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Management of Change — The Transformation of UK Coal Project 105

K J Irving¹

ABSTRACT

In the UK during the 1990s the energy companies had developed a policy of ‘Dash for Gas’, building large natural gas power stations to produce more than 30 per cent of the UK’s electricity demand. The price of imported thermal coal was dropping and the electricity generators were putting pressure on the UK coal producers to produce coal at a reduced cost. Imported coal from Columbia, South Africa, America and Australasia had increased their market share in thermal coal sales to over 50 per cent of a 55 Mtpa market. The pressure on the UK coal industry to reduce costs and improve productivity levels from an ever decreasing resource was high. Companies were benchmarking their operations on the imported coal producers and had to realign their organisations, productivity levels and costs to world best practice, not just technically, but in world class organisational management techniques.

INTRODUCTION

In the 2001 UK Coal, at the time Europe’s largest independent coal operator, announced its intentions to embark on a management of change process to transform one set of beliefs and values to another. The case study will describe one of the most exciting and stimulating periods that UK Coal PLC experienced since the industry was privatised in 1994. The focus of this paper is on the transformation of the deep mines division of the company, but the whole program brought about change throughout all the functions within the group, from marketing through purchasing to the coal face operations.

BACKGROUND

UK Coal was born out of the privatisation of the coal industry by the Conservative government in late 1994. Richard Budge, an entrepreneur with a background in open cut coal contracting, leased in 1994 the year before privatisation, the licence to mine coal at three underground closed mines. In 1994, on the back of successfully re-opening these mines, he took his company to a public offering, and financed the buying of the English Coalfield at a cost of £ 814 million. In 2001 the company changed its name from RJB Mining to UK Coal PLC.

In 2001 UK Coal was Europe’s largest independent coal mining company, and 14th largest world producer. In 2000 the company produced 19.1 Mt of saleable coal, mainly thermal, 15.2 Mt from deep mines and 3.9 Mt from surface operations. Employing some 7200 people with an annual turnover of A\$ 1700 million, production coming from 13 deep mines and 13 surface mines.

In the early years the company profited from prices agreed under the nationalised British Coal Company and the realisation of the stocks bought under the privatisation agreement.

In 1997/1998 the contract prices were floated, to fall in line with the competition and the prices reflected the direct competition from imports.

In 1995 the company held 50 per cent of the market in thermal coal in the UK; the market share has since fallen to less than 20 per cent. Productivity had barely improved. The cost of operations had increased and the unit cost of production had steadily risen.

In 2001 the main board of the PLC decided to launch an initiative named Project 105 (targeting the cost of production to £ 1.05/gj) and direct a complete transformation of the company and how it operated.

This program of change entailed a detailed analysis of all facets within the company from mining operational efficiency, purchasing consumables to marketing.

The objectives of the program were to:

- transform UK Coal into a world class coal mining company;
- produce coal at less than £ 1.05/gj by the end of 2003; and
- build a long-term future for the UK coal industry.

The program had five key elements in the deep mines section:

- drive costs down through productivity improvements and cost;
- align the organisation structure of deep mines, HQ, and surface operations;
- develop a management process that would become the UK Coal way of management and a model for others to follow;
- to achieve mining excellence in production, development, installation and salvage; and
- expand capacity by increasing production time through changing planned shifts with the agreement and support of the workforce.

The program was to take two years to implement and it began with a phased approach (see Figure 1).

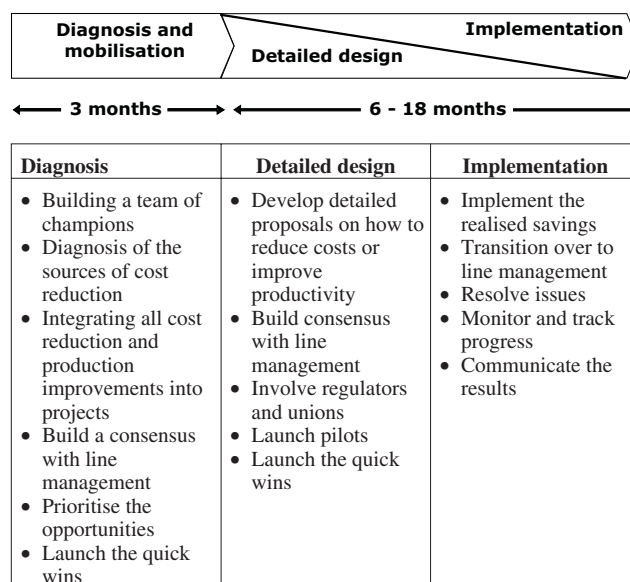


FIG 1 - Change program.

