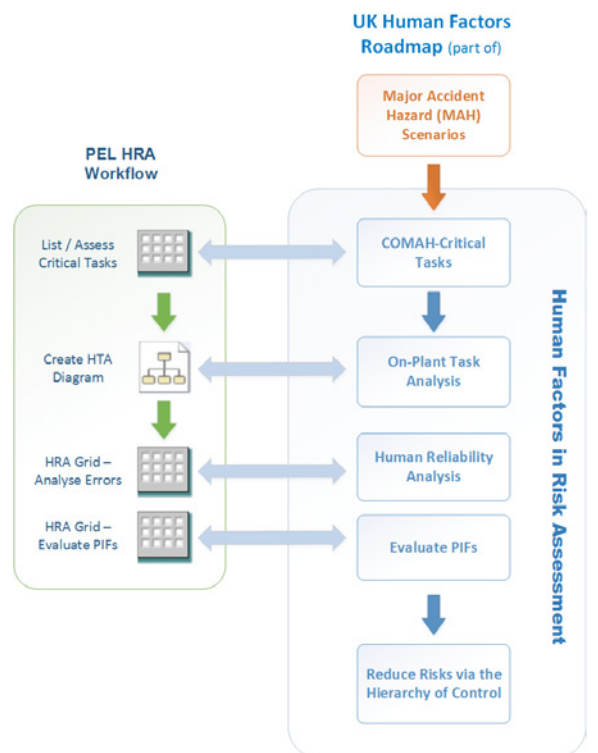
¹ <http://www.hse.gov.uk/humanfactors/topics/01introhf.pdf>

Right: Human factors roadmap.

A key part of the 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 Control of Major Accident Hazards (COMAH) requirements is the management of Safety Critical Tasks (SCTs) using a structured and documented process, often referred to as HRA.

PEL-HRA provides a software tool based on recognised qualitative methodologies to help you improve understanding of tasks and sources of human error. By following a series of defined steps aligned with the HSE ‘human factors roadmap’, the PEL-HRA software supports and documents the assessment of SCTs.

- List and assess critical tasks**
 Once companies have identified Major Accident Hazards (MAHs), tasks associated with MAHs are gathered and assessed to establish a list of SCTs. These can be tasks where a person could trigger or fail to mitigate a major incident, or where maintenance, inspection and testing is relied on to maintain the integrity of a physical barrier. 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 an indication of the task’s criticality rating, which can be used to develop a prioritised programme for further analysis.



Tasks should be referenced to a clear link (“line of sight”) throughout the hazard identification and risk assessment process between the MAH, initiators and COMAH or Chemical and Downstream Oil Industries Forum (CDOIF) scenario to maintain protective measures. 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 usually completed by a team with appropriate expertise and knowledge of the task.

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.

3. Human Reliability Analysis (HRA)

The task analysis is used as the basis for the next step, HRA. 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, plus it is required under COMAH regulations. 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 HTA and HRA enable 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 ABB 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

- Demonstrate 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