Some UKAEA experience in Transition Planning and Decommissioning Management

A.F. McWhirter
International Marketing Director - UKAEA

IDN Meeting IAEA Vienna
31 October 2007

UKAEA

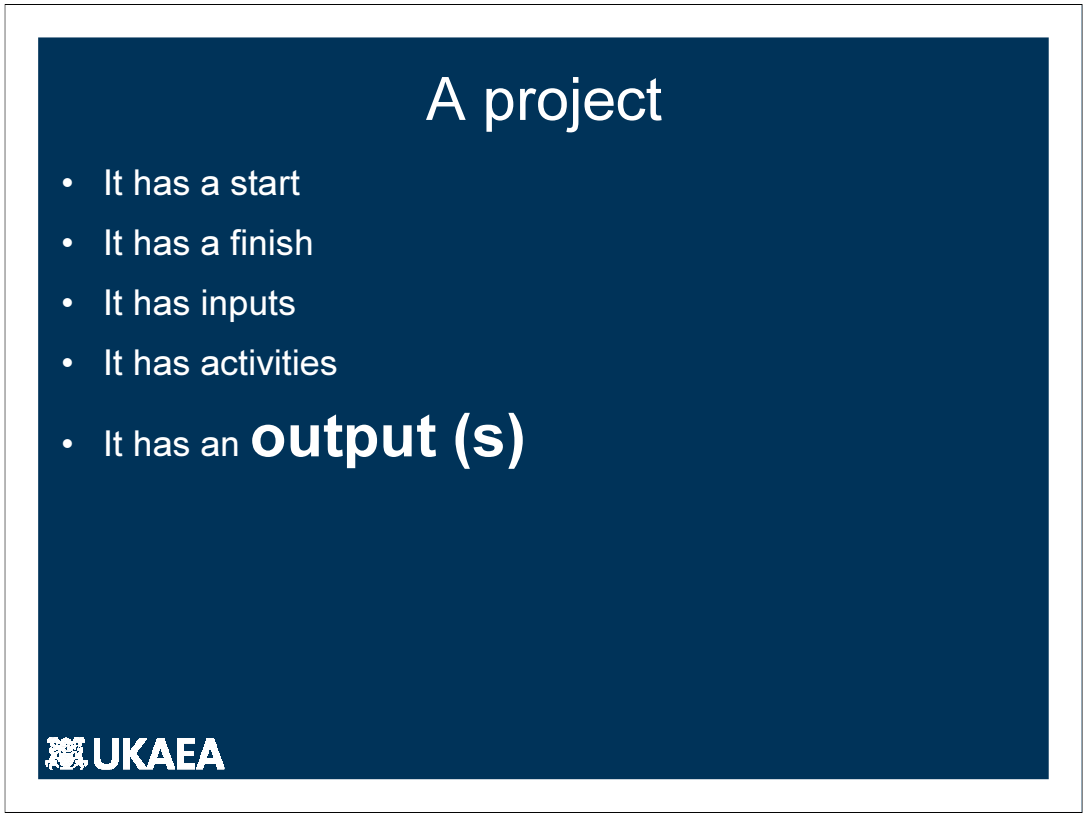
The purpose of this slide was to say that it is essential to produce a complete plan for the decommissioning of a facility and the definition of completeness will vary from location to location.

The purpose of my presentation was to highlight some of the less obvious issues that can have an unexpected impact on the success of the Decommissioning Plan.

Topics

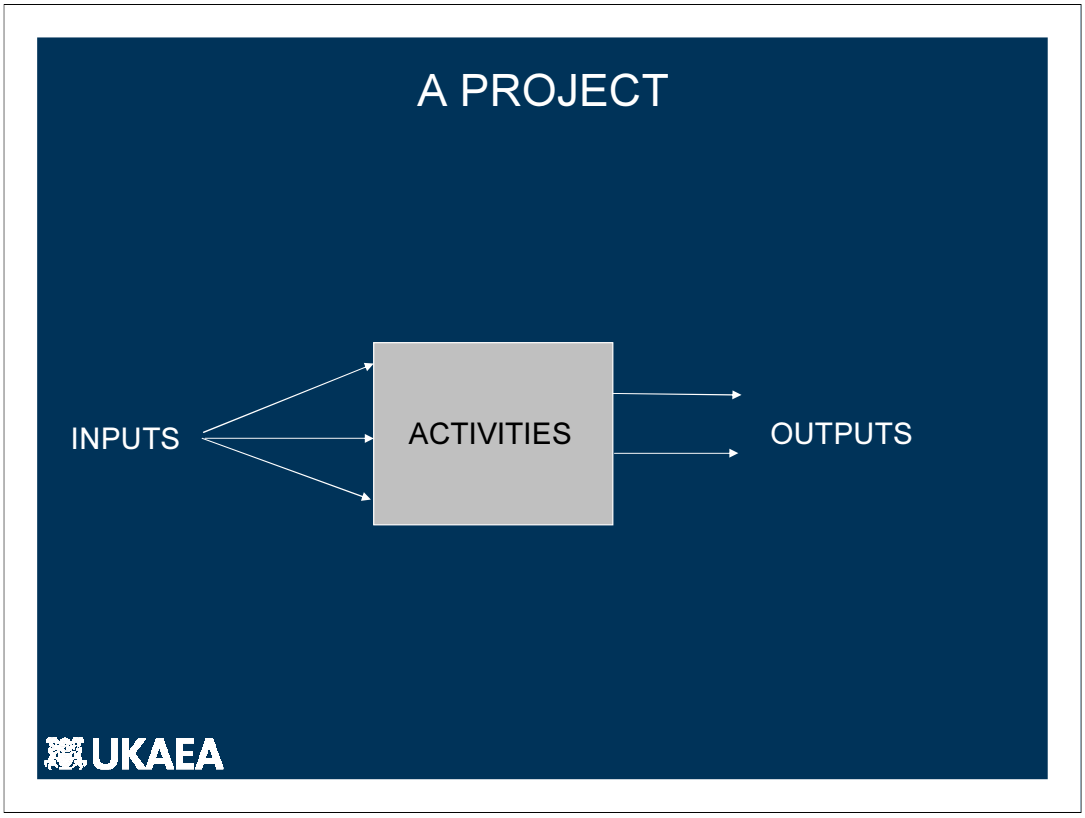
- Projects and Programmes
- The End State
- The Start State
- Waste Management and tracking
- Staff
- External considerations
- IPR