The initial three months was a diagnosis and mobilisation period. The following six to 18 months was a detailed design through to implementation.

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After the initial diagnostic stage there were five key projects to which the program aligned itself for detailed design and implementation:

- deep mines turnaround,
- purchasing,
- surface mines improvements,
- market revenue growth, and
- business control.

The change program that this paper will focus on will be the deep mines operations as it accounted for 80 per cent of the coal operations.

DEEP MINES TURNAROUND

The 13 deep mines were mainly longwall retreat with one mine using room and pillar methods. Most mines were operating at depths of around 600 m with some operations nearer 1000 m.

During the initial three months of diagnosis there were five areas, which became apparent needed to be changed:

- deep mines organisation structure,
- HR initiatives,
- productivity improvements,
- maintenance process,
- focussed on improving development performance:
 - by detailed design and risk management, and
 - straight line drivages.

Deep mines organisation structure

Before the program took place the organisation structure consisted of a managing director, and a director of mining to whom 13 mine managers reported directly.

The initial step was to reorganise these 13 mines into three distinctive groups comprising of:

1. long life mines focussing on continued capital investment and improving productivity;

2. mines who were marginally profitable or loss-makers and needed turnaround into profitable entities; and
3. short life mines that would close in the near future, mainly consisting of the Selby Coalfield pits.

The decision behind this grouping was to focus a specific strategy to each of the groups, ie investment, turnaround, and cash cows. Each group was then managed by a small team – consisting a group director, accountant, engineer, and planner. This enabled the mine manager to focus on costs and production and the group to focus on mid- to long-term investment planning and engineering. The group team were heavily involved in the roll out of the new initiatives from the change program.

HR initiatives

A new approach to incentives was introduced for all the deep mines, the aim being to align, simplify and standardise agreements. Before, the mine managers had agreed local incentives and this had become a divisive way for the unions and the workforce to play agreements off against different mines and, of course, choosing which agreement at which mine suited them best for their negotiations.

Flexible working patterns, eg 24/7 (most mines in the UK worked five days with overtime at weekends) were introduced to improve – productivity where there was perceived to be a significant benefit. For example at some mines with shaft capacity constraints like Welbeck Colliery, there would have been no significant benefit increasing the working shifts, whilst at Maltby mine there was a benefit and 24/7 was introduced successfully.

Management process (productivity, maintenance and development)

To target the productivity improvements UK Coal introduced a new management process built around the well known cycle of:

- plan,
- do (action),
- review, and
- intervene.

