

What is Task Analysis and Why is it Important?

Understanding the Task

Identifying the potential for human failure in preventing an accident or exposure to substances hazardous to health requires having a thorough understanding of the task the person is carrying out.

A thorough understanding of the task can contribute to:

- Accurate and workable procedures.
- Assuring the competence of operators.
- Workload analysis.
- Design of workstations, plant and control systems.
- Human error analyses as part of a risk assessment.

Most methods for achieving an understanding are based on observations of the task and physically demonstrating the task on the plant or equipment where the task is carried out using the Walk-Through Talk-Through method.

Walk-Through Talk-Through (WTTT)

The WTTT process is a method used to collect, record and analyse information about a Task at a basic level to help understand how people actually get the work done. It is a tool to help identify where errors or mistakes can be made, the Performance Shaping Factors (PSFs) that increase the likelihood of error and how the operator might typically react to recover the situation.

This affords real opportunity to make changes that improve Human Performance.

[Explore the WTTT guidance and template](#)

Advanced Methods

The following summary describes recognized methods used to collect, record and analyse information about Operator tasks. These methods are designed to help understand what is required to be completed in the task and identify any changes that may be needed to improve Human Performance.

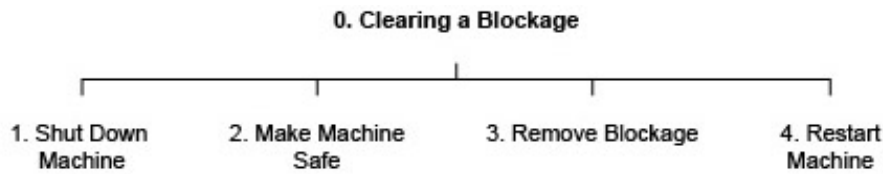
It is recommended that further reading, familiarization and training is undertaken prior to applying any of these methods.

METHOD	OVERVIEW	USED TO IDENTIFY OR DEVELOP
Hierarchical Task Analysis	The task is re-described at a high level, then in increasing detail	<ul style="list-style-type: none"> • Human Failure potential, • Selection and Training needs, • Procedures, • Competence requirements.
Link Analysis	The spatial links and relationships between people and / or between people and equipment or plant	<ul style="list-style-type: none"> • Allocation of functions between humans and machines, • Improved workplace and equipment layout, • Efficient procedures.
Timeline Analysis	Studying time taken between task steps	<ul style="list-style-type: none"> • Efficient and effective staffing, • Task sequence optimisation.

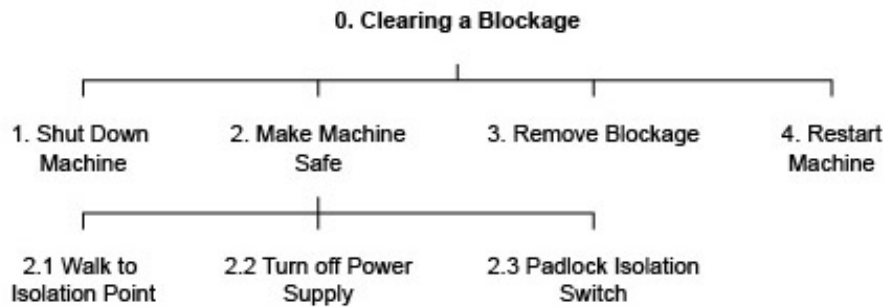
Hierarchical Task Analysis

Hierarchical task analysis (HTA) is a way of organising the data collected during the walk-through talk-through in a systematic way. The key advantage of an HTA is that it allows consideration not just of each task step, but of the way in which task steps are related to each other, the order in which they are carried out and what would happen if a group of task steps were missed.

The usual process is to identify the goal of a procedure e.g. ‘clearing a blockage on the machine’. The task steps identified through the walk-through/talk-through are then grouped into operations necessary to achieve the goal.



Each main operation can then be broken down into sub-operations:



The next step is to draw up “plans” which specify the order in which the operations should be carried out. Plan 0, for example, would be “Do steps 2 to 4, if blockage cleared, continue, if blockage remains repeat steps 1 to 4 in order”. Plan 2 would be “Do steps 2.1 to 2.3 in order”.

Based on the walk-through talk-through, the preconditions for achieving the goal are identified. This might include the availability of sufficiently trained staff, the necessary tools, time restraints and so on.

The HTA contains four components:

- The goal
- Operations and sub-operations
- Plans
- Preconditions

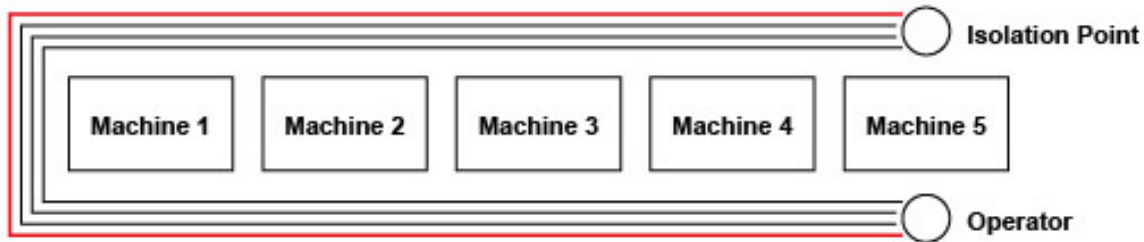
Each of these can be analysed for potential failure in addition to the operational failures that might occur in each task step as identified in the walk-through talk-through. For example:

- What if the operator has the wrong goal?
- What will the operator do if a precondition is not available?
- What if a plan is carried out in the wrong order?
- What if a plan is not carried out at all?

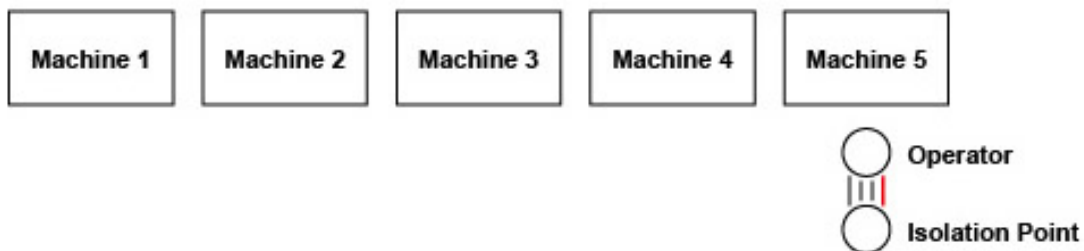
Link Analysis

Like HTA, link analysis is a way of organising the information gathered in the walk-through talk-through. This methodology is used to examine the spatial relationships between people and the operational parts of plant and equipment, individual task steps and the links between different people.

On a small scale, link analysis can be used to identify the controls and displays most frequently accessed by an operative in a task so they can be grouped together in the most prominent and readily accessible part of the workstation. This technique can be useful in understanding inefficient procedures (prone to non-compliance).



Above is a simple link analysis focusing on interaction with an isolation point whilst clearing a blockage. The red line indicates a task that is safety critical. The operator presses the stop button on the machine, isolates the machine, clears the blockage, de-isolates the machine, press the power on button on the control panel, then sets the machine away. The operator has to visit the isolation point twice – to isolate and then de-isolate the machine. The more frequently the operator has to interact with a control, and the more important the control, the nearer it should be to the operator.



Redesigning the controls increases the likelihood that the operator will follow the safe working procedure and isolate the machine before clearing a blockage.

Contains Public Sector information published by the HSE and licensed under the Open Government Licence (UK)

[See also Energy Institute Briefing Note 11.](#)