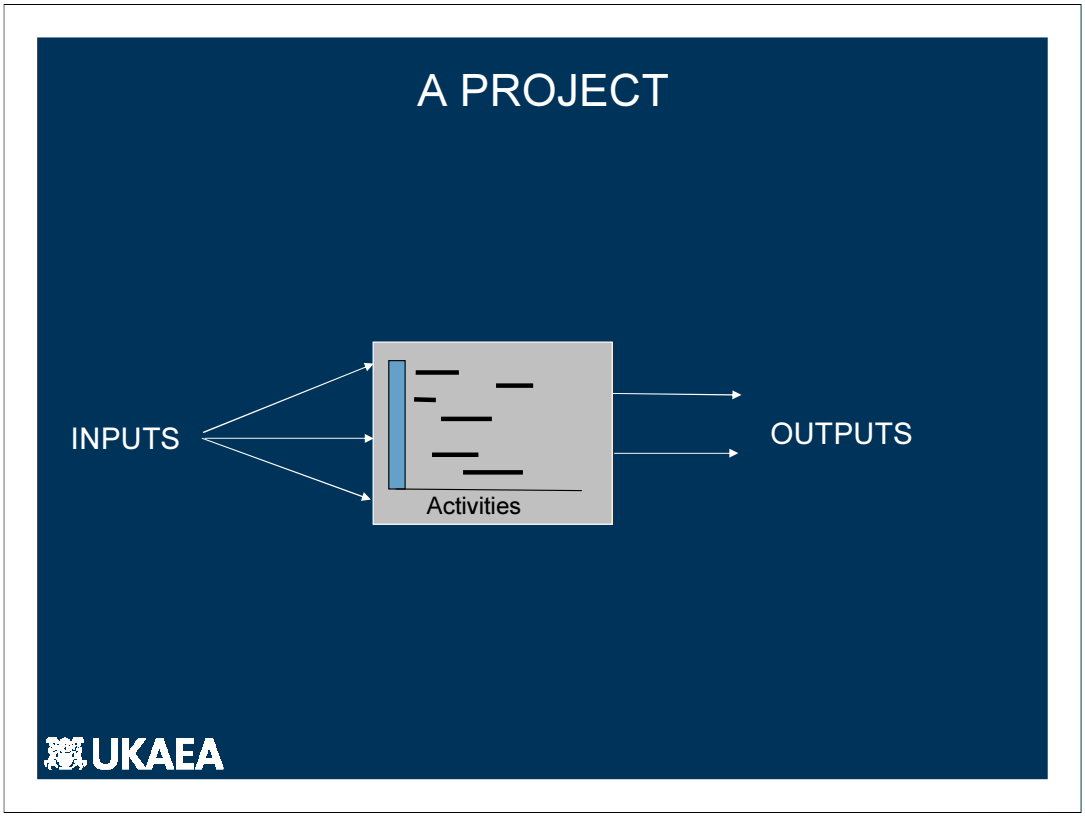
UKAEA



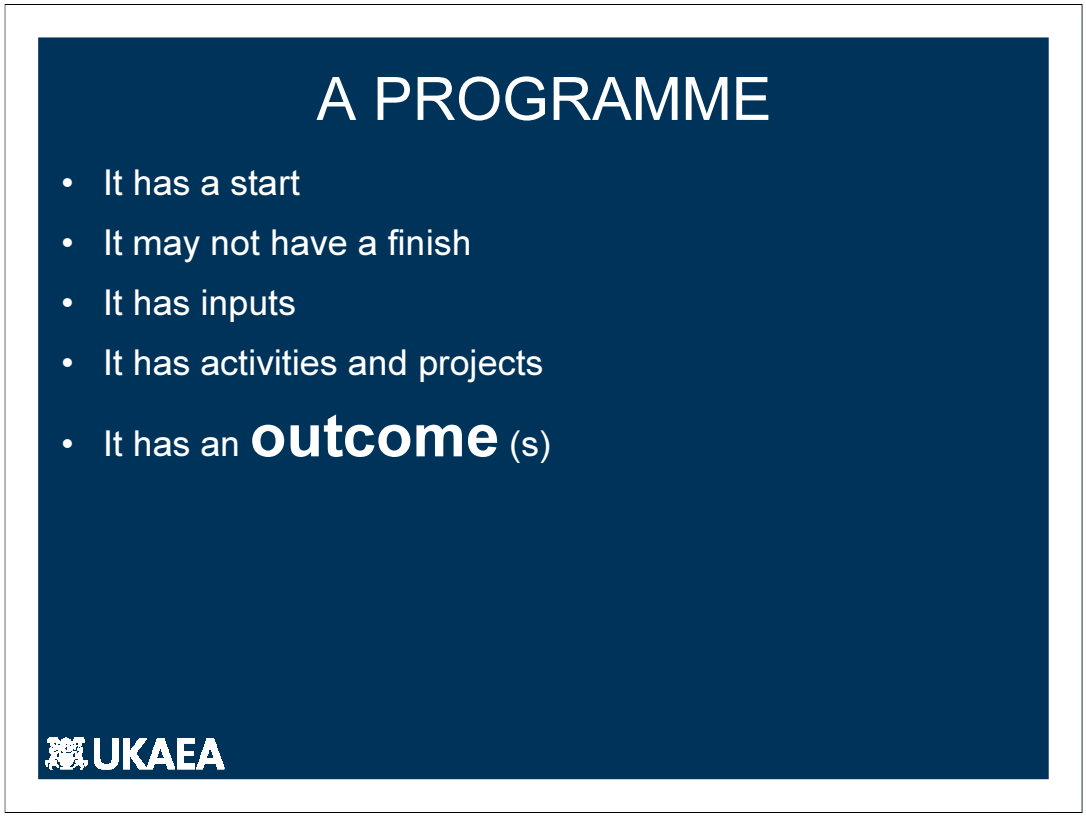
In this slide, I introduced the notion of there being a difference between a Project and a Programme. This is not merely a question of semantics. The way in which one manages a programme is fundamentally different to the management of a project and the way in which progress is monitored is also very different.

