

Title	EHS13: Guidelines for Quantitative Risk Assessment Uncertainty	
Publisher/Author	UKOOA	
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Scope	<p><b>EXECUTIVE SUMMARY</b></p> <p>Quantitative Risk Assessment (QRA) is, by its nature, subject to a range of uncertainties. It is important to recognise and address these to build confidence in the results. Uncertainties become particularly important in situations where very different options are being compared, or where the basic estimate of the risk is close to a criterion or to other key decision points.</p> <p>Addressing the issue of uncertainty does not necessarily mean performing an uncertainty analysis. However it is important to recognise that the extent to which uncertainty analysis may be required should be determined by the nature of the results of the QRA and the use to which they are to be put.</p> <p>At one extreme it could be nothing more than giving an argument as to why uncertainty analysis is not appropriate. The scope and level of uncertainty analysis undertaken should reflect the nature of the QRA and the use of its output in decision making. The need for uncertainty analysis will also be affected by the actual risk figures estimated. If these are well within any criterion or make a decision very obvious, then there is probably little point in going any further.</p> <p>Current QRA practice is to initially perform a highly conservative analysis followed by simple sensitivity analyses, if required, to assess the impact of some of the more influential parameters on the overall risks. These can provide a sufficient demonstration of the robustness of the risks where they find no cliff edges which could change the decision or mean that risk criteria are not met, and where only a few relatively independent factors are shown to have a significant impact on the risks.</p> <p>Where a highly conservative assessment and a sensitivity analysis alone is unable to demonstrate the robustness of the QRA, e.g. in situations where the extremes straddle criteria or decision points, or where there are many significant uncertainties, then a more probabilistic means of addressing the uncertainties may be required. This could range from an assessment of a limited set of input parameters or models considered to be the most important, to a more comprehensive analysis of input parameters and models. Various methods that may be used for this are described in these Guidelines.</p> <p>Finally it should be remembered that uncertainty analysis, like QRA, it not a precise process and is itself subject to uncertainties. These include shortcomings in data, methods, people and systems. Whilst it can provide useful insights into the robustness of the QRA and any decisions this supports, its results will still be open to interpretation and uncertainty. Judgement is still needed in deciding whether to embark upon it, in its interpretation and on how to use the results. Therefore a careful balance must be struck between the efforts to ensure the suitability and sufficiency of the QRA itself, any uncertainty analysis on the QRA and the overall requirements of the decision making process.</p>	
Table of Contents	<p>FOREWORD ..... iii</p> <p>EXECUTIVE SUMMARY ..... v</p> <p>1 INTRODUCTION ..... 1</p> <p>2 THE ROLE OF QRA IN THE UK OFFSHORE INDUSTRY ..... 3</p> <p>3 SOURCES OF UNCERTAINTY IN QRA ..... 5</p> <p>4 AN OVERALL APPROACH TO ADDRESSING UNCERTAINTY .... 9</p> <p>    4.1 A CONSERVATIVE APPROACH TO RISK ASSESSMENT ..... 9</p>	

	4.2 BROAD HISTORICAL COMPARISONS .....	10
	4.3 SENSITIVITY ANALYSIS .....	10
	4.4 UNCERTAINTY ANALYSIS .....	11
	4.4.1 Type 1 - Parameter Uncertainties .....	12
	4.4.2 Type 2 - Model Uncertainties .....	13
	4.4.3 Type 3 - Overall Quality Uncertainties .....	14
	5 MATCHING THE QRA AND UNCERTAINTY ANALYSIS .....	17
	6 REFERENCES .....	19
	7 SUGGESTED FURTHER READING .....	21
	8 GLOSSARY .....	23