"A research study into furthering the
understanding of Management Accounting
in practice with specific reference
to the practices utilised in the North
Derbyshire area of the NCB"

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DECLARATION

No portion of the work referred to in
this thesis has been submitted in
support of an application for another
degree or qualification of this or
any other University or other Institute
of learning.

DEDICATION

This research thesis represents at least eight years of my life. Eight years of enjoyment, freedom and intellectual struggles. It is with great joy and feeling of immense satisfaction that I am able to dedicate this work to the following people:-

To my husband, David Capps, for his continual encouragement, silent perseverance, financial support, understanding and love.

To my Mother and Father, Teresa and John Robson, for their struggles in making this work possible. Struggles encapsulated in their ability and foresight to leave a dying coal and steel community, Consett.

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ABSTRACT

The primary purpose of this study is concerned with providing improved understanding of both accounting and management systems through the use of case study based research. To provide this improved understanding, this research study is based upon several key assumptions which are also key conclusions. Firstly, that management and accounting systems and practices exist in organisation contexts. Secondly, that these systems and practices obtain their meaning, in part, from the organisation contexts in which they are situated. Thirdly, that accounting knowledge and management theory, to-date, has failed to provide adequate descriptions and prescriptions for the organisations. Fourthly, that the key problem in accounting knowledge and management theory which has prevented adequate understanding is to do with the ontological issues which underlies such knowledge.

The contents of this study can be seen to be divided into three parts. The first outlines the nature of management accounting knowledge paying particular attention to the ontological and epistemological assumptions. Through analysis of these assumptions, the importance of understanding the complexity of social reality is introduced. A model of a 'temporal-spatial' reality is introduced and described. The conclusion from this part is that the main problem in understanding accounting practices is linked with the ontological issues and that a more complex subjective reality needs to be explored.

Part two provides the description of the case-study utilised to understand accounting practices in an organisational context. Part three provides an analysis of the use of the management and accounting systems by providing an understanding of the social-reality of the dominant decision-makers within the case-study.

The conclusion forthcoming from this study is four-fold and stated in paragraph one. However, these have major considerations to the development of accounting knowledge and require major shifts in the dominant methodology of accounting thought.

CHAPTER 1

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CHAPTER 1

INTRODUCTION

1.0 <u>PURPOSE</u>

This study is concerned with providing improved understanding of both management and accounting systems. This understanding is imperative to ensure an improvement in the teaching, design of systems and practice of both management and accounting. This study utilises the argument that it is only through rich descriptions and analysis of organisational practices that improvement in understanding of both management and accounting systems will be created.

To provide this "improved understanding" this research study is based upon several key assumptions which are also key conclusions of this study. Firstly, that management and accounting systems and practices exist in organisation contexts. Secondly, that these systems and practices obtain their meaning in part, from the organisational contexts in which they are situated. Thirdly, that accounting knowledge and management theory, to-date, has failed to provide adequate descriptions and hence prescriptions for the organisations. Fourthly, that the key problem in accounting knowledge and management theory which has prevented adequate understanding of accounting and management systems and practices in organisational contexts is to do with the ontological issues which underlies such knowledge.

This research study uses a 'naturalistic' approach in order to gain a deeper understanding of 'social realities' within organisations; to understand how these 'social realities' impinge upon the use and design of accounting information systems, in order that accounting can make a much needed contribution to society (Tricker, 1979).

1.1 STRUCTURE AND OVERVIEW OF CHAPTER 1

Section 1.2 provides an overview of the state of the art in management accounting knowledge. It recognises that any attempt to survey and classify management accounting is a difficult task due to the immense variety which exists under this global heading (see Scapens, 1982; Otley, 1982). This brief analysis of the 'state of art' is provided so that the ontological assumption upon which these schools of thought are based, can be explored : as section 1.0 outlines, a key assumption to this study is that the ontological assumptions in accounting knowledge and management theory has prevented an adequate understanding of accounting and management systems and practices in organisational contexts.

Section 1.2 argues that the 'taken for granted' ontological assumption that runs throughout the varied features of management accounting knowledge is one of an objective, pre-determined, concrete reality. Section 1.3 introduces the concept of a "temporal-spatial" reality : a reality that is partly pre-determined and is given the appearance of "concreteness" by the acceptance of certain "functionally" based terms/languages and rules, but is also a social world that depends upon its form, to a certain extent, by the negotiation and re-negotiation between the human beings that make-up that world. This concept is fully explored and developed in section 1.3. This thesis argues that the importance of this "spatial-temporal" reality is that it is this reality that accounting practice works within and contributes to. Hence, the reasoning for the gap identified between accounting knowledge and practice. (AAA report, 1977)

The implication for the design of accounting systems given the difference between these two notions of reality is captured in the work of Boland and Pondy:-

> "Rational models assumes managements are confronted
> with an objectively knowable, empirically verifiable
> reality that presents demands for action. Guided by
> a functionalist framework, managements analyse the
> apparent cause and effect relations, calculate costs
> and benefits and take action in response to the
> requirements of the external environment or the
> technology of production. Natural models, on the
> other hand, see managements as responsible agents
> who interact symbolically and, in so doing, create
> their social reality and give meaning to their
> on-going stream of experience".
> (Boland and Pondy, 1983 : 223)

Hence, rational models assume an objective, concrete reality which is taken for granted and determines people's reactions and actions. With these ontological assumptions, accounting systems are designed to objectively monitor movements in revenues and costs. These observations will then feed through into decisions. This is the approach that is typical of the conventional wisdom upon which management accounting, as it is known and taught throughout the professions, of to-day is based.

Whereas the natural models assume a reality that is negotiated and re-negotiated by the participants. The concrete, objective reality is replaced by a reality based upon subjectivity and agreement. This thesis, builds not just upon the notion of such a subjective, social reality, but upon a reality that also has certain features of the objective reality upon which accounting knowledge, as we know it to-day, has developed. Therefore, it portrays a reality that is complex and at times contradictory and confused : features which are mirror-imaged in management accounting.

Section 1.2 is highlighting that accounting knowledge and management theory, to-date, has failed to provide adequate descriptions and hence prescriptions for organisations. This has culminated in the gap highlighted by the AAA report (1977) between theory and practice.

Section 1.2 argues that the key problem, in the failure to provide adequate descriptions, is related with the ontological issues which underlie such knowledge. What implications does this have for management accounting knowledge?

Section 1.2.2 explores the future developments or steps necessary in furthering our understanding of accounting practice. Section 1.2.2 highlights the parochialism that exists between the various paradigms that exist within the field of management accounting and argues that this is counter-productive to the future development of accounting systems and practices. Section 1.2.2 concludes that the way forward to a better understanding of existing accounting practices is by utilising naturalistic research to describe and understand management and accounting in an organisation context.

To be able to describe and understand management accounting practices in an organisational context, it is necessary to understand the ontological assumptions and how social realities are formed and maintained. Section 1.3 explores and explains the varying ontological assumptions sets, as portrayed by Morgan and Smircich (1980). However, the main emphasis in this section is in the creation of a "spatial-temporal" reality : to outline the processes and influences that are an integral part of the negotiation and re-negotiation of social reality. It is this concept of reality that is the basic underlying ontological assumption applied throughout this research project.

Section 1.3 builds a "spatial-temporal" reality which is where the social subjective realities of interpreting human beings are brought together with the objective reality. This forms a reality that is partly pre-determined and is given the appearance of "concreteness" by the acceptance of certain "functionally" based terms/languages; (the meanings of which are taken for granted); positions, purposes and rules, but is also a social world that depends upon its form, to a certain extent, by the negotiation and re-negotiation between the human beings that make-up that world.

Section 1.3 argues that as the assumptions regarding the conceptions of social reality change so do the assumptions regarding the nature of knowledge. Figure 1.2 outlines the varying ontological assumptions with scientific modes of inquiry being attached to the objective notions and more naturalistic modes being attached to the subjective conceptions of reality. Sections 1.3.1 and 1.3.3 briefly outline these two forms of knowledge; the classical scientific model and the grounded theory approach applied to an interpretative approach. Section 1.3.2 briefly outlines Giddens Theory of Structuration which is utilised during the analysis in Chapter 4, 5 and 6. The concept of structuration is used due to its similarities with the concept of a 'spatial-temporal' reality outlined in section 1.3.

Section 1.4 outlines the genesis and conduct of this research project. This section describes the two phases of the research projects : Phase one adopted a research strategy of gaining credibility with the NCB and providing a background for further research by understanding the actual accounting and control processes utilised. Phase two had the primary objective of describing and explaining th processes of accountability

from the coal-face management to as high-up the organisational hierarchy as possible. The primary research methods used were in the first phase, understanding documents and records produced by the NCB augmented by a series of semi-structured interviews. During phase two, the research methods adopted were observations and semi-structured interviews. Section 1.5 outlines the conclusions from Chapter One and an overview of the structure of the remaining chapters.

1.2 MANAGEMENT ACCOUNTING : THE GAP BETWEEN THEORY AND PRACTICE

The idea of management accounting has been defined as:-

> "providing information for internal reporting to managers
> for use in planning and controlling routine operations,
> for use in making non-routine decisions and in formulating
> major plans and policies".
>   (Horngren 1982; 4)

The focus of modern management accounting systems is on control over all aspects of organisations : human and physical. This concern with control can be seen in the historical development of management accounting theory.

Management accounting can be divided into two descriptive sections, following Bhasker (1981) and Scapens (1984), of 'quantitative and 'behavioural'.

The quantitative strand of management accounting developed directly from cost accounting practices which are based upon the neo-classical economic theory of the firm. The historic concern in the quantitative development of management accounting was with the control of costs : that is the ability to accurately measure, monitor, and predict costs. In order to control costs, increasing levels of sophisticated techniques have been and are being applied to costs in order that the discretionary element is removed (Horngren, 1982). In this way, instead of coping with uncertainty and ambiguity, these become ignored and the concept of reality portrayed is one of certainty. This desire or need to be "in control", which is a prominent feature of technical control, will always relegate uncertainty and ambiguity to the background.

These concerns for control remain, but since 1946 developed into a stronger user orientation. Scapen (1984) calls this expansion of the cost accounting function the 'conventional wisdom. It is this 'conventional wisdom that is so much a part of current text-book material and the technical excellence of the professions.

Conventional models, based upon conventional wisdom, have been expanded to deal with reducing levels of uncertainty (Jaedicke and Robichek, 1964, Jensen, 1968). These developments were further enhanced by the use of information economics (Demski and Feltham, 1976); 'Game Theory'; 'Agency Theory' and 'Transaction Cost Theory'. Hence, a strand of management accounting theory was developing on the basis of economic theory and of paramount importance was the notion of control and rational decision-making, but with a limited recognition of uncertainty.

The 'behavioural' development of management accounting has its roots in the need to understand the relationships between management accounting systems and their impact upon people and peoples impact upon the accounting systems (Argyris, 1952; Stedry 1960).

The objective concept of reality utilised in the development of the quantitative aspects of management accounting creates a problem between the accounting techniques designed to control organisations and the actual social realities that exist within organisations. This becomes a vicious circle in that the practising accountant is adding higher levels of sophistication to the accounting tools to attempt to control the members of the organisation to act in a purposive - rational way as defined by technical control : as a consequence, ever-decreasing circles of control games are played; for example, people try to "beat the techniques".

However, at the same time, members of the organisation are adopting
systems to manipulate the accounting tools to fit into their own notions
of reality. A scenario of contradictions and confusions and hence, the
complexity of the behavioural aspects of management accounting which is
embedded within the organisational context ideas.

The late 1960's saw the first realisation of this complexity as a new
concern was emerging with respect to the impact of people on management
accounting system design (cf Lowe and Shaw, 1968; Schiff and Lewin,
1970). This line of reasoning has developed over the years until a newer
school of thought (cf Hopwood, 1978, 1979, 1983; Burchell et al, 1980;
Colville 1981; Tomkins and Groves, 1983) has emerged which regards
management accounting systems as an organisational phenomena. The nature
of which cannot be explained nor understood solely in terms of current
developments in organisation theory, but must also look towards social
and historical phenomena. For example, Burchell et al (1980) recognises
the ways in which the practice and use of accounting helps to create a
particular conception of organisational reality and recognises the
increasing importance of accounting to today's society. Burchell et al
state:-

> "Such extensions of the accounting domain have had major
> implications for the development of both accounting thought
> and practice. As the theorists of management control
> (Anthony, 1965) now recognise, accounting can no longer
> be regarded as a mere collection of techniques for the
> assessment of individual economic magnitudes. Whilst
> procedures for the derivation of various categories of cost
> and economic surplus are still important, the growth of
> the modern business enterprise has resulted in their
> incorporation into more all embracing forms of
> organisational practice which can enable the co-ordinated
> and centralised control of the function (Littver, 1961 and
> 1963), divisionalised (Johnson, 1978) and now the matrix
> and project orientated organisation (Ansari, 1979 : Chapman,
> 1973; Sayles and Chandler, 1971). Similarly, the increasing
> demands for financial information made by the capital

markets, agencies of the state and organisations within
the accounting profession itself have resulted in more
extensive and rigorous approaches to financial reporting
and disclosure (Benston 1976; Hawkings, 1963).
Accounting problems have seemingly got ever more
detailed, precise and inter-dependent, resulting not
only in the need to articulate new practice, but also
to formally explicate what previously had been implicit
in practice".
                    (Burchell et al, 1980: 6)

Hence, Burchell et al are arguing for the need to express the "taken for
granted" basis of accounting and argues that accounting:

     ".....No longer seen as a mere assembly of calculative
     routines, it now functions as a cohesive and influential
     mechanism for economic and social management".
                    (Burchell et al, 1980: 6)

Burchell et al question the taken for granted and argue that:

     "Although we still know all too little about how
     accounting systems function in practice, the studies
     that are available do enable us to question the
     descriptive accuracy of many of the functional
     imperatives that are claimed on behalf of both
     financial and management accounting systems. Whilst they
     may be introduced in the name of particular conceptions
     of social and organisational efficiency, rationality
     and relevance, in practice accounting systems function
     in a diversity of ways, intertwined with institutionalised
     political processes and the operation of other forms of
     organisational and calculative practice. Accounting
     it would appear, is made to be purposive rather than
     being inherently purposeful".
                    (Burchell et al, 1980: 13)
Behind these statements lie fundamental viewpoints on ontology,

epistemology and methodology, non of which are explicitly explored in the

study of management accounting or financial accounting. The studies of

management accounting and accounting in general are based upon "taken for

granted" assumptions regarding ontology, epistemology and methodology.

These "taken for granted" assumptions are clearly visible in the

professional spheres of accounting, for example, in the professional

examinations the emphasis is on 'technical control' techniques and

technical excellence in these techniques : the need to be in control is

prevalent.

Technical control operates upon the basis of objective assumptions about reality and the empirical-analytical scientific assumptions of epistemology (see section 1.3 for a discussion of ontology and epistemology). Given these "taken for granted" assumptions, the aim of the techniques developed in these professional spheres is to direct action through the application of technical rules which have been based on empirical knowledge. In this way, the concern of the professional accountant becomes one of technical control and manipulation so that conditions are constructed under which human beings, just like objects within nature, will behave in the purposive-rational way intended by the use of the techniques : the basic assumption behind the quantitative development of management accounting and the 'conventional wisdom'.

The AAA (1977) report brings attention to the gap that exists between accounting theory and practice. The importance of this schism is strengthened by the claim of accounting practitioners that accounting research is of little relevance to accounting practice (Tomkins and Groves, 1983).

An explanation for this 'schism' revolves around the assumptions regarding reality and in consequence epistemology : with research/theory operating on a clear cut objective - subjective concepts of reality and practice operating in a complex concept of reality which this thesis calls a 'temporal - spatial' concept of reality and is explored and developed more fully in section 1.3.

A temporal - spatial reality refers to a social reality that is constantly being re-negotiated and therefore can only be studied at specific moments in time. However, the constant re-negotiation of those specific moments in time can give the false impression of a stable order that is concrete and deterministic in nature. Over the years it is this impression that has contributed to the emphasis of management control being on the mechanical control and manipulation of human beings. This applies to the practice of accounting in two important ways. Firstly, the professional accounting educative process is built upon notions of technical control. Secondly, the accounting techniques are described as influencing behaviour in a purposive - rational way intended by the user of the techniques. The purpose is mechanical and therefore, the user of the technique expects the outcome and is not consciously manipulating.

As a consequence of the 'technical control' influence, both in present-day management and accounting techniques, the manager or accountant does not become involved in reflection. Development of the subject area becomes concerned with technical excellence divorced from an understanding of the 'temporal-spatial' reality within which it works. The main relevance to life is:

> "the experience of success as feedback control built into
> the systems of social labour and already realised in every
> successful elementary performance of labour".
> (Habermas 1973 : pg. 264).

The emphasis of technical control produces technical recommendations, but fails to furnish answers to the practical questions, those concerned with the acceptance or rejection of norms - especially those related to action, depending upon reasons. With this concentration on technocratic consciousness, the potential for human enlightenment (eg. genuine self-reflection) is traded for that of human manipulation. Habermas (1973) recognises the benefits that technocratic consciousness has brought to industrial development, but argues that this emphasis on "scientism" fails to raise human life to another level.

In exploring the theory of knowledge, Habermas investigates how instrumental reason has dominated modern thought. This focus has aided the ascendance of positivism, to the deficit of the capacity for reflection by the subjects on their activities, as noted above with the practising accountant.

The influence of scientism can be felt through the field of accounting in the argument which surrounds the placing of accounting in the field of the sciences or that of the arts. The emphasis on adopting the view of accounting as a science came when the field of accounting was under severe criticism for its loose or particularised approach. The way ahead, it was felt, was in developing a more modern, rigorous or generalised approach (Jensen et al 1976).

Hence, empirical questions which cannot be posed and solved in the form of technical tasks cannot expect to receive a well-thought theoretical answer in terms of deductive logic. The method is concerned with technical excellence. In the field of management accounting; technical control and therefore technical excellence has become the foundation of a functionalist theory of the subject area.

Burchell et al (1980) are recognising the methods by which accounting expands its domains and spheres of influence using the objectified assumptions of social reality. Today's society is interested in notions of rationality, objectivity and science. Features which are repeatedly emphasised in the art or craft of accounting and especially relevant to the attempts to "scientise" accounting.

Burchell et al (1980) state that the extension of computational practice can be seen in other approaches to organisational management. This wide-spread social movement to remove judgement to the area of computational practice recognises the social acceptability of objectified processes. This move towards computational practice appears to be attempts to manage the complexity, uncertainty and ambiguity of both today's society and its organisations. However, other methods exist to handle the complexity and uncertainty of organisations. These include greater understanding of the areas described by the computational practice within a given conception of reality and/or a greater understanding of the "taken for granted" assumptions of ontology and epistemology and the active search to understand the complexity of the "spatial-temporal" reality of organisations. It is the latter of the two which is part of the central theme of this case-study research of the NCB.

The present-day viewpoint of practising accountants displays quite strongly the notion that accounting is involved with technical interest and reinterprets "practical problems" as "technical problems" requiring "technical solutions" based upon "technical excellence". Any attempt of reflection by the practising accountant is done so against a background of the need for technical excellence and the need to be "in control".

The dilemma is that accounting theory and professional practice is based upon the conventional wisdom. A wisdom that is based upon objective notions of reality, positivistic methods for epistemology and the need to control through technical solutions. Hence, a world re-interpreted in terms of technical problems.

However, these ideologies are practised in an arena of a subjective reality. A reality that is complex, uncertain and ambiguous unlike the stable and deterministic order built into the notions of an objective reality. Hence, conflicts, contradictions and confusions abound and techniques fail to manipulate behaviour and instead of the accountant and the accounting tools being purposeful and aiding the decision-maker, they become purposive in their attempts "to control" the decision-maker. This gives rise to the criticism of accountants and the claims that "accounting has failed society" (Kaplan and Johnson; 1987). There is therefore, a need to develop an understanding of accounting and accountants in practice.

1.2.1   Future Developments in Understanding Accounting Practice

Tricker points the way to future developments in accounting through the following:-

> "At all three levels - empirical, formal and philosophic - it has to be said that in accounting there is an alarming ignorance and lack of activity. Only on the basis of knowledge in all three can accounting progress in a responsible way, making that contribution to society that is so much needed. And true knowledge can only come from study and thought sustained by research.
> (Tricker 1979 : 8)

Section 1.2 argues that one of the reasons for this identified gap between theory and practice lies in the ontological and epistemological assumptions utilised in Management Accounting Theory and Research; that of a concrete reality and the application of positivistic methods : the term 'Positivistic' is used to refer to an epistemology that seeks to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements. It is in essence based upon the traditional approaches which dominate the natural sciences. Positivists may differ in terms of detailed approach (Burrell and Morgan 1979: 5), for example, in terms of the need for verification or falsification. For a full account see Popper (1963).

In adopting these positivistic methods a notion of "being scientific" has grown in popularity. This has developed into a generally acceptable scientific model. The central features of this model are that it operates with such concepts as hypotheses, diagnoses, models, theories and systems which are subjected to systematic testing procedures to establish falsification. This is further explored in section 1.3.2. The validity of this 'scientific model' has been questioned over the years including authors such as : Bertalanffy (1968); Goffman (1959); Berger and Luckmann (1966); Schutz (1967); Colville (1981) to name, but a few. Abdel-Khalik and Ajinkya (1979), however, see the narrowing of this theory/practice gap being achieved through utilising the process of science, its main features being as described above, a method which they imply is superior to other methods.

Abdel-Khalik and Ajinkya appear not to make the link between ontological assumptions and research methodology either through design or ignorance. This line of thinking is also implicit in the work of Jensen, Watts and Zimmerman (1976). Abdel-Khalik and Ajinkya contend that a naturalistic defined mode of research, in terms of an understanding of reality from the viewpoint of the actor, should serve as an explanatory stage of research preceding "scientific" analysis; that is to highlight variables worthy of further research. However, it may be argued that utilising naturalistic (Bernstein 1976 : 138) modes of research in such a fashion reflects a misunderstanding of the purpose of and ontological foundations upon which such naturalistic analysis is built.

As Tomkins and Groves comment:

> "...... in so far as accounting research is concerned
> with the effects of accounting practices upon social
> action whether that action relates to accounts producers,
> user or those otherwise affected, there is a strong case for
> examining "naturalistic" research approaches".
> (Tomkins and Groves 1983 : 367)

The naturalistic approach recognises that social reality is less concrete and deterministic than the concrete natural world and that accounting researchers must recognise that they are really social scientists (Morgan, 1983). Morgan and Smircich (1980) explore the relationship between research methods and the assumptions regarding the nature of knowledge.

As they comment:

>   "....... The grounds for knowledge are different
>   because the fundamental conceptions of social reality
>   to which the proponents of each position subscribe
>   are poles apart".
>   (Morgan and Smircich 1980 : 493)

As they also comment:-

>   "Once one relaxes the ontological assumption that the
>   world is a concrete structure, and admits that human beings,
>   far from merely responding to the social world, may actively
>   contribute to its creation, the dominant methods become
>   increasingly unsatisfactory, and indeed, inappropriate...."
>   (Morgan and Smircich 1980 : 498)

Morgan and Smircich argue for the use of qualitative research

methods as researchers relax the ontological assumptions that the

world is a given structure (see section 1.3 for a discussion of

subjective-objective continuum).

The use of naturalistic analysis in research provides a fresh

perspective on the concept of organisational control, and a

different way of understanding the "behavioural aspects of

accounting" (Morgan, 1983). Whilst all kinds of knowledge, whether

from positivistic assumptions or not, have contributed to the

development of accounting research, a naturalistic approach offers

the possibility of narrowing the theory-practice gap. The

re-constructing of behavioural accounting through the use of

naturalistic analysis has many proponents such as Tomkins and Groves

(1983); Colville (1981); Cooper (1983); Hopwood (1979); Davis, Menon

and Morgan (1982); Morgan (1983); Boland (1979); to name but a few.

An example of the contribution of a positivistic approach to management accounting research is the application of information economics to management accounting within a single person framework (Demski and Feltham, 1976). The insights gained from information economics encouraged some researchers to examine, using empirical studies and simulation analysis, the relative benefits of using simple and complex models (Scapens, 1983).

This analysis highlighted that practitioners should not be criticised for not applying the stock of management accounting techniques since the simple or rule-of-thumb techniques can be an optimal reaction given the costs and benefits of information. Scapens (1983) states that an apparent consequence was that subsequent research became more concerned with explaining the reasons for particular practices : that is, a move towards more naturalistic analysis. The work of Tomkins and Groves (1983), argues that the theory/practice gap could be closed through a concentration on naturalistic research which develops a concern with the accounting practitioner, ie. to understand what accounting means and is from, for example, the viewpoint of the practitioner.

An important aspect of undertaking naturalistic research lies in obtaining and building upon the co-operation of the practitioner. However, the narrowing of the gap is not just a one-way process of the researcher adopting a naturalistic mode as posed by Tomkins and Groves, but I argue, entails the education of the accounting practitioner firstly in the ontological foundation of the subject area and progressively, over the decades, into the epistemological and methodological foundations. This can be started via the graduate and post-graduate courses offered in the U.K. educational

establishments, but must progress into management training courses and professional accounting courses. An education process, aimed at company management, with the aim of opening up the ontological assumptions should aid in the narrowing of the gap between practitioner and researcher, as both become more aware of the social reality which surrounds them and provides explanations or insights into how the decision-processes work within their own environment. The accounting practitioner is, in many cases, the system designer and as Boland (1979) argues, the system designer must be able to understand the ways in which social reality is constructed and re-constructed in day-to-day activities. At present, the practitioners are building upon education which reflects the technical interest and developing systems on the decision-model approach. For example, in developing management accounting concepts and techniques researchers had to identify the information needs of managers. According to Scapens (1983) this meant constructing decision models to indicate how decisions are, or should be, made. In the decision models used by management accounting researchers in the 1960's, profit wealth maximisation is expressed in terms of the profits or wealth accruing to the owners of the business, relying upon the concept of responsibility accounting to ensure goal congruence between the owner and the practitioner. In this way, a stock of management accounting techniques, such as capital appraisal, cost allocations, marginal costing, exist for the practitioner to utilise if desired.

To further the co-operation of the practitioner, it can be argued
that the academic fraternity will have to suggest prescriptions to
management problems to demonstrate the effectiveness of utilising
more insightful descriptions and explanations of the workings of
"society".

As Kaplan (1984) argues........

> "Because of the newness of the research focus, change
> in research methods, and longer time frame required for
> recognisable results, this (case study base approach)
> is a risky research strategy for Phd students....".

It can be argued that this is a necessary risk which could perhaps
be reduced through the use of "team-research", in that groups of
people from differing disciplines and beliefs come together to
undertake case-study based research : in this way, group members can
provide constructive critiques of each others' analysis. Tomkins
and Groves (1983) in a recent examination of all leading accounting
journals over the period 1976-9, revealed only 7 out of 650 articles
which related to case-studies and they argue that if the
'naturalistic' approach was defined strictly, this number would be
less. This is further evidence of the 'riskiness' of case-study
research in terms of the career potential of the researcher.
Publishing is an important performance indicator in academic life.

Management Accounting appears to be undergoing a revolution within
the academic community (eg. Cooper 1983; Hopwood 1983). If Kuhn's
(1970) notion of a revolution is applied, then accounting appears to
be emerging from a state of crisis in that alternative ideas have
been proposed and debated and schools of thought are beginning to
emerge. The next stage, according to Kuhn is:

"an increasing shift in allegiances".

(Kuhn 1970 : 158)

But how applicable is Kuhn's notion to accounting? Kuhn argues that the outcome of the revolution in science is that one paradigm exists. This may be so in science, this issue is not at debate here. However, in accounting alternative ideas are being debated and Laughlin and Lowe (1988) identify the major streams of thought that are present in accounting today; they argue that the overall impression is now one of an expanding set of schools of thought in management accounting more generally.

According to Kuhn, a shift in allegiances will occur until one paradigm emerges. However, multiple and fiercely divided paradigms exist in accounting. Each with its own publishing outlet, for example, the scientific school aims to publish in a journal such as The Accounting Review. Many articles published in Accounting, Organisations and Society would rarely be published in The Accounting Review, so divided are the paradigms. So each paradigm stands alone and exists in a world of its own : oblivious of the inter-relationships and influences each have on one another. Contributing to the complex, contradictory and sometimes confusing social reality that we create for ourselves. It can be argued that such parochialism is counter productive to the future development of accounting. However, the main issue is that a better understanding of existing practices is necessary before prescriptions can be made. To effect this better understanding means utilising naturalistic research to describe and understand accounting. This thesis describes a case-study based research project which attempts to provide such an understanding.

