

Adapted Subjective Workload Assessment Technique (ASWAT)

Instructions and Guidance

Purpose of the Tool

The Subjective Workload Assessment Technique (SWAT), developed in other industries, none the less seems to be generic in terms of workload dimensions. It includes dimensions that signallers have already suggested as representing their interpretation of the term workload. SWAT has therefore been considered as potentially the most relevant multidimensional workload scale for signallers.

The tool provides a relatively quick and easy general comparison scale for signallers to assess three dimensions of workload retrospectively. It allows a comparison of signaller workload between two situations (e.g., change in timetable), two systems (e.g. Panel versus VDU) or different times in the day over a period of time. It also allows some degree of diagnosis about where the signaller's greatest demands or effort might be.

The original SWAT has been adapted in 2 main ways to facilitate use within the signalling context. Firstly the original SWAT has three dimensions - time load, mental effort and psychological stress load. Testing with signallers suggests that the term 'stress' is inappropriate. The culture of signallers appears to view stress as a weakness; the term 'pressure' was more frequently associated with workload and was suggested by signallers as a suitable alternative. Hence the Adapted SWAT refers to pressure rather than psychological stress load.

Secondly, the original SWAT normally involves a 2 stage scale development. However, using the SWAT scale by considering the dimensions as continuous and having equal weighting avoids the need for the first phase of scale development. This use of SWAT has actually shown a higher level of sensitivity than the original SWAT in assessment between tasks of medium workload. This more simplistic version has been adopted for the Adapted SWAT tool to provide a practical tool for use in the field of signalling.

Using the Tool

It is intended that this tool should be applied retrospectively as a signaller becomes available or when a second signaller can temporarily provide relief from signalling duties to allow the main signaller to respond to ASWAT almost concurrently with their work.

The laminated scale should be used and the signaller instructed to indicate one of the three boxes that best represents their perception of each of the three workload dimensions in relation to the period of time and situation being assessed.

Recommendations on frequency of rating are difficult to provide, as this is dependent upon the nature of the workload issue under investigation. One example of how the tool may be applied is assessing the workload impact from granting and withdrawing possessions. In this instance you may wish to take an ASWAT rating for the key stages involved in this activity. This would reflect which of the key stages were more likely to contribute to time load, mental load and pressure for the signaller. Consequently the frequency of rating is determined by the occurrence of each key event.

Data management

Each dimension within the adapted SWAT has three levels, scored one to three from the top to the bottom level. An example is given below showing the dimension of 'Time Load'. Please tick the phrase a), b), c) that best describes how you feel about the time you had.

a) Often have spare time. Interruptions or overlap among activities occur infrequently	1
b) Occasionally have spare time. Interruptions or overlap among activities occur frequently.	2
c) Almost never have spare time. Interruptions or overlap among activities are very frequent, or occur all the time.	3

A total score can be calculated by adding the rating obtained from the signaller for each dimension. The total represents an individual's perception of the workload experienced in relation to the time available, mental effort and pressure experienced across different situations, events or time periods. Alternatively calculating the mode or frequency with which each scale descriptor was selected over a period of time will reflect the most frequently used descriptor for each workload dimension.

All data should be reported back to Network Rail, Ergonomics team to allow for further analysis and validation of the tool.

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Limitations

The data collected should be treated as ordinal data (categorical data). This prevents a 'mean' (average) of multiple ASWAT ratings over the period of time where the tool has been applied from being calculated. This will also suggest any statistical testing will require the use of non-parametric statistical tests.

This tool relies on the retrospective rating of a situation by signallers. A delay in rating workload may inhibit the accuracy of this rating. A delay of up to 30 minutes is considered to not distort ratings. However, where a period of greater than 30 minutes is likely, a signaller may benefit from reviewing the situation either using a video recording or CCF data.