

Review of ALARP at Sellafield

NuSAC (2007)P19 Open Paper

Dave Mason
Director, EHS&Q
Sellafield

1 INTRODUCTION

Major decommissioning projects starting or already underway on the Sellafield Site will provide a significant challenge to control of dose uptake across the site over the next few years. It is essential that these projects are subject to effective review at all stages of the work to ensure that dose uptake is tightly controlled and ALARP (As Low As Reasonably Practicable).

In addition, routine work in old redundant facilities or maintenance areas of new plant must also be subject to high standards of dose control to meet the ALARP principle.

This paper summarises the arrangements for the application of the ALARP principle in the control and optimisation of dose at Sellafield.

2 BACKGROUND

The requirement to reduce doses to As Low As Reasonably Practicable, ALARP, is a statutory requirement of the Ionising Radiations Regulations 1999 (IRR99). The definition of ALARP in law was established by a judgement of the Court of Appeal, which concluded that it is reasonable to require an employer to avert a risk unless the 'sacrifice' (cost, time or trouble) is 'grossly disproportionate'.

The site must therefore be able to demonstrate that we have;

- Assessed the risk
- Estimated the 'sacrifice'
- Performed a comparison between the two
- Taken action to avert the risk where appropriate

A process for ALARP was developed by BNFL a number of years ago, based on experience gained from major projects undertaken on the site. This process is summarised in Table 1.

3. DEMONSTRATION OF ALARP

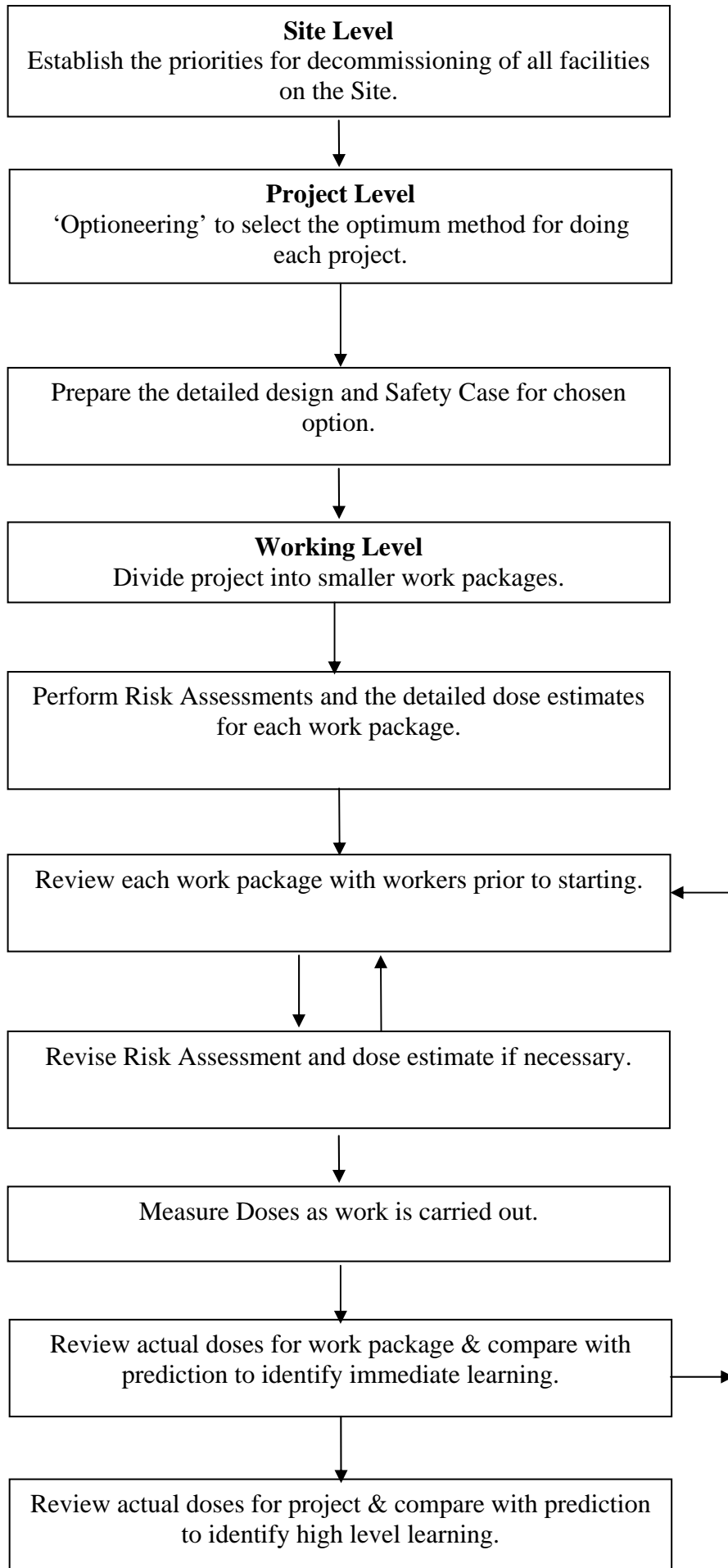
Demonstration of ALARP can be achieved in a number of ways. For a complex project involving a number of elements, it is usually sufficient to demonstrate that we have done all that is reasonable at each stage to manage dose carefully.