1.3 OBJECTIVE SUBJECTIVE CONTINUUM : SCIENTIFIC NATURALISTIC

One of the key assumptions and conclusions of this research project relates to the ontological issues which underlie differing paradigms within management accounting knowledge. To be able to understand the management accounting practices in an organisational context, it is necessary to understand the ontological assumptions and how social realities are formed and maintained.

The varying ontological positions are explored and explained in Section 1.3 with a major emphasis being on the creation of a social reality. Section 1.3.1 and 1.3.2 outlines the various epistemological positions : scientific and naturalistic which are attached to the objective-subjective ontological assumptions sets as summarised in figure 1.2.

Morgan and Smircich provides a range of notions of reality moving along a continuum from objective to subjective. Within this continuum six basic ontological positions are presented in figure 1.1.

Figure 1.1 : Six Basic Ontological Assumption Sets:

1. Reality as a concrete structure

2. Reality as a concrete process

3. Reality as a contextual field of information

4. Reality as a symbolic discourse

5. Reality as a social construction

6. Reality as projection of human imagination

1 to 6 are viewed as alternative ways of looking at the world and can be described on a continuum moving from an objective view along to a subjectivist view, as depicted in Figure 1.2 in which the view of social reality moves from an extreme of a determinate, stable relationship through to an extreme of a social reality which is a projection of the human imagination.

As one moves further from the objective category 1 conception of social reality, the scientific method of inquiry (for a description of the scientific model see section 1.3.1) causes increasing difficulty for the social scientist, because of the difficulty of experimenting with large social systems. One of the difficulties is that large social systems have many interacting variables and holding all but one steady may be infeasible (except in some statistical sense); this is further complicated in defining the boundary for the system to be studied. Precise and narrow definitions of the boundaries, necessary for rigour, can lead to some factor, that is basic to the behaviour of the system being moved into the system environment.

Social reality is subjective and therefore, there is a need to understand from the frame of reference of those being studied as opposed to the given social world constraining the individuals behaviour. Garfinkel (1967) has been a major proponent of one of the social construction perspectives which assumes that the social world is fleeting in nature and therefore, has no concrete status in the sense that the scientific/positivists would believe. The research mode adopted is one in which the focus is on exploring the deeper subjective perspectives.

Hence, as one moves along the objective-subjective continuum differing research modes are applied to aid explanation, description and prediction. The above conceptions of social reality, positive theories; normative theories and naturalistic approaches are summarised in Figure 1.2.

Figure 1.2 : Objective-Subjective Continuum of Social Reality

<u>CATEGORIES</u>

▲Objective	⌐1	Determinate, stable relationships These stable functions relating to subsets of the social world can be used for accurate prediction.	Scientific, Positivist generalisable results.
	⊢2	Key formulations which describe 'change' and are stable.	Scientific, generalisable patterns of change.
Conceptions of Reality	⊢3	Human Information Processing	Holistic Patterns of Change.
	⊢4	Symbolic discourse: People create their own impressions through a process of human interaction and negotiation.	Naturalistic/ scientific: attempts to "understand" the work situation.
	⊢5	Social Construction	Naturalistic : Focus deeper into the subjective perspective Ethnomethodologists believe that Category 4 is too rational a model for them.
▼ Subjective	⌐6	Human Imagination	

Hence, Morgan and Smircich (1980) are arguing that as the assumptions regarding the conceptions of social reality change so do the assumptions regarding the nature of knowledge.

Positivistic theory with its emphasis on classical scientific assumptions is depicted by the Rochester School of Accounting as being based upon a conception of a "concrete" social reality in which understanding is based upon observable and measurable phenomena.

This understanding is gained through the classical approach of scientific investigations which is explained in Section 1.3.1.

Science, especially empirical experimental science, was seen as a touchstone for distinguishing superstition, bias, and mere opinion from hard fact and empirically warranted knowledge (Bernstein, 1976 : 60). The fruitfulness of the application of formal and empirical sciences can be seen in the tremendous growth which occurred in human knowledge. However, through time, the approach which had once been a "great liberating idea". became a "suffocating straitjacket" (Bernstein, 1976 : 60) with the emphasis of "what is" and the assumption that metaphysics is "meaningless".

The positivists insisted on a categorical distinction between the two and questioned the very possibility of normative theory and insisted that truth comes from facts : in this assumption it failed to recognise the view that theory, itself, 'plants' some of the facts. Coming full circle, positivism pre-supposes a subject-object split in that we (the subjects) can observe and analyse reality (the object) in a completely detached objective fashion (Tinker et al : 1982; 1973).

With the increasing realisation that we (the subjects) actually create
the social reality, that it is not a given concrete, physical entity as
the universe is to the scientist, then it becomes impossible to
pre-suppose a subject-object split as in positivism. Hence, a differing
epistemology is required : one that can search into subjective meanings
and describe and explain the influences and process that are entered into
in creating a social reality. Section 1.3.2 briefly outlines the
grounded theory approach utilised in this research project to provide an
interpretative approach.

Figure 1.3 is a diagrammatic model which outlines the complexity involved
in the negotiation and re-negotiation of the 'spatial-temporal' reality.

Figure 1.3 : Influences on the 'Spatial-Temporal' Reality
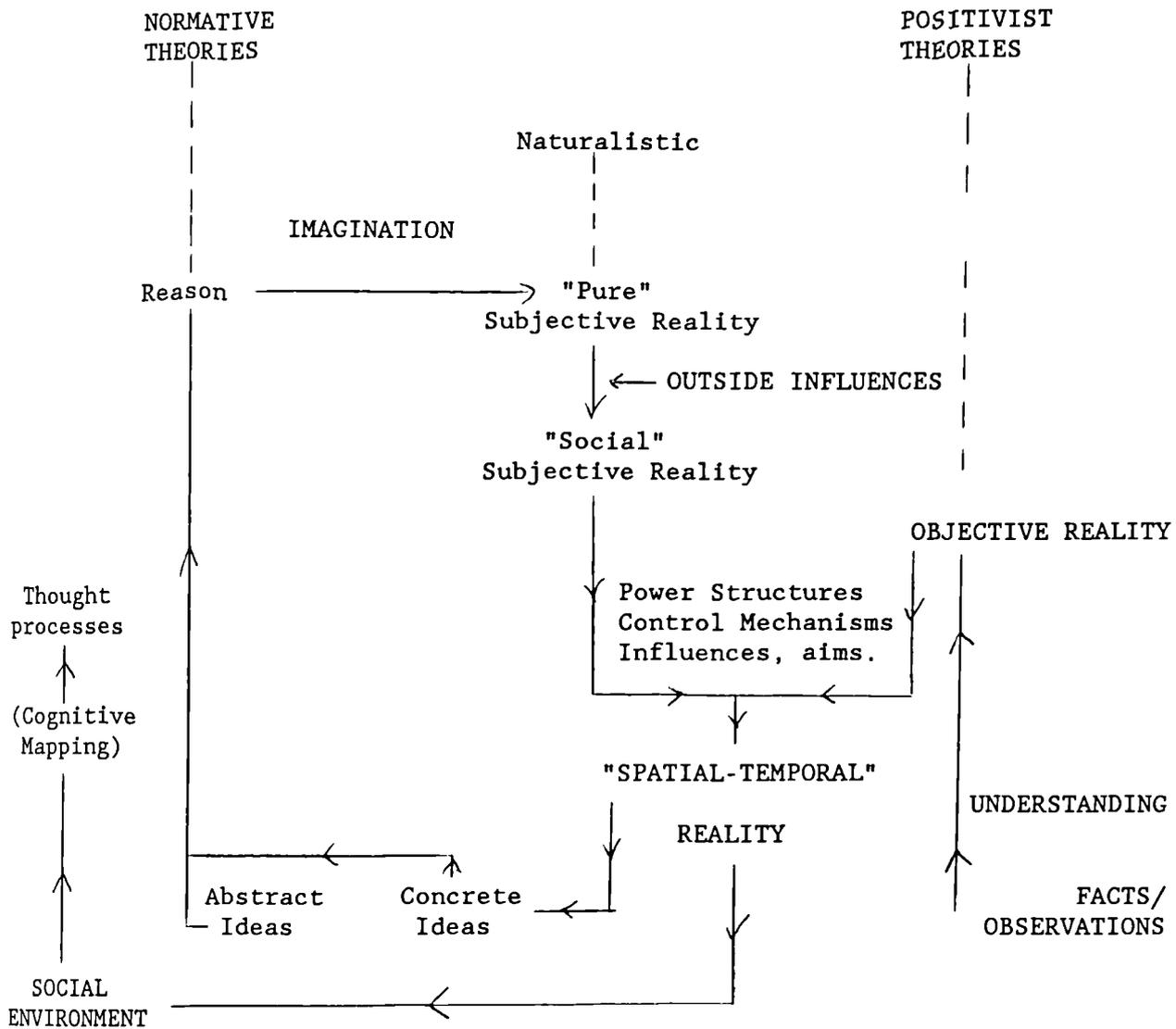
NORMATIVE
THEORIES

POSITIVIST
THEORIES

Naturalistic

IMAGINATION

Reason ————————————> "Pure"
Subjective Reality

<—— OUTSIDE INFLUENCES

"Social"
Subjective Reality

OBJECTIVE REALITY

Thought
processes

Power Structures
Control Mechanisms
Influences, aims.

(Cognitive
Mapping)

"SPATIAL-TEMPORAL"

UNDERSTANDING

REALITY

Abstract   Concrete
— Ideas   Ideas

FACTS/
OBSERVATIONS

SOCIAL
ENVIRONMENT

It is this 'spatial-temporal' reality that is the basic underlying

ontological assumption applied throughout this research project. It

portrays my own values as it is the way I see the creation of

social-reality. Conceptions of reality, for example those portrayed by

the Burrell and Morgan (1979) framework that underpins organisational

analysis, tend to 'black-box' reality into either objective or subjective

with grey areas as one moves along the continuum. However, I do not

believe that social reality is that 'clear-cut'; it is complex, confused

and contradictory. The complexity, confusion and contradictions come

into being because many influences are brought to bear through the actors

in creating this 'spatial-temporal' reality.

Figure 1.3 is a 'busy, complex' diagram of the influences that, through

my thought-processes and observations, I believe are part of the

processes that create this 'spatial-temporal' reality : the reality that

organisations are part of. By understanding the influences that I have

depicted then one can understand the reasoning for the descriptions given

in Chapters 2 and 3 and the analysis that follows in Chapters 4 through

to 7. Hence, figure 1.3 is built upon the notion that to understand

human action then one has to grasp the continuity that exists in all

forms of inquiry and knowledge : it is a model of social theory that is

empirical, interpretative and critical.

As Bernstein argues:

> "In the final analysis, we are not confronted with exclusive
> choices : either empirical theory or interpretative theory or
> critical theory. Rather, there is an internal dialectic in
> the restructuring of social and political theory : when we
> work through any one of these moments, we discover how the
> others are implicated. An adequate social and political
> theory must be empirical, interpretative and critical".
>   (Bernstein, 1976 : 233)

Figure 1.3 tries to portray diagrammatically the relationships that exist

between normative theories; positivistic and naturalistic approaches

through an understanding of the influence of these and people on the

building of this 'spatial-temporal' reality.

As Bernstein argues:

> "We are interested not only in the variety of beliefs and
> dominant models, but in their origins and in the causes for
> their dominance, reinforcement, and collapse...., But if we
> are to understand human beings, we must explore the adequacy
> of these models....."
>   (Bernstein 1976 : 61)

As Bernstein argues, to understand human beings, then we must be capable of exploring the adequacy of these models. Therefore, it is imperative that readers can understand and explore the dynamics portrayed in figure 1.3. A description of these dynamics follow, however, it is difficult to portray in words.

Entering into a dynamic model is difficult, however, to aid the process the model in figure 1.3 is divided into 3 sections : A, the normative theory section; B, the positivist theory section and C, the naturalistic section. Section A, of figure 1.3 depicts the normative theory section, that is an emphasis on "what ought to be", as being based upon abstract ideas and "reasoning". It expresses an individual's perception of "what ought to be" and as such is based upon the individual's dominant order of models of what the world is like. The value aspect of these models does not refer to any facts. Hence, it cannot be true or false, this represents a stark contrast to the factual aspect of positivistic models which refers to a part of a given reality (in the positivist's understanding of reality) which is observable and measurable.

It portrays the most subjectivist position on the continuum in figure 1.2, that of "human imagination". In this approach, the social world and what passes as 'reality' is a projection of an individual's abstract ideas that are developed through reasoning to establish a projection or model of reality : a "pure subjective" reality.

However, such a "pure" subjective reality would mean that the individual was isolated from people and their ideas. That the individual was capable of creating pure abstract ideas with no influence from outside. In this creation of a 'pure subjective' reality the individual is influenced by, for example, present-day theories. For example, I have through applying my thought processes, through reasoning, established a mental picture of the workings of an area of the NCB and have described this in the following chapters. This description is not just based upon abstract ideas that my imagination has created. It is also founded upon concrete ideas that belong to a physical world, for example, the extraction of coal from the mother earth; upon discussions and ideas that belong to the participants of this temporal-spatial reality (in other words, the influences they have brought to bear), that is the social environment and the ideologies and theories that permeate inside my-self. Ideologies and theories, for example, management accounting theories, based upon positivistic assumptions. All of these influences are brought into the creation of an individuals reality.

In essence human beings are self-interpreting beings. The beliefs that human beings have about themselves and others are not simply subjective states of the minds : they are to use a Kantian expression - constitutive of the actions, practices and institutions that make up social and political life (Bernstein, 1976). In this way, outside influences come to bear to construct a "shared" social reality - explained further below. This dynamic demonstrates the complexity involved in the construction of social-reality. An individual's values and beliefs are built from the social environment experienced and ideologies that are a central component of that environment : these are brought together through one's thought processes and reasoning to build models of the way in which one believes the world works. In this type of construction of reality, the

techniques available within cognitive science (Dillard 1984) presents a
methodology which can be applied to explore the subjective thought
processes of the individual. Cognitive science can be described as a
field containing elements of cognitive psychology, computer science,
philosophy, education and artificial intelligence (Dillard 1984).
Techniques of cognitive psychology are utilised to ascertain how an
individual's thought processes actually work, but is not sufficient, in
my view, to understand the influences that are working to create the
conception of reality within the individual.

However, individuals do not exist in isolation and outside influences
such as language, labels, actions and routines are brought into play to
constitute symbolic modes of "being in the world". In this way, an
otherwise "pure" subjective reality is constructed into "shared" or
"social" subjective realities which are multiple in nature. These
"realities" so created are only real in so far as individuals sustain
them : in this notion of reality, the purpose of research is to
demonstrate the methods used in every day life to create subjectively an
agreed or negotiated social order. Naturalistic modes of research are
applied to try to understand that social order from the viewpoint of the
participant.

Schutz argues :

>"It is inter-subjective because we live in it as men amongst
>other men, bound to them through common influence and work,
>understanding others and being understood by them. It is a
>world of culture because, from the outset, the world of
>everyday life is a universe of significance to us, that is,
>a texture of meaning which we have to interpret in order
>to find our bearings within it and come to terms with it".
>   (Schutz in Bernstein 1976 : 141)

However, what brings these people together to form multiple social realities. In an organisational context, work is the binding feature. The social subjective reality is transformed into my notion of a 'spatial-temporal' reality through the concept of work. Where the social subjective reality is brought together with the objective reality to create this spatial-temporal reality : a reality that is partly pre-determined and is given the appearance of "concreteness" by the acceptance of certain "functionally" based terms/languages, (the meanings of which are taken for granted), positions, purposes and rules, but is also a social world that depends upon its form, to a certain extent, by the negotiation and re-negotiation between the human-beings that make-up that world.

Section B of figure 1.3, if taken in isolation, depicts a positivist theory approach to reality. That is, reality is a given, for example an organisation exists in a concrete form. It has aims, objectives and strategies that are communicated and understood by a collection of people bound together, usually through, a hierarchy of positions. Each performing their part of the task by applying physical and mental resources to agreed problems. These tasks build towards the overall purpose through goal congruence. These processes and the facts presented by the system designed are observable and measurable and therefore, can lead through empirical research to positivist theories. The classical scientific process is outlined in section 1.3.1.

However, this is the positivistic stance in isolation. The model portrayed in figure 1.3 is arguing that certain features of a temporal-spatial reality could belong to an objective reality, for example the physical process of extracting coal; the physical resources that are brought to work (computers, machinery); the physical accounting system; aims and purposes; control mechanisms. All of these features are brought to mould a social subjective reality into a " spatial-temporal" reality that has purpose, that can initiate action and produce goods, wealth, continuity. That is, it gives the appearance of being a concrete entity that belongs in space and time. However, it is only through the application of naturalistic research that one realises that it is not one reality being guided towards the aims of the organisation it is a series of multiple realities : all of which are being interpreted by differing groups of individuals : a series of social subjective realities and objective realities inter-wined and creating a continuing existence.

Hence, a certain degree of continuity is preserved through the operation of rule-like activities, for example, the social realities of organisations are preserved to a certain extent by the power structures, the control mechanisms, influences and aims : these tend to give the appearance of an objective reality, but the fundamental character of the social world is embedded in the network of subjective meanings that sustain these rule-like actions that lend it enduring form. This notion of an objective reality is a component part in the thought processes and reasoning that is used to build an 'individuals' model or models of the working of reality : that is, it impinges upon the 'pure' subjective notions of reality.

The process is a complex reconstruction; the operation of rule-like activities gives the impression of concrete ideas based upon a given order and that reality is ultimately the same for every observer. However, reality is not the same for every observer, hence emphasis in certain scholarly quarters is on understanding how social order is constructed by human beings in ways that are meaningful to them and as such the knowledge generated is "substantive theory" (Glaser and Strauss, 1967). It must be recognised that "theory" may come to form part of the reality that the theory purports to describe : thereby fashioning the individual's thought processes and their perception of a 'pure' subjective reality; the influence of this theory and present-day ideologies on outside influences and on the interpretation of "rule-like" activities must be recognised.

In this way, the "spatial-temporal" realities are demonstrated as complex processes depending upon : Individual reasoning and imagination; outside influences which construct "shared realities" that is a concept of "being in the world"; human action and inter-action with continuity being preserved through "rule-like" activities; signification process of the above inter-actions and individual reasoning that relies in part on present-day theory and ideologies of society.

In this way, the inter-relationship of all the six categories in Figure 1.2 in determining a concept of a "spatial-temporal" reality can be portrayed as a reality that has aspects of the "human imagination", of social construction and symbolic discourse and of objectivity through its on-going "rule-like" activities and negotiated order. But all of these aspects rely to a greater and lesser extent upon the ability of individuals to reconstruct or sustain a notion of reality.

This thesis is built upon notions of a "spatial-temporal" reality and the need to understand the methods used to create this subjective "spatial-temporal" reality in terms of the individual's subjective experience of an agreed or negotiated social order.

In utilising naturalistic research methods, one of the crucial assumptions is that human beings are capable of bringing to consciousness the interpretations, evaluations and standards that they accept and can subject these to rational criticism. This, I have tried to do in the portrayal of the dynamics of the creation of a 'spatial-temporal' reality : this I believe is part of the development of the person in a doctoral process. However, in performing naturalistic research, we expect the members of organisations to be capable of doing the same : some are, some are not. Hence, to reduce the amount of ethnocentism in a research project is a complex process. We are still vastly ignorant of the material conditions necessary for critique to play a role in the transformation of social and political reality (Bernstein 1976). Bernstein argues that for this we need to seek to build in depth understandings of existing forms of social reality. This thesis attempts to provide such an understanding through a case-study approach of certain aspects of the NCB (now known as British Coal - 1986).

1.3.1   THEORY OF STRUCTURATION

Structuration is the production and reproduction of the social systems through the application of generative rules and resources.

Giddens argues:

"The differences between these perspective on social science
have often been taken to be epistemological, whereas they are
in fact also ontological. What is at issue is how the concepts
of action, meaning and subjectivity should be specified and how
they might relate to notions of structure and constraint.
If interpretative sociologies are founded, as it were, upon an
imperialism of the subject, functionalism and structuralism
propose an imperialism of the social object. One of my
principal ambitions in the formulation of Structuration theory
is to put an end to each of these empire building endeavours.
The basic domain of study of the social sciences, according to
the Theory of Structuration, is neither the experience of the
individual actor, nor the existence of any form of societal
totality, but social practices ordered across space and time
.... It is the specifically reflexive form of the
knowledgeability of human agents that is most deeply involved
in the recursive ordering of social practices. Continuity of
practices presumes reflexivity, but reflexivity in turn is
possible only because of the continuity of practices that makes
them distinctively the 'same' across space and time.
'Reflexivity' hence should be understood not merely as 'self
consciousness' but as the monitored character of the on-going
flow of social life"

(Giddens : 1984 : 2.3)

As Giddens noted:

"A social system is thus a "structured totality". Structures
do not exist in time-space, except in the moments of
constitution of social systems. But we can analyse how
"deeply-layered" structures are in terms of the historical
duration of the practices they recursively organise, and the
spatial 'breadth' of these interactions. The most
deeply-layered practices constitutive of social systems in each
of these senses are "institutions".

(Giddens; 1979 : 65)

Hence, Giddens Theory of Structuration has similarities to the

concept of a spatial-temporal reality outlined in Section 1 3.

Giddens argues that:

"An onotology of time-space as constitutive of social practices
is basis to the conception of structuration which begins from
temporality and thus, in one sense, history"

(Giddens, 1984 : 3)

This is the most basic similarity to the 'temporal-spatial' reality outlined in section 1.3. In which social practices are ordered across time and space and only 'exist' in terms of the structuring properties which 'lend' them 'systematic form'. In structuration and in the 'temporal-spatial reality, time-space is fundamental to the production and reproduction of social life. Time is perhaps the most enigmatic feature of human experience.

In creating a social reality, human beings interact and apply a 'stock of knowledge' to understand the interaction. As Giddens notes:-

> "The vast bulk of the stocks of knowledge in Schutz's phrase, or what I prefer to call the mutual knowledge incorporated in encounters, is not directly accessible to the consciousness of actors. Most such knowledge is practical in character : it is inherent in the capability to 'go on' within the routines of social life"

> (Giddens 1984 : 4)

As stated in section 1.3, one of the crucial assumptions of naturalistic research methods is the capability of human beings to bring to their consciousness the mutual knowledge that they utilise in making sense of being in the world.

This theory of structuration is utilised throughout the analysis given in chapter 4, 5 and 6. With Chapter four looking at the structure of domination and chapter six looking at signification through the application of semiotics in an organisational context. Chapter five outlines the 'stock of knowledge' which the dominant social actors utilise in producing and reproducing their social world.

A brief summary of the main components of structuration follows:-

Giddens duality of structure in social interaction is diagrammatically shown as:

Interaction	Communication	⟷	Power	⟷	Morality
	↕		↕		↕
Modality	Interpretative Scheme		Facility		Norm
	↕		↕		↕
Structure	Signification	⟷	Domination	⟵	Legitimation
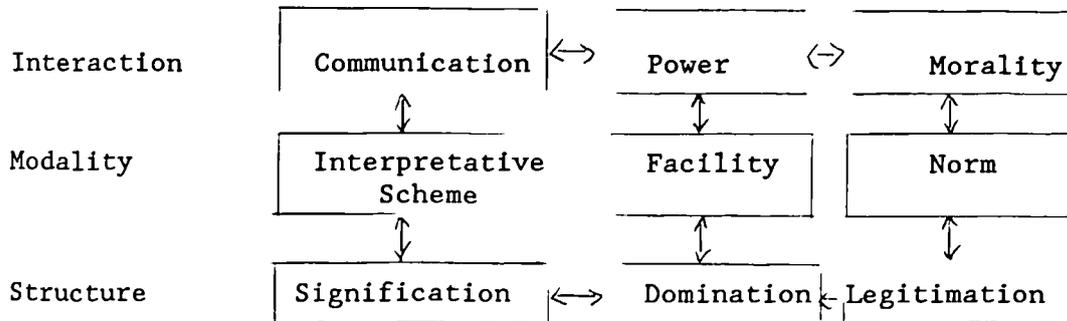
Giddens (1976 : 122)

The top line refers to the elements of interaction, communication, power and morality; those on the bottom line refer to the characterisations of structure, signification, domination and legitimation. Structure of signification has to be grasped in connection with domination and legitimation.

Hence communication, power and morality are the properties of interaction and structures are the rules and resources that people use in interaction. Structures are analysed as dualities, in that, they are both the medium of and the outcome of interaction. They are the medium due to the fact that they provide the rules and resources which are used or drawn upon, by individuals, to interact meaningfully. However, they are also its outcome because these rules and resources are created and negotiated in interaction : they only exist through being applied and acknowledged in interaction; that is they have no reality independent of the social practices they constitute (Giddens 1979),

"structures only exist as the reproduced conduct of situated actors with definite intentions and interest".

(Giddens, 1976 : 127)

Giddens (1976) in the Theory of Structuration employs power as an important element, along with communication and morality, in the construction of interaction. Giddens (1976) argues that the interpretative sociologies have produced conclusions which are of profound importance, but which also have three weaknesses. Firstly, they deal with action as meaning as opposed to action as praxis, that is, the involvement of actors with the practical realisation of interests, including the material transformation of nature through human activity. Secondly, due to the concentration of action as meaning and the building of "shared realities", the centrality of power in social life is not recognised. Thirdly, connected with the idea of 'shared reality', the school of thought does not seem to incorporate the notion that social norms or rules can be differentially interpreted.

Giddens argues that the:-

> "production of society is brought about by the active
> constituting skills of its members, draws upon resources and
> depends upon conditions of which they are unaware or which they
> perceive only dimly"

(Giddens 1976 : 157)

The three elements of interaction are intricately interwoven in the construction of social life. In the production of meaning, Giddens draws attention to mutual knowledge that is applied to create and re-create contexts of communication. He argues that this mutual knowledge is "background knowledge" in the sense that it is "taken for granted" but, is not fully articulated; this "background knowledge" is produced and reproduced anew by the actors as part of their everyday lives (Giddens 1976).

The background knowledge is taken for granted with no ambiguity or differences in interpretations allowed for.

On the constitution of interaction as moral order, Giddens (1976) argues that it can be understood as the actualisation of rights and the enactment of obligations. He argues that norms are both constraining and enabling and distinguishes between "norms" and "rules", he treats normative or moral rules as a sub-category of the all-inclusive notion of role, and connects the latter with the notion of structure. Giddens argues that an actor approaches moral/normative claims in the same way as he approaches 'technical prescriptions"; that is that a moral claim does not necessarily imply a moral commitment to it, the actor can 'calculate the risk' of transgression and since the sanctions of such transactions do not

operate in the mechanical nature of the 'technical prescription', the transgressor can use the 'free space' available to negotiate the character of the sanction.

In this way, the production of normative order exists in close relation to the production of meaning (Giddens 1976). In actual situations, several sanctions may operate simultaneously, but Giddens draws the conclusion that no external sanction, that is, a reward is only such if it impinges upon a person's wants. Giddens concludes that:

> "The moral co-ordination of interaction is asymmetrically inter-dependent with its production as meaningful and with its expression of relations of power"
>
> (Giddens, 1976 : 110)

He argues that this can lead to clashes of world-views and the possibility of clashes between diverging understandings of common norms.

Giddens uses 'power' to refer to the transformative capacity of human action rather than to a relational aspect of power and to distinguish between the two utilises the term 'transformative capacity'; which is the capability of the actor to intervene in a series of events and alter their course or sustain it, that is, it is the mediation between intentions and wants and the actual realisation of the outcomes sought.

The relation aspect of power, he terms as 'domination', in that, it is the capability to secure outcomes which depends upon the action of others, that is a power over others.

Hence, Giddens associates power with capabilities and does not imply the existence of conflict through the concept of power. He argues that the concept of interest relates directly to conflict and solidarity and not that of power; and the two are only linked in that power is linked to the pursuance of interest and if these interests are not congruent between the actors, then conflic is brought into existence. Therefore, power is an element of interaction, but conflict is not necessarily an element.

Giddens argues that the use of power in interaction can be understood through the resources or facilities that an actor mobilises as elements of its production; thereby directing its course. These resources include the skills which constitute the interaction as meaningful, authoritarian and forceful to name a few.

