The Nicholson curve

Usability of the curve

The Nicholson Curve is only applicable for schedules that disrupt normal sleep i.e. those with early starts, late finishes, overnight duties and those travelling across time zones. Normal daylight duties are not affected and clicking on each of the points of the Nicholson curve will indicate the duties that are considered for the calculation of the cumulative fatigue point.

However, the Duty Risk metric has been designed as a better performing metric, so users are recommended to use the Duty Risk metric in preference to The Nicholson Curve. That said, some Users find it works very well for their type of operation, so it remains a part of the toolkit in SAFE and CARE.

Professor Tony Nicholson led the sleep and fatigue research at Institute of Aviation Medicine (IAM) at Farnborough, England, throughout the 1970s and created his eponymous curve.

While having reasonably robust science at the core of the Nicholson Curve, the science behind the Nicholson Curve is not as robust as that held within the SAFE model. Consequently, when the Nicholson Curve appears to be at odds with SAFE, then the user should assume that the SAFE analysis takes precedent.

The Nicholson Curve is integrated into SAFE as an additional tool to be used to form a more complete picture of the nature of the fatigue risk and should not necessarily be used as a stand- alone decision-making system.

The Nicholson Curve is shown below. It compares the sleep taken within a schedule with work- rate of the schedule; and clients who have used this curve in earlier version of SAFE have reported its consistency when analysing incidents and accidents. These clients report that whenever they have an incident, the time of that incident almost invariably occurs where the work rate curve exceeds the cumulative fatigue curve i.e. the area shown in red.

The group of icons to the top right indicate a pdf download is available and the screen can be minimised (and maximised) and the curve fitted to the width of the screen

While the exceedance of the work-rate curve beyond the Nicolson Curve does not indicate that an incident is inevitable, it indicates that the red areas are best avoided. This can be done by making sure the sleep obtained before the point of exceedance is increased. A day or two off-duty is a way of achieving more sleep with a reduction of work-rate.