Projects have a start and finish, require a number of inputs such as money, plant, equipment, people etc. Activities are performed and monitored which result in an output or outputs. This can be a new machine, a building or a modification to a plant etc. The point is that at the outset, the definition of success can be produced and easily confirmed at the end of the project.


A PROJECT
INPUTS
ACTIVITIES
OUTPUTS
UKAEA



In this slide and the previous one, I suggested that the Project Programme is predictable and contains a finite number of steps, each of which has a resource allocated to it and a timescale. The result is a predictable, monitorable series of activities which is referred to as the Project Programme.



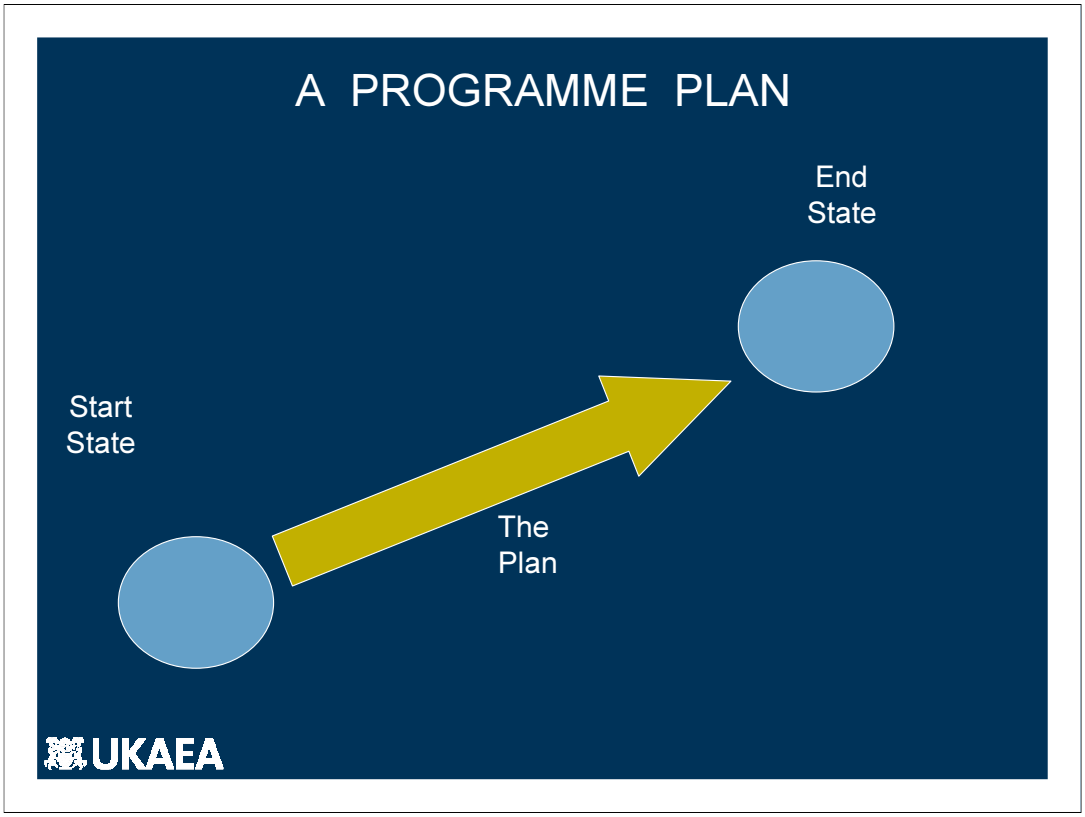
A Programme is different. Of course, it does have a start but it may not have a finish – or at least, the definition of the finish may not be known at the time the programme is started.

Like a project, it has inputs and activities but it also contains projects.

Unlike a Project, a Programme has an OUTCOME. For example, it is possible to create a project programme by which to design and build a building such as a house. All of the steps can be defined, their durations predicted with certainty and the cost of the activity assessed accurately.

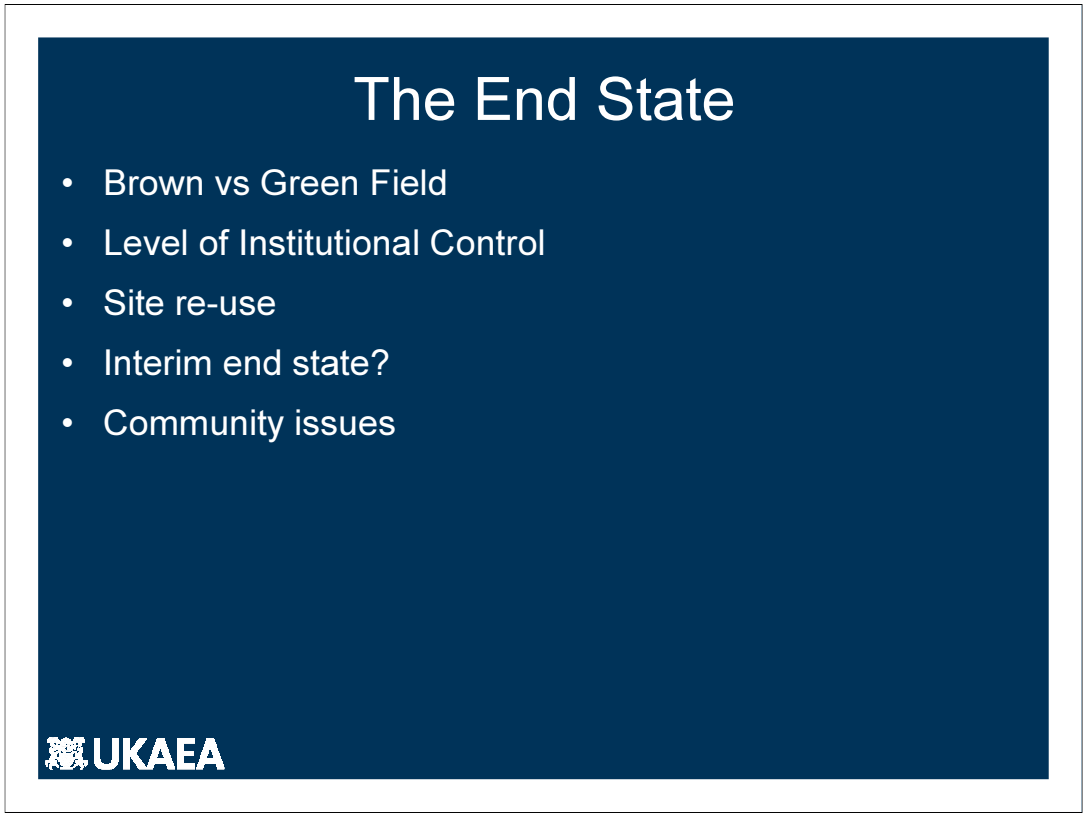
A programme could be the decommissioning of a nuclear facility where the details of the construction of the facility are not known with certainty. At the commencement of the decommissioning programme, it is not possible to say precisely how long the programme will last, what that specific actions are and the cost.