Giddens therefore concludes that:-

> "the creation of frames of meaning occurs as the mediation of
> practical activities, and in terms of differentials of power
> which actors are able to bring to bear .... The reflexive
> elaboration of frames of meaning is characteristically
> unbalanced in relation to possession of power, whether this be
> a result of the superior linguistic skills ....; the possession
> of relevant types of 'technical knowledge', the mobilisation of
> authority or 'force' etc."

(Giddens, 1976 : 113)

The communication of meaning in interaction involves the use of an

interpretative scheme which draws from 'mutual knowledge' - that is,

the 'taken-for-granted' part of their reality which enable actors to

make sense of actions and words. This represents a cognitive order

of the organisation which is re-created in its use. The use of

power in interaction provides the facilities to influence outcomes

by affecting the conduct of others - in this way the order of

domination is utilised and reproduced. In the same manner, the

moral order of interaction involves the use of norms which draw from

the legitimate order and in its use, reproduce this legitimate

order.

This system produces structuration and the most deeply-layered

structures explain the 'institutions' or the 'frame-work' of the

organisation; actors create and re-create the structures which form

the patterns of interaction, ie. the carriers of the rules and

resources-structures (Riley, 1983 : 415)

The use of case-study research raises the issue of the

transformation of common-sense thinking to the status of theory. In

this transformation, a central problem concerns how an external

observer can gain knowledge of the intentions and meanings of social

actors. Verstehen, according to Schutz, is first of all the name of

a complex process by which we interpret our everyday lives and those

with whom we interact.

".... Verstehen represents the first level constructs
upon which the second level constructs of the social
sciences have to be erected, but the second level
constructs must always include and refer back to the
subjective meanings an action has for the actor".
(Schutz 1972)

In this way, the level of analysis is elevated from that of

description to one of conceptualisation to further understanding and

explanation. The first level constructs of description are

contained in chapters 2 to 3 and chapters 4, 5, 6 and 7 provide the

second level constructs that are derived from the first levels and

are continually referenced back to the descriptions provided.

Our methodological perspective which seeks to operationalise the

above process is the Grounded Theory approach of Glaser and Strauss

(1967).

".... The approach offers a practical guide to the
generation of theory from data : theory is grounded
to the extent that it is based on and emerges from
the data, systematically obtained from social
research. Theory is thus inductively developed from
data and is said to be "discovered", a term that
emphasises the idea that theory originates from the
data and should be worked out in relation to the
data. The primacy of the data is stressed because
it captures and depicts the essential characteristics

of an area of enquiry. Any ideas not contained in
the data or not developed in the context of the
data detract from the power of a theory by
distorting the underlying patterns of the data. This
is because the essential relationship between data
and theory is a conceptual code, in which the code
conceptualises the underlying pattern of a set of
empirical indicators within the data".
            (Colville 1981 : 125).

As acknowledged by Glaser and Strauss:

".....the root sources of all significant theorising
are the sensitive insights of the observer himself"
        (Glaser and Strauss 1967 : 251)

However, as stated above, it is insights based upon the data which

has been systematically obtained and the problems of ethnocentrism

(see section 3) overcome by adopting a rigorous approach to research

which refers findings back to the social actors to clarify

understandings and explanations. In this way, an understanding of a

"temporal-spatial" reality, as depicted in Figure 1.3, can be

constructed. By constant referring back to the social actor then it

is possible to introduce a critical perspective of the reality so

constructed. The critical perspective is introduced by bringing to

the social actors consciousness the models that dominate and

penetrate their thoughts and actions and by the analysis of the

descriptions of reality by the processes outlined in chapters 5, 6

and 7 to suggest alternative models.

1.3.3   Classical Approach of Scientific Investigations

The objectives of research, in general, might be said to be one or

more : of description; explanation and prediction.

These objectives are common to both the "scientific" and the
"naturalistic" modes of research, but a difference of emphasis
exists with the scientific emphasis being on explanation which will
then be useful for prediction purposes, whereas naturalism places
emphasis on explanation and description to answer the question
'why', which can then be harnessed into control, produce action for
change and predict.

As indicted in section 1.1., the majority of accounting research
strive to be undertaken as "scientific investigations". Tomkins and
Groves (1983) describe these "scientific investigations" in Figure
1.4.

	FIRSTLY	THEORY FORMULATION
	↓	
	SECONDLY	RESEARCH PROBLEM
	↓	
→THIRDLY	HYPOTHESIS
	↓	
FOURTHLY	DEPENDENT AND INDEPENDENT
RE-FORMULATION		VARIABLES ARE IDENTIFIED
	↓	
FIFTHLY	HIGHLY STRUCTURED DATA COLLECTION
	↓	
—SIXTHLY	MATHEMATICAL OR STATISTICAL TECHNIQUES
		VALIDATION OF THE HYPOTHESIS
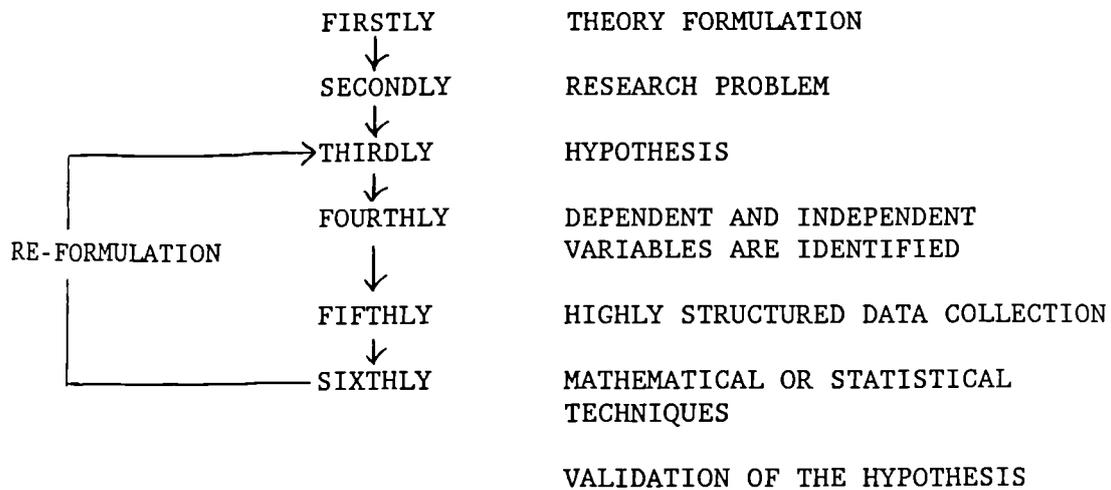
Figure 1.4 : Classical Approach to Scientific Investigations

Tomkins and Groves (1983) have described a classical approach to scientific investigations which involves a deductive process based on a measurement of observable propositions. The process, as highlighted in figure 1.3 is described as being based on logical deduction, however, researchers recognise that, in practice, the process is more complex and sometimes involves intuitive leaps from observation to reformulation. (Tricker, 1979 : 10).

A normative description of the scientific process starts from the existing body of knowledge (Theory Formulation) from which a hypothesis is formulated. The researcher then experiments, tests, observes, collects facts to test the hypothesis formulated. If it proves false, then the researcher goes back and reformulates the hypothesis. When he has performed the rigors of falsification, the new theory should become part of the body of knowledge, supplementing or replacing existing theory. The scientific process requires precise boundaries. The significant variables must be recognised and the researcher will endeavour to hold all constant except the one under study (Tricker, 1979 : 10).

Tomkins and Groves (1983) argue that this emphasis on "scientific investigations" has led to the "schism" which exists between accounting research and practice (see Section 1.1).

The report of the 1977-1978 "Schism" Committee of the American Accounting Association explored the charge that one of the causes of the "perceived schism" between practising accountants and academic accountants was the irrelevance of the bulk of published accounting research to the practice of accounting. The "schism" committee also criticised the elaborate statistical techniques utilised in accounting research. As Scapens (1983) argues, the major attraction of an economic framework coupled with its postulate of profit maximising objective was that it permitted rigorous mathematical analysis of management accounting problems. This provided academic respectability in view of the dominant paradigm of academic/scientific school of thought. But its practical usefulness was never questioned. The accounting theory texts are almost entirely devoted to "what ought to be".

The Rochester School of Accounting (1976) would argue that the 'Schism' exists due to the unscientific approaches adopted due to the focus on normative research. The Rochester School believe that by concentrating on 'positive' empirical science the "Schism" would be narrowed. Blumer (1978), arguing on the issue of positivism, states that this "scientific research" enables the scholar to remain unconcerned that he has little direct familiarity with the sphere of life being studied. Hence, this 'conventional scientific model' has been questioned on the validity of the model for understanding social behaviour : that is, on the ontological, methodological and epistemological assumptions upon which it is based.

Tomkins and Groves argue that the accounting schism between practice and research can be narrowed by adopting 'naturalistic' modes of enquiry that seek to describe and explain present-day accounting practices as seen by the actors themselves.

1.4 RESEARCH METHODS

This section seeks to describe the variety of research methods utilised throughout the different phases of the research.

1.4.1   The Different Stages in the Genesis, and Conduct of this Project

In an attempt to respond to the criticism of the theory-practice gap a meeting was arranged between the Sheffield Committee of the Institute of Cost and Management Accountants (ICMA) and the accounting group in the University of Sheffield. One of the outcomes of that meeting was that an invitation was given by the Administration Director of the North Derbyshire Area of the National Coal Board (now known as British Coal) to visit the area. Following a series of discussions with academic colleagues about a possible research project the visit took place.

The researchers were seeking to create a research project involving close collaborative work with management in an interpretative and action framework.

The following statement was drawn up:-

> **"July 2nd 1982**
>
> A research project on management control in the N.D. Area is to be undertaken in the summer of 1982 by a small group of academics from Universities of Sheffield, Lancaster, East Anglia and the Manchester Business School.
>
> The research group was formed several years ago in response to a belief that research is needed upon the general issue of control in organisations as a task of managing, to be complementary to the more traditional discipline based approaches.

The team will conduct a study of the control processes through examination of formal documentation and by holding discussions with some members of the management. All discussions will be confidential and opinions will not be attributed to any individuals.

The output of the research will be a first description of the process of management control in the N.D. Area with a commentary. The purpose of this output is to provide some reflections upon current processes and to focus upon areas of further study".

Certain constraints were imposed upon the above statements:-

-   Investigation to be confined to the management team in the

    Area, that is we would not have any contact with any of the

    trade unions or with the Headquarters of the NCB.

-   Agreement that we would not research decisions and procedures

    relating to the closure of collieries.

Appendix 1 lists the managers interviewed during the 'first phase'

of the research (see section 1.4.2.) and the documentation received

and studied during this phase is listed in Appendix 2.   The

semi-structured interview schedule is given in Appendix 3.

Relating to the documentation received which was fairly extensive in

terms of describing the techniques of control utilised by the NCB.

At that time (the time of the first phase of research : Summer

1982), the government had invited the Monopolies and Mergers

Commission (MMC) to conduct an investigation of the NCB.

The work conducted during the Summer of 1982 provided a detailed description of the management control systems within the North Derbyshire area of the NCB. This work was further developed, by the same team, during the Summer of 1983 during which time a detailed review of the processes of accounting and accountability both at the area level and at several specific collieries was undertaken. The review of the processes utilised also included an assessment of the degree to which financial thinking had permeated down to the production units, that is collieries. The research methods adopted are outlined in section 1.4.2.

The research findings highlighted the need to extend the research studies into the whole organisation of the Coal Board. Several themes were emerging, for example; a comparative study of control and accounting in coal industries in other countries; a study of the social and political context of the industries.

The Industrial Dispute of 1984/85 curtailed the research project and future contact with the Industry. Certain of the financial rationales relating to the Industrial Dispute are contained in Berry et al, 1985.

1.4.2   The Research Methods Adopted At the First Two Phases of the Research

A: Phase One : Summer 1982

The research strategy during the first phase was to gain some credibility with the NCB and to provide a background for further research by understanding the actual accounting and control processes in the NCB.

Primary data collection methods utilised were documents and records (see Appendix Two); a series of interviews with a variety of members of the management teams at the Area Office, individual pits and with individual members of the area accounting staff (see Appendix One and Three).

Later, the above data was augmented with a series of interviews with accountants, planners, marketing and industrial relations personnel at Regional and National levels (see Appendix One and Three).

The aim of the interviewing stage was to interview a cross section of the NCB Area Managers to solicit three types of information, firstly, specific information on careers, positions, structures and control; secondly, information on orientations, attitudes and organisational cultures and thirdly, and perhaps most importantly a managerial perception of how planning and control generally operated and particularly the operating and capital budgeting process.
The method adopted for the interviews was that of a semi-structured interview process. An example of the semi-structured interview schedule is given in Appendix Three. The questions were intended as a guide and checklist, but the final line of questioning lay with the skill and judgement of the interviewer.

These interviews were based upon an interview protocol. The team tried to have three members present at all interviews in order to ensure adequate coverage, to follow interesting leads, to enable comprehensive notes to be taken and to enable notes to be compared in order to produce a sufficiently accurate record of the responses of the interviewee.

The primary task of this phase of the research was to describe the

process of accountability from the coal face management to as high

up the organisation as possible. By describing these processes, it

was possible to, firstly, gain a deeper understanding of 'social

realities' within organisations, namely the NCB; secondly,

understand how these 'social realities' impinge upon the use and

design of accounting information systems in order that accounting

can make a much needed contribution to society and thirdly provide

evidence to support Burrage's (1970) hypothesis that public

corporations are moving along the normative - imperative continuum

towards the imperative form of organisation, and the implications of

this on the use and design of accounting information systems.

The primary research methods used were interviews and observations.

Observations of monthly and quarterly accountability meetings at six

collieries; a full set and cycle of accountability meetings within

each of these collieries; "shadowing" managers and supervisors

during their normal day underground and overground; a series of

interviews at one colliery to check on the accuracy of observations;

interviews at HQ to explore accountability at higher levels; a

meeting between researchers, the six participating colliery

managers, the chief accountant and the area director to discuss

issues raised during 1982 and 1983.

These types of empirical observations are imperative to the use of Grounded Theory. It is only through such observations that a researcher can derive insights into the processes utilised to produce insightful description which provides an accurate explanation about the nature of the social world. For further amplification see section 1.2.1 and 1.3.

These observations allowed the researcher to acquire an intimate knowledge of the behaviour of the mining-line within an area of the NCB. It allowed a recording of "What was happening" within settings where decisions were made and action occurred, by focusing on how the mining-line perceived their worlds; understanding the issues which concerned them and on how accounting has influenced and is influenced by the mining-line.

1.5 SUMMARY OF CHAPTER ONE AND OVERVIEW OF REMAINING CHAPTERS

This research project, within the NCB, was an attempt to respond to the criticism of the theory-practice gap identified in the AAA report (1977). An example of the effect of this gap is the claim by accounting practitioners that accounting research in of little relevance to accounting practice (Tomkins and Groves 1983). Examples of this gap are given in the paper by Coates et al (1983). One of their main conclusions was that:-

> "there appears to be a substantial gap between theory and practice"'
> (Coates et al, 1983 : 280)

The above conclusion resulted from a survey of companies to ascertain the extent of the accounting research-practice gap. It is therefore, necessary to invoke response to this gap and this research project seeks to respond by providing improved understanding of both management and accounting practices in an organisational context.

Section 1.0 outlined the key assumptions utilised in the analysis of organisational practices throughout this research project. These are also key conclusions to the research project : firstly, that management and accounting systems and practices exist in organisational contexts; secondly, that these systems and practices obtain their meaning from the organisational contexts in which they are situated; thirdly, that accounting knowledge and management theory, to-date, has failed to provide adequate descriptions and prescriptions for organisations; and fourthly, the key underlying problem in accounting knowledge and management theory is to do with the ontological assumptions utilised.

Section 1.2 highlighted that accounting knowledge and management theory, to-date, has failed to provide adequate descriptions and hence prescriptions for organisations. The failure to do so, has culminated in the gap highlighted by the AAA report (1977).

Section 1.2.1 explores the steps necessary in furthering our understanding of accounting practice and concludes that the parochialism that exists in management accounting is counter-productive. The way forward lies in utilising naturalistic research with organisation contexts to describe and understand management and accounting practices from the viewpoint of the accountant or user. Section 1.2 argues that the key underlying problem relates to the ontological assumptions utilised in conventional management accounting theory : that of an objective pre-determined reality which creates accounting systems based upon the need for technical control. This conflicts with the social reality created within organisations and creates confusion and contradictions around the accounting systems. Hence, section 1.2 is highlighting the differing ontological assumptions that exist between theory (objective reality) and practice (subjective reality) which gives rise to the theory practice schism.

To further understand how accounting is practised in organisations it is necessary to gain an understanding of how social realities are negotiated and maintained. Section 1.3 outlined the influences and processes that are utilised in creating the underlying ontological assumption utilised in this research project, a "spatial-temporal" reality.

An understanding of this "spatial-temporal" can be effected by the application of grounded theory : theory is grounded to the extent that it is based on and emerges from the data, systematically obtained from social science research. Theory originates from the data and is worked out in relation to the data and is constantly referred back to the data.

This research project is case-study based and seeks to build theory by using grounded theory to provide an understanding of how the "spatial-temporal" reality is created within the North Derbyshire Area of the NCB. Rich descriptions of the area are provided in Chapters 2 and 3 with analysis of the mining-line based reality being provided in chapters 4, 5, 6 and 7 which is constantly referred back to the data.

The context of the research site is outlined in Chapter 2 with the detailed descriptions of the workings of the colliery being provided in Chapter 3. References to these descriptions and contexts are made throughout the thesis. A central argument to this research study being that it is only through rich descriptions of organisational practices will improved understanding of both management and accounting systems be created. This understanding is imperative to ensure an improvement in the teaching, design and practice of both management and accounting.

CHAPTER 2

DESCRIPTIVE CONTEXT - THE NCB AND SOCIETAL CONSIDERATIONS

2.0   INTRODUCTION AND OVERVIEW OF CHAPTER 2.0

2.1   COAL AND THE NCB

2.2   THE ENERGY CONTEXT

     2.2.1   UK COAL RESERVES

     2.2.2   ECONOMIC GROWTH AND ENERGY DEMAND

     2.2.3   COAL PRICES

2.3   GOVERNMENT NCB LINKS : BRITISH-ECONOMY SCENARIO

     2.3.1   FINANCIAL PERFORMANCE OF THE NCB

2.4   ALTERNATIVE ENERGY PATHS : SOCIO-POLITICAL CONTEXT

2.5   SUMMARY

2.0 INTRODUCTION AND OVERVIEW OF CHAPTER TWO

A series of models can be brought into 'play' to describe an organisation. In terms of:-

the NCB it can be described in terms of

An economic environment;

A Socio-political-economic environment.

Each of the above are examples of viable systems in their own right. Each of these characterisations of the NCB may be required for problem-solving in order to maintain the viability of the NCB. Figure 2.1 can be interpreted as providing a description of the NCB as a member company of the World Energy Industry and as such provides possible solutions to the UK and the World energy problems. This is explored in section 2.5; the socio-political economic context. A context which has not yet impacted upon the management of the NCB, but has future implications.

Figure 2.1 can also be interpreted as providing a description of the NCB as a member company of the World Energy Industry and as such provides a description of the competitiveness amongst alternative sources of energy in the UK and overseas suppliers. Plus the interactions of the UK energy industry with the British economy. This provides a description of the NCB that articulates the concerns of the management : efficiency; technical control; competitiveness; success measured by market parameters, for example, bottom-line profit.

Figure 2.1 : A Model of the UK and World Energy Industry

(From E A Lowe)
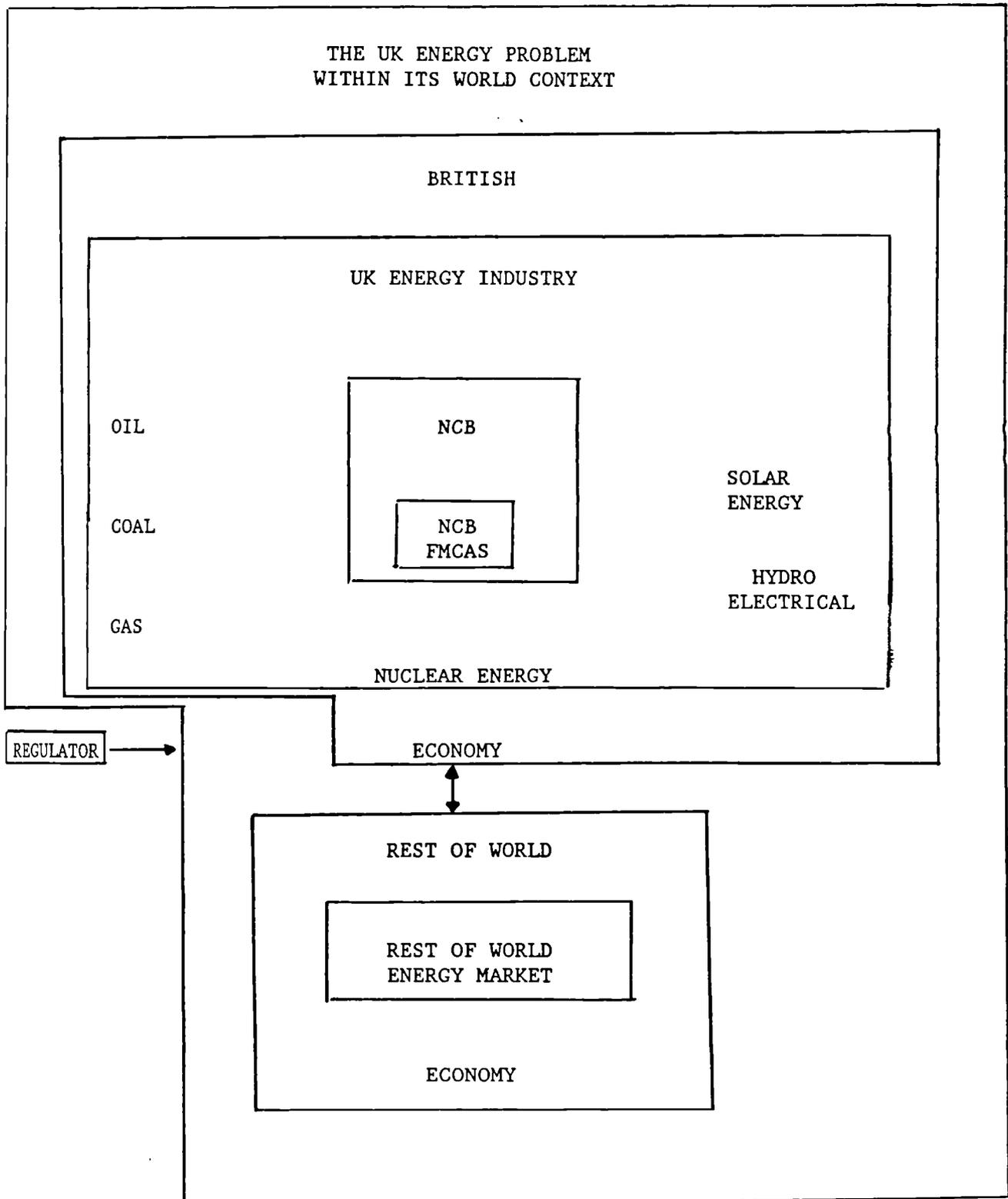
The market or economic model depicts two main systems; firstly, the British Economy and secondly, the 'Rest of the World' economy with the possible interactions between the two. These two main systems and their interaction are main concerns that are frequently articulated by the Area and HQ management of the NCB.

Within the British Economy system, the UK energy industry is depicted as a sub-set : the NCB being a sub-set of this UK energy industry. Section 2.1 concentrates on coal and the NCB. It highlights the differing historical periods that coal has moved through. From periods in which the modern world depended upon coal as the primary and only source of energy to the present-day period in which coal competes, in a four-fuel economy, with gas, oil and nuclear energy. The increasing concerns for efficiency and technical control depicted in the development of the coal industry since nationalisation can be interpreted as a reaction to the interactions of these systems on the NCB : the UK energy industry with its increasing competition and the British Economy with its increasing emphasis on market forces and bottom line profit. These factors are all felt by and articulated by the mining-community.

Section 2.2 outlines the interactions of the UK energy industry on the coal industry. Section 2.2 demonstrates, briefly, the tensions that are present in the use of energy and the uncertainty that surrounds the position of coal in the UK economy. This is magnified by the failure of the present day Government to present an overt policy.

Section 2.1 outlines the various plans that the NCB management have
compiled to manage the future investment, given the long-lead times,
required in an extraction industry. Plans that in 1959 recognised the
need for contraction and rationalisation due to increasing competition.
The long-term strategy emphasised cost reduction, to increase coal's
competitiveness and this was to be pursued by concentrating on the more
efficient collieries and faces. Hence, a concern with efficiency and
effectiveness arose that created changes to structure and organisation
systems. Bringing the introduction of technical control oriented systems.

However, the 1973 energy crises saw the coal industry embarking upon the
1974 Plan for Coal which re-asserted coal as a vital primary fuel and a
major investment programme was instigated. However, due to the long-lead
times required in an extraction industry, the NCB could not respond
quickly enough to provide a solution to this energy crisis. By the time
the investment programme started to impact, the UK economy was in
recession and the demand for coal had fallen. This saw the Government in
1979 adopting a more financial oriented approach to the NCB and
instituted external financing limits. This failure to recognise a
long-term energy policy entails clear ramifications for the NCB
management.

Section 2.2.1; 2.2.2 and 2.2.3 deals with the complexity involved in
predicting energy and coal demand into the year 2000. Demand
calculations that are required not just at UK level, but at world level
due to the depleting energy resource problem and the long-lead times
required for investment. All resources need to be identified; in the
present market based economies of the Western World only those reserves
that are economical will be recovered. This raises issues on the price

of coal which is explored in 2.2.3 and the interaction with 'the Rest of the World' energy markets. The short-term impact of overseas competition is managed by the NCB and is a concern articulated by management. Increasing pressures on productivity and costs are one reaction to the competitiveness of oversea suppliers of coal from, for example, Germany and Polland. Providing increasing pressures on the "uneconomic trail" of the NCB.

Throughout section 2.1 and 2.2, examples have been given as to how the NCB reacts to increasing government pressures and the British Economy, for example, recession. Section 2.3 outlines the British Economy scenario in which the NCB has to work and be 'successful' as measured by the present-day accepted economic parameters, that is, bottom-line profit.

These economic based models outline the concerns of the NCB management, however, section 2.4 describes the Socio-political economic model that is contained within figure 2.1. The world must cope with the problem of energy depletion, but at the same time it must maintain socio-political stability. Section 2.4 outlines two paths that can be taken in the future evolution of the energy system : the soft path which advocates the exploitation and exploration of "regionally available energy" which are very efficient in satisfying end user demands or the hard path that provides for 'world-wide' supplies of energy. These paths are not concerns yet internalised with the management of the NCB, but will have future implications on all energy related industries in the next decade. Section 2.4 depicts the increasing complexities that are yet to be faced by the energy industry.

2.1 COAL AND THE NCB

This research thesis is a case-study based in a deep-mining area of the NCB : its product being the extraction and production of coal.

Coal has been the foundation of the modern world; it powered the Industrial Revolution and provided domestic energy for the newly created sprawling cities. As P James comments:-

> "..... The mines from which it was won made vast fortunes for their owners and employed millions who - with their families - handled the political and social development of their nations".
> (P. James 1982 : 228)

But as James (1982) highlights, this foundation for the social and political development of the modern world had its price. A high price in the number of miners lives which have been lost over the centuries in "turning the coal". Environmental costs were high, with landscapes scarred by waste tips and in the cities grime and dirt blanketed the buildings causing bronchitis and respiratory conditions. Costs which the National Coal Board has radically reduced since nationalisation, although environmental considerations cause bitter opposition for the NCB's plans for new mines, eg. Selby. James comments that:-

> "This opposition will become, more rather than less, intense and will, at best, create extra costs for the NCB as stringent environmental conditions are attached to mining approvals and, at worst, completely prevent the opening of some new capacity".

However, these environmental costs ensured that when alternative energy

sources became available non-economic factors reinforced their

attractiveness. As James comments:

>"Thus, in the twentieth century, coal lost all of its
>traditional markets except for metallurgical coke and was
>only saved from virtual extinction by the rapid growth
>of electricity generation".
>   (P James, 1982 : 228)

Between 1950 and 1973 other energy industries, oil and gas enjoyed rapid

expansion whilst the production of coal fell dramatically in the UK from

223.6 mt in 1957 to 124.4 mt in 1979.

Up until the 14th July 1946, the extraction and production of coal was

privately owned. On July 14th 1946, the British Coal Industry was taken

into public ownership.