At Sellafield, demonstration of ALARP for a project is achieved by application of the process summarised in Table 1 below, which involves a series of steps to ensure that doses are carefully managed throughout the work.

This does not necessarily mean that dose has been **minimised**, as minimising dose in isolation could have an unreasonable impact on other key factors such as project timescales or cost. The requirement is therefore to minimise the overall project risk (as far as reasonably practicable) by **optimising** the key elements of:

- Dose
- Cost
- Project timescale
- Number of people
- Environmental Discharges
- Conventional Safety

Table 1 – Summary of the Sellafield ALARP Process



4 CURRENT DOSE TRENDS

The collective and mean dose trends for the site from 1990 – 2006 are shown in Graphs 1 to 3 at the back of this paper.

4.1 Overall trends - Sellafield Employees

After a period of steady reduction in mean and collective doses through the last decade, doses have largely levelled out from the start of the current decade with some fluctuation from year to year. The profile of Contractor employee doses is broadly similar to Sellafield employees, but there is more fluctuation in the Contractor profile due to greater variation in the numbers of people employed.

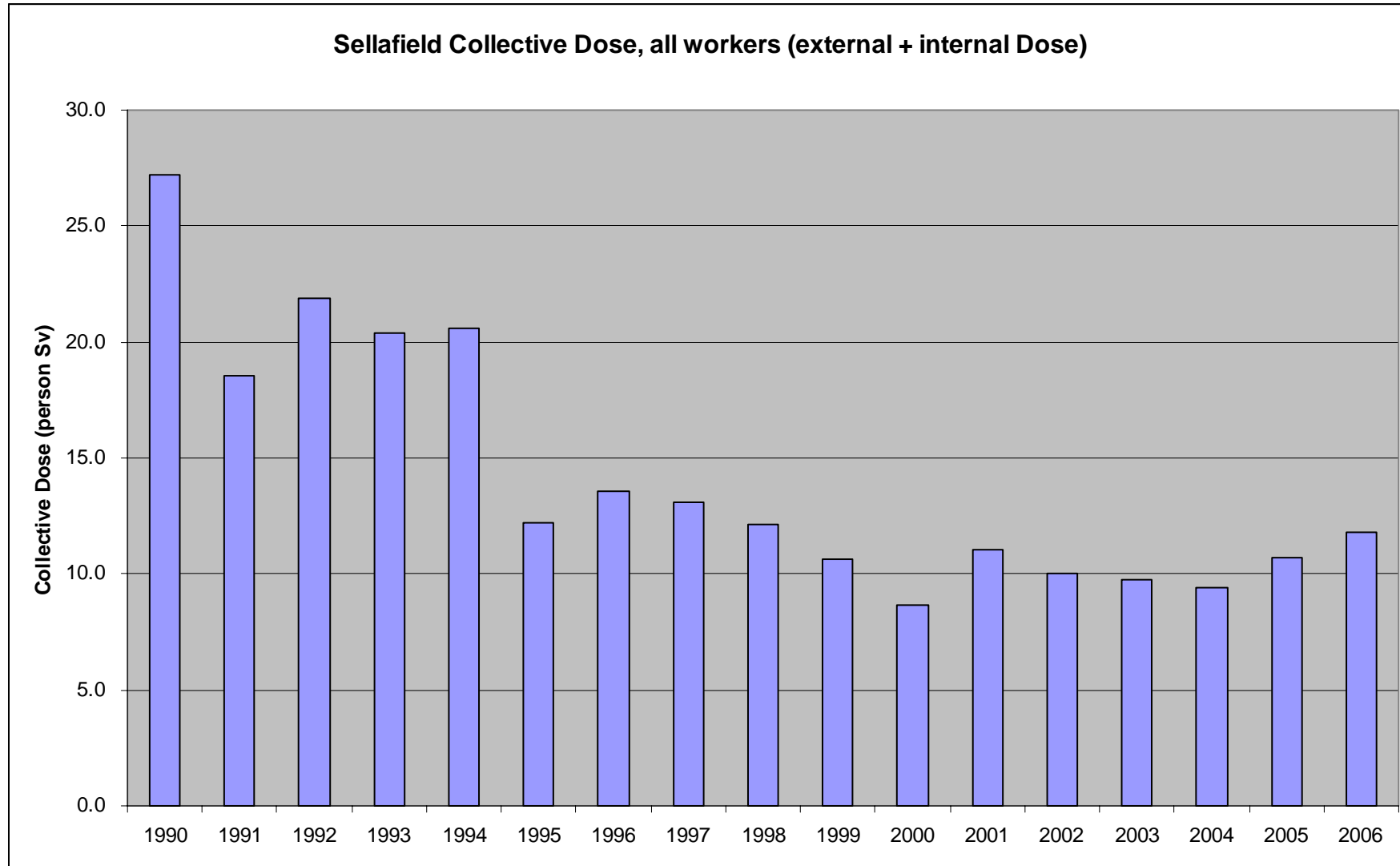
4.2 The main reasons for these trends are;

- 4.2.1 The reductions in the 1990's were due to the efforts of plant operators to reduce routine doses on the site. This was greatly facilitated by the transfer of reprocessing operations from old to new plants such as Thorp over the late 1980s and early 1990s, which were specifically designed to reduce dose uptake. The introduction of new technologies, such as electronic Personal Alarmed Dosimeters also helped by providing better dose information to workers thus enabling them to exercise better control over their dose uptake.
- 4.2.2 Since 2000 there has been a steady increase in decommissioning operations on the site. This has involved both an increase in work in the older redundant facilities, and an increase in the number of workfaces. The nature of decommissioning can also involve work in high radiation fields. While this is done remotely where possible, this is not always practicable if it requires more flexibility than is possible with remote work or is unreasonably costly for the benefits gained.
- 4.2.3 Examples of the decommissioning work include work on the first Magnox Swarf Storage Silo (B41), the later Magnox Silo (B38) and the Magnox Fuel Ponds (B30). The objective in each case has been to reduce risk and prepare for future dismantling operations. Some of this work involved operations in high background doserates, and careful optimisation of the work to avoid excessive dose uptake. Dose uptake has been controlled within dose budgets.