I compared it to a PROGRAMME for the preparation of a cure for AIDS. There is no set of activities which, when completed, will give confidence that a cure will be found. Such a cure is an outcome of the programme, not an output from a single project and the time required to obtain it and the complete detail of the research work to be carried out, is not known at the outset..



A Programme Plan needs to have a starting state and an End State. These may not be known definitively before the Programme begins but some bounding assumptions must be made for there to be progress.

In the case of nuclear decommissioning, one of the important aspects of the plan is the determination of the end state of the site when decommissioning is complete.



The End State needs to be considered first. This determines many of the projects that may or may not need to be carried out. As an example, if it is planned that the area will be returned to a 'Green Field' status, then this will have a bearing on important issues such as the removal of all contaminated soil. This leads to the question of where the lightly contaminated soil will be taken which may then require the location of a Very Low Level Waste repository. Finding a site for such a repository can be a difficult task and will take a great deal of time and money.

If on the other hand, it is accepted that some remnant contamination can be left, the need for and siting of a repository can be removed.

The level and nature of the long term Institutional Control of the decommissioned site will also need to be known or assumed and this could impact on the ability of the site to be re-used for other nuclear or non-nuclear purposes.

In the UK and some other locations, the non-availability of an ILW repository means that an interim end state is required. In a project,. It would be considered wrong to start work until the availability of all the required resources was established. In the case of a Programme this is not so.

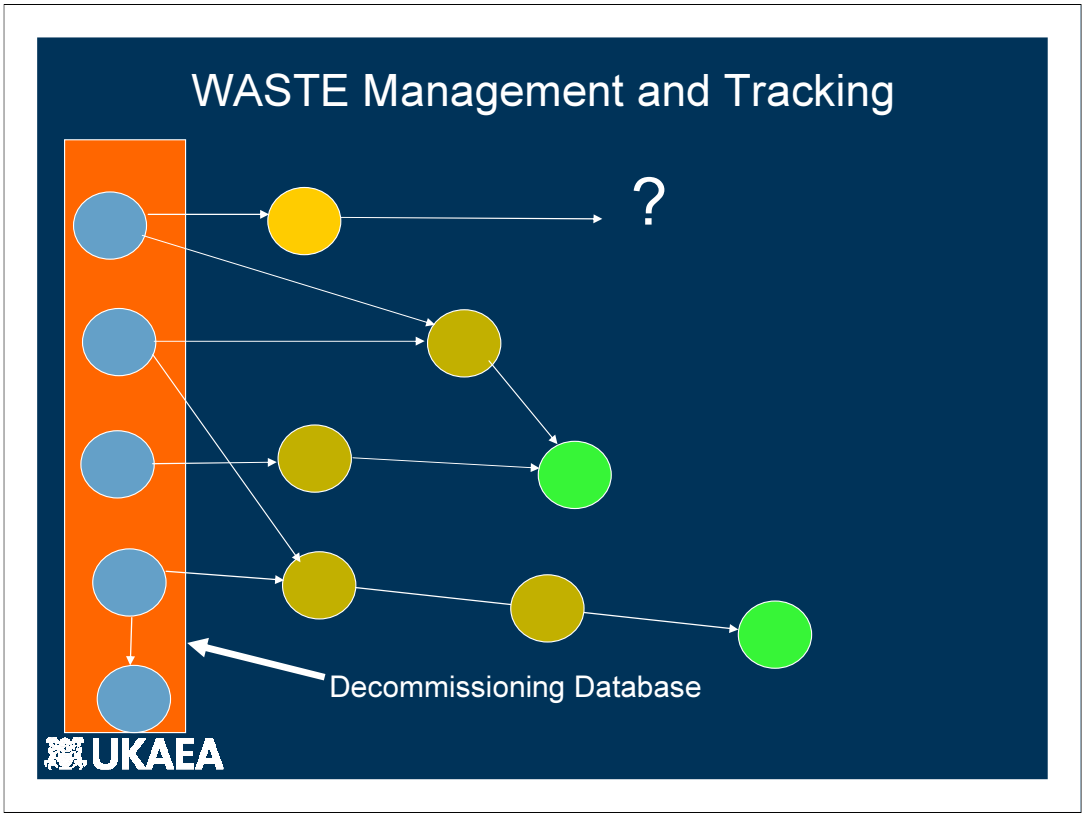
The End State will need to have the blessing of the local community. This means that an important aspect of the 'Outcome' of the programme is not even in the control of the Programme Manager. The way in which the End State options are developed and presented to the community can have a massive bearing on the end state and so the programme timescale and cost.

It may seem easier to define the start state since this already exists. However, there is always uncertainty about the state of nuclear plants. Their drawings may not be accurate, modifications of dubious provenance may have been carried out and the operational history can have an enormous impact on the nature and levels of contamination.

At the Athens Conference in December 2006, the statement was made, "Characterise, characterise, characterise."