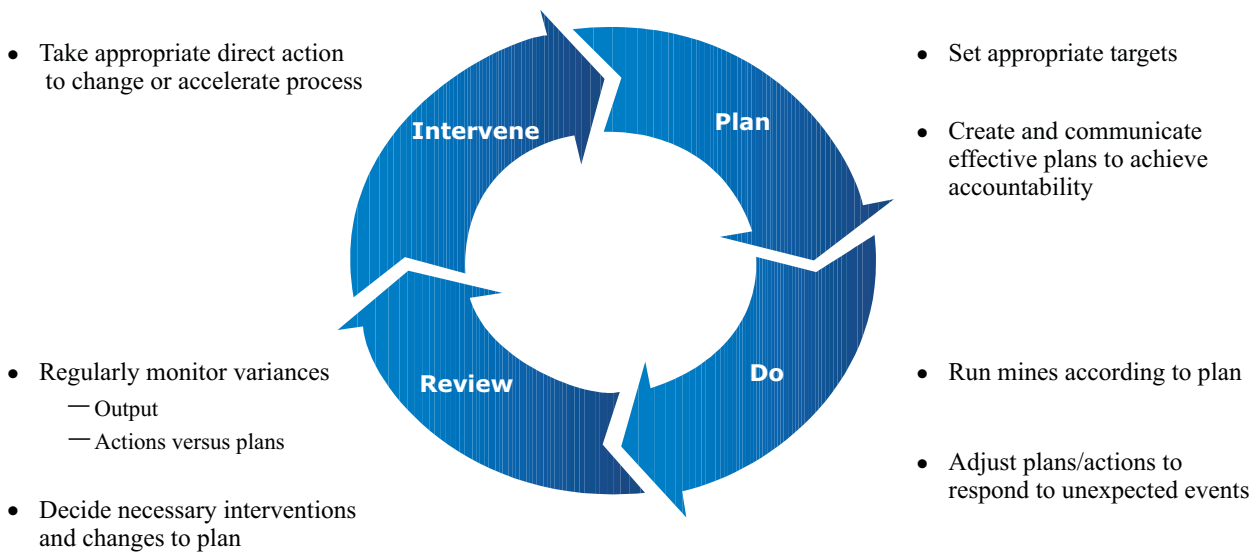


FIG 2 - Management process.

The process was about integrating the three main functions of mining, development-production-maintenance. Mining has never been easy and never will be and there have always been major roadblocks to introducing management systems, which were extensively used in manufacturing for example, TQM, TPM. The main difference between manufacturing and mining in terms of input-process-output is the high level of uncertainty and risk, and the significant physical distance between management and the operations. To tackle the uncertainty there needed to be good planning.

UK Coal took a normal management process ‘plan, do, review, intervene’ and adapted it to create a robust, effective way of managing the business on a daily basis to improve profitability.

The planning cycle

The essence of the new process was a robust planning cycle as shown in Figure 3.

Most coal mining companies have a process for steps one to three in Figure 3. The five year plan, the annual budget and detailed project plan. The project initiatives would cover for example face transfers, development heading start ups and major conveyor drive installations. Where the UK Coal process was to differ would be the application of the same detailed planning into the daily operational cycle. This involved the introduction of a planning cycle for the mine management starting with a four weekly rolling plan, a weekly plan down to a daily plan. The ultimate aim to improve productivity was through better communications, good planned maintenance, and resolving any resource or transport constraints between the many teams in the mines.

To ensure good planning one must have high quality relevant data and good interpretation of the information.

The planning process must address the risks and plan for contingencies. Unforeseen events must be considered. The process should allow deviations from the plan to be recognised and dealt with at the lowest possible level.

The Scottish poet Robert Burns wrote in one of his poems:

*But, mousie, thou art not alone,
In proving foresight may be in vain,
The best-laid schemes of mice and men
often go astray,
And leave us nothing but grief and pain,
For promised joy*

Plans will change. In fact, in the uncertain environment of coal mining – they (the plans) must change. A good, robust management process allows active planning, rather than planning by reaction, to ensure that desired outcomes are achieved.

The second key to good planning is to ensure that those responsible for implementing the plan have ownership. Then they must be held accountable for the outcome. Within the new process, shift bosses and shift supervisors were involved in the process and this had a major impact on results due to increased ownership.

The process ensured that the daily plans and weekly plans were printed and delivered to the key underground operators by the afternoon shift after the plan had been finalised. Each shift had its tasks written out and were held accountable for the delivery of their planned performance.

Efficient, cost effective longwall mining means using the high capital value equipment for as many hours in a day as possible, for every day over the length of the panel. One example of exploiting good planning is integrating the maintenance policy into the production cycle and not adopting the attitude ‘the belts are stood for a few hours, let’s take the opportunity to do some maintenance’.

Who has ownership of maintenance? The longwall superintendent or the engineering department? Some would say the whole team has ownership. Under a good management plan, only one person has ownership, and that is the longwall superintendent. He also carries the burden of accountability.

In a target led organisation when making plans, there needs to be constructive challenge from immediate supervisors or managers. There needs to be a healthy challenge between those who create the plan and those who manage the plan. There must be a focus on being ambitious yet challenging. If too aggressive the personnel carrying out the actions will feel failure; too hands off, and the plans will fail.

A good business plan defines not only what you propose to achieve, but how you are going to achieve it. It must be a living document and the driving force behind the business. The documentation that was developed were four weekly rolling plans, weekly plans and daily plans:-

Four weekly rolling plans

The underground monthly plans looked at the non-routine process activities and exceptional items, such as substation or power moves and emptying conveyor storage loops. Manpower requirements were estimated for jobs that were likely to require

	Plan	Objectives	Target audience
Increasing detail 	5-year plan	<ul style="list-style-type: none"> • Long-term strategy • Investment decisions 	<ul style="list-style-type: none"> • CEO, CFO, COO
	Annual plan	<ul style="list-style-type: none"> • Budgeting tool • Equipment/manpower decisions 	<ul style="list-style-type: none"> • Op Group, COO
	Project plan	<ul style="list-style-type: none"> • Reduce completion time of one-off projects 	<ul style="list-style-type: none"> • Mine management team
	Rolling four-weekly	<ul style="list-style-type: none"> • Align down-time between teams • Resolve resource/transport constraints between teams 	<ul style="list-style-type: none"> • Mine management team
	Daily		<ul style="list-style-type: none"> • Shift managers and district officials

FIG 3 - Planning cycle.

extra men and by looking at the plans, conflicts of resources were easily identifiable and conflicting issues resolved to ensure efficient use of the workforce.