The nationalisation of the industry was seen as the inevitable solution

to the problems of the industry which had manifested themselves during

the Second World War (Arnot R.P. 1949; Hall 1981; Fine et al. 1982).

The Nationalisation Act charged the Board of the NCB with the duties of,

firstly, working and getting coal in Great Britain; secondly, securing

the efficient development of the coal mining industry and thirdly, making

supplies of coal available of such qualities and sizes, in such

quantities and at such prices as might seems to it best calculated to

further the public interest in all respects.

Its objectives also covered the maintenance of safety, health and welfare

of employees and to gain the benefit of the practical knowledge and

experience of its workers. Its financial objective was one of

breaking-even after payments to the Exchequer for redeeming debt, paying

interest and establishing a reserve fund "on an average of good and bad

years". (MMC Report, 1983).

On Nationalisation, two main problems confronted the NCB : the short-term problem of a major coal shortage and the longer-term problem, relating to the effectiveness and efficiency of the extraction process.

Several official enquiries in the inter-war years and after (for example, Reid : 1945) indicated that the British coal industry, compared with its European competitors, exhibited low labour productivity, minimal capital investment, obsolete technology, poor working conditions and poor industrial relations.

The Board tackled the long-term problems of the industry through the creation of a co-ordinated national plan for the industry which addressed three main areas. The reconstruction of old pits and sinking new ones; forecasting the demand for coal and settling a long-term policy for prices; wages and welfare.

The first Plan for Coal, 1950, attempted to discover the most efficient size and shape of the industry over the next 15 years. It laid the foundations for future plans and workings of collieries. It was superseded by the 1956 Plan, 'Investing for Coal', the object of which was to achieve substantial increases in the industry's productivity and set in motion the 'factors of expansion'. The solutions to the production problems entailed changes in machinery; this mechanisation policy strengthened during the 1960's was coupled with a contraction of the industry as outlined in the 1959 'Revised Plan for Coal'. The objective behind the 1959 Plan was to rationalise the industry in order that it would be more compact, more efficient and more able to compete with alternative fuels. The long-term strategy switched from volume of production to one of cost reduction, to increase coal's competitiveness, by concentrating on the more efficient collieries and coal faces.

These changes in technology and economic conditions also resulted in changes in the organisation structure. The form of organisation adopted by the Board was one of "line-staff". This philosophy still exists today, but the organisation structure has been modified.

The line, was and still is, the dominant core of the industry and relates to the mining aspects of the organisation (Fig. 2.2). The staff functions include Finance, Marketing, Industrial Relations, Manpower and Welfare. This organisation structure corresponds to the 'orderly, functional groups' found within the nationalised industries as opposed to the more 'muddled' structure of the capitalist economy and represents the influence that the military forces had on the design of nationalised organisation structures due to the fact that up to Nationalisation, the only organisations under the auspices of the government were military ones.

Board

↓

Divisional Board

↓

Area Managers

↓

Colliery Managers
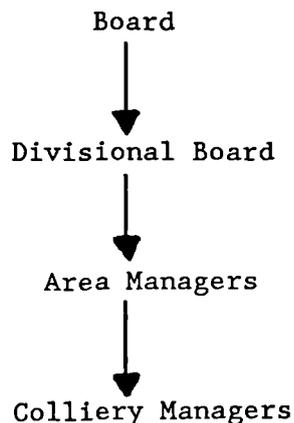
Fig. (2.2) : The Original "spine of command" of the NCB.

During the first ten years of Nationalisation, the Board commissioned the

Fleck Report (1955) to advise on the organisation structure of the NCB.

In brief, the Fleck committee agreed with the basic philosophy of

"line-staff", but recommended certain changes within the philosophy.   One

of these changes related to the concept of 'decentralisation'.

The Fleck Report was of the opinion that the Board had a 'wrong

conception' of decentralisation and had therefore, failed to enforce

policy decisions in the desire not to interfere with day-to-day

management.   They referred to the 1948 Annual Report to support their

argument.

> "The Board felt that it would be wrong to force the
> adoption of budgetary control and standard costs on those
> who were reluctant to use them; full weight was given to
> local opinion that in some coalfields it would be
> impracticable to evolve a workable system of standards
> which would be flexible without being cumbersome.   The
> National Board therefore, left it to the Divisional
> Boards to decide whether or not to experiment at this
> stage with budgetary control and standard costs of
> mining operations; and this is one example of the way
> important decisions of management are decentralised
> to the coalfields".
>   (Extract from 1948 NCB Annual Report).

The Fleck Committee's definition of decentralisation was:-

> "..... that each level of management specifies clearly
> the powers which may be exercised by the level below
> it.   Having done so, it leaves the lower formation free
> to examine these powers.   But each level of management
> must see that the policies which it lays down are
> punctually and effectively carried out by the level of
> management below it .... This should be done, not
> by interference in detailed day-to-day matters, but
> by modern management techniques of approved programmes
> followed by periodical reports and reviews of progress
> and by physical inspections".

The Fleck Report recommended precise and firm clarification of

decentralisation, as defined by the Committee; the setting up of and use

of standards of performance; and the use of organisation and methods to

investigate informational needs : the Committee's opinion was that too

much information was generated within the NCB.

The above account presents the beginnings of the present-day

'Accountability' system which was adopted throughout the NCB.   The 1956

Annual Report commented upon the use of Responsibility Accounting in the

form of a Standard Costing System, covering operational revenue, and

Budgetary Control Systems, covering non-operational revenue.   Tighter

capital controls were instigated through the emphasis on individual

proposals and planned maintenance was introduced to aid in decreasing the

number of face-machine delays.   These changes both in 1956 and 1967

demonstrated the increasing pressures upon the NCB to deal with issues

concerning efficiency which had taken a more background role due to the

higher obligations of 'public interest' which were entrusted to the NCB

on nationalisation.

1967 saw the NCB undergoing a complete administrative re-organisation

partly due to the massive closure programme, but also because of the need

to rationalise the organisation in the search for efficiency.

The line-staff philosophy was retained, but the 5 tier organisation

structure was replaced by the present-day 3 tier organisation structure.

The three tier structure is outlined in figure 2.3.

Board

|
▼

Area

|
▼
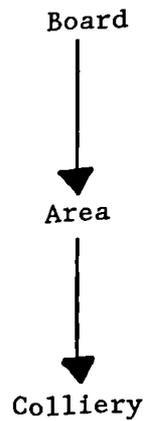
Colliery

Figure 2.3 : Three Tier Structure

Each area was, and still is now, headed by an Area Director who is directly accountable to the Board for achieving the objectives laid down for the Area and its collieries. The responsibilities and accountabilities of the Area are outlined in section 3.1. At the same time, a Management By Objectives (MBO) system was implemented; the Board saw the objective of the MBO system as being a method to improve business management throughout the industry.

In the 1970's, the NCB adopted a systems engineering approach to technological planning and development (Burns, Newby, Winterton, 1984), as outlined in Chapter 4. This approach is seen as a phase of automation with the emphasis on management's ability to obtain information on all aspects of the mining activity and the use of this information to supervise and control mining activities, described in Chapter 3.2.2. According to Burns et al:

"Technology is taken here to mean the organisation of work
around particular technical solutions to problems. In this
view of technology, the design of machinery and design of ·
work organisation are all part of the process of organising
the method of production ".
                    (Burns et al 1984 : 2)

As Burns et al. (1984) state the new mining systems are designed around a

view of work which ignores autonomy and decision-making for the

work-force and a view of the organisation structure which places 'power

and control' at the top-most levels of the hierarchy.

This automation programme is being implemented through MINOS (Mine

Operation Systems) (see 3.2.2.) which is hierarchical and highly

centralised, designed to bring information from the lowest level of

activity immediately to the highest levels of management, and to remove

control and decision-making to the highest levels of management.

Along with MINOS, FIDO (Face Information Digested Online) is being

developed with the objective to remove the "lost time". FIDO gathers

information about the activities at the face and reports them to the

control room, located on the colliery surface, and in theory gives

valuable control information to the management through the secondary

management computer. The function of FIDO is to identify delays in coal

cutting, to note the delay, its cause and duration. The NCB would argue

that FIDO's primary purpose is to supervise in order to reduce "lost

time", its effect to increase machine running time, managerial control

and to intensify work (Burns et al. 1984).

In the past two decades, since 1967, considerable effort has been devoted

to the development of suitable techniques to measure economic

performance, in search of monitoring efficiency, and 'moral'

responsibilities have been divorced from normal activities. At the same

time, the autonomy of public corporations has decreased as Burrage

comments:-

"Executive intervention by the responsible Minister has tended
to increase (Munby 1962; Thornhill 1968: 64-65; SCNI 1967-68: 32).
The Treasury has assumed greater control over their finances
(SCNI 1967-8: 1-38), and the opportunities for members of
Parliament to question, investigate and debate the activities of
the corporations have significantly increased, most noticeably
by the establishment of a Select Committee on the Nationalised
Industries (Hanson 1961: 114-146; Thornhill 1968: 53-74)
            (Burrage 1970: 267)

The NCB, since Nationalisation, has undergone many changes as

demonstrated in this section. The 1959 "Revised Plan for Coal" committed

the industry to a run-down of facilities which was supported through

several government Publications and Acts of Parliament on nationalised

and fuel industries in 1961; 1965; 1967; 1971; 1973. However, the 1970's

saw a 'change in fate' due to the Energy crisis in 1973/4. The coal

producers warned of the forthcoming oil crisis in 1973, but few listened

and the industrial plans of the UK economy reflected the reliance on the

limitless supplies of cheap energy which the middle Eastern oil

reservoirs represented. The 1974 and 1977 Plans for Coal re-asserted

coal's position as a vital primary fuel and a major investment programme

was instigated. However, by the late 1970's the situation had been

reversed (further outlined in section 2.2).

The W.O.C.O.L. (1980) study reinforced the vital role to be played by coal. However, the Government in 1979 adopted a more financially oriented approach and instituted a tight external financing limit (EFLs) as described in the energy scenario section 2.2. This situation is set against a background of recession in which the demand for coal has decreased coupled with the profit oriented objective. Thus increased pressures are placed on the issue of the "uneconomic tail" of the NCB.

2.2 The Energy Context

The UK is basically a "four-fuel" economy based on oil, natural gas, coal and nuclear energy. This "four-fuel" economy was strengthened by decisions taken after the 1973-1974 energy crisis. Before this oil crisis, coal had been utilised as a secondary source in relation to oil, and the industry had been run down in terms of investment and operating reserves, as indicated in section 2.1.

The energy crisis was precipitated by the Yom Kippur War of 1973 which resulted in an Arab embargo on oil supplies to some Western countries and OPEC's quadrupling of prices. This energy crisis, as it is termed, forced the UK Government of the day into adapting its energy policy. The decisions taken involved the endorsement of a programme of investment to re-generate and expand the coal industry, as specified in the Plan for Coal 1974; the taking of powers to control the development of the UK's off-shore oil resources in the national interest and to secure for the nation an appropriate return from their exploration; a 4,000 MW programme of nuclear power based on the Steam Generating Heavy Water Reactor and an initial programme for the conservation of energy.

James (1982) highlights the dramatic changes in the fortunes of the world coal industry which took place during the mid-1970's and argues that it is almost unique in economic history:

> "Coal is not the only growth industry of one year to become the laggard of the next, only to be revitalised again by changing market conditions - but it is by far the largest".
>   (P James, 1982 : 229)

The coal industry was expected to respond to this energy crisis quickly despite its long-lead times which are a feature of deep-mining. Hence, the coal expansion of the 1970s did not occur as rapidly as expected. Set-backs in other energy industries were also occurring. Oil and gas prices were remaining high and supplies were subject to disruptions for political reasons. James (1982) points out that public opposition to nuclear power slowed construction programmes and in some countries stopped new buildings. Renewable energy sources were still some years from full commercialisation and the majority belief was that these would never evolve into a major energy source. Therefore, by the end of the seventies, coal was seen as the only energy source whose output could grow sufficiently quickly to meet the anticipated deficiencies in energy supply. It was also recognised that to meet these objectives the coal industry would require substantial political and economic support. James comments:

> "..... Notable decisions to provide this support were made by Western leaders at their 1980 summit conference, the Communist states in the COMECON discussions and national plans, and the World Bank with regard to its lending for coal projects in Third World nations".
> (P James 1982 : 230)

The above four decisions supported by the UK government after the 1973 energy crisis, are subject to ambiguity and conflict. During 1984/85, the coal industry was subjected to an industrial relations conflict over pit closures and a union directive to return to the programme outlined in the 1974 Plan for Coal. The use of the UK oil reserves, in the national interest, has been and still is, an issue which causes concern. The position of nuclear energy has caused conflict both on economic grounds; in that actual costs are higher than recorded and on ecological grounds. The use of an energy conservation programme or energy management (for an outline of energy management see Beveridge (1980)) is a controversial area. This demonstrates the tensions which are present in the use of energy and the uncertainty that surrounds the position of coal in the UK economy which is magnified due to the failure of the Government to present an overt energy policy. Failure to recognise a long-term energy policy entails clear ramifications for the management of the NCB.

2.2.1   **UK Coal Reserves**

In discussing primary energy, a distinction needs to be made between "resources" and "reserves"; based on McKelvey's classification; reserves, are geologically and geographically identified resources that are economically and technically recoverable and producible under present conditions or under conditions that are expected to prevail in the near future.

Resources can be of two types : identified, that are presently considered non-producible for economic reasons and unidentified, these are portions of a given resource that are not identified, but surmised to exist.

The comparisons between reserves and resources are highlighted in

Table 2.1

	Reserves	Resources
Interest In	Large (due to the need to plan industrial production).	None in the past, now emerging.
Time Horizon	10 - 30 years	Long or Very Long Term.
Economic Aspect	Must be profitable.	Non-Profitable today, "Science-Fiction" technology.
Estimated by	Industry	Industrial or Governmental Institutions.
Data	More or less reliable.	Uncertain or Speculative, but Scientifically Orientated.
Methods	Industrial Work (expensive) exploration, drilling and measurements.	Paper or computer work "geological" "historical" and so forth.

Table 2.1 : Comparison of Reserves Versus Resources : Source IIASA

The W.O.C.O.L. Report (1980) provides one of the most comprehensive forecasts of major coal expansion. The Report of the World Coal Study Group included contributions from coal producers, coal users and governments from OECD and other countries. For each member country, the Report considers two scenarios. Scenario one which is "high coal" (in terms of "trebling" of coal demand in year 2000), in which world energy demand grows at 2.5 per cent per annum. Scenario Two which is "low coal" (in terms of coal demand "doubling" in year 2000), in which world energy demand grows at 1.7 per cent per annum.

These figures represent a doubling of coal demand to the year 2000 in the low coal case and a trebling of demand in the high coal case. The W.O.C.O.L. report argues strongly that these demand figures can be supplied as the World coal reserves are enormous and that the technologies of production and transport generally well-proven and readily available. In summary, the Report portrayed coal as being "a bridge to the future", which could provide most of the world's incremental energy needs to the twenty-first century without requiring any fundamental change in existing energy, economic or political systems.

However, the W.O.C.O.L. Report has been extensively criticised on methodological grounds, James comments:

"..... particularly the fact that the national forecasts
on which it is based make different assumptions as to
the future course of world oil prices, and the resulting
income and substitution effects - and because it
forecasts an end which is clearly desired by its members
and proceeds to "prove" that this can be achieved.
Nevertheless, in the early 1980's, its projections are
likely to be justified, as coal production and use
rises rapidly as a result of high oil prices...... However,

in the medium-long term, many of the assumptions and
arguments contained in the W.O.C.O.L. Report are open to
serious question".
(P James, 1982 : 231)

Three major ways are advocated for increasing reserves; firstly, by

raising the price. Previously uneconomical deposits may then become

viable/profitable. However, the supply and price of energy in the

world is determined largely by the price of OPEC oil. In the case

of coal, the British Industry could not increase reserves in this

manner, the NCB does not exist as a monopoly power in either the

supply of coal or the supply of energy. It is constrained by

internationally traded prices. Secondly, by improving the

technology or developing new technologies. The IIASA projection

(1977) points to the success of underground coal gasification which

could increase global coal reserves. It is advocated that often,

raising the price and improving a developing technology act jointly

to increase reserves. Thirdly, by discovery, such that resources

are transferred to reserves.

The main criteria for reserves is that they are economically

recoverable, that is, profitable. The criteria for determining

profitability is determined by the industry itself. This in itself

can lead to conflict and tensions and the exploration of reserves

which are not in the National Interest. To manage energy, a

coherent energy policy is necessary; the UK has no such energy

policy, the last policy was the 1979 green paper. IIASA (1977) is

of the opinion that the above criteria, on profitability, should be,

and in the USA is being revised from a National viewpoint (ie. from

the USA in total, rather than at company level).

James (1982) outlines the difficulties involved in energy
forecasting due to the complexity of the energy markets, the number
of diverse energy products and the number of uncertainties involved.

The W.O.C.O.L. Report forecasts are based on moderate rates of
economic and energy demand growth. Estimates of GNP growth to 2000
for W.O.C.O.L. participating countries range from 2.2 per cent to
4.6 per cent per annum; accompanied by a 25 per cent decline in the
amount of energy used per unit of economic activity. James
highlights that since compilation of the Report in the late 1970's,
the world has endured a major recession which has changed opinions
as to the future levels of economic growth and energy conservation.
Energy conservation is likely to produce greater improvements than
the W.O.C.O.L. Report assumes. Hence, a differing scenario is being
created than the one envisaged in the W.O.C.O.L. Report.

The W.O.C.O.L. Report assumes that coal will successfully compete
with other energy sources - or will replace them - and thereby take
a greater share of the market. Therefore, the W.O.C.O.L. Report
assumed that coal will increasingly take over the role of oil.
James (1982) argues that although a considerable amount of
substitution may occur, its scale may be limited by the effects of
high oil prices in commercialising previously uneconomic oil
supplies. James also argues that during the recession of the 1970s
and the 1980s, the coal industry was unable to react quickly enough
to the short-lived periods of expansion and argues:

"Similar problems may continue to stymie the coal
industry during the next decade".
(P James, 1982 : 233)

2.2.3   Coal Prices

James (1982) argues that the scale of coal expansion to the year

2000 will be primarily determined by its price.

It is argued that in the medium to long term, the more accessible

and easily mined deposits will be exhausted and higher-cost reserves

will be exploited. Therefore, on the supply side of coal, cost

increases, some of which will be substantial, can be expected.

On the demand side, the W.O.C.O.L. Report assumes a classical model

of competition where capacity at each stage of the supply chain

adjusts smoothly to changes in demand and price. Therefore, no room

is left for market imperfections, due to monopoly power or physical

limitations to capacity expansion, or for the resulting economic

rent.

Coal does not capture its total economic rent and it is argued that

if strong energy markets re-emerge with a renewal of economic growth

during the 1980's, pressure could be, and is being, exerted on coal

producers to capture economic rent up to the point where coal just

retains competitiveness with oil in the power generation and heating

markets.

Hence, possible increases in coal prices are part of the above

scenario, but some supply analysts suggest that coal price increases

will be restrained by an abundance of low-cost coal and the

attraction of new suppliers into the market if excess profits are made. Although, if the international market is described by a few suppliers, then the pressures to extract maximum value may be hard to resist.

Hence, James (1982) is pointing to the fact that coal prices have considerable room to rise relative to oil before it loses its competitive edge.

It can be argued that the nearest that we will get to a "hard-path" is the development of an EEC Energy Policy; however, at this point in time there is no explicit energy policy, neither a UK based policy nor an EEC based policy. The nationalised energy industries in the UK seems to be managed as an important part of the public sector borrowing requirement (PSBR) on an 'incremental' basis with the holistic issues of being part of a world energy industry only being addressed in a restricted sense. The UK government has emphasised the importance of controlling interest rates, M3 and the PSBR as means to reduce inflation in order to create and distribute wealth within the framework of a mixed economy. The Government of the day has adopted a framework of a free enterprise economy which uses prices and markets; however, such a framework can only work with state regulation, given the economic and political dynamics and inter-dependencies of the UK system. A framework of analysis must be equally complex and this analysis remains under-researched.

Any nationalised industry is subjected to the contradictions present within the mixed economy. For example; does the nationalised industry simulate private-market behaviour or is it a vehicle for the Government to achieve its goals? Successive governments have changed the roles of nationalisation; one spreading the notion of nationalisation, the next curtailing the public sector involvement. These ambiguities and contradictions serve to emphasise the difficulties surrounding all Nationalised Industries.

The NCB is subject to such uncertainties and the Government of the day, will judge performance - past and present - against their own objectives. Future investment monies and therefore, the future of the industry depends upon these assessments. The Government of the day, having a primary concern with the control of the PSBR has introduced policies such as economic financial limits (EFLs) and privatisation (Jackson, 1982). Recent Acts of Parliament and statements by the Government indicate a concern to reduce output, to concentrate on new facilities, to re-structure the grant and subsidy structure of the NCB and to achieve profitability in the short-term. In the 1983/84 Annual Accounts, this "profitability concept" was replaced by an objective to "maximise profit". This results in the adoption of a "private market economy" model for the coal industry which emphasises the need to manage loss-making capacity either through closure, reduced output or returning to profitability. Investment monies would be channelled into expanding production at low cost units/or reducing the costs of product at any unit. That is, through privatisation and the active use of international competition the present Government has attempted to eliminate the 'uneconomic tail' of the NCB and to match demand and supply.

However, this private-market model emphasises the PSBR interest of the Government and important questions remain unanswered, such as: how are the nation's interests in the security of energy being managed? What happens to the industry's performance when state intervention is required for either social, political or economic reasons? The way in which the NCB has handled the ambiguity and instability of Government objectives is reflected in its working practices, as discussed in subsequent chapters.

2.3.1   <u>Financial Performance of the NCB</u>

If success is measured by the 'bottom line profit' figure, then the NCB would appear to be an unsuccessful industry. The trading loss in 1981/82 was £84.5m and interest and other charges necessitated government grants of £428m to cover the deficit. Together with grants for coke stocking, sales promotion, redundant and transferred miners the total came to £575m from the UK government, and the trend of increasing grants has continued. The figure for 1984/85 is distorted, however, due to the industrial dispute.

Before arriving at a conclusion regarding the above financial performance figures, it is important to recognise the inter-dependence of several of the UK industries. Approximately 70% of coal sales are to the power stations, 5% to British Steel and the vast majority of British Rail's freight trade comes from coal. Hence, any criteria of 'success' must take into consideration these inter-dependencies and the fact that the recognition of profit reflects economic conditions plus bargaining and social considerations at government level.

The poor financial results of the NCB can be explained in several ways, such as unfavorable market conditions, particularly since 1959-1972 (Berkovitz, 1977; Hall, 1981). Fine et al. (1983) take an alternative stance and argue that the decline has been a consequence of financial constraints - particularly on investment which derive from a more or less continuous policy unfavorable to the NCB, but

the intensity of which was variable. Price controls in the 1950s
and a low 'transfer' price for coal to the electricity supply
industry in the 1980s both dramatically reduced revenues. In 1981,
the Conservative Government 'U-turned' on the issue of pit closures.
All of these resulted in financial constraints, and also add to the
argument that it is difficult to conceive of the coal industry in
terms of a commercial market model. The governments of the day,
since 1600, have intervened in the management of the coal industry
(Nef, 1932). Some financial relaxation was given to the industry
during mid 1960s to 1977 through the writing off of some interest
bearing liabilities. It can be argued that the causes are complex
and are a combination of unfavorable policies, as above, difficult
market conditions and inflexibility within the NCB organisation with
its production orientated culture (Berry et al 1985).

2.4 Alternative Energy Paths : Socio-Political-Economic Context

The energy problem is complicated by the fact of "limited substitution of
other fuels", such as solar power, wave energy, and the dynamic nature of
the world. The population is growing, economies are growing and
development requires energy which in terms of conventional energy
supplies (coal, oil, gas) are depleting or the remaining supplies are too
expensive to use. The world must not only cope with the above factors,
but must also attempt to maintain socio-political stability. Hence, the
NCB exists in a socio-political-economic environment that needs to
address the world energy problems.

IIASA and Meadows and Lovins held preliminary discussions in 1976 on the
subject of which concept, that is hard (a scientific/technological
stance), or soft (a socio-political stance) should govern the future
evolution of the energy system. Both parties were in agreement that
major global reliance on conventional oil and gas reserves must be phased
out during the next fifty years. Both parties felt that "plentiful
energy supplies" would still leave many other crucial problems unsolved.
From here, the parties split and each developed two incompatible global
perspectives:

A   Perspective of Meadows and Lovins

Their perspective rests upon the technical and "socio-political"
structure of the energy system. According to this viewpoint, the
socio-political constraints provide the basic starting point in
re-analysing and further modifying the technological system, ie. the
socio-political scenario will determine the preferred technologies.

Meadows and Lovins are of the opinion that no significant political entity will adopt energy policies that rely upon other political entities for its energy supplies.

They also predict that global population will not exceed eight billion people, war, pestilence and famine will follow present cycles. These assumptions are accompanied by a prediction of "massive climate changes". They also feel that changing structures of political blocks will decrease the possibility of future free trade world wide.

Under all the above assumptions, they estimate that a realistic global energy production would be around twice the present current levels. They advocate the exploitation and exploration of "regionally available energy" which are very efficient in satisfying end user demands and are highly resilient and easily de-coupled. This would include the development of small-scale solar applications, wind-power, use of fossil resources, and towards efforts to attain "zero-energy growth" in the wealthier nations. This demonstrates that the use of "soft-technologies" are less vulnerable to social, political or military interference.

Lovins (1977) identifies the soft technologies as:-

> "those that are decentralised - spread throughout man's environment, used and controlled by many individuals - as opposed to the centralised energy technologies such as a large electric power station that is run by relatively few people and that is meant to serve the needs of many people over a hard-wired grid".

Meadows and Lovins argue that reliance on these soft technologies will tend to stabilise the political system due to the fact that small scale conflicts could still exist and these do not automatically lead to escalation. In other words, one lessens the interdependencies of the World Energy Systems in a quite deliberate way.

B Perspectives of IIASA's Energy Systems Program

The IIASA's perspective rests upon the "technical" structure of the energy system. Their objective is to provide the technological possibility to supply ample energy for all ages and thereby eliminate all raw material problems and all environmental problems. IIASA is of the opinion that the first rationale is to identify the features of present and future supply systems capable of providing carrying capacity for man in the billions.

IIASA feel that the "ideal" system should be developed as above and then presented to the political groups and decision-makers as a basis for analysing and weighting the institutional and social problems against the benefits that accompany the extension and evolution of modern energy systems. IIASA are aware of the criticism that their socio-political constraints are too narrow to permit still further development/utilisation of technological possibilities to significantly extend man's material resources.

However, they defend their view-point in that they have adopted a

"Scientific Approach" which must clearly reveal what is at stake

without taking into account socio-political scenarios.

The assumptions behind their "Modern Energy System" are that

according to U.N. population projections, the demographic growth

path of the present four billion people will level-off between

twelve and thirteen billion people. Hence, energy consumption will

grow from the present 1.8 kwyr/yr cap to 3-5 kwyr/yr cap, in

comparison to the Meadows and Lovins assumptions of smaller

population and hence smaller energy consumption. The

inter-relationships between energy supply and the rate of population

growth is not considered. Only the absolute size of the population

is considered to determine the necessary energy product capacities.

IIASA state that some of the present energy systems are already

"hard" and "global" in nature, for example, the Persian Gulf which

is nearly a "point source of energy" which yields 1.7 TWyr/yr across

global distances. IIASA feels that "limiting" our choices to "soft"

energy sources would deprive mankind of many of its cheapest energy

sources, which are limited to only certain areas in the world,

reducing the availability of energy or heavy investment programmes

would have to be developed by those countries that lack rich natural

resources. On these grounds, IIASA argue that world tensions would

not be reduced by soft energy technologies. IIASA also argue that

the development of IIASA's Energy Systems Programme would lead to

international co-operation and economic exchange and they argue that

hard technologies have the capability of adapting to unexpected

disturbances. They point, for instance, to the closure of the Suez

Canal which was followed by the introduction of a new class of oil

tanker which took the route around the Cape of Good Hope.

Meadows and Lovins suggest that "hard" technologies could potentially

damage a nation by the interruption of its energy supplies from

centralised facilities. They argue that this will exacerbate

international tensions and lead to "self-destruction" of the technologies

and the infra-structure originally designed upon the assumption of

international order and altruism.