There are activities on-going in many Member States of IAEA to create Decommissioning Databases. This is laudable and may well involve detailed characterisation.

However, waste tracking is needed. This not only considers the nature of the material in a room or building, but also considers the whole life-cycle of the waste from the point of creation right through to disposal or interim storage.

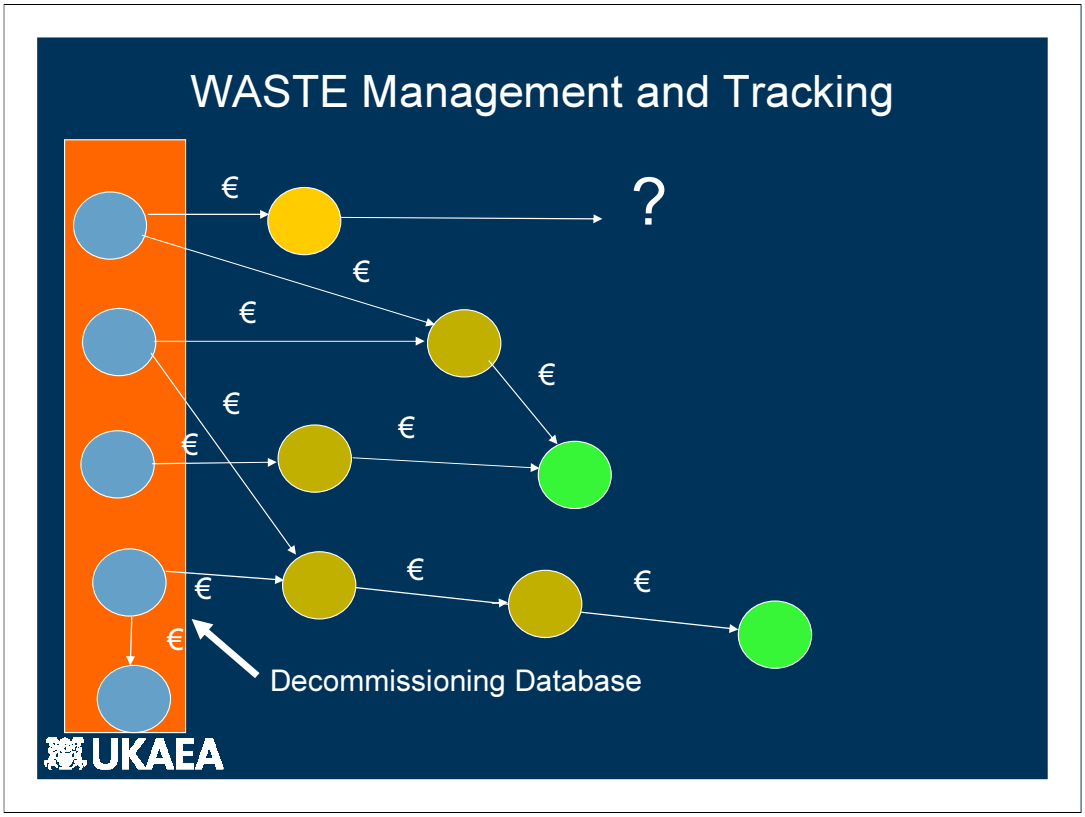


The slide shows some of the issues that need to be considered in Waste Tracking.

The circles in the orange box are plants or equipment that will be the sources of waste and the box is the decommissioning database itself. In the case of the top box, there are two waste streams. The second one shows that after creation, the waste is processed in some way in a yellow box after which, it is sent to a final location, signified by the green box.

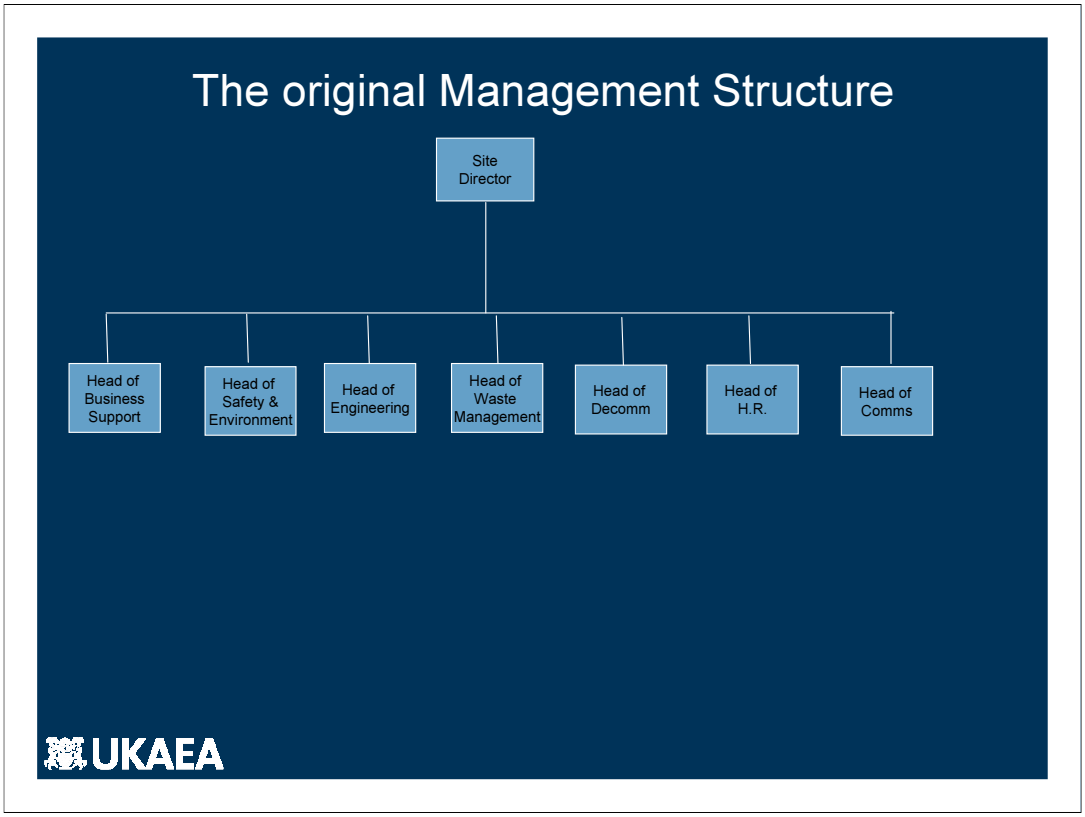
The first waste stream from the first plant has no end point. An example of this is Graphite where there is no real solution to the graphite problem. In years gone by, waste was often sent from one place to another simply to get it out of the way. An example of this is shown in the bottom two facilities where one of the waste streams from the upper box is sent to the facility below and does not come out again.