The phased performance was calculated for each shift, based on planned downtime and assumptions from historical face performance. The target for the team was set and an individual nominated to be responsible to make the work happen on time and to budget, or better still to beat the target.

The surface plans were similar for the coal preparation process, maintenance, mobile plant and any other surface operations.

Weekly plans

These meetings were organised to be held every Friday and was used as a tool to integrate the monthly planned work into weekly tasks, but in greater detail. Other tasks, which had been highlighted from a dedicated team dealing with detailed analysis of current and past performance from the longwalls and the developments, were then integrated into the weekly activities. For example, one longwall was suffering from poor 't' junction roof conditions and required extra support. The face teams came up with a practical solution for delivering the extra support. This was then added to the daily transport plans, and also incorporated into the daily face management plan. This improved turnaround times at the face end by over five minutes per turnaround; significant improvement.

The daily plan

The next part of the process were the daily plans. These were made at a formal meeting arranged early each morning to review the previous days performance and plan the next daily shifts work load. The tasks were separated by discipline (mechanical, electrical and mining activities). The reasoning behind this was to ensure there were no conflicts between the engineering and mining requirements and resources required.

The daily plans produced at each mine included transport plans, longwall production, and development production.

This regime of planning monthly, weekly and daily was in essence the main change to the planning cycle.

This level of detail was applied by UK Coal management teams normal applied to projects such as the face transfers began to show improved results; downtime due to poor maintenance was reduced, development productivity improved and the shearers uptime became noticeably greater leading to improved productivity.

Action

Execution of a plan is simple in theory yet hard to achieve in practice. Why? Well this varies from company to company.

Execution relies on people; how engaged they are in the organisational process, and their level of involvement and commitment. If the people aren't engaged, involved and committed, the plan will fail, and you will never fulfil the potential of the business. This applies from the very top, the CEO, all the way down to the supervisors. Engagement and commitment is shown by example. Another adage tells us that 'the least we are prepared to accept is the most we will ever achieve'. If company leaders do not show exemplary standards of commitment and engagement, why should those below them?

By the same token, the company must ensure that they have the best people. If you don't get the people process right, you will never fulfil the potential of the business. Action depends on leadership at all levels. This requires a process that ensures that the right people are in place to execute the plan, since without them you may have no hope of executing it.

A robust people process provides a powerful framework for determining the organisation's talent over time and for planning the actions required to meet those needs. The process must be based on an understanding of the needs of the company, developing leadership at all levels, and succession planning in depth. It is clear that the operations of the human resources department must be integrated into the overall management process.

Review

Why review? It could be a pointless exercise building plans if no time were invested in reviewing performance against plan in a logical systematic manner. The same emphasis and time is needed on the reviewing cycle as in the planning. There is a need to assess all aspects of performance; both the hard metrics (tonnes and metres) as well as the compliance to planned jobs. How much time is spent in turning around the shearer at the longwall face end? How good is the roof support system in the gates to overcome front abutment pressures to ensure continuous mining?

Longwall operations these days produce a forest of information. In UK Coal another change was to introduce dedicated personnel who collated the data, analysed the data and then problem solved with the management team to look for improved performance. The team usually consisted of two personnel; one who was focused on longwalls and the other person dedicated to development inventory improvement.

The new reviewing process revolved around accountability from the manager to the longwall supervisors (deputies).

UK Coal set a formal system for review, to check the plans and find the right challenge through:

- manager's meeting,
- variance meetings, and
- delay analysis meeting.

The criteria being to check the plans and find the right challenge to the process.

Coal mining, surface or underground, has four main metrics; safety, tonnes, development rate and costs. These are hard metrics – they can be measured accurately, and these metrics and their subsidiaries must be the key focus of a target led organisation.