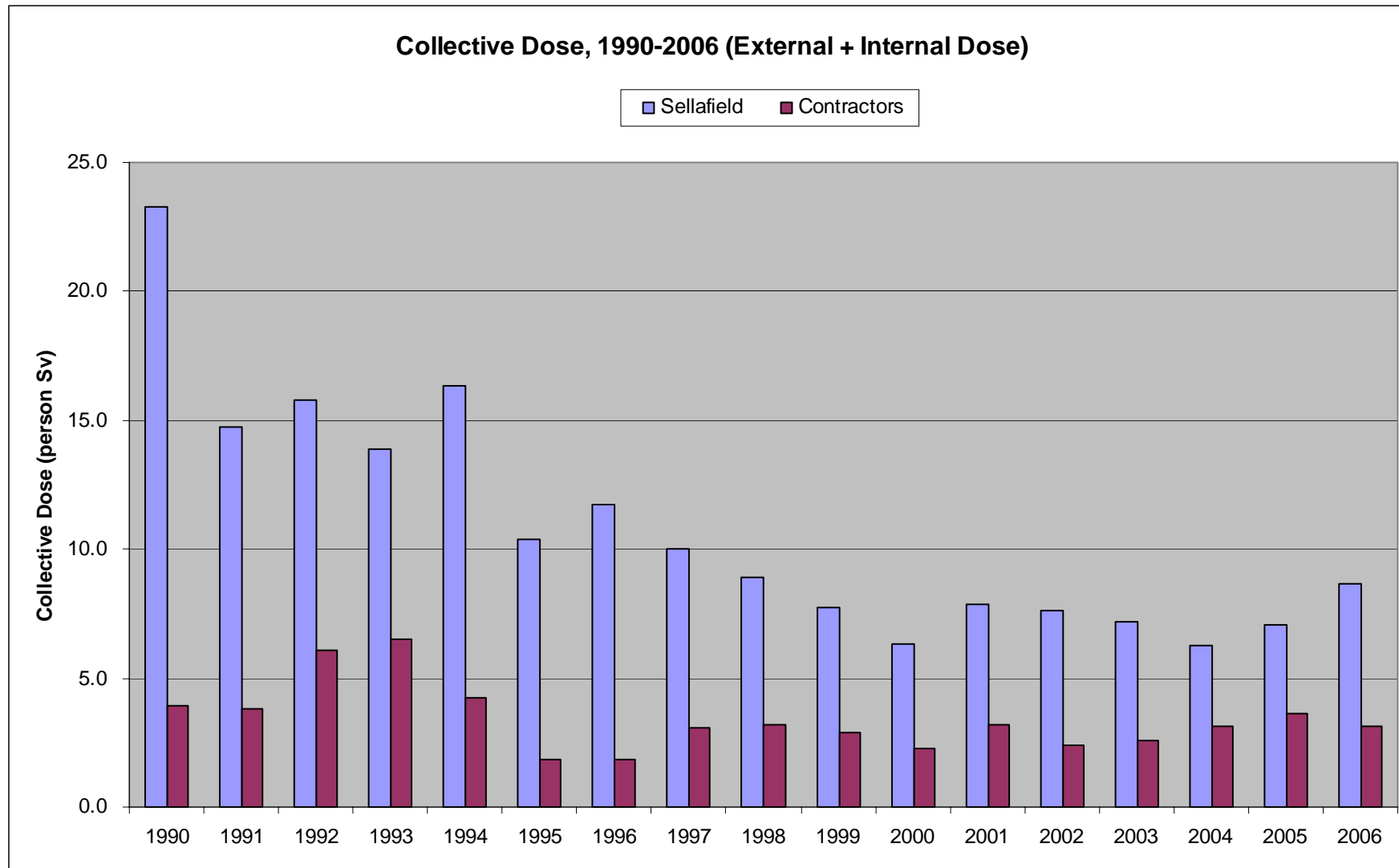
5 SUMMARY AND CONCLUSIONS

- 5.1 There is an ALARP process in operation at Sellafield. The process is considered to be comprehensive and appropriate for the needs of the Site.
- 5.2 It is recognised that there will be an increasing challenge to the control of dose uptake over the next few years, and a review of the effectiveness of the ALARP process is therefore considered timely. We are currently undertaking a review of the application of the process to ensure it continues to be effective.

Graph 1. Sellafield Site Collective Dose, All Workers, 1990 – 2006



Graph 2. Collective Dose, Sellafield and Contractor Employees, 1990 – 2006



Graph 3. Mean dose, 1990 – 2006