Hence, in the 'soft' technology scenario, equity and interaction have

strong relationships with the energy problem. Whereas in the 'hard'

technology scenario it is carrying capacity and legacy that dominate.

Table 2.2 summarises the two schools of thought as seen by IIASA.

	SOFT-ENERGY		HARD-ENERGY
FEATURES :	De-centralised, low technology systems harnessing "unconventional" sources of energy that is "energy income based".	FEATURES :	Centralised high technology systems harnessing "conventional" sources of energy, that is "depletable energy capital".
GOAL :	Socio-political stability and long-term energy.	GOAL :	Long-term energy supply for mankind.

Table 2.2 : Summary of Soft-Energy and Hard Energy Characteristics

This hard-soft controversy (see Table 2.2) provides an insight into the

magnitude of the energy problem and its complexities.

2.5 Summary

The concerns presented in this chapter, e.g. the Socio-Political concerns; the British Economy concerns and the energy model concerns highlights the difficulties involved in the conventional separation of the organisation and its environment as outlined in works such as, Lawrence and Lorsch (1967), Thompson (1967). In the study of organisations, the intricate ties of organisations to the larger society and to the everyday activities of people should be recognised and the processes which produce and reconstruct these ties should be subject to inquiry (Benson, 1977). This pre-occupation of conventional studies with organisations as a unit of analysis has been criticised for various omissions, such as, the neglect of society within which the organisation exists, its reification of systems and goals, an over concern with the systems adaptation to external forces and neglect of the internal and external power dynamics and social clan interest and conflicts.

"Conventional organisational analysis accepts organisational definitions of organisational rationality...... In this way the assumptions lying behind such rationality are overlooked, as is the relationship between these rational criteria and sectional or class advantage - or disadvantage. Furthermore, the emphasis on organisation rationality is the main determinant of organisational structure and process - operating to ensure that for a given size, technology, market, product 'environment', etc., an organisation must adopt particular characteristics - removes organisational structure and function from the world of class interest or politics. The problems of organisational analysis - like the problems for organisations themselves - become technical ones".
    (Salaman, 1978, Page 519 - 520).

In terms of the NCB, this chapter has sought to describe the economic model which the members of the NCB articulate : concerns with efficiency; competitiveness, technical control and success. Concerns which are products of interactions with viable systems that exist in the UK and World Energy model, that is, the British Economy; the UK energy

industries and the World economies with their energy industries. As such it provides a description of the intricate ties that exists between the NCB and the larger society : UK and the world as seen by the NCB management. However, it provides an over concern with the systems adaptation to external forces and external power dynamics and neglects the internal power dynamics and social clan interest and conflicts that exist within the NCB and the impact these have had on the systems adaptation. The internal power dynamics and social clan interest and conflicts are described and analysed in chapter 4, 5 and 7.

This chapter has also provided an alternative interpretation to the model depicted in figure 2.1; that of a socio-political-economic model in which the NCB is a member company of the World Energy Industry and as such provides possible solutions to the UK and World Energy problems. Section 2.4 describes the possible two paths that can be taken to solving this problem, the self-sufficient, but socio-politically safe path or the world-based solution, but socio-politically imbalanced. *Section 2.4* depicts the increasing complexities of the energy industry that are yet to be faced by the company members.

The economic model depicted environmental considerations, outlined in section 2.1, for example, stringent environmental conditions being attached to mining approvals. Conditions which could prevent the opening of new capacity. The political considerations impacting the economic model are outlined in section 2.2 and 2.3 and revolve around the issue of economically recoverable reserves, measured by bottom-lime profit and the National Interest.

All of these issues, raises questions as to "How does the NCB perform and manage in a situation of such acute uncertainty"?

CHAPTER 3.0

COLLIERY (OR PIT)

3.0 INTRODUCTION AND OVERVIEW OF CHAPTER;

3.1 A DEEP-MINING AREA OF THE NCB

   3.1.1   THE ACTION PROGRAMME OR BUDGET PHYSICAL PLAN;

   3.1.2   FIDO - FACE INFORMATION DIGESTED ON-LINE;

   3.1.3   IMPACT - IN-BUILT MACHINE PERFORMANCE AND CONDITION TESTING;

   3.1.4   MINOS - MINE OPERATION SYSTEM

   3.1.5   THE ACCOUNTABILITY SYSTEM

3.2 THE FINANCIAL INFORMATION SYSTEM

   3.2.1   BUDGETS

3.3 DAILY PROCESS OF COAL GETTING

3.4 DAY TO DAY CONTROL PROCESSES WITHIN THE COLLIERY

   3.4.1   A DAY IN THE LIFE OF AN UNDER MANAGER

   3.4.2   A DAY IN THE LIFE OF A COLLIERY MANAGER

3.5 SUMMARY

THE CONTEXT OF THE RESEARCH SITE

THE NORTH DERBYSHIRE AREA OF THE NCB

3.0 INTRODUCTION

The findings and descriptions formulated within this research project
relate to the specifics of the North Derbyshire Area of the deep mining
side of the NCB. The information sources and methodology are discussed
in Chapter 1, but are summarised below in order that the reader can
establish the authenticity or status of the descriptions.

The main information sources relate to, firstly a series of
semi-structured interviews during summer 1982 with selected colliery and
area based personnel and HQ personnel. Secondly, a series of
observations of every day colliery-management practices and
accountability meetings between colliery and area, during summer 1983 and
a series of interviews with colliery-management, to discuss issues raised
during the 1982 interviews and the 1983 observations. Coupled with the
documentation provided by the NCB : a great deal of this related to the
Monopolies and Mergers Commission review which took place in the same
Area during 1982.

From these sources, the detailed descriptions contained in this chapter
were formulated. To off-set any ethnocentrism that may creep into such
descriptions a further meeting was arranged after the summer 1983 with
the colliery managers, the Area Director and the Area Chief Accountant to
discuss our main findings and descriptions. The value of such a meeting
may be limited by any fear on the part of the colliery managers of
actively participating without knowing the feelings of the Area Director.

With the permission of the Area Director, the research team was to

organise individual meetings with the colliery managers to establish

their own individual views on the research findings. However, the Strike

of 1984/85 prevented completion of this third phase of the research, but

various opportunities during 1983 and 1984 did provide avenues through

which the descriptions and findings could be discussed such as lectures

and seminars given at the NCB Staff College as part of the NCB General

Management Course.

The descriptions are provided in order than an appreciation can be gained

of the analysis which follows in Chapter 4, 5 and 6. Section 3.1

provides a description of the deep-mining area of the NCB. The

description depicts the deep-mining areas as 'profit centres' with the

accountability system working through the well-defined line-staff

management structure. The deep mining area of the NCB consists of twelve

areas of which North Derbyshire is regarded as being one of the most

efficient. Section 3.1 outlines the age and geology of this area.

The North Derbyshire Area, itself, consists of eleven collieries whose

seams interact with each other. Section 3.1 outlines the primary purpose

of a colliery and describes the three inter-related activities of coal

production : winning the coal from the face; haulage to the surface and

the preparation of coal to produce a marketable product with the

associated systems required to perform these activities : a management

system; a physical and financial control system; a safety system and an

Industrial Relations system.

Section 3.1 recognises that the colliery management are held to account for meeting the planned performance as laid down in the physcial action plan, known as the Action Programme. Section 3.1.1 describes the Action Programme and recognises this document as being the key short-term physical plan of the colliery and that day-to-day controls; in terms of FIDO (Face Information Digested On-line); IMPACT (In-built machine performance and Condition Testing) and Minos (Mine Operating Systems) systems, are implemented to ensure that action is implemented to deliver the plan. These day-to-day controls are described in sections 3.1.2; 3.1.3 and 3.1.4 respectively.

These control systems are implemented to change physcial resources and workings in order to deliver performance in line with the physical plan. the performance of the colliery is reviewed through the Accountability System that works down through the 'line' of the NCB from the Board through to the Colliery. Section 3.1.5 describes the Accountability System. The accountability system that is utilised between the colliery management and the area management is performed through the colliery/area quarterly accountability meetings. Section 3.1.5 focuses on this key meeting utilising sections of transcripts from these meetings to describe the technical nature of these meetings with the decision model that if the physicals are correct then finance automatically falls into place.

Section 3.2 outlines the financial information systems utilised within the colliery and area. The main financial control system being provided by the Budget. Section 3.2.1 describes the Budget as being a static financial evaluation of a rolling eighteen month action programme. Both documents are therefore, utilised to communicate the main objectives, but as tactics change within the action programme then the budget becomes

only a partial description of the physical workings. The objectives and

tactics included within the budget and action programmes during the

research period are discussed in section 3.2.1.

Sections 3.1 and 3.2 describe the physical process and its associated

information systems and control systems both physcial and financial.

Section 3.3 attempts to provide a more dynamic description of how these

physcial processes and information/control systems interact by providing

a detailed schematic of the 'daily process of coal-getting'.

Section 3.4 outlines the day-to-day control processes within the

colliery. All of the systems outlined in sections 3.1; 3.2 and 3.3

depend upon human action and inter-action. Section 3.4.1 and 3.4.2

describe the daily human action and inter-action of two key personnel in

the colliery hierarchy : the Under-Manager and Colliery Manager

respectively. The day-to-day control process surrounding the extraction

processes rests with the Under-Manager and his overman and Deputies. The

overall control processes and accountability rests with the Colliery

Manager.

Section 3.5 provides a summary of the chapter and focuses on the complex

relationship that exists between profit and accountability as described

throughout the chapter. One of the main conclusions to the chapter is

that to understand these complex issues and relationships, an analysis of

the mining-line culture is required. That is a need to move into

understanding how the mining-line create and interpret their social

world.

3.1 A Deep-mining area of the NCB

The NCB comprises four profit centres, as shown in figure 3.1 Coal products; Ancillaries; Open-cast and Deep-mined Coal. The research project is based in a deep-mining area of the NCB

NATIONAL COAL BOARD

| HEAD QUARTERS DEPARTMENTS | | OTHER BOARD FORMATIONS |

| COAL PRODUCTS | ANCILLARIES | DEEP-MINED | OPEN-CAST |

| NCB (COAL PRODUCTS LTD) | NCB (ANCILLARIES) LTD. | DEEP-MINING AREAS | OPEN-CASE EXECUTIVE |

| WHOLLY OWNED SUBSIDIARIES | WHOLLY OWNED SUBSIDIARIES | | REGIONS |

| PARTLY OWNED SUBSIDIARY/ ASSOCIATED COMPANIES | PARTLY OWNED SUBSIDIARY/ ASSOCIATED COMPANIES | COLLIERIES | SITES |
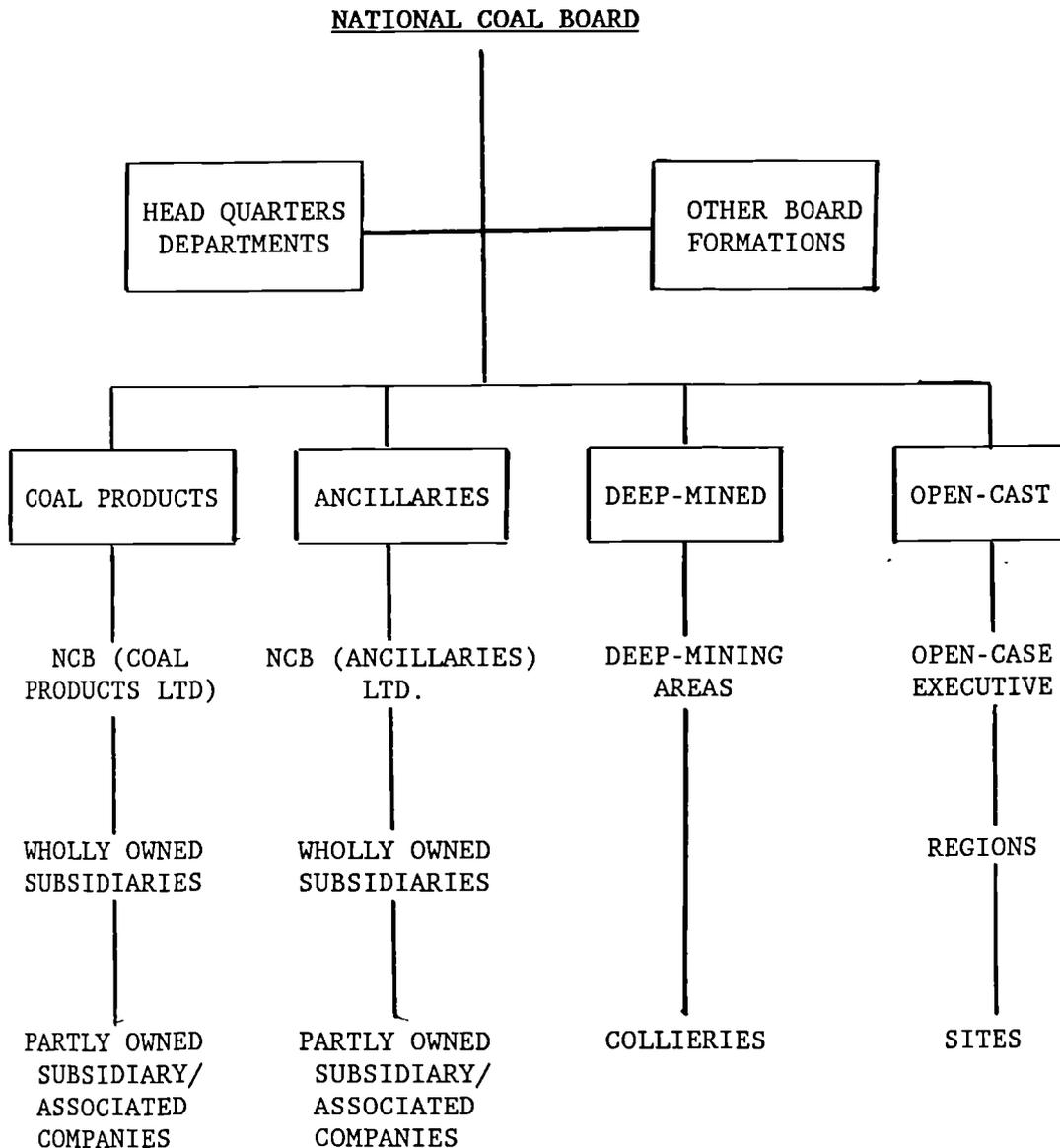
Figure 3.1 : Profit-Centres of the NCB

The NCB is organised around a line-staff concept. The line is the direct

line of authority and is supported in its activities by functional

specialists, such as Marketing, Finance, Industrial Relations, Welfare.

The line relates to the "mining" line of the industry and it is through

this line that the Board's policies are transmitted down through Area to

Colliery. This line is also utilised to exercise "accountability" for

the performance of the Area and its Collieries.

This "accountability" is exercised from the Board to the Energy Select

Committee for the overall performance of the NCB. Whereas, the

Area/Colliery accountability is "production orientated" reflecting the

production concerns of these levels, the Board Accountability is

"business finance orientated" reflecting concerns such as cash flow,

production, markets.

The current official position is that Areas and Collieries are now to be

regarded as "business centres", ie. autonomous units with regard to

sales, investment and cash management. This concern was reflected in the

Monopolies and Mergers Commission (MMC) report of 1983. This position is

advocated by top managers at H.Q., but has only entered into the basic

philosophies of the managers, in the Area and Collieries, to a limited

degree. The business orientation is limited at colliery level to a link

between production and financial results, in that the "correct"

production leads automatically to the "correct" financials. This issue

will be explored further through an explanation of the "dominance" of the

mining-line in the industry in Chapter 4. Managers within the colliery

and Area seem to be held responsible and to account for meeting the

planned performance.

Of the twelve Areas which comprise the NCB's deep mining operation, North Derbyshire is of about average size in terms of annual output - approximately 8mt which produced £250-300m of revenue in 1981/82. It employs fewer than average men, the average being around 18,000, and tends to receive a smaller than average share of annual capital investment, which could be explained in terms of the relatively small number of long life pits.

North Derbyshire is regarded, both within the Area and the NCB, as a whole, as a "well-run" and "efficient" deep mining Area. It is a well-cultivated and compact mining area with a tradition of good industrial relations although it has 3 union branches - Yorkshire NUM, Derbyshire NUM and Nottinghamshire NUM - the majority of its pits belong to the more moderate Derbyshire and Nottinghamshire branches which during 1985 have formed the Nottingham Union of Mineworkers.

It enjoys high labour productivity, a saleable commodity and relatively straight forward geological conditions within a compact mining reserve area. It is termed a "profitable" area but is one which consists of 11 pits of which only 3 are now considered to be long-life. The Area is therefore, in the process of managing a run-down of its mining reserves whilst maintaining profitability. The survival of the Area, as a separate unit, is uncertain and possible merger into other Areas is a strong possibility.

The workable coal deposits are limited in total. The Area is an old one, nine out of the eleven pits date back to 1850 and 1900, hence the extent of the resources and the geology is will known; the mining uncertainties are not a major problem. However, the area is compact in terms of

working seams and co-ordinated planning between the collieries is required to manage the main mining problems associated with the interaction where workings overlap and the presence of very old workings and the need to prove these and any shafts that may be involved.

The Area consists of eleven collieries. A colliery being a collection of coal reserves. Due to the age of the collieries within the Area, the average age being over 100 years, the allocation of the coal reserves relates to historical factors, to a certain extent, but within a context of gradual change. Figure 3.2 schematically describes the physcial aspects of a colliery : it depicts the colliery as a collection of interacting coal seams within an estimate of geological risks.

The primary purpose of a colliery is to extract coal from developed seams of coal. In order to extract the coal, various systems are required, these are described schematically in figure 3.2. A colliery has a collection of coal reserves which are worked by the "long-wall advancing" technique. To work the seam, a collection of face-related plant; machinery; materials and face-men are required. At each side of the seam of coal are the tail-gates : a main-gate and a tail-gate. At each tail-gate is a coal development area; men and machinery.

In the North Derbyshire Area, the main system of mining, as shown in figure 3.1, is "longwall advancing" whereby headings, a main-gate and a tail-gate are driven into the strata from the roadway and the coal is worked by means of a coal-cutter from the face between the headings. A face work team is distributed along the coal face and the roof is allowed to collapse into the "gob" behind them as the face is advanced.

COLLIERY MANAGER		
DEPUTY-MANAGER	FINANCE AND ADMINISTRATION	INDUSTRIAL RELATIONS
ENGINEERS		
UNDER-MANAGER		
OVER-MAN		
CONTROL ROOM DEPUTIES		

INDUSTRIAL RELATIONS

SAFETY

ESTIMATE OF GEOLOGICAL RISKS
INTERACTION WITH OTHER SEAMS, ETC.

TAIL GATES					TAIL GATES
DEVELOPMENT MACHINERY AND MEN	SEAM OF COAL				DEVELOPMENT MACHINERY AND MEN
	FACE MATERIALS	ADVANCE-RELATED MACHINERY	FACE MEN		

1*

VENTILATION

ELSEWHERE BELOW GROUND : MACHINERY MATERIALS	CONVEYORS BUNKERS SHAFT	ELSEWHERE BELOW GROUND MEN

2

WINDING-GEAR

SURFACE

SURFACE MEN	SURFACE MACHINERY

WASHING-PLANTS

3*

Figure 3.2 : DESCRIPTION OF A COLLIERY

* Note : Process 1, 2 and 3 are described in Section 3.1.

A colliery can be termed, or described as:-

"a system for converting coal reserves buried underground to mined coal on the surface (which may be used for electricity generation, industrial or domestic use).

(Holmes R.K. and Wostenholme E.F. (1983:3)

Three distinct activities are involved in this system (as depicted in figure 3.2). The winning of coal from the face, followed by the haulage from the face and up from the pit bottom and finally the preparation of coal on the surface.

Hence, the extraction of coal requires sophisticated support systems to bring the coal to the surface. Investment, in terms of plant and machinery, and men are required elsewhere below ground to perform associated tasks, for example, maintenance of the conveyor system. A ventilation system to enable people to work below ground. A system of conveyors, bunkers and shafts to transport the coal to the surface.

The surface requires an investment in plant and machinery and men to perform surface-related tasks, for example maintaining the winding-gear; transporting the coal to the wash-plants. The washing-plants are required to transform the extracted coal into a marketable commodity.

The central aspect of colliery operations is the development and use of production capacity. Figure 3.3 is an influence diagram of the Coal-Getting Process, depicting the inter-connections between development, production and "bottom-line" profit.
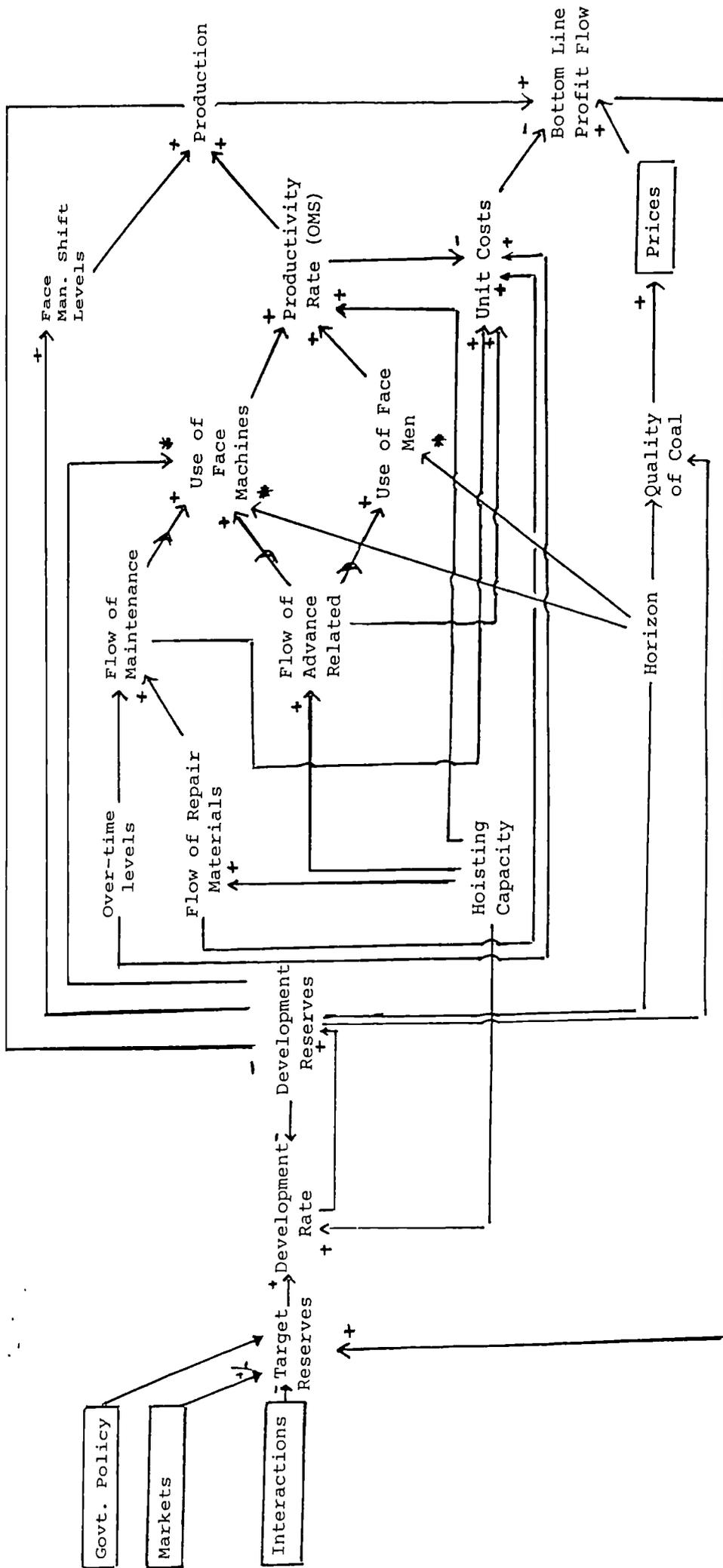
Figure 3.3 : Influence Diagram of Coal-Getting Process

An influence diagram records the way in which a system works or is
perceived to work utilising functionalist assumptions. The direction of
the arrows shows the direction of causation or influence. If the "head"
variable changes in the same direction as the "tail" variable a "+"
(plus) sign is used, if it changes in the opposite direction a "-"
(negative) sign is used (Coyle, 1977).

The "bottom-line" profit flow (which is explained in Section 3.2.1) is
depicted as being influenced by the following factors : level of
production; price per tonne and unit costs.

An increasing level of production due to the fact that a colliery is
credited for all output whether or not sold (see section 3.3.1. on net
proceeds).

The price is negotiated centrally by Marketing which is a relatively
centralised function and sales revenue is allocated to individual
collieries according to a complex formula matching quality and price, but
the colliery can influence the price to a small degree through the
quality of coal extracted and the presence of coal preparation
plants/washing plants.

Unit costs, on the grounds that as unit costs move, the bottom line
profit flow reacts in an opposite direction. (Colliery management
believe that unit costs and profit react in opposite directions; although
in economic theory increases in unit costs could still lead to increases
in profits). Pressure is exerted to decrease unit costs and therefore
the bottom line profit flow.

One of the constraints on the level of production is the hoisting

capacity available; many other constraints can be identified such as

safety, geological factors, level of investment. These are not

identified in Figure 3.3.

The inter-relationship between the extraction (or production) process and

the development process is demonstrated through the level of production :

the greater the level of production, the lower the level of developed

reserves, and all other things being equal, the greater the pressure to

increase the development rate of target reserves with its depleting

resource implication.

The level of target reserves are depicted as being influenced by the

profitability of the 'coal-getting' process, (notions of contribution do

not appear to be explored), plus the effect of Government Policy,

available markets and the internal physical interactions with other coal

seams from neighbouring collieries. It is at this level of the system

that the resources are allocated, future research work is required to

explore the inter-relationship of Government Policy and the workings of

the National Coal Board and its collieries, but important considerations

are described in section 2.4.

For the purpose of the present study, it is the section of the influence

diagram (Figure 3.3) between developed reserves and Production-Bottom

line profit flow that is of interest : that is, the coal extraction

process. This depicts the day-to-day workings of a colliery utilising

functionalist assumptions and shows the inter-relationships with

objectives outlined in Section 3.3

The level of production is depicted as being influenced by the number of face shifts (face shift levels) worked and the productivity rate is seen to be influenced by the use of face-machines, for example, increasing the machine-running time and the use of face men. The use of face machines is influenced by the flow of maintenance, and the flow of advance related materials into the colliery and the horizon. Breaks in these flows creates delays in the system, depicted as 'D' on the influence diagram.

The use of face-men is influenced by the flow of advance related materials, which is constrained by the hoisting capacity, and the horizon of the working face (if the horizon moves off course, then the face is stopped).

The horizon affects the quality of coal. If the horizon alters, then more dirt can be cut with the coal which affects the price of the coal produced.

The first two of the activities involved in the coal system; coal extraction and coal haulage; are integrated through the use of "power conveyors". The cutting machine traverses the face, tearing slices of coal and directing it onto conveyors. These conveyors haul the coal to bunkers and then to the surface via winching gear. The integration of these two activities overcame the problems associated with partial mechanisation (see Appendix six).