Good data is genuine data. It is real, validated and consistent in quality. When data is genuine, management can be confident that decisions are being made on the basis of relevant information.

Most modern longwall mines generate abundant data, usually through the output of the various automated monitoring systems and software packages. This information often encompasses mine planning, action plans, geological and geotechnical data, and results from the mine – production, costs and coal quality. The key to providing good data to management is to combine the key information into one management system where all the significant facts are available to all. This then allows personnel to incorporate their process into the overall mine objectives, creating the integrated management process.

The keys to good, efficient longwall mining are short face changes, good development performance (good inventory) and maximising shearer cutting. But to what degree do we analyse the data from these activities? The data from a longwall nowadays is well logged; with the information technology available we can tell exactly where the machine is, when it moves and how fast it travels. But do we sit down and analyse how long the bolting cycle takes in the continuous miner section in the same detail?

At Ricall Colliery in the UK, where there are lengthy bolting cycles, the result of high bolt densities required to counter high stresses were monitored by supervisors who included the monitoring data in their shift reports. This was entered into the management computer system and then analysed by the teams. The review process included the involvement of the miners, supervisors and dedicated management. The changes developed by the process resulted in a performance improvement of more than 20 per cent.

Any good management review process is about accountability.

But what is accountability? It is:

- giving an individual responsibility to complete a task or set of tasks to a target within a specific period of time;
- assign the individual control over all the resources required to deliver the outcome; and
- provide objective positive and negative feedback based on achievement of outcome.

To be successful, accountability reviews must include:

- clarity,
- involvement,
- control,
- support, and
- feedback.

Each plan and action will have had its owners who have been involved in the drawing up of the plan. Each task should have a key person responsible for the outcome. Progress is reviewed, and deviations are noted and reviewed with the accountable team member. The review can be either formal or informal; the reviews are a mixture of both.

Developing and achieving an effective review process results in a target led process. Measuring outcomes against the plan is essential. Introducing key performance indicators also improves the accountability. This creates a performance or delivery based culture.

What should be reviewed? Effort should be concentrated on the cyclic events not just focussed on the major stoppages. For example, turnaround times at face ends represent a delay to coal cutting. Reviewing performance of this activity, which occurs many times in the run of a day, can generate significant improvements. Every minute saved here could result in another 15m of coal cut. The impact of thorough review of this simple, repeated activity can actually increase revenue. Lost production from a major breakdown will never be recovered.

Management need to keep track of the key performance indicators. One needs to keep in mind the old saying 'what you measure is what you get'. Monitor performance, drive improvement and signal the key priorities. The use of a balance scorecard with those key metrics of safety, development performance and production tonnes, will highlight how the operations are performing against the plan. Balance scorecards work just as well in the boardroom as with truck and shovel operators. They give high visual communications to success or failure.

In reviewing the actions against the plan the management process must promote problem solving by identifying problems through analysis of variance to a detailed plan, then supporting informed cross-functional teams to formulate solutions.

Successful businesses know how their performance compares with the market as a whole, to their principal competitors and to what the customers want. They understand the reason for the difference and are committed to improving performance. They are out in front and want to stay that way. They rigorously assess their performance and look for new ideas from any source that will help them do better.

Intervention

The final key component of a good, robust management process is intervention. This is the part of the process where adjustments are made to the plan based on the review of outcomes. Successes and failures are analysed. Improvements are planned on the basis of good, relevant data. Improvements are immediately applied to the plan.

With good intervention one can manage according to the plan. When adjustments are needed, adjust the plan and then continue to manage.

A truly integrated management process determines how an organisation behaves from the way in which decisions are made in the boardroom and communicated to the employees, through to leadership, how the planning is done, how each individual physical process is managed, and how the accountability achieved.

Being target led will increase operational performance, improve communications, and overall lead to a well-motivated team. If the process is managed effectively it will have a major impact on the bottom line.

IMPLEMENTATION OF CHANGE

Enough about the process; what about the management of change and the implementation? When reading this you may be asking yourself 'what's so unique and different about this process – we do this at our mine'.

This is exactly the response UK Coal had initially from every mine. From mine manager to shift supervisor the feedback initially was 'we do this already, why introduce this formal paper system', 'waste of money these consultants telling us what we already know and do', 'we need to be at the coalface where we make it happen'.