Modern Waste Management employs processes, often software based, which enable the waste manager to decide where the waste from each source will go and ensure that this essential aspect of the plan is prepared before the waste is created. This involves the creation of an Integrated Waste Plan which is an essential element of a complete decommissioning Plan.



Other software systems can be added which will, from past experience, assign a cost to each of the various waste management operations so that the full cost of the waste management element of decommissioning can be determined. The software that we have used in UKAEA enables "What if?" questions to be asked and have the cost implications of revised waste plans revealed.

The Decommissioning Database is shown in the two preceding slides as the orange box. The Decommissioning Database is a necessary element of the waste management plan but it is not sufficient to guarantee a full understanding of the methods to be used, the availability of "cradle to grave" routes and the associated cost.

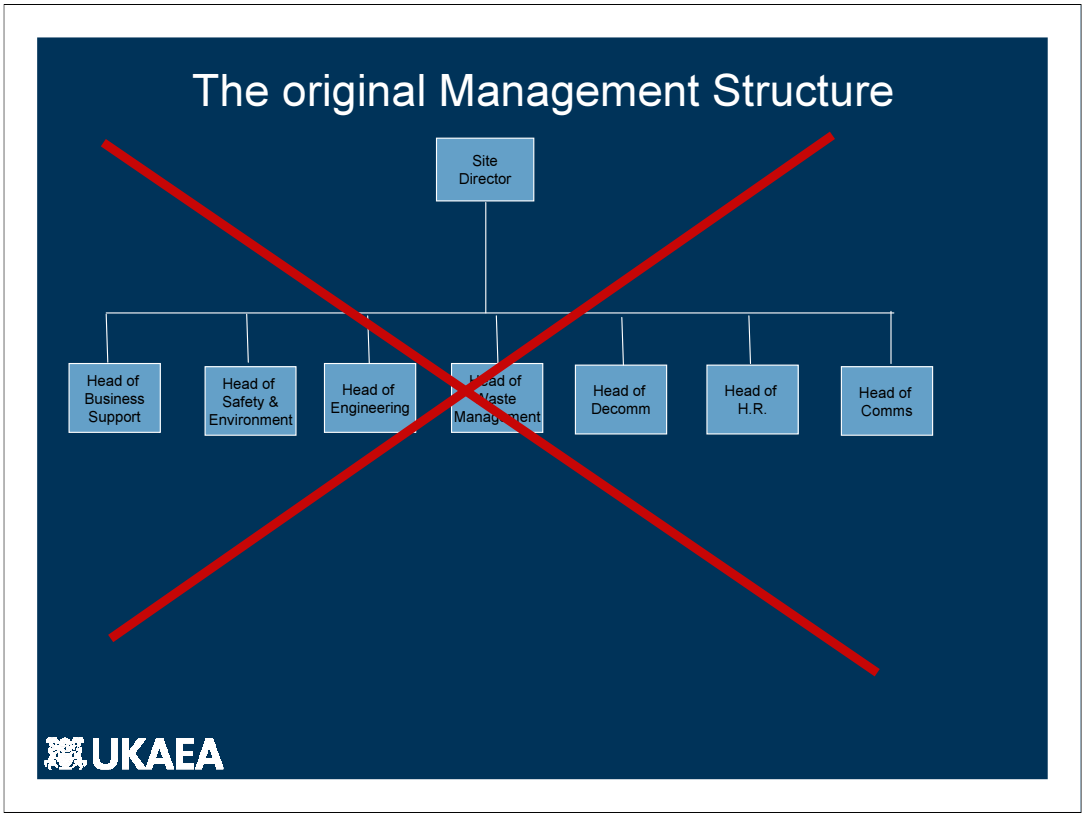


I said that an important element of the decommissioning plan is the organisation of the decommissioning site. It is unlikely that the staff structure that is appropriate to the operation of a facility will be ideal for its decommissioning.

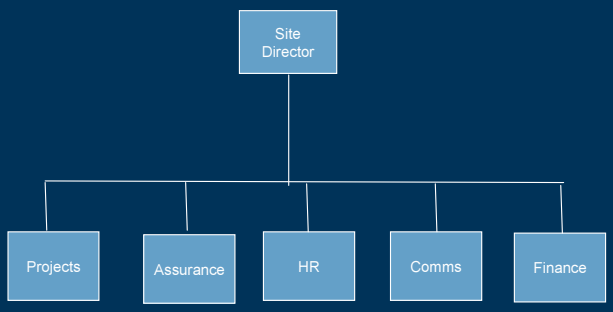
I suggested that this is likely to be particularly true in the case of research reactors where there are likely to be many physicists, chemists etc on the staff. For decommissioning, however, the skills necessary are engineering, industrial cleaning, demolition etc.

There is also the human aspect to be taken into account. Those who have operated a reactor facility for many years tend to be unwilling to decommission it and their efficiency is therefore lower than bringing in new people.

