

Identification of Time At Risk Periods of Significance to ALARP Justifications

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Abstract

Behind the simplicity of the ALARP Principle – which requires that all reasonably practicable risk reduction measures should be taken – lies a great deal of complexity. One of the difficult areas is Time At Risk, when risks are above the mean value for a period of time. In this paper, three methods are developed as an aid to the process of agreeing what constitutes a significant period of increased risk that may possibly be worthy of separate ALARP consideration.

Disclaimer: The work discussed in this paper has been developed from an MSc dissertation by the author (George 2003) and is a personal view.

1. Introduction

UK Health and Safety legislation can be considered as consisting of two types: Prescriptive, where precise and specific requirements are laid down, and Goal-setting, which requires judgements to be made on how well safety goals have been met. The trend in recent years has been towards reducing prescription in favour of a goal-setting approach. The main embodiment of this is the 1974 Health and Safety At Work Act which requires protection of health, safety and welfare of employees and the public “*so far as is reasonably practicable*”. This philosophy is perhaps better known through the ALARP Principle: the requirement for risks to be As Low As Reasonably Practicable.

The subjectivity associated with the Goal-setting approach has created many areas of debate. It is on one of these – periods of elevated risks (or “Time At Risk” (TAR) periods) - that this paper is focused; specifically, it proposes ways to identify whether or not a particular TAR period is significant enough to warrant a separate ALARP justification. It is anticipated that this will be of most benefit when handling large numbers of risk profiles and/or large quantities of data.

The proposals presented in this paper have developed from consideration of nuclear-related risk, where there is the potential for accidents to lead to large and widespread consequences. The methods are sufficiently general that they might, with suitable adjustment, form the basis of applications in other sectors where the consequences may be of lesser magnitude and/or more localised.

1.1 The ALARP Principle

The ALARP Principle is an essential part of an overall decision-making process in which potential risk-reducing measures are identified, assessed and the most Reasonably Practicable solution chosen. The benchmark definition of Reasonable Practicability was set by Lord Justice Asquith in 1949 when he described it as a comparison between risk and the “*sacrifice involved in ... averting the risk (whether in time, money or trouble)*”. In order to claim that risks are ALARP, the sacrifice must be shown to be very much greater than (in Gross Disproportion to) the amount of risk averted. The Gross Disproportion varies with risk: the higher the risk, the more effort is expected to be spent on each quantum of risk reduction.

The ALARP Principle is often illustrated through the ALARP “Carrot” shown in Figure 1. The varying width is depicts this increased effort at higher risks.

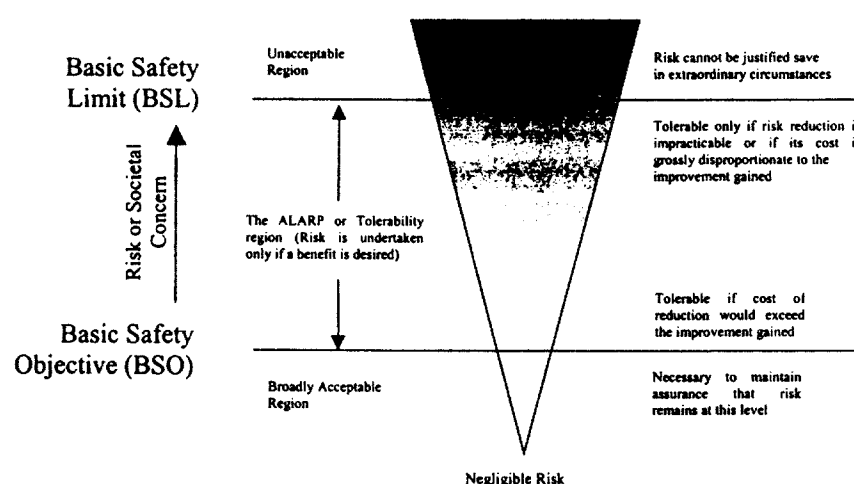


Figure 1: ALARP Carrot

1.2 Regulatory Guidance on ALARP

The ALARP Principle is simple in concept but can be very difficult to apply. The most recent general guidance from the Health and Safety Executive (HSE) is contained in the document commonly known as R2P2 (HSE 2001) and is expanded in the “ALARP Suite” of three other documents (HSE 2001A, B & C). A number of divisions within the HSE have followed by providing more specific guidance for their own areas – for example, the Nuclear Installations Inspectorate (NII) published their Technical Assessment Guide (TAG) in 2002 (NII 2002). Outside the HSE, other regulatory bodies have also produced ALARP guidance, and these include the Ministry of Defence (MoD) nuclear plant regulator, the Naval Nuclear Regulatory Panel, in JSP518 (MoD 2003).