The increase in the sophistication of mining technology, the shearers, conveyors and hydraulic supports lead to the increase in proportion of craftsmen in the industry; see the effect of mechanisation and engineers in Chapter 4.4; and the development of the 'Elsewhere below Ground'.
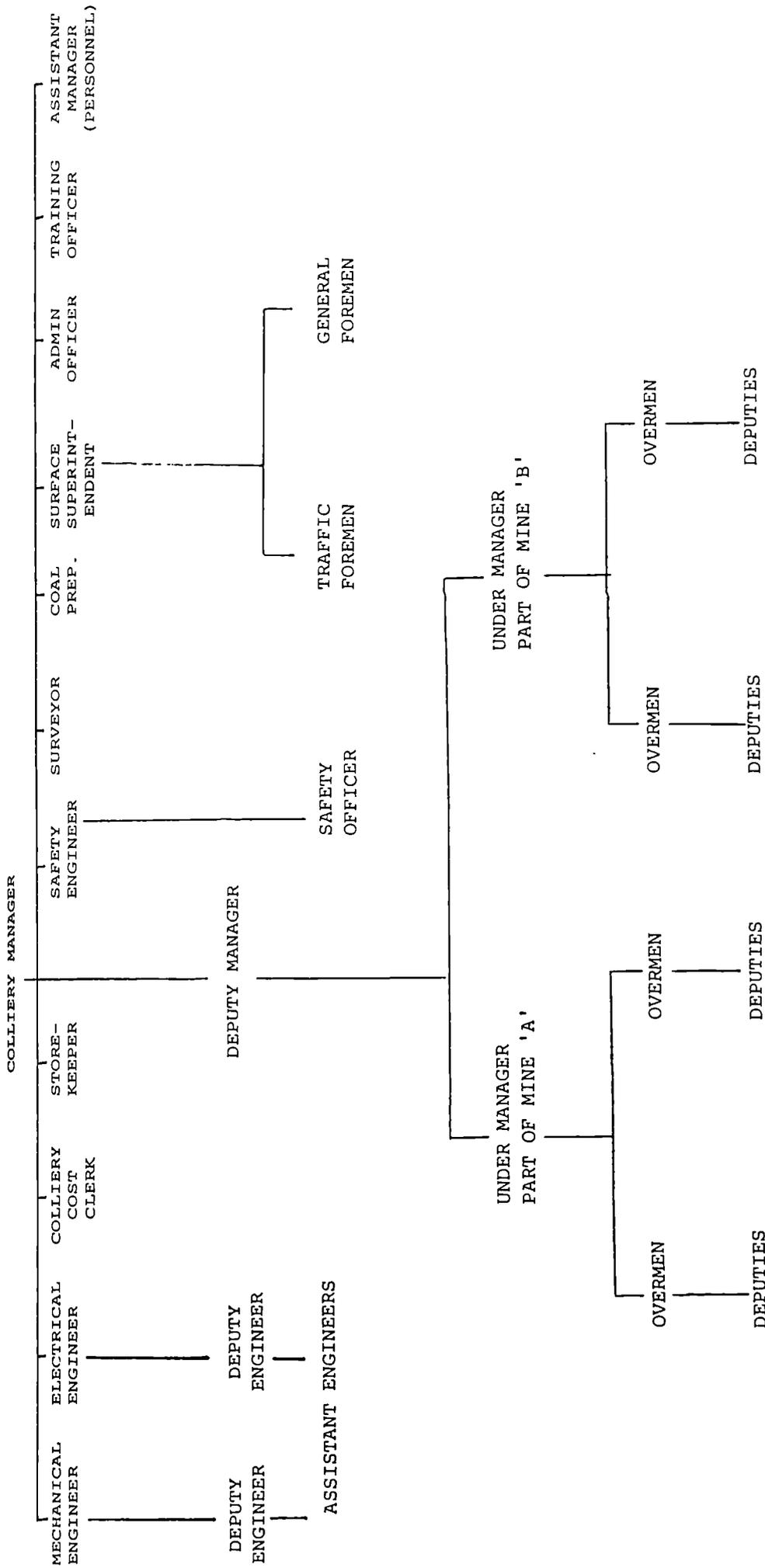
FIGURE 3.4 : COLLIERY ORGANISATION (MMC REPORT, 1983 based on NCB documents)

Extracting coal is a hazardous task and many lives over the century have been lost in "turning the coal". Hence, safety is of paramount importance in the Area and extracting coal works within a well developed safety system. The safety system being maintained by both the Unions and management. The extraction of coal involves a management system and a collection of control systems.

Figure 3.4 describes the line management structure of a colliery as consisting of a Colliery Manager who leads a team containing the Deputy Manager, Engineers (Mechanical and Electrical), Under-Managers and Over-men.

Staff related functions exist to provide a finance, administration and industrial relations service to the line colliery management. A detailed organisation structure for a typical colliery is shown in Figure 3.4.

Brief descriptions of the above line-management, surface operations management and the finance function is provided in Appendix Five.

Surrounding these physical processes are a collection of control systems : a financial control system and a physical control system. These control systems recognise that the colliery management are held to account for meeting the planned performance of the colliery as laid down in the physcial action plan, known as the Action Programme.

3.1.1 The Action Programme or Budget Physical Plan

Each and every colliery produces a three month rolling action programme covering the activities of the colliery for the next eighteen months. It is a physical blue-print of the colliery's faces. The individual faces are described in "bar-chart" fashion with descriptions and timing of faults, new developments. The action programme sets out the Colliery Manager's physical objectives and the physcial factors highlighted are saleable tonnage - by individual faces, giving details of face length, sections, advances, estimated life cycles of working, faults; manpower and manshifts by main categories; productivity; development - drivages to be carried out during the period, classified as capital or revenue activities; salvage - reclamation of materials and equipment for use elsewhere; plant pool requirements - supports, power loaders, heading machines etc.; manpower savings and efficiency schemes; closure details (if appropriate);

The action programme is a detailed description of all the collieries faces and forms the first eighteen months of the 5 year medium term plan, which is presented in some detail, and the ten year plan, which is more a general outline.

The Action Programme is the key short-term plan. It is prepared by Area Planners and displays all "planned work", advancing by weekly increments. Geologically known risks and difficult mining conditions are clearly identified. The Action Programme is also used to plan the continuity of the coal extraction process by displaying the advancement of developments, salvage and remedial

work. The MMC Report (1983) refers to the Action Programme as a plan from which management can determine the strategic deployment and allocation of resources, including manpower, in order to optimise the efficiency of operations at a colliery. Therefore, the Action Programme provides the valuable short-term physical plan of the colliery. The day-to-day controls to ensure that the action implemented is as required lies with FIDO and MINOS, the computerised systems plus the traditional manual systems.

3.1.2 FIDO - Face Information Digested On-Line

FIDO (point (3) on figure 3.7) is part of the MINOS system (a management information system). The purpose of FIDO is to gather information about the activities at the face and report these to the control computer and then into the MINOS system. The function of FIDO is to identify delays in coal getting, to note the delay, its cause and its duration. The computer operator is an active part of the FIDO system on the recognition of a delay and can determine its nature by telephoning the face. FIDO is a sophisticated method of attempting to "open up" the visibility of the face. The system remains firmly in the realms of the mining-engineers. The conflicts over the "control" of the control room are noted in Hopper et al (1984) between the NCB supervisory staff and the Union.

The information content of FIDO remains problematical. As section 3.2, on the day-to-day workings, indicates the manual systems (eg. the blue book, point (2) on figure 3.7) are religiously maintained and very often FIDO and the manual systems record different outcomes. The subjectivity involved in information and the

subjectivity of the truth of information is not perceived by the

mining engineers. This is verified by the following quote from a

Board engineer:

> "The controller knows immediately the face is stopped; he does
> not have to rely on a message from underground...... People
> underground are aware of the resources that are available to
> the controller. They realise that he will not be fobbed off
> with imprecise information".

3.1.3 IMPACT : In-built Machine Performance and Condition Testing

The objectives of the NCB regarding increasing production efficiency

have been highlighted throughout this chapter and references made to

possible approaches adopted to achieve this objective. The IMPACT

system, coupled with FIDO are seen as ways in which greater control

over the production process can be exercised. IMPACT's primary

objective is to obtain an increase in machine running time (Cooper,

1982) and its secondary objective is to reduce the number of skilled

technicians and fitters required to carry out installation, repair

and maintenance (Horton 1983). FIDO is used to impose closer

control/supervision of men, and attempts to reduce delays (point (3)

on figure 3.7) whereas IMPACT monitors machines with the aim of

reducing "operational and ancillary time" (Cooper, 1982).

The IMPACT system performs the technical function of monitoring the

condition of plant and machinery and increases the level of

management control over the whole maintenance operation. The

long term plans for the technical function is to instal measuring

equipment (transducers) in the machines themselves and to build up a

data base of the fitters' knowledge into the IMPACT system. When

IMPACT is fully installed the "built in" transducers will

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continually feed information into the MINOS system regarding the "health" of the plant and the machinery. The information gathered is used to plan maintenance, to predict break-downs, and to record and diagnose faults as they occur. Many of these decisions are to be made by the computer system.

IMPACT removes the central element of the fitter's skill by its capability of predicting break-downs, by noting temperatures or excessive vibrations and when break-downs do occur IMPACT can diagnose the fault and effect a repair plan. This ability to predict and diagnose break-downs also removes the need to have fitters and electricians on standby with each face-team. Instead a skeleton team can be available directed to deal with break-downs from the MINOS control room. The overall effects of IMPACT are summed up by Horton:

> "The philosophy will bring about a change in the composition
> and deployment of colliery maintenance staff, with the need for
> a nucleus of technical craftsmen trained in condition
> monitoring techniques, supported by the face operatives trained
> to carry out the small "nuisance break-downs" maintenance".

> (Horton, 1983)

The skill element is programmed and the engineer's role in the managing of a critical resource is substantially reduced with the consequence of reducing the power position of the engineers in the NCB; the control of MINOS remains firmly in the realms of the mining-engineers.

3.1.4 MINOS - Mine Operation System

One of the main objectives of MINOS is to provide management

information on all aspects of the mining operation. MINOS is a

highly centralised system which is composed of a number of

sub-systems, such as FIDO and IMPACT, which collect information from

the lowest levels to the highest levels. Figure 3.5 shows the

build-up of the MINOS systems.

Figure 3.5 : THE MINOS HIERARCHY

Source : Burns et al. (1983 : 13)

```
                                        ┌─────────────────────────┐
                         ┌─ ─ ─ ─ ─ ─ ─ │ FACE DATA               │
                         │              │ BACK NCB                │
                         │              │ COMPOWER COMPUTER       │
          ┌──────────────┴─────────────────────────┐└─────────────────────────┘
          │ MANAGEMENT INFORMATION SYSTEM           │
          │ SECONDARY MANAGEMENT MINI-COMPUTERS     │
          └─────────────────────────────────────────┘

┌─────────────────────┐                          ┌──────────────────────────────────┐
│ MINOS CONTROL ROOM  │─────────┐     ┌──────────│ COAL PREPARATION PLANT           │
│ MINI-COMPUTERS      │         │     │          │ CONTROL ROOMS MINI-COMPUTERS     │
└─────────────────────┘         │     │          └──────────────────────────────────┘
  │        │      │             │     │
COAL          IMPACT      ENVIRONMENTAL                      AUTOMATED COAL
CLEARANCE                 MONITORING                         PREPARATION

     FIDO
    / \
   /   \
 FACE   MIDAS

AUTONOMOUS MICRO-COMPUTER
CONTROL SYSTEMS AT THE FACE
```
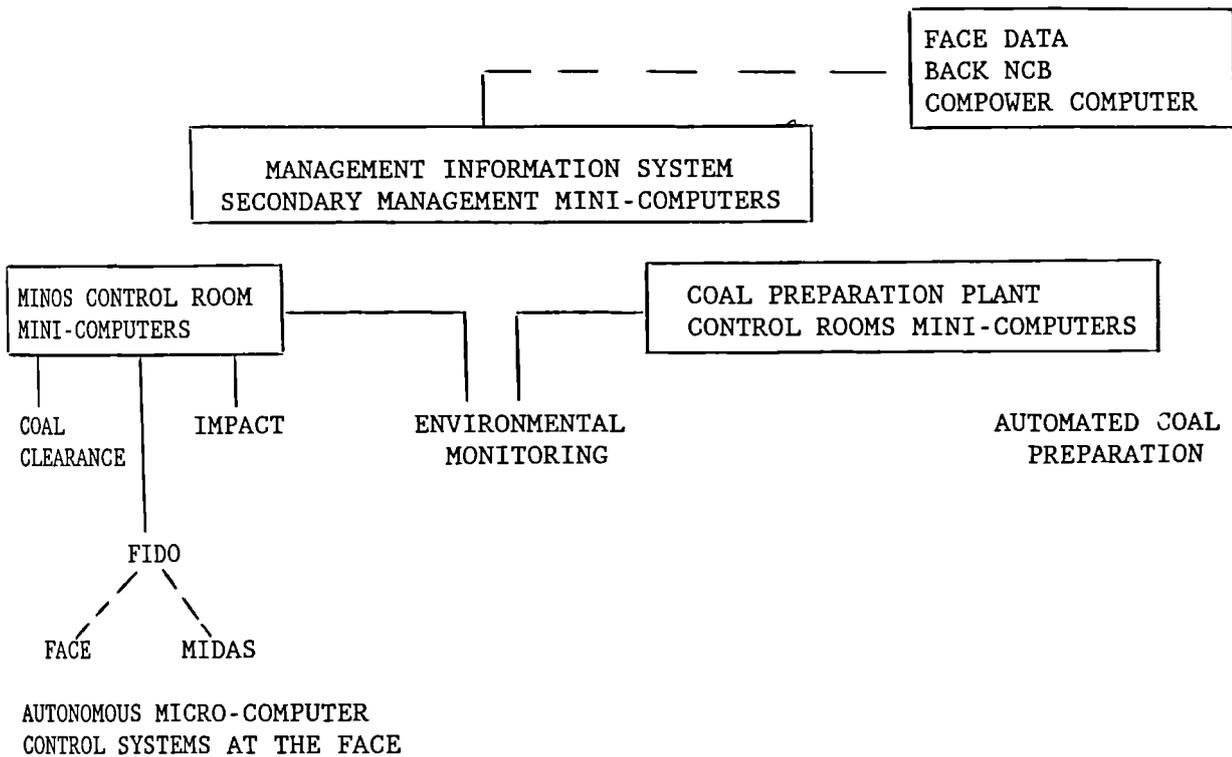
MINOS is designed to allow managers to analyse summary data, to

produce reports of productivity, absenteeism, shift performances,

etc. The system is designed for management control and the top of

the hierarchy is the Board and Government. Planning and control can

be exercised from the highest levels of management.

3.1.5 The Accountability System

The main element of the management control system is the

'Accountability System'. The concept of accountability is built

into the history of the NCB, in that the Board is accountable to the

Minister for the use of public monies. Accountability, for the

delegated responsibilities, is performed down through the line of

the industry, as shown in Figure 3.6.

SELECT COMMITTEE

Accountable to

CHAIR AND BOARD

Accountable to

AREA DIRECTOR AND DIRECTOR'S COMMITTEE

Accountable to

COLLIERY MANAGER AND MANAGEMENT TEAM
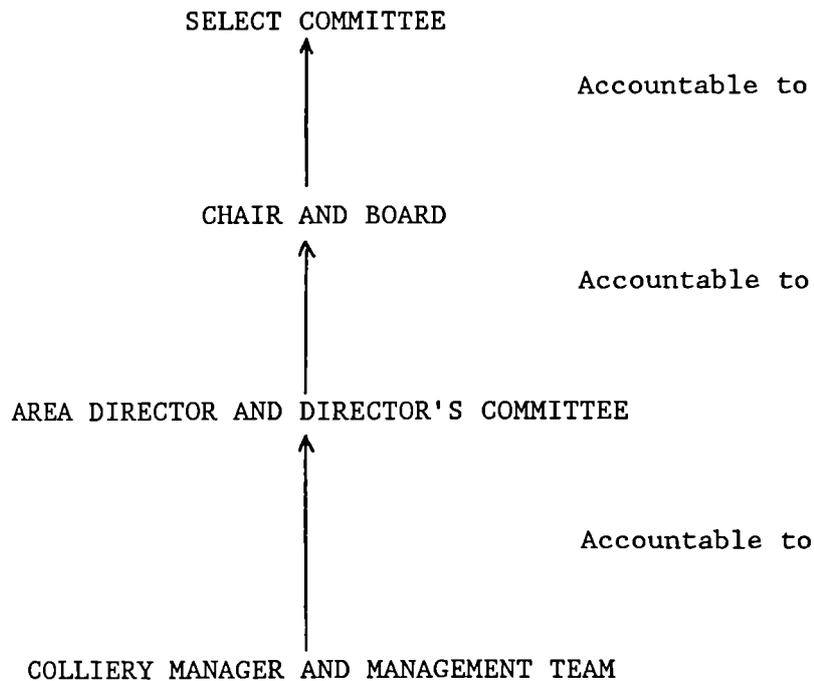
Fig. (3.6) Quarterly Accountability System

The Area Director ensure that each colliery manager maintains a system of accountability within his colliery and each quarter, the colliery manager and his management team (deputy manager, electrical and mechanical engineers) are "held to account", for the performance of the colliery, to the Area Director and the Director's Committee (Deputy Director, Area Chief Accountant, Production Manager, Area Industrial Relations Manager and Area Marketing Manager) who in turn are "held to account" by the Chairman of the Board.

Monthly accountability meetings between the colliery management team and the production manager are programmed in between the quarterly meetings. These monthly meetings follow the same procedure and content as the quarterly meetings.

The main documents produced, by the colliery based accountant, for the Area/Colliery Accountability System are financial in nature, for example: the F23 Colliery Profit and Loss account actual results compared with budget, in physcial and financial terms; the F22 Shifts results compared with budget: these reports are compared with the results for the same period last year. A Statement of position of capital drivages compared with budget in both physcial and financial terms and lastly the short-term future is catered for in the form of projections.

The format of these documents is constant and no attempt appears to be made to 'highlight' relevant information in the reports. They appear to be 'score-keeping' documents, which can and indeed are, interpreted in many ways.

Although the workings of the Accountability System reflects the physcial orientation of the Area and its Collieries and the belief that 'Correct Production yields Correct Financials'. Whereby, the financial results are managed by the Area Director through the physcial reports of the colliery which are detailed in nature and focus attention on specific and tangible issues.

The colliery/area quarterly accountability meetings are the key management meetings. The format of these meetings are highly predictable and technical in nature. To understand the issues raised in such meetings and to highlight the secondary nature of finance, within the Area/Colliery, a quarterly accountability meeting is briefly summarised below. A full transcript of the quarterly accountability meeting is related and analysed in Chapter 5.

The accountability meeting was held, as usual, at Area Headquarters. In attendance was the Colliery Manager (CM), Deputy Manager (DM), Electrical and Mechanical Engineers (EM), Area Director (D), Deputy Direct Mining (DDM), IRR Managers (IM), Marketing Manager (MM), Chief Accountant (CA), Production Manager (PM).

The meeting started promptly at 9.00am and lasted until 11.13am. During this time, production details were discussed for the majority of the meeting.

D. "Let's look at the physcial items first, then finance falls into place".

When finance was discussed, the discussion was soon reverted back to production details.

D.D.M. Gives cost of overtime here - _19,000.

D. "The management frame of mind is that they work to budget and that is the end of it. In categories 15 to 20, I can see the need for overtime and constantly running plant - but elsewhere, I can't see any need. Silence.

D. You two people (looks at engineers) are maintenance planners. You are not creative engineers. If you are then you are a bloody nuisance. Tells a story ...... why overtime on transport?

C.M. It's cheaper.

D. You can satisfy me that in the future all overtime is necessarily spent? Why overtime on the surface? Silence.

Eng. There are occasions when we have to put things in the pit. Also medical jobs.

D. You must look at life through different spectacles. This Area is the highest in the country for overtime. Really we need to say - in this category there's no overtime. Discusses overtime arrangements in detail with Engineer.

D. I know they won't like it, but you must explain that it is better than being on the dole. The T.U.'s argue that overtime is a sin. You must say that more men will be employed as a result. We used to run pits without overtime.

D.M. But things were simpler then - there wasn't so much machinery. Things are much more sophisticated now.

D. But this is a 2 shift face. We could plan for maintenance being done on a 3rd shift.

D. P---- and myself believe the men and I have a better reality of the real world than the T. U. and their leaders. Suggests confronting the men with the fact that the pit is facing closure. If electricians moan about working only 5 days a week, then ask them how many days their friends are working".

Production issues were discussed in detail, covering issues such as manning levels; specific jobs to be done; industrial relations issues; machinery issues and ways to work the coal.

D.	checks progress against plan (ie. map). Considerable discussion of machinery and the direction of faces.
D.	suggests a new direction for the face. General silence.
D.	Outlines with reference to the plan, points out the geological faults. General silence for a very long time - approx. 1 minute.
C.M.	comments.
D.M.M.	asks questions about details of the plan, especially displacement.
D.	suggests that there is a parcel of reserves behind a fault.
D.M.M.	suggests there may not be.
D.	suggests the absence of detailed information goes back to an old royalty boundary. Makes it clear that he does not like the existing parcel being worked.
C.M.	but it's easy
D.M.	suggests another way of working the coal.
D.D.M.	puts in another alternative.
D.M.	responds - my method requires less funding.
D.	tells them 'now is the time for a decision'
D.D.M.	backs up D's comment.
D.	asks about supplies.
C.M.	responds.
D.	asks about a haulage problem.
C.M.	gives progress report.
D.	what is the nature of the problem.
C.M.	harmonics - I don't understand it".

The pattern and content of the quarterly accountability meetings appear standard throughout the area. The meetings are highly technical in nature. Technical expertise is used to demonstrate superiority of knowledge. Superiority which appears to 'belong' or to be associated with status or position within the hierarchy.

3.2 The Financial Information System

Section 3.1 described the physical process and control systems that monitor these processes. However, the colliery is not just an extraction unit, it is also a profit centre with increasing pressure to become a 'business unit'. In terms of being a profit centre, the colliery manager is not only held accountable for the planned physical performance of the colliery, but is also held to account for the financial performance.

The financial performance is monitored through the financial information system which is a two part analysis depicting budgets and actual costs. Both of which are summarised in the form of a colliery profit and loss account (point 14 in figure 3.7); the F23. However, as indicated in section 3.1.5, the belief is that the correct physicals automatically leads to the correct financials. Hence, majority of decisions and discussions surround the physical workings of the colliery. The main documents at the accountability meetings are the action programmes and the financial documents, the colliery profit and loss account (F23) and the shift reports (the F22). However, the financial documents are used as a 'score keeper' and all decisions surround the physcial plan in order to provide an acceptable 'score'.

3.2.1 Budgets

The budget is the financial evaluation of the January based
Action Programme and is fixed in nature. The main objectives
incorporated in the action programme and the budget are
communicated annually and include the increase of output to the
maximum level possible within existing capacity; the objective
for 1980-81. To improve productivity, maximise proceeds per
tonne and contain costs, the objective for 1981-82.
(From MMC Report, 1983)

The objective of 1980-81 did not take into account the
depressed demand for coal and emphasised a 'need for coal' and
the extraction of coal up to the levels of the shaft capacity
with performance being recorded in terms of "unit costs",
labour, productivity, output per man-shift - OMS and earnings
per man-shift - EMS.

However, by late 1980, it becomes apparent that the growing
general recession was depressing the demand for coal in the
short and medium term. Hence, the 1981-82 objectives of
containing costs as above, could not be pursued against a
policy of maximising output at all collieries, as in 1980-81.
Areas had to explore all opportunities to reduce high cost
capacity and manpower and seek to maximise output from capacity
with relatively low margin costs.

The workings of this objective could be seen throughout the research period; 1981-82; 1982-83; 1983-84. Section 3.1 discusses the importance of reducing delays, the importance of controlling overtime levels; these are operational strategies employed to meet the budget objectives.

The budget objective of "maximising proceeds per tonne" involved two possible strategies, one of which involves the improved washing of coal and the other involves the blending of coal from various collieries. For example, the coal from the High Moor Colliery (one of the collieries in the North Derbyshire Area) was not marketable as extracted and washed; it required "blending" to increase its marketability and maximise its proceeds per tonne. Blending involves mixing a "shovel-full" of type A coal with "shovel-fulls" of type B coal. The High Moor Coal was blended, for example, with coal from Bolsover colliery (one of the collieries in the North Derbyshire Area). The Bolsover colliery coal was of a marketable quality but the colliery was required to transfer coal, at a given transfer price, to High Moor.

The policy involved the cross-subsidisation of collieries and appears to have been developed not to maximise proceeds per tonne, but to mask the economic efficiency of "marginal pits". The implications of this policy is expressed in the following extracts from two quarterly accountability meetings and a meeting with a colliery manager:

Area Director	Net proceeds. We depressed these.
Marketing Manager	They are more or less in line with May/June.
Chief Accountant	This is due to the transfer prices.
Marketing Manager	The heavy import of coal depressed proceeds.
Area Director	I thought it wouldn't affect proceeds. What you are doing is transferring profits from Bolsover".

Extract B

The Area Director and Managers know the exact effect on profits at this pit of the 'special' transfer-prices introduced. £22+ million. When the Colliery Manager complains about the effect that this has on his bottom line, he is told:

Area Director : "this is nowt to do with you".

This is an example of finance being taken away from the managers of the collieries. The budgets appear to be malleable, strategic tools for use by the Area Director. Hence, finance and accounting is not perceived as being objective and neutral depicting some notion of the "real"

financial situation of the mine. Instead it is viewed as being subjective and is utilised to provide the required "financial snap-shot" of the transformation process. It is also being utilised subjectively to aid promotion prospects of key personnel.

Extract C

At this meeting, the revenue side of budgets was discussed with a colliery manager. With the Area Director's directive Bolsover had been selling coal to other collieries at a pre-determined transfer-price. The Colliery-Manager admitted that this type of practice was not uncommon and was a method of smoothing profits across the Area, especially where a colliery was in temporary difficulty.

Extract A: High-Moor Quarterly Accountability Meeting:
             Wednesday, 27th July, 1983, 2.00 pm.

Extract B: Bolsover Quarterly Accountability Meeting:
             Wednesday, 3rd August, 1983, 9.00 am.

Extract C: Meeting with Bolsover Colliery-Manager:
             Wednesday, 6th July.

The economic efficiency of collieries was also 'masked' during this period by the changes made in the Action Programmes in order that all the "thick" seams of coal were extracted at the same time. Usually coal is extracted from a combination of

thick and thin seams. Thick seams are easy to mine and higher

volume of output is extracted at lower levels of costs.

Therefore, by mining all the available "thick" seams, the

performance measurements, in terms of unit costs and output per

man-shift are improved in the short-term. This is very much a

short-term strategy and renders the long-term more

problematical in that it leaves the "thin, high cost" seams to

be extracted. This policy could result in "shorter economic

lives" for the collieries concerned.

The details of the NCB Colliery budgetary control process is

given in Appendix Seven.

3.3 Daily Process of Coal-Getting

Section 3.1 and 3.2 has described the physical process, physical and financial information and control systems that are utilised in the process of coal extraction and preparation. Figure 3.7 provides a schematic of the daily process of coal-getting to describe the complicated interactions that exist between the physical processes and the information and control systems deployed. Reference to this schematic has been made throughout sections 3.1.2, 3.1.3 and 3.2.

Figure 3.7 depicts the flow of capital monies (point (8)) which flow into the colliery to provide the basic coal-getting environment and the necessary "on-going" developments.

Information, in the NCB, is used to a certain extent to "open-up" the visibility of the process and covers the financial aspects through the budgeted and actual profit and loss account, F23: point (14) on figure 3.7. The physical process through FIDO: point (3) on figure 3.7. Section 3.4 describes the discrepancies that exist between the manual reports (points (2) on figure 3.7) and the computer report (point (3) on figure 3.7).

The day-to-day working parameters are set-up yearly in the physical budgeting exercise (see Appendix 7) and the Area provides the colliery with manpower, output and overtime targets (point (7) in figure 3.7).
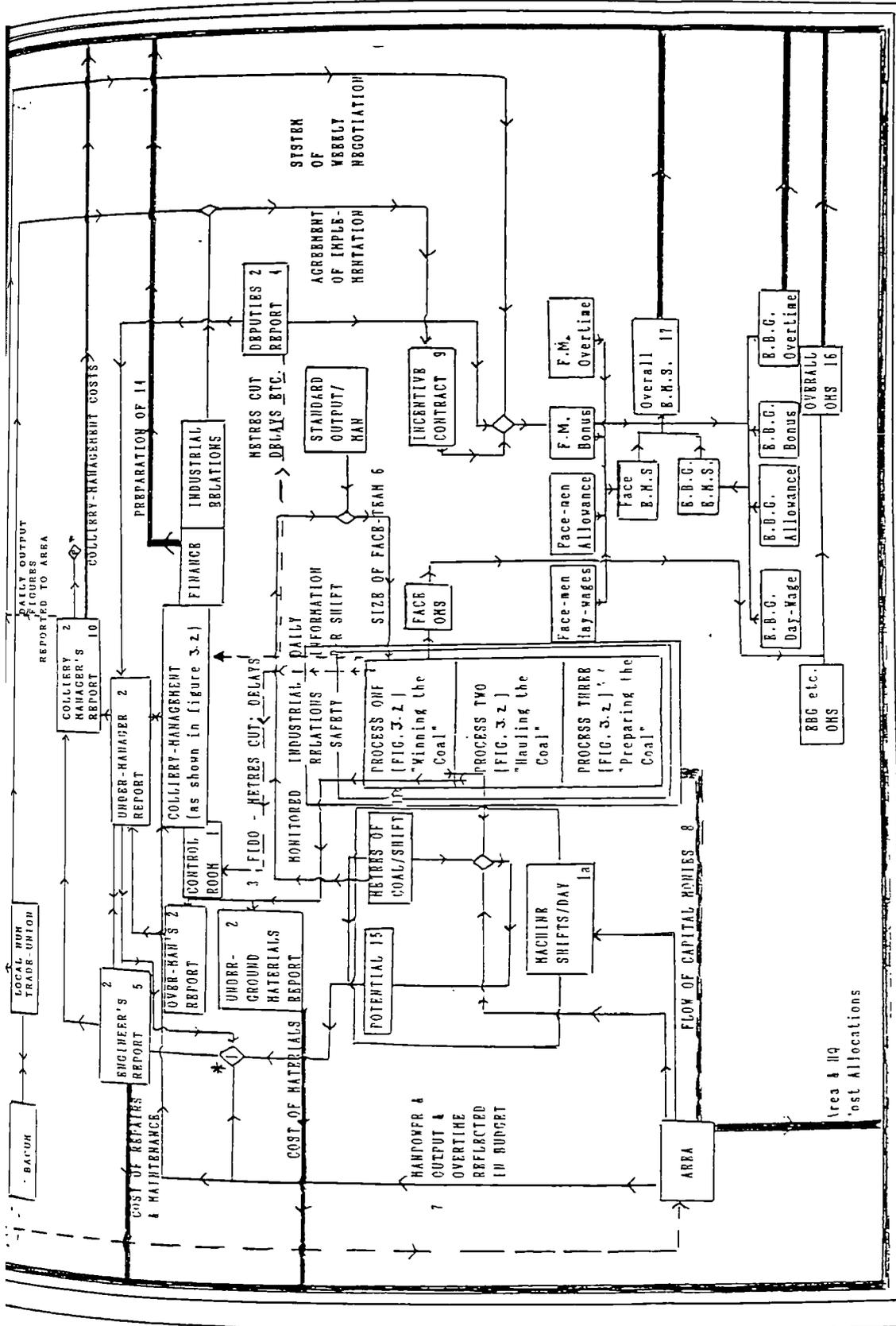
FIGURE 3.7: DAILY PROCESS OF COAL-GETTING

The buildup of the colliery plans is shown schematically in Figure
3.8 below:

ACTION PROGRAMME
(AP 18 MONTHS)

BUDGET
(FIRST 12 MONTHS AP)

MEDIUM-TERM PLAN - 5 YEARS
(INCORPORATES THE BUDGET)

LONG-TERM PLAN - 20 YEARS
(INCORPORATES THE MEDIUM-TERM PLAN)
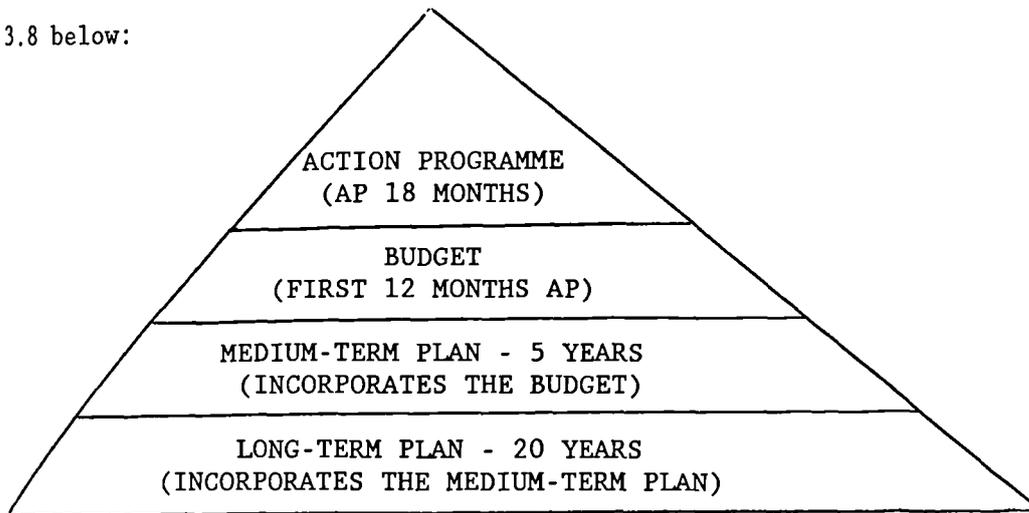
FIGURE 3.8 : SCHEMATIC PRESENTATION OF COLLIERY PLANS

The Action Programme, as outlined in Section 3.1.1, provides a

blue-print of the physcial workings of the colliery and covers a

rolling eighteen month period.   The Action Programme (AP) is

evaluated financially to formulate the budget which is fixed in

nature for the next twelve month period.   The budget forms the first

year of the five year medium-term plan which is revised annually and

includes face layouts and the resources required.   The medium-term

plan forms the first five years of the twenty year long term plan

which is reviewed annually and covers physical factors and

resources.

The main financial document and in fact the only colliery plan which

is completely financial in nature is the short-term budget.

The operational planning, control and decision-making (point P on

figure 3.7) tasks work within these set-parameters.   The day-to-day

operational tasks involve the daily deployment of men (point 6); the

maintenance of machinery; the maximum use of machinery (point 15);

the maximisation of saleable output (point 16), to name, but a few (also see figure 3.3 section 3.1).

The following is a description of the daily process of coal-getting and is referenced to the points in figure 3.8.

The actual output per shift achievable from a colliery depends to a great extent upon the number of machine shifts per day (point 1a) and the metres cut per shift (point 1B). A typical colliery in the North Derbyshire Area, consists of several seams, for example, Arkwright includes the "2nd Waterloo"; "Deep Soft", "Tupton" and "Threequarter", which work on varying number of machine shifts per day, from one to three per day. In order to maximise machine cutting time with the given level of manpower, "spare" seams are kept as a buffer to maintain production due to factors such as geology and machine break-downs.

Two of the objectives of the industry include: increased labour productivity (Cooper, 1982; Horton, 1983); measured by OMS (Point 15 on figure 3.7) and increased productivity of capital (Cooper, 1982; Horton, 1983); not overtly reflected in the NCB system.

These two objectives are outlined in papers by the mining engineers, Cooper and Horton, which indicated that the coal cutting machinery was only running for about one-third of the potential cutting-time

on an average shift (point 15). The remaining two-thirds was
equally split between "lost time" due to delays caused by the men
and "operational and ancillary time", this is, delays caused by
maintenance and repair.

This focus on delays is a central issue in the management
information, decision and control systems utilised in the collieries
observed. The coal face system (process one in figure 3.2), which
consists of the shearer, armoured face conveyor, roof supports,
power supplies, gate-end activity, the coal seam, face-workers and
information about production, delays and machine status, is
monitored through FIDO (point (3)) and then into the minos system.

The task of the face team is to keep the machine cutting throughout
the shift, to avoid cutting into the roof or floor, that is the
horizon aspects of coal getting, and to advance safely after each
cut. These tasks are based upon manual skills in handling the
machinery. The face workers are "stationed" along the length of the
face and are connected via intercoms. The cohesion and trust
between members of the face team are important factors because of
the interdependence of different jobs. The performance of the
face-team is based upon the informal knowledge acquired about the
behaviour of the face, roof and floor; the application of this
learning by experience is based upon autonomy and discretion.

The face teams are paid according to Area Incentive Schemes (AIS)
(point 9) which are negotiated contracts covering standards for
bonus purposes for each new face. These contracts are negotiated
for each new face with the local NUM officers. The bonus system
supplies a major component of the manpower costs. The actual

payment of bonuses is dependent upon the deputy's report of metres cut and delays (point 4) coupled with a system of weekly negotiation between the local NUM officers and the local industrial relations officers, and the already negotiated incentive contract (point 9).

Under AIS, "short-delays", that is delays of less than 20 minutes, are paid for by the men through loss of bonus, whilst "long delays", unavoidable delays of more than 20 minutes are paid for by the NCB at an average bonus rate.

The productivity of the faces are monitored through the use of output per manshift (OMS) and earnings per manshift (EMS) statistics. Over the years, increasing pressure has been applied to productivity as measured by the OMS. It is the productivity rationale which has increased mechanisation; instigated the use of AIS and focused attention on delays. These two factors EMS (point 17) and OMS (point 16) have direct impact on the colliery profit and loss through the wage costs incurred and the maximised output within the wage cost. The MMC Report (1983) highlights the way in which the aim of increasing productive efficiency can be divided into two approaches:

· increasing production rates of saleable coal by increasing machine extraction rates, machine utilisation and the proportion of useful output, thereby maximising revenue.

and

· reducing the manpower needed to run the machines at the face, and reducing the amount of work or men needed elsewhere below

ground and on the surface to support a given rate of face

output. With consequent cost savings which impacts the

colliery profit and loss account.

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These aims can be seen throughout the operational strategy of the

North Derbyshire Area and is implemented against a backdrop of

static or declining coal market; therefore increased productivity

from seams will inevitably lead to the need for fewer seams. The

installation and use of the MINOS philosophy will tend towards the

second aim, enormous reductions in manpower aided by the increase in

productivity.

3.4 Day to Day Control Processes within the Colliery

The day-to-day control processes within the colliery rest with the colliery manager down through the hierarchy. The following two sections, section 3.4.1 and 3.4.2, provide descriptions of typical days in the life of under-managers and colliery managers respectively. These descriptions are based upon transcripts of research findings based upon observations of under-managers and Colliery managers at work.

3.4.1 A day in the life of an Under-Manager

As outlined in Appendix Five, the under-manager is appointed under section 6(i) of the mines and Quarries Act 1954. They are charged with the tasks of maintaining planned output, as outlined in the Action Programme, deploying manpower and controlling expenditure to a budget for a designated area of the mine. The under-manager is assisted in these tasks by Overmen and Deputies.

A typical day for an under-manager starts at around 6am and finishes around 5pm. The under-managers work "long-days": 10 to 12 hours actually on the NCB premises and then "on-call" for 24 hours per day. The under-manager's whole life is dedicated to work and the general impression is that they enjoy work, the long days of 10 hours are questionable as a certain amount of this time is spent "waiting around". There appears to be a reluctance to "go-home" which is based upon his

responsibilities, his inner feelings of the "need to be around just in case" and the distrust of subordinates to handle situations. This is summed up in the following quote:

> "I have a responsible position here - anything goes wrong I'm, responsible (on the wall)"
>
> (Under-Manager)

The under-manager uses the first two hours of his day, for example, from 6am to 8am in surveying a number of reports (points (2) on figure 3.7) which outline "what has happened" in his part of the mine since he left the day before. He leaves about 5pm, but will regularly 'phone the pit during early evening'.

A number of informal meetings are held during this first two hours. The night-shift overmen provide a verbal account of the night-shift to support their written reports. The overmen maintain a "Report Book" which is the overmen's "official" account of all the underground activities. The report book specifies what has happened, what has broken down, what has been repaired, what has been produced. It is an on-going history of the problems of the mine. It also includes solutions to the problems not yet solved. At the meetings between the under-manager and the overmen certain of these problems are discussed. This Report Book plus the verbal discussions forms a short-term "on-going" accountability system which ensures that things "get-done".

As well as the "Report Book", the Deputies maintain the Deputies' Report (point (4) on figure 3.7) which is of a highly technical nature relating to one face. It includes an account of manpower used for the calculation of incentives and issues relating to safety.

The overmen and under-managers maintain their own "black books" in which they record comments from the above reports and from the verbal discussions. These "black books" are a type of aide-memoire to the on-going accountability process.

The Assistant Mechanical and Electrical Engineers report each morning to the under-manager on delays, problems from the day before, urgencies, expected jobs to be performed, jobs to be performed between shifts. The Assistant Engineers do not appear to have an "official" book, but the under-manager notes extensively in his "black-book".

These manual "reports/books" run in parallel with the computerised systems, for example, FIDO (point (3) on figure 3.7). These manual reports often do not tally with the computer sheet on delays.

The under-manager's job is operational planning and control. His area of discretion is fairly low with output targets; overtime targets; metres of coal per shift targets; and investment monies being determined for the pit at Area level (see figure 3.7 point (7) and (8)). The under-manager plays

an important role in administrating the day's work. An
important initial task is the deployment of men. During the
morning meetings the day-shift is signing on. Once the number
of men is known, the under manager and overmen can deploy these
men to various tasks. In this way, the mine is "set up" for
extraction on the shift and to cope with urgent tasks.

The under-ground materials officer "checks-in" with the
under-manager to ascertain what the under-manager wants down
the pit today and what he wants tomorrow. Material can be a
limiting factor due to the difficulty in taking materials
under-ground. Therefore, careful material planning is
important to the smooth running of the mine.

The under-manager has an important co-ordinating function
pooling the specific or fragmented knowledge of the overmen,
deputies and engineers and reporting these to the colliery
manager. This gives an example of the multiple-channels of
information which are used in the day to day control processes.

The daily output figures are reported to the deputy managers
who reports these to the Area on a smoothing basis:

"We don't want to show large differences from day to day".
    (Deputy Manager).

After these morning meetings, the under-manager relaxes until he is expected in the mine, usually around 9am. The under-manager is responsible for all activities in his part of the mine. In the 3 to 7 hours he normally spends in the mine each day, he visits one of the major activities, for example, maintenance, development or extraction. Generally speaking, this means that he sees each activity once a week.

At the beginning of his stay underground, he spends quite a lot of time on the telephone discussing topics with the people on the surface. The rest of the time is spent on the move, speaking with people was either carried out walking past them or standing still for less than one minute. The topics discussed were of a technical nature and involved "things going on". The people in charge of both development and extraction were addressed as a matter of course. This implies that a formalised hierarchy is well developed and understood.

The underground control clearly resides with the men. On one visit, the cutting machine had broken down causing a long delay. The deputy and under-manager stayed on the face, but clearly were not expected, or invited, to tend or supervise the repair. When the deputy used the intercom to check the progress, he was told to "mind his own business" and that the less he pushed the quicker the fault would be rectified.

Around 12.30, the under-manager deploys the men, via the telephone, for the next shift. He surfaces around 1pm and holds an informal meting with the overmen about the day's problems, a replication of the morning meetings, but on a smaller scale. After this, the under-manager returns to his office to solve issues that he "realised" underground. The rest of the day is spent on issues such as overtime, special projects.

The under-manager's concern with finance is related to materials spending:

"My finance limits itself to general control with material costs ".

    (Under-manager)

The under-manager's role is based upon physical processes and is de-coupled from the financial implications. The financial implications are built into the physcial processes through the assumption that if production is right then finance is alright. Finance is not the concern of the under-manager, his concern is with the physical processes. The Area Director sums this position up with the following quote:

"The under-manager regards finance as a mystery".

    (Area Director)

Finance appears to "belong" to upper management from Colliery Manager upwards.

In summary, the under-manager's day is based upon a traditional production culture (see point (11) on figure 3.7 and chapter 5) and concerns the smooth running of the present production system; as such their role is programmed and predictable and they experience difficulties in discussing change.

Figure 3.7 describes the main information flows that the Under-manager draws upon to ensure the "smooth-running" of the production system (outlined in figure 3.3) and their decision-making process is depicted by point P on the diagram.

3.4.2 **A day in the life of a Colliery Manager**

The Colliery Manager is appointed under section 2(i) of the Mines and Quarries Act 1984. His overall responsibilities cover the physical aspects of the business, the safety aspects and the financial aspects of the business in terms of the "bottom-line" profit figures recorded on the colliery profit and loss account, F23. In controlling operations he is assisted by the line management, deputy manager, under-managers, overmen and deputies.

A typical day in the life of a colliery manager starts at around 7-8am. The first two hours of the day from 8am to 10am are "fact gathering" times. Between 8am and 9am, the "daily accountability" for output takes place. This entails visits from the deputy manager to report on output. The Production Manager (area personnel) rings around this time for the output figures which he then reports to the Area Director through the

Deputy Director of Mining. These output figures reported to

Area are "smoothed". This gives an example of the centralised

hierarchical nature of the information flows.

During this first hour, reports (points (2) of figure 3.7) are

"flowing freely" around the pit. The colliery manager will

also refer to the under-managers' "blue books". These provide

the colliery manager with a description of "what has happened"

and "what is to happen"; they describe the under-manager's

short-term commitments and form a base for day to day

accountability.

Colliery managers keep their own versions of the "blue book"

(point 10)) in which they note extracts from the above reports

and information from other daily reports such as, reports on

mineworkers leaving the pit early; surveyor's reports.

Around 9am, the colliery manager holds a series of meetings,

for example with the Mechanical and Electrical Engineers to

discuss the short-term problems of the pit. For example, with

the engineers the discussion surrounds break-downs, machine

repairs, machine problems.

Within these first two hours of the day, the information and

meetings are of a short-term technical nature with information

flowing upwards in an extremely detailed format. For the

colliery manager, this information allows a "mental picture" to

be constructed of the colliery workings and provides a

"back-cloth" against which daily accountability can be

achieved. However, this information flow only provides "one

version" of a mental picture, that is, the picture which his line managers wish to paint. Therefore, a considerable amount of the colliery manager's working-week is spent underground. After under-ground visits, the colliery manager makes notes in his "black book" (version of the under-manager's blue book) and uses these as an aide-memoire in daily accountability, and short-term planning and interaction with the Area.

Certain days of the week, the colliery manager may not go under-ground, but will be involved in various meetings, for example, project planning meetings. At one colliery visited, the colliery manager arranged a weekly meeting for his "whole" line management, Assistant Engineers and Engineers. These meetings caused quite a lot of confusion due to the fact that under-managers and assistant engineers felt uneasy about being on the surface and not going under-ground for 24 hours.

Around 3pm, the deputy-manager reports back to the colliery manager on issues such as current production, current problems and forecasts (prepared by the under-managers) on tomorrow's output. Certain colliery managers receive hourly reports on production output.

The colliery manager's day does not really finish, he may leave the NCB premises physically around 5/6pm, but mentally he remains at the pit and is on twenty-four hour call. Wherever he goes, he leaves a telephone number so that he can be contacted and often rings in to be appraised of the situation. Mining, at whatever level, is a "way of life" to the mining-line.

The colliery-manager's decision-making process is depicted by

point P on figure 3.7 and is based upon all available knowledge

that he can 'glean' from the production process as discussed

above.

3.5 Summary and Conclusion

The colliery levels are regarded as "Production Centres" although there is increasing pressure to be a "business unit". The NCB maintains, as far as possible, relatively stable conditions within these centres and the management functions are broken down into specialisms and routines. The technical methods, duties and responsibilities attached to each task and post are clearly defined and a high value is attached to loyalty, local knowledge, experience and skills which are self-reinforcing through the "Culture (and myths) of the Industry".

The structure of management control utilised stresses the hierarchical form of control, authority and communication which is reinforced through the assumption that the location of relevant knowledge is at the "top" of each level, for example, Colliery Manager, Area Director, the Board : apparently the only man who knows or should know "all" about the organisation is the "man at the top". This is reflected by the prestige and aura of mystique with which these roles generally seem to be regarded.

This hierarchical form of control is displayed in the MINOS philosophy. MINOS works on the concept that the effectiveness of management control is directly correlated to the amount of information available. Over-abundance of information can be problematical. Burns (1984) highlights how other industries that have developed highly centralised information systems have also developed communication problems and that information saturation can be as unproductive as information scarcity.

The management control system used at the colliery level is similar to that used at the Area level, the line being utilised to exercise accountability (point 13 on figure 3.7) for the performance of the colliery manager. The colliery manager is responsible to the Area Director for carrying out the Action Programme, for fulfilling the stringent legal requirements and for obtaining the profit levels set out in the colliery budget.

The colliery manager is held to account to production managers and ultimately to the Area Director at various meetings throughout the financial year. The accountability process and the accountability documents are outline in section 3.1.5.

Section 3.1.5 describes the periodic accountability between the colliery/area. To the colliery management team, the idea of accountability is a "taken for granted" part of their world. The meaning of accountability is associated with responsibility, it is the system with ensures that the colliery management are held responsible for the performance of the colliery as a whole and it is viewed as periodic "reckoning" or "explanation" of these responsibilities by reference to the achievement or non-achievement of a "correct" level of production. "Correct" seems to imply notions encompassing both physical and financial implications.

Accountability is not just a periodic process, but is continuous in nature as described in section 3.4 of the day to day workings of the under-manager. Section 3.1.5 provides a detailed account of a typical area-colliery accountability meeting.

The influence diagram, figure 3.3, depicts the colliery as a production centre and as "profit centre". As described in section 3.2, the colliery is seen as a "profit centre" with its own financial objective in terms of the "bottom line" profit figure. This "bottom line" profit figure has a complex relationship with performance appraisal and accountability. The relationship depicted on the influence diagram is simplistic in nature and portrays functionalist assumptions; a more complex portrayal would involve the development of an understanding of the mining-line frames of meaning. This understanding is developed in Chapter 6 by investigation of the principles and working rules of the mining-culture(s).

The complex relationship of profit and accountability (points 13 and 14 on figure 3.7) is encapsulated in the contradictory way in which the Area Director conceives this relationship. This contradiction is implied in the following quotes from the Area Director:

> "I don't thing accounting is strong enough within the colliery".
>
> "They don't see clearly enough the relation between accounting and production".
>
> "It wouldn't bother me never to discuss finance because if production is alright finance is".
>
> (Area Director)

The Area Director, during the researches, has commented on the "uselessness" of the bottom line profit figure as an indicator of performance and that he would not stress this profit figure as an important criteria, yet, at times it appears that "profit" is an important objective; (see section 3.2.1 on transfer prices) gaining

in importance as outlined in Chapter 2. The analysis of the
mining-line culture (point 11 on figure 3.7) may assist in
understanding these complex issues.

DOMINATION BY THE MINING-LINE

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4.0   Introduction

4.1   Definition of the organisation

4.2   Invisibility of the extraction process

4.3   Failure of standard costing

4.4   Mechanisation and automation programme

4.5   De-coupling in the industry

4.6   Socialisation process - Closed nature of the
                industry

4.7   Summary

Section 2.1 traces the production and organisation changes that have taken place in the NCB since nationalisation. It highlights that the form of organisation structure adopted was one of "line-staff". This line, was, and still is, the dominant core of the industry and relates to the mining aspects of the organisation. This chapter explores the ways in which the mining-line has maintained and strengthened its domination over the industry; enabling the production and reproduction of the 'mining-line reality'. Power and its facilitator, domination, being important elements in Giddens Theory of Structuration (See Chapter 1).

The power dimension of the mining-line is encapsulated in the view expressed by a Colliery Manager and a Production Manager:-

Colliery Manager: "... Only three jobs of significant
                           power and interest; Colliery Manager,
                           Area Director and Chairman of the
                           Board".

Production Manager: "... The colliery manager is responsible
                           for everything ... he ought to know
                           everything".

A major issue in the production and reproduction of 'social reality' is the power dimension inherent in the ability of an individual to create his/her own reality in that:

"what passes for social reality stands in immediate relation to the distribution of power".

(Giddens 1975: 113)

This is similar to Foucault when he refers to the positive side of power and states:

"In fact power produces; it produces reality; it produces
domains of objects and rituals of truth."

(Foucault, 1977:194)

Although the models of Foucault and Giddens relate to society in the

macro sense. The shifting and fragmented nature of power in their

models is the feature which is to be stressed by applying it to the

micro issues of sub-group and organisational power. Clegg (1979)

criticises Giddens' use of power (in relational terms) and argues

that Giddens fails to make power problematic and argues:

".... that the key to the 'duality of structures' must be the
acting individual 'drawing' from and 'reproducing' 'that order
of domination'".

(Clegg, 1979: 74)

Clegg argues that the "domination is" and is not something which one
"draws from"; this argument is encapsulated in the following quote:

"One cannot choose what dominates one, other than through
concerted class praxis as a revolutionary way of reformulating
dominance."

(Clegg, 1979: 74)

According to Foucault, power should be understood as the

'multiplicity of power relations' at work in a particular area.

These power relations are the object of an unceasing struggle in

which they are transformed, strengthened and perhaps reversed. Power

is not something that can be acquired, seized or shared. It is

exercised from innumerable points, in a set of unequal, shifting

relations. However, at some points, beliefs can become

institutionalised and they are no longer questioned and are accepted

as a normal part of the operations of the organisation.

"... social knowledge once institutionalised exists as a fact,
as part of objective reality and can be transmitted directly on
that basis. For highly institutionalised acts, it is sufficient
for one person simply to tell another that this is how things
are done".

(Zucker 1977: 726)

Hence, "shared world views" are developed which legitimise and institutionalise the present practices and structures of the "dominant parties". Thus within the NCB the "shared world view" of the dominant mining-line has been legitimised and institutionalised over the years. This chapter explores the ways in which this domination has become legitimised and section 4.7 explores the socialisation process which operates within the NCB to provide institutionalisation.

The above refers to self-perpetuation of power; if this is so, then once power is strengthened and the process institutionalised, then organisational change is made more difficult. Pfeffer (1981) gives a well demonstrated account of the institutionalisation of power and the reasons for the stability of major power distributions in organisations. However, as Foucault points out, power relations are the object of unceasing struggles; therefore struggles are continuing in order to maintain the above stability.

Therefore, it can be argued that organisations consist of multiple power relations which are in continual struggles in order that a dominant image of reality can emerge; in some organisations these power relations have become institutionalised which gives the image of stability: an image of a concrete reality. Thus, in the NCB, a strong sense of stability and continuity can be perceived. The processes of management tend to reinforce these images of stability even though the Area is in a "decline" situation in terms of the age of its collieries and the extent of its resources.

Section 1 outlined Giddens' Theory of Structuration.

As Giddens noted:

> "A social system is thus a "structured totality". Structures do
> not exist in time-space, except in the moments of constitution
> of social systems .... The most deeply-layered practices
> constitutive of social systems in each of these senses are
> "institutions".

(Giddens; 1979 : 65)

The above notion of the creation of a social system and structures is similar to the "spatial-temporal" reality described Section 1.3.

One of the main elements within structuration is power which is facilitated into structure through domination. Within the context of the NCB, domination of the mining-line is an important concept to understand since the spatial-temporal reality portrayed is that 'belonging' to the mining-line.

The remaining sections 4.1 to 4.7 describe the rules and resources drawn upon by the mining-line to ensure domination.

4.1   Definition of the organisation

In the power literature two approaches to the concept of reality can be taken, namely an objective, functionally determined perspective or a social constructionists perspective of reality. In the former, the organisation's survival requires certain environmental inputs and power is accrued to those who are best capable of providing or reducing uncertainty surrounding these inputs (Crozier, 1964; Hickson et al., 1971). Within this perspective, the environment acts as a constraint limiting the extent to which the distribution of power can become or remain out of line with the organisation's requirements for survival.

Within the social constructionist's model of reality (e.g. Pondy, 1977), the critical resources, organisational uncertainty and important contingencies, which are taken as 'a given' in the objective, functional perspective are a matter of social definition. The social definition agreed upon is a function of the power relationships and strengthens the power network/relations which give rise to a possible corpus of knowledge, and knowledge extends and reinforces the effects of this power. Power is not a collection of localised or isolated points, but is a connected network and each localised struggle induces effects on the entire network.

The social constructionist's perspective towards reality can be utilised to understand the power networks involved within the NCB on nationalisation. The historical section in Chapter 2, indicated that nationalisation was seen as the inevitable solution to the problems of the coal industry, for example the severe shortages of coal which manifested themselves during the Second World War. This was compounded by the fact that at this time the UK was a one fuel

economy therefore there was no alternative to coal. This was also a time of Industrial Capitalism in which growth was possible due to the predictable nature of the economic market and the ability to adapt to the market by effectively planning and predicting supply and demand relationships (Karpik, 1978). Hence, great emphasis in the early years of nationalisation was placed on formalising the 'Plan for Coal' process which attempted to match supply and demand. A combination of Industrial Capitalism plus severe shortages of coal during a crisis period for the country resulted in a definition of social reality for the NCB which stressed the "need for coal production and new technology". In this way, production orientated resources were defined as being critically important and the power networks stressed the "mining-line" authority and power.

Other definitions could have been argued for, for example, industrial relations were very poor and the critical factor in the organisation's success and survival could have been seen as "developing good working conditions and good industrial relations"; if this had been adopted as the critical factor, then industrial relations and welfare could have been the most important relationship in the power network.

Taking another example, the industry desperately required capital investment, taking this into account, the critical factor could have been in ensuring that the public monies were invested wisely in the modernisation and expansion of the coal industry including a system of accountability for the investment; this would have strengthened the power relationships towards the accountants within the Industry.