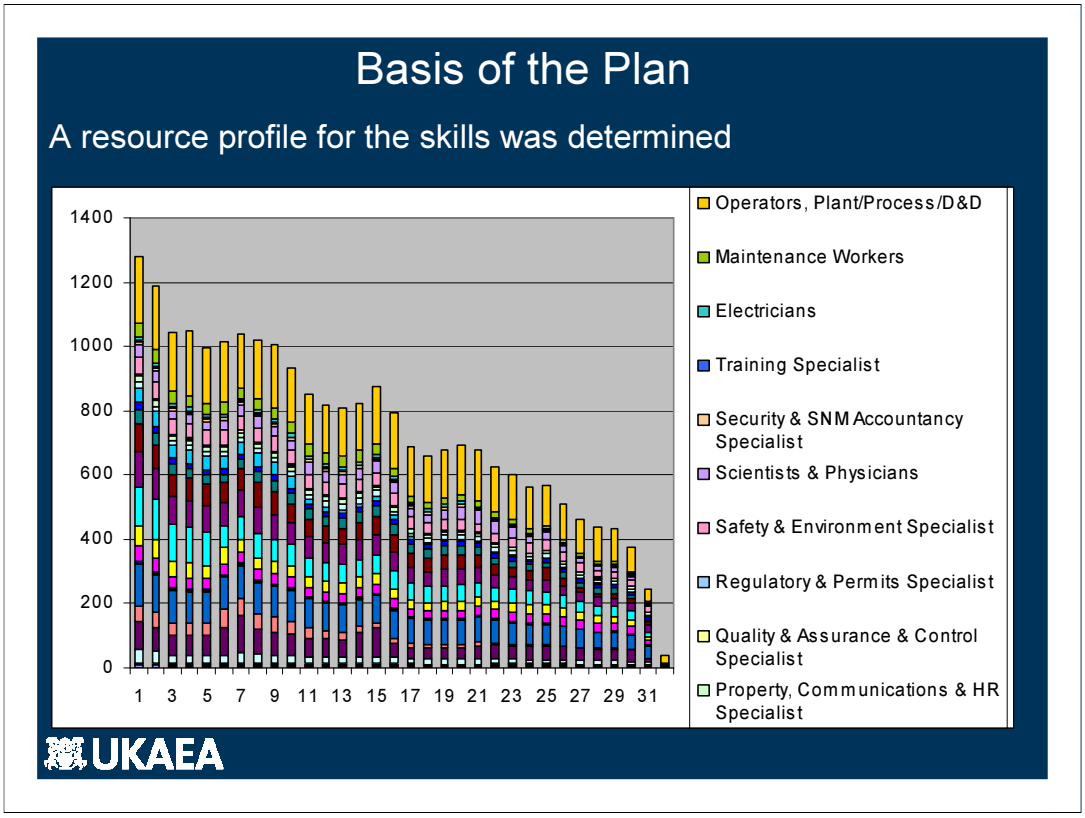
It is therefore essential that a new management structure be put in place and the transition from one management system to another must be carefully planned with good communications to staff at each step. In the UK, the safety aspects of such transition has been recognised by the Regulators who now require to approve new organisational changes and expect to see not only the new structure but also, the transition plan.


The original Management Structure
Site Director
Head of Business Support
Head of Safety & Environment
Head of Engineering
Head of Waste Management
Head of Decomm
Head of H.R.
Head of Comms
UKAEA

The New Management Structure



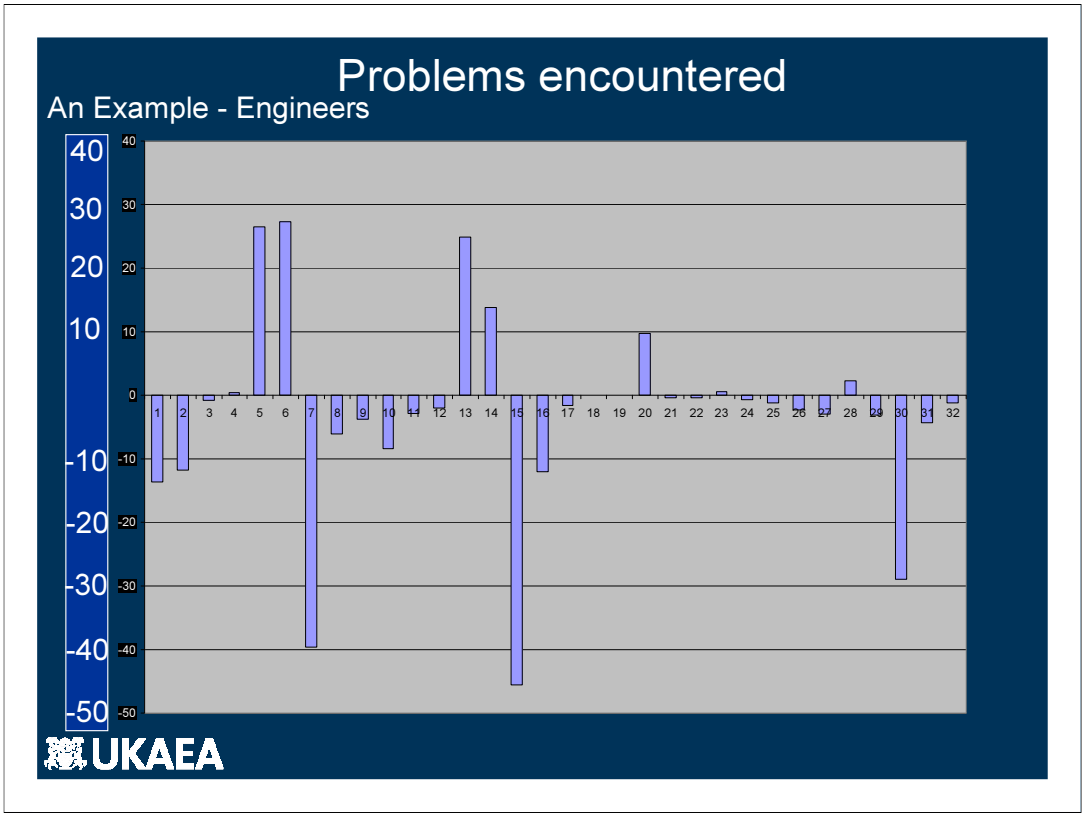
UKAEA



When one of the early transition plans was prepared for the UKAEA site at Dounreay, the profile above showed the numbers of staff falling over the thirty or so years of the programme. This shows a gradual run down from a total of about 1300 staff to eventually, almost zero.

The histograms shown in the slide are created as a result of the addition of the numbers of people required in each of 28 skill sets that were identified.