This is a common theme when managing change. The people who 'the management of change' will most affect, can't see what the differences are between the old and the new, or how the change will affect their daily lives, or what changes will actually take place and why there is a need to introduce the change in the first place.

Figure 4 shows a typical 'bath tub' diagram commonly used by management theorists when describing the change process. And from the authors own practical experience the model is very close to what occurs in practice.

Managing the change

Implementation is about building a team to carry out the change, finding the key enablers for change, setting targets for the change which are aligned to the strategic vision, developing a process to carry out the change, and then ensuring a system is in place to monitor and review the change process (Figure 5).

Building the change team

For company-wide transformation change to be successful, the CEO must be seen to lead the change. The CEO can then identify the key positions and assemble the team. This team is then empowered to make the changes with the CEO's blessing and involvement. The CEO must develop the vision and strategy for change, and his team of champions will make it happen.

Setting targets

The implementation plan, for UK Coal, started off by identifying the key targets: costs, maintenance downtime, productivity improvement, development inventory and so forth. The particulars would vary from mine to mine, but what was important was the key focus on what actions were required to

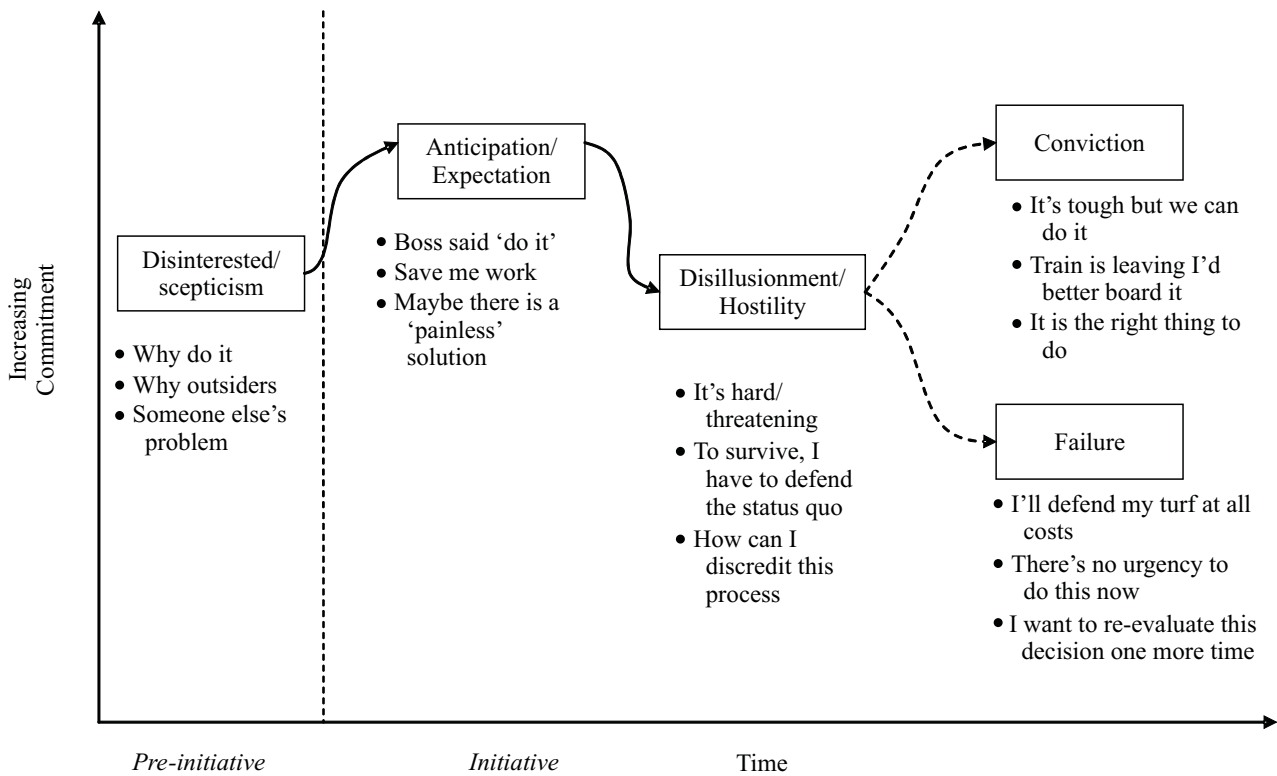


FIG 4 - Change process 'bathtub curve'.