However, the above demonstrates the social definition of critical resources and that in the case of the NCB, the critical resources were defined, on nationalisation, as being "production orientated". This resulted in the "line-staff" philosophy which gave the position of authority to the mining-line, in a centralised, hierarchical organisational structure.

Power in the organisation is derived to a certain extent from the official authority structure and those occupying these positions have the power to establish and enforce a model (Benson 1977). Plus, as Foucault (1977) argues, the power relations give rise to a body of knowledge and this knowledge enables the extension and reinforcement of the effects of power. Hence, the social definition of critical resources is open to manoeuvring and negotiation and the initial definition of these critical resources is an important element in the development of an 'organisational body of knowledge'.

The mining-line acquired the initial strength in the power network in 1946 which gave rise to a 'mining-line' body of knowledge which has been used in many varied ways to maintain, reinforce and strengthen their power networks. This process is examined through various phenomenon which includes the invisibility of the extraction process; the failure of the Standard Costing System and the mechanisation and the automation programme. The de-coupling which exists in the NCB in terms of both functions and hierarchy, for example, the strategic issues of the industry are separated from the day-to-day workings of the industry. The strong socialisation process which exists allows the creation of 'thick' social understandings. The strong socialisation process is aided by the closed-nature of the Industry in that initial employees are recruited from the mining communities and promotion is from within the industry.

4.2   Invisibility of the extraction process

Visibility appears to be an important part of a control process (see
A. Loft, 1984).   In a deep-mining situation, the extraction process
has a high degree of invisibility.   It could be argued that this
invisibility has led to the use of the 'multiple' channels of
information in attempting to "open-up" the visibility of the process.
The need for visibility is reinforced by one of the myths of the
industry which is frequently reiterated, for example:

PRODUCTION MANAGER   "The Colliery Manager is responsible
                          for everything ... he ought to know
                          everything....".

Management at all levels appear to pressurise lower management
regarding their mental models of reality, for example:

AREA DIRECTOR   "But we need to know what is happening
                          there."

        and   "You want to know why."

The "need to know" appears to be an important element in the process
of reinforcing power relationships.   The difficulty in obtaining
'truthful' accounts of underground activities puts the pressure back
on personal observation; and a large percentage of a colliery
manager's time is spent underground.   Every member of the mining-line
spends substantial parts of their working weeks underground and tend
to continually refer to the time spent there.   Certainly from
Colliery Manager downwards the natural environment appears to be
underground with the philosophy that to control you need to be
underground as demonstrated in the following comment:

| ENGINEER | "... they'll be saying that we are running the pit from the pit-top." |

It appears to be important to be seen underground; this is rationalised in terms of the difficulty in obtaining "truthful" information from the pit bottom; therefore physical visits are required to clarify the situation:

| UNDER-MANAGER | "You can think about problems better if you can actually see them." |

However, it was admitted that despite spending so much time down the pit, the managers saw very few of the causes of problems, only those to which their attention was drawn to after the event. This can be evidenced in the following quotes:-

| OVER-MANAGER: | "... When you are down in the district you don't know what goes on because nobody wants to tell you so you must force them using thumbscrews." |
| UNDER-MANAGER: | "... The man on the job - if he is good - knows what the snags are. There is no way we know that." |

This is reinforced by the way in which the managers looked about (or didn't) as they walked about down the pit. This physical observation is a ceremony which is important in symbolic terms to reaffirm the power networks of the mining-line (Pfeffer, 1981). Hence, the 'walk-abouts' have important ritual significance: it maintains appearances and validates the mining-line. The need for physical observation and its importance to control is produced and reproduced in the mining-line. Attempts to negate the need for physical observation are strongly resisted or taken over and maintained by the mining-line itself.

The Fleck Report (1955) emphasised the need for "modern management

techniques" which gives an example of the social definition of the

legitimacy imbedded within the "management techniques" adopted.

Examples of the "modern management techniques" advocated were

standard costing; tighter capital controls; planned maintenance (see

Chapter 2). The emphasis was on 'bureaucratic' forms of control. As

Meyer and Rowan comment:

> "and because these building blocks are considered proper,
> adequate, rational and necessary, organisations must incorporate
> them to avoid illegitimacy."

(Meyer and Rowan, 1977: 307)

The Fleck Report was advocating an engineering cost approach which

could have severely restricted the mining-manager's job to the

attainment of the correct amount as specified by the standard. This

input-output technique would have programmed the mining activity and

placed strain on the dominance of the mining-line by opening-up the

visibility of the mining activities.

This bureaucratic control would have been the 'property' of the

Accountants, and the Cost Accountant was elevated to "management"

level to cope with the new system. The standard costing system was

implemented by Robson and Morrow (a consultancy firm) with assistance

from the Area Development team which consisted of finance and mining

personnel. Standards were developed for all production factors,

including output shifts, wages, materials and the system covered

individual faces.

Standards of performance are still utilised in the industry today and yet the standard costing system was declared a "disaster". This disaster was rationalised in various ways such as: the increasing mechanisation hampered the stability of standards creating frequent revisions or the unreliability of information, underground the existence of 'crisis-type' problems meant that, for example, materials were utilised in areas not designated for that particular material usage, therefore the inability to maintain accurate material usage records caused the system to fail.

It is argued in this chapter that a more powerful reasoning for its failure lies in the threat it posed for the dominance of the mining-line. Physical observation is perceived as an important element in maintaining the mining-line dominance, the use of standard-costing would have created an observable process to all parties concerned not just the mining-line and the process would have been programmed and predictable (Crozier, 1964). The dominance could have been transferred to the Accountants within the industry, the legal requirements of the colliery manager could be coped with structurally. The mining-line to retain its dominance must reinforce the "black-box" appearance of the mining-process, by, for example, defining the process as "not easily understood". This will reinforce or create the view that to understand the process you need to have spent time underground, so that one builds up a sound knowledge of the nuts and bolts of the industry. This is a powerful ideology and reinforces the non-substitutability of the mining-line and corresponds to the normative form of organisation. That knowledge of the precise process is difficult to acquire through the information system due to factors such as the difficulty in recording issues, as specified earlier and the difficulty in attaining the 'truth' from information and the need for physical visits.

This view of the failure of the standard-costing system is reinforced

through a comment from a director at H.Q.

DEPUTY DIRECTOR GENERAL: "... did not work because they
                                (mining-line) would not let it."

Evidence from the German mines, refutes the mining story that, for

example, material recording is difficult. Cleary (1983) describes

the material control system utilised by Lohberg colliery in the Ruhr

coalfield. He also describes the computerised labour control systems

at Schlaegel and Eisen colliery with benefits such as improved

deployment.

"Materials Control

Each item of equipment has its own exclusive code number and
this code number has a designated corral in the storage area.
Each material container also has its own identifying code
number.

When an order is placed for materials for underground it
includes the cost code of the district it is going to, the code
for the item itself and the quantity required. This request is
forwarded through the stores to the material disposition centre
where the information is input to the system. The computer
produces a loading program which is used in the stockyard
control room. The program says which material is to be loaded
and at what time, with which surface handling device and to
which track it has to go when loaded.

A ticket is printed for the material and it shows what the
material is, where it is stored, how it is to be loaded, its
eventual destination and its route to that destination. The
upper part of the ticket is twin leafed: the lower part of the
ticket is a strip of magnetic tape, which also has the same
information recorded magnetically.

Once the tickets have been printed, they are given to the crane
operators. The operator takes the type of container stipulated
on the ticket to the nominated corral and loads the container.
He removes the two top leaves of the ticket and sticks one on
either side of the container, he makes a note of the container's
number on the remaining part of the ticket; the ticket is
returned to the control centre. The container's number is typed
on the reading unit as the magnetic strip on the ticket goes
through the unit. The system now knows that the container is
loaded. The computer produces a dispatch list and the
controller directs the loco-driver by radio to marshall the
containers according to the dispatch list.

At the shaft side there is another computer terminal which reads
the magnetic tape on the container body and records the
departure of the container underground. Thus the complete
history of the materials order from initial acceptance to
dispatch to the pit bottom is stored on the computer. This
information is used to keep stock at the right levels, to
generate orders at the correct times and to keep an inventory of
the flow of material in the pit.

<center>Effects of the Rationalisation</center>

The rationalisation has brought about a saving in direct costs
of one million DM a year in the running of the materials
distribution system. Other advantages claimed by the colliery
for the system are a 20% reduction in wastage, a 15% increase in
the recovery of material from underground, a 20% improvement in
the speed of turnover of containers and an 80% reduction in
accidents."

(Cleary, 1983: 202)

The mining-line recognised the threats from such an engineered cost

system, but also recognised that to maintain legitimacy an

information system was required. Around the same time, the

organisation and its environment was being re-defined which stressed

the need to increase coal's competitiveness by concentrating on cost

reduction. This re-definition could have created a major threat to

the mining-line unless it could be harnessed within the structures

produced by the mining-line.

The outcome of these pressures was an information system which forms the basis of the current system. It consisted of "daily flows of information" which concentrated on physical items, e.g. output, use of labour. To incorporate the need for 'modern management techniques', this daily flow of information would be compared to a pre-determined but flexible production plan and prompt action to correct variances. These daily flows of information were provided by the mining-engineers, e.g. over-men, under-managers. This system of reporting still exists today, side-by-side with the computerised systems and is shown as Points 2, 4 on figure 3.7 in Section 3.3.

The financial control was introduced on a colliery basis (due to the difficulties of attaining face-level information). The design of a financial system on a colliery basis reinforced the power of the mining line; costs remained discretionary and the face remained as a black-box. As stated earlier, the budget used today is an imperfect articulation of the production plan, the unit of analysis for the budget is the colliery whereas for the action programme it is the 'face'. The Budget process is outlined in Appendix five and the action programme in Section 3.1.1.

The discretionary cost description holds strong today in that the mining-line still argue that there is no 'rational' way of estimating the 'right' amount of costs, yet standards of performance are utilised over the face. In the absence of an engineered standard, the amount to be spent is a matter of judgement; judgement of the mining-line:

DEPUTY DIRECTOR ADMIN (DDA): "The whole procedure is not very
                              scientific - it's just a question
                              of who's guess is the best, theirs
                              (HQ) or ours (Area)."

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An interesting comment in the interview with the DDA was:

> "We are dealing with the Treasury who imagine that things can be
> made very accurate."

This demonstrates the internal tensions and conflicts between the

sponsoring body and the NCB. This interview also demonstrated the

central role that "production" plays.

DDA: "In this business if somebody has exceeded his
         budget, you can't stop the pit."

Along the same lines, in the years before the introduction of the

External Financial Limits (EFL), colliery managers were allowed to

over-spend to produce output above budget; the situation today has

changed and is described in the use of financial penalties to limit

over-production.

The use of a discretionary cost system requires the use of "physical

observation" to assess "what has been accomplished" and to form a

judgement on the effectiveness of the manager(s) and their teams.

The importance of physical observation was highlighted in section 4.2

and demonstrates to the outside and inside worlds the centrality of

the mining-line to the extraction process.

Markus and Pfeffer (1983) suggest that power structures and

organisational paradigms must be considered in both research and

practice dealing with accounting and control systems. They draw

attention to the increasing importance of accounting and control

systems and the increasing sophistication of these systems (Markus

1979, Steward 1971). Markus and Pfeffer put forward three consonance

hypotheses to explain the resistance to accounting systems and system

difficulty:

"accounting and controls systems will be implemented easily to the extent that they are:

a)   consistent with other sources of power in their implications for the distribution of power;

b)   consistent with the dominant organisational culture and paradigm in their implications for values and beliefs; and

c)   consistent with shared judgements about technical certainty about the organisation's goals and technology."

(Markus and Pfeffer 1979:   205)

Certainly within the historical analysis of the NCB, the failure of the standard costing system and its replacement by a discretionary cost technique tend to support the above hypotheses.

The standard-costing system did not correspond to the distribution of power in the organisation; its language and symbols failed to correspond to those of the dominant organisational paradigm and culture, for example, it stressed quantitative evaluation whereas the culture stressed qualitative evaluation. In summary, the proposed accounting and control system based on standard costs did not 'fit' the dominant organisational paradigm. However, the discretionary cost system devised provided a "better fit" with the dominant culture, for example, it did not imply a major change in hierarchical power, it stressed qualitative evaluation and builds upon an assumption of a technology which is not well understood. It also provided for external legitimacy.

As Meyer and Rowan (1977) comment:

"... organisations are driven to incorporate the practices and procedures defined by prevailing rationalised concepts of organisational work and institutionalised in society. Organisations that do so increase their legitimacy and their survival prospects, independent of the immediate efficacy of the acquired practices and procedures..."

(Meyer and Rowan (1977 : 304)

This social definition of legitimacy affects the strategies and
tactics that can be and are used within the organisation to create
meaning. An interesting aspect in the NCB is the manner in which the
mining-line has utilised this social definition of legitimacy in
producing and reproducing their own organisational meanings. This is
explored in Chapter 6.

Today's system of "accountability" was introduced in 1967 (the
history of accountability is related in Chapter 2) and the structure
of this system strengthened the power of the mining-line and the
structure of accountability adopted demonstrated the domination and
structuring privilege of the mining-line. Accountability works down
through the line of the industry, in that, the Area Director is
directly accountable to the Board for achieving the objectives laid
down for the Area and its collieries. This system of accountability
created in the Areas two distinct groups; those who are accountable
and those who are not. The accountability system, the production and
financial planning and control systems highlight the extraction
process and numerous other processes remain unaccounted for, for
example, the accounting process; industrial relations process to name
but a few.

Part of the initial organisational definition stressed the

technological state of the industry which required re-vamping; the

NCB, on nationalisation, adopted a policy of mechanisation. This

mechanisation of faces and Elsewhere Below Ground (EBG) created a new

group of professionals, the 'engineers'. As Crozier (1964:   109)

indicated, maintenance engineers have the ability to redistribute the

power networks:

> "machine stoppages are the only major happenings that cannot be
> predicted."
>
> (Crozier, 1964: 109)

and the engineers had:

> control over the last source of uncertainty remaining in a
> completely routinised organisational system."
>
> (Crozier, 1964: 154)

Hickson et al (1971) argues that the above is not sufficient for
power and that:

> "control of strategic contingencies which gave power to the
> engineers has to be explained on all counts and not by
> uncertainty alone."
>
> (Hickson et al (1971:225)

These strategic contingencies are subject to the issues discussed in

the definition of the organisation which, stressing a social

definition perspective highlighted that in the case of the NCB, the

strategic contingencies were defined as issues surrounding volume of

production, such as work-flow pervasiveness and immediacy.

Certainly within the context of the NCB, the reasoning of Crozier

does not apply as the "engineers" do not have control over the "last

source" of uncertainty. However, their affect on work-flow

pervasiveness and immediacy is strongly coupled with safety aspects.

Machine break-downs can stop coal output or affect safety. This

situation could strengthen the power network towards the engineers.

Increasing tensions between the under-managers (mining-line) and

engineers are observed at most meetings. This tension is

demonstrated in the following quote:-

ENGINEER   "...it may be mechanical failure (it's
                      my responsibility) but caused by
                      inadequate lubrication by miners."

However, the two functions - mining-engineers and engineers appear to

be held together by the "all in the pit together" culture and even

though tensions are high, the importance of physical and engineering

factors are reflected throughout all of the colliery meetings and

accountability meetings. The "all in the pit together" is captured

in the following quote:

COLLIERY MANAGER: "Must engineer the team spirit, not
                      that we are two separate units."

The importance of the physical and engineering factors are captured

in the following quotes:

AREA DIRECTOR: "...You've had the faces, but the
                      tonnes per machine shift are down."

AREA DIRECTOR: "...Use the machinery where it can
                      contribute."

AREA DIRECTOR: "..If I had come into your pit a few
                      weeks ago... people in the control room
                      didn't know the start-up and finish
                      times."

Therefore, both types of engineer recognise the stress placed on volume of production and this stress, in part, creates the tensions coupled with the 'fluid' power networks. The volume issue is evidenced in the Area Director quote above which stresses tonnes/machine-shift.

The above discussion points to the potential power position of engineers in the power network, however, the engineers appear to have been managed in various ways to reduce this 'potential'. For example, the engineers are responsible to and report to the colliery manager. The colliery manager is always a mining-engineer due to the strict 'legal statutes' covering the job which decrease the substitutability of this position. All colliery managers must possess a 'first-class' ticket, and this 'ticket' maintains the functional split between the mining-managers and the engineers.

Engineers appear to define their situation in terms of "a world of machinery", for example:

"It's all technical underground."

Their domain surrounds the installation, testing, maintenance and provisioning of equipment coupled with its 'safe' operation. This "world-view" of machinery is reinforced by the planning system utilised and provides another example of the 'way in which the engineers are managed'. The engineers have no involvement in drawing up the action programme of the 5 year plan but utilise these documents to "plan" their own function's equipment, for example:

ENGINEER   "I need to be able to predict the
                            likely load requirements and these
                            depend on the size and number of faces
                            etc....".

An interesting point is that the engineer is held to account in terms of objectives in the action programme and is judged by the colliery manager in terms of these. The day-to-day actual progression of development of the mine and district is controlled by the Under-Managers and the Deputy Manager. This accountability creates tensions:

ENGINEER   "it may be mechanical failure ('its my
                            responsibility') but caused by
                            inadequate lubrication by miners."

This creates a complex problem for the NCB and the split between engineers and mining management, especially under-managers, was perceived throughout the research and as one colliery manager commented:

COLLIERY MANAGER   "Must engineer the team spirit, not
                            that we are two separate units."

UNDER-MANAGER TO
MECHANICAL ENGINEER   "You're not catching me out with this."

The situation between the under-managers and engineers is extremely complex, further confused through the opaqueness of job positions and responsibilities and divided through the differing definitions of the *situation* constructed. The Area Director has incorporated the Mechanical and Electrical Engineers of the collieries in the Quarterly Accountability meetings. This socialisation process may help towards the re-definition of the engineer's situation more towards the mining management and vice-versa. This process is also taking place at collieries on a day-to-day basis. Health monitoring of equipment is also being developed which will reduce the 'judgmental element of the engineers job and aid the introduction of preventive, planned maintenance.

Crozier comments:

"... as soon as the first intuitions and innovations can be translated into rules and programs, the expert's power disappears.

(Crozier, 1964: 165)

See Hickson et al (1971) for an outline of the two types of routinisation and their effects on power. The NCB is actively pursuing this "health monitoring" and rationalises its introduction in terms of cost-efficiency; it is also a way of handling the situation between the engineers and the under-managers in that the areas of judgement are removed and the decision-making becomes part of an expert system. The engineers being de-skilled to "fitters" responding to computer assessments of the health of the machinery.

The automation programme and its stress on system engineering demonstrates, amongst other things, the responsibility of the mining-line and avoids claims of negligence (Meyer and Rowan, 1977). To retain the dominance; the mining-line must "show" that they are incorporating the "proper" elements of structure as outlined in the textbooks on management, and complex organisations ensuring the necessary resources needed to survive. The automation programme builds upon cybernetics (with its growing following at that time) and the use of information technologies in the design and use of MINOS and FIDO (see Chapter 3). An interesting feature of this programme is that the main input is the production plan for the mine/face, the outputs are coal and information, the secondary inputs are capital and labour. This again demonstrates the predominance of production and the secondary role played by finance, see section 4.6 on decoupling for further analysis of this phenomena.

Horton refers to:

"the large investment in coalface equipment in recent years, and
the fact that the full potential of this equipment has still to
be realised.

Machine running time, at present approximately one-third of the
total shift time, must be improved by reducing the available
delay time. To achieve this, operating managers in the future
will have available continuous and comprehensive records of face
delays by type and duration, stored and available for analysis.

.... The use of FIDO allows management to identify operational
delays easily and accurately and to take immediate remedial
action."

(Horton, 1983; 454)

The information flows throughout the collieries are subjects

involving contradictions and controversies, for example, computer

delays often do not tally with deputies reports of delays. Stories

pervade the collieries regarding the inaccuracy of data supplied by

the computer, for example, the computer print out recorded that a

machine was broken-down, but verbal reports stated the machine

working. It was basically put that either someone was lying or one

doesn't believe the print-out.

COLLIERY MANAGER ".. must utilise both sources of
information to try to ascertain the
truth."

The above quote provides evidence for the controversy that exists

between the manual and computerised information system recording

delays. Inaccuracies are inevitable because the computerised system

only records delays of over 20 minutes. Minor delays, less than

twenty minutes are common-place.

UNDER-MANAGER "...Deputies reports of delays do not
always tally with computer delays."

"... it has been a lousy day - but
there's nothing you can put your finger
on."

The lousy day is attributable to numerous small unrecorded, on the
computer-system, delays.

This type of behaviour tends to support the concern of keeping the
face as a black-box in that there is difficulty in attaining the
'truth' from information and the need for physical visits and the
traditional 'blue' books (deputies, overmen, under-managers all
record production information in 'blue books') which form their
personal record of the shift's activities (see Chapter 3 for a
descriptive analysis). This represents a gap between the theory
behind the automation programme and the actual practice; but also
demonstrates how the 'stories' reinforce the power networks, coupled
with solution such as Horton refers to:

> "Preference has been made to the large investment in coalface
> equipment in recent years...."
>
> (Horton, 1983: 454)

The solution to this problem in mining terms, lies in increasing
output form the available machine-time. Volume of production appears
to be the central feature in the planning and control systems
utilised, for example, cost reduction is managed in terms of
increasing volume of production, efficient use of capital features
the maximisation of output. This is all occurring in a market where
supply far exceeds demand. However, these issues of matching demand
and supply are de-coupled from the operations of the colliery and are
treated as HQ concerns.
The problems of capital investment relate back to the Plan for Coal
1974 which advocated and instigated a major investment programme.
The finance personnel reflect back to this time and argue that
insufficient investment appraisal techniques were utilised to screen
projects.

The industry utilised the features of industrial capitalism which is characterised by, amongst other features, technological development.

The lead times in the mining-industry are long and the collieries are now working with the "highly mechanised pits" which require high output levels in order to legitimate the high investment levels, hence the use of MINOS and FIDO, which are 'mining-owned' computer systems.

In summary the function of mining has become a highly mechanised task where the maintenance engineers could have capitalised upon their potential power position and reduced the dominance of the mining-line. However, the maintenance engineers have been managed in various ways to reduce this "potential". Part of this has occurred through structure as the engineers are responsible to and report to the colliery manager. Within this structure the engineers are not party to the planning exercise relating to the development of the mine but utilise the end result to plan their own functions resources.

The mining-line are introducing concepts such as health monitoring which will reduce the "judgmental" element of the engineers job and aid the introduction of preventative, planned maintenance. Hence reducing the experts power and reducing the threat posed by engineers on the dominance of the mining line. These are examples of how adaptive the mining-line are in absorbing and managing threats to their dominance.

4.5   De-coupling in the industry

Capital is decoupled from the revenue generating activities of the
NCB. Collieries are "profit centres" and produce profit and loss
accounts but balance-sheets are not produced. Managers are not held
to account for their use of capital; it is seen, at least in this
(accounting) sense, as a free source of finance. Technological
development does not appear to have a capital cost attached to it, in
the eyes of the operating managers. Areas do not appear to be
expected to manage their cash, working capital, stocks and fixed
assets in any direct manner. This is evidenced in the following
quote:-

COLLIERY MANAGER   ".... what sort of finance - they don't
                    handle a penny at Area."

These are HQ concerns and are managed centrally, e.g. management of
working capital and negotiation of finance, in order that economies
of scale can be achieved. These are economically sound reasons, but
place severe limitations on the image that Areas are increasingly
espoused to hold, that of "business centres". Instead these features
of financial management are subsumed under production decisions, for
example, as in Horton's (1983) article; and it was suggested to the
research team that there would be no differences if Areas produced
balance-sheets. This is due to the format of the present-day profit
and loss account which computes profit on the basis of "saleable
output". Adhering to the NCB system of attribution and the level of
recognition of inter-dependencies and the problems of accounting
thereby encountered.

The bottom-line profit is before interest, but after an appropriation
of Area and HQ overheads (based on output) and can be increased
through increasing output levels to create "paper" revenue and
reducing unit costs (the EFL is viewed as a spending limit within
which output is maximised in order to reduce unit costs the majority
of costs are viewed as fixed costs). See Chapter 3 for a description
of the profit and loss accounts used. Kaplan (1984) refers to the
art of producing "paper" profit or improved "paper" return on
investment rather than "real" wealth generation. This also holds
with the collieries in that increased profit can be paper
manufactured with a negative effect on wealth creation through the
stocking of coal. Sales are credited to all output whether sold or
stocked, thereby producing paper turnover as opposed to cash inflows.
The stock has a negative effect on the cashflow due to the tying up
of working capital.

With the production of balance-sheets and the use of
return-on-investment (ROI) to evaluate performance, the same types of
behaviour would be recorded with the emphasis still on volume of
production to increase the bottom line profit figure coupled with
book-keeping exercises with depreciation to increase the reported
ROI. This demonstrates that the accounting system, supported and
used by the mining-line, defines the organisation of collieries and
areas as "production-centres" and its replacement by "ROI" criteria
without major changes in the accounting system or/and the mining-line
culture or dominance will still utilise this definition.

The criteria for return-on-investment, "ROI", is defined as:-

$$\frac{\text{COLLIERY BOTTOM-LINE PROFIT}}{\text{INVESTMENT}}$$

Investment spend is already curtailed by colliery managers to off-set the effect of increased depreciation charges on the P & L Account. Thus both the bottom-line profit figure and the investment figure would be beneficial towards a reported ROI. Chapter 6.0 explores the metaphorical nature of tools such as profit and loss accounts and return on investment. These two represent the same dominant context of the mining-line - the extraction process and therefore would provide for the same type of behaviour. Behaviour which cannot be adequately nor accurately understood without a comprehension of the dominant, mining-line culture of the organisation. Chapter 5 further elaborates this culture.

The format of the accounting system reinforces the view of the 'protection of production' from the short-term financial and marketing decisions, reinforcing the importance of the continuity of production and the mining-line. It also means that longer-term issues of wealth creation are not articulated within the shorter-run orientation of Area financial policy and it can be argued justifiably is not (yet) a part of the dominant paradigm at collieries and Areas; this creates tensions, ambiguities and uncertainties at the Area/HQ boundaries.

The above demonstrates the "horizontal decoupling" in that functions outside of the mining-line are detached from Production and Engineering e.g. Corporate Policy, Finance, Marketing and Industrial Relations respectively.

Weick defines loose coupling as:

> "the image that coupled events are responsive, but that each
> event also preserves its own identity and some evidence of its
> physical or logical separateness .... and that their attachment
> may be circumscribed, infrequent, weak in its mutual affects,
> unimportant, and/or slow to respond."

(Weick, 1976: 219)

See also Klir (1969)

Conventional organisational literature views "loose coupling" as
undesirable, however, the NCB appears to have utilised de-coupling to
manage varying types and degrees of uncertainty and complexity,
namely production and technical as opposed to political and economic,
by sealing each from the problems of the other (Berry, et al., 1985).

> "... if there is a break-down in one portion of a loosely
> coupled system then this break-down is sealed off and does not
> affect other portions of the organisation."

(Weick, 1976: 223)

This allows the collieries to pursue the continuity of production,
while finance, marketing and HQ copes with the changing environment.
The use of "saleable output" as the basis for crediting revenue to
the colliery profit and loss account is an example of the decoupling
of marketing and finance; the problems created by the volume of
production are coped with by HQ and the productive core is protected
from what might be short-term fluctuations or 'fads of fashion'. The
accounting system is absorbing these uncertainties at area level and
below and legitimating attention to production. However, these
uncertainties require managing at some level and this appears to take
place at Board level and at the Department of Energy where issues
such as finance limits, cash resources, are discussed and approved.
This area of the interaction between the Board and the Department of
Energy provides an area for further research (see Chapter 7.0).

Marketing aspects appeared to be of only a superficial nature at Area level. Marketing issues were addressed at Accountability meetings between colliery and area, but remained the province of the Area Marketing Manager, and only addressed issues such as proceeds and then only as outlined by regional marketing. Alderson (1983) outlines how in the Western Area marketing requirements play a part in the formulation of the 5 year production plans and that each colliery 5-year plan has what is called a "marketing assessment". This marketing assessment is a quality assessment of each seam that features in the 5-year plan based on quality parameters of moisture, ash, sulphur, chlorine, rank and ash fusion. He argues that the process of drawing up each quality assessment involves the active contribution of mining, geological, scientific and marketing aspects. This supply of coal in terms of quality is matched with the demand for such coals. As the Western Area recognises