The reduction looks to be well controlled however, when the underlying details are revealed, the situation is very different. When assigning financial resources to activities, it is simple to add the requirements of the variuos tasks and obtain a financial profile that can be as accurate as the individual estimates. Contingencies can be provided to reduce risk. In the case of human resources, it is not appropriate to add staff numbers together. I said that $10 + $10 = $20, but what is 2 physicists + 1 engineer + 1 accountant ?

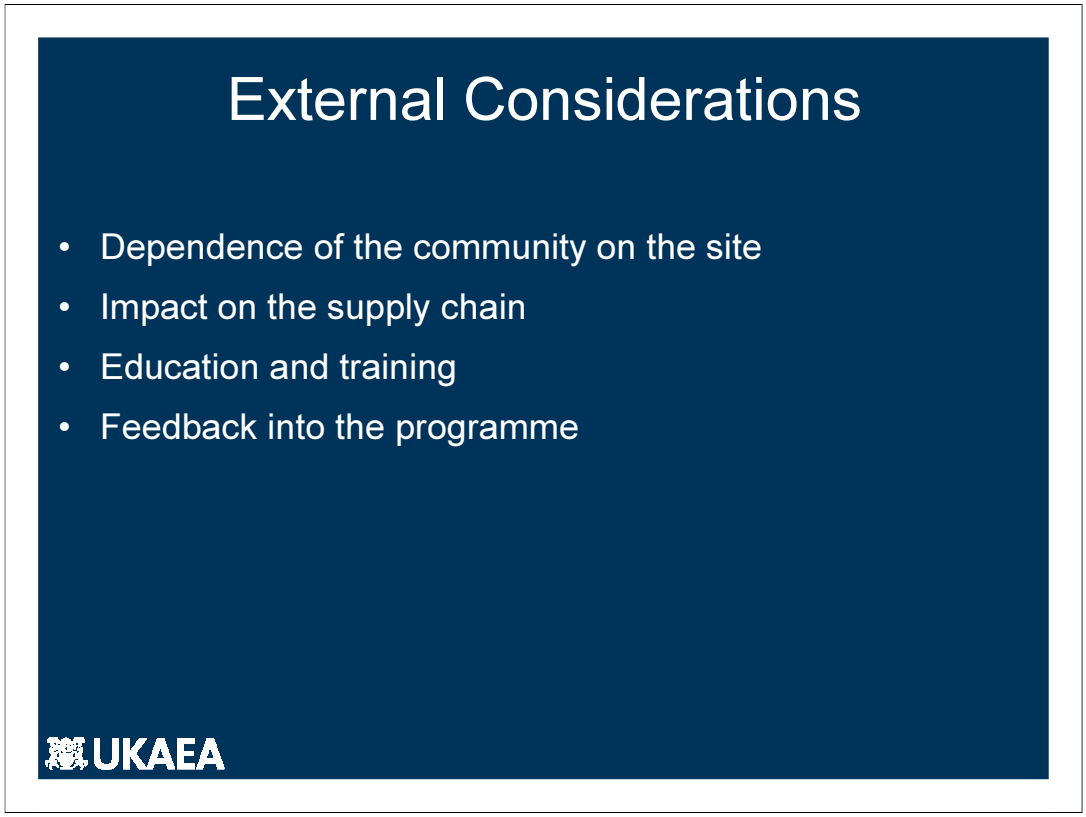


This chart shows the changes, year by year, of the numbers of engineers from the previous profile. This shows uncontrolled swings of recruitment (+) followed by lay offs (-) only to be followed by more recruitment and so on.

Clearly, such swings are not tenable and even if casual labour, obtained via agencies is used, it is simply not possible to have experienced staff leave and be replaced by new staff in the way that is demonstrated above.

Developing the detailed manpower schedule in this way enabled UKAEA to revise its plans to enable the manpower requirements to be better managed. It also required us to re-examine the way in which some projects and other activities were managed. This is the so called “Make / Buy” decision. If the work is to be carried out in-house, this is a “Make” activity while contracting the work to others is a “Buy” activity.

By carefully scheduling activities and assigning some former “Make “ activities to “Buy”, the staff requirements were smoothed. This has, however, to be kept under close scrutiny to ensure that new technologies and new commercial arrangements can be brought to bear and improve the efficiency of the decommissioning plan.



In the UK, the responsibility for the management of the decommissioning programme rests with the Nuclear Decommissioning Authority (NDA). One of their requirements of the site M&O contractors is that they should prepare a Socio Economic Development Plan. This is to ensure that the impact of the decommissioning of the sites on the local community is understood and managed. Most nuclear research facilities in the UK are in relatively remote areas and this is also true in many other Member States. The nuclear facility is often the major employer in the area and the impact of the decommissioning on the viability of the community can be great. This needs to be considered.

The local supply chain which has grown up around the site may chose to re-locate or to seek new business from other industries. In the same way, the presence of the local nuclear facility will have resulted in the availability of nuclear related courses at local colleges and universities and with a projected reduction in nuclear skills required by the site, the colleges will seek students to be trained for other industries with different skills.

This will all feed back into the decommissioning programme. The future of the community may cause many of the current staff to leave and seek new work elsewhere before the date that their skill set is no longer required and this will impact on the resources available for the decommissioning programme. The loss of the local supply chain will also have an impact. This could be in the form of non-availability of skills or alternatively, a significant increase in costs due to the need to use staff from more remote locations.

With decommissioning programmes extending for decades, there will be the need to have some nuclear trained staff and yet there may not be enough skills needed to justify local training courses.

I felt that it was important to say that in today's commercial world, decommissioning is big business. Some companies have developed skills, techniques tools etc which enable them to decommission facilities very efficiently. They will be very willing to provide this service (It will be freely available) but they will expect to be paid for it. (It will not be available free).

It has been the custom when carrying out nuclear research, to share the results of some of the studies by means of conference papers and other publications. This can lead to an expectation that similar information will be exchanged in decommissioning and while there is still a possibility that this will happen, the details will, in most cases, require contracts to be let.

It will, however, usually be better and less expensive to contract experienced companies to advise, plan and implement decommissioning. They will have had successes and failures in the past and will be able to capitalise on the former and avoid the latter.

The End ！

Thank you.

UKAEA