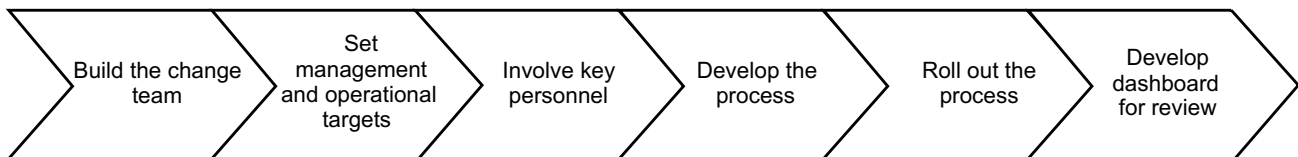


FIG 5 - Steps involved in the implementation of change.

drive the improvements. It is important to establish the importance of metrics, stretch targets, and performance tracking in raising the performance standards of an organisation, as outlined below:

- metrics must be balanced, consistent and linked to strategy:
 - balanced metrics promote comprehensive measurement;
 - 'what gets measured gets managed';
- target setting must be customised:
 - high enough to stretch the organisation, realistic enough to motivate action;
- strategic metrics must be driven down to operational levels:
 - metric cascades facilitate the metric linking process;
 - 'actionability' increases as metrics are translated to lower levels;
- accountability should be established for all metrics and associated targets:
 - integration with individual performance incentives is critical.

The target setting was customised and based on:

- historical performance,
- benchmarking across the mines, and
- benchmarking worldwide.

The targets were set to stretch the organisation to meet its potential, representing significant improvement over current performance levels.

For example, each mine was set an operational target for improving its efficiency. Most mines were operating longwalls at 50 per cent or less of full potential (based on theoretical figures on machine speeds and total time available to mine with the longwall shearer). World best practice had some mines over 80 per cent. In the past some mines within UK Coal had operated at 65 per cent to 75 per cent. So mines were given realistic stretch targets based on their own historical records.

Rolling out the new management process

Using the planning process the mines had to develop a key action plan on how these targets were meant to be achieved and what was required to be done differently. These plans were then incorporated into the planning process.

One mine was chosen to pilot the planning process. Other mines were involved in developing the new maintenance program, development inventory improvement, and others in methods to improve longwall relocations.

Once each of the initiatives had been piloted, a rollout program was developed that involved training the many personnel through various workshops.

A UK Coal manual was produced on the 'UK Coal Way of Management' and each Mine Manager was trained and issued with these at a two day seminar.

The rollout program involved the change team going to two mines simultaneously and rolling out the process through training and hands on assistance in the new planning process. The Group Director and his team were heavily involved in the rollout and were seen to be endorsing the program. Over a period of 12 months all the mines were operating the system.

A vital factor in any change program is communication. This needs to be frequent and involve the whole workforce, not just the management teams. Throughout the program, the change team used the company's newsletter as a vehicle to promote the quick wins and keep the employees informed of the many initiatives that were taking place.

Communications were not restricted within the company; presentations were made to city analysts who were frequently updated on progress.

RESULTS

Through this structured change and planning process the capability within the company changed and productivity improvements were realised.

The real change over the two years at the mines included:

- mine manager understanding and leadership;
- new talent introduced from outside the coal industry with new fresh ideas;
- low tolerance for failure and meaningful targets;
- organisation by process;
- problem solving, planning-oriented approach;
- high workforce involvement;
- willingness to deploy best teams to important places;

- execution orientation – 'just do it';
- alignment of incentives; and
- cross-mine transfers of best practice.

These changes resulted in the following improvements:

- improved productivity at some mines to over 65 per cent efficiency;
- reduced operating costs by A\$ 80 million;
- reduced downtime improved by more effective planned maintenance;
- a clear strategy for closure of mines with low economic valued resource; and
- improved profits in deep mines by 2003 of A\$ 38 million.

The UK Coal initiative saw the company's overall profits increase and in 2003 a small profit was made, which was a significant change to the losses in the previous years. The share price rose to new levels in 2004 on the back of business improvements.

CONCLUSION

Coal mining in the UK has recently involved a great deal of uncertainty. When mining at depths of 600 m to 1000 m the equipment is under greater stresses and the geological risks are higher. To ensure world class performance, world class management techniques are required. UK Coal is still evolving, but with a clearer defined strategy for business improvement, streamlined organisational structure and a more dependable management process, it has the tools to continue to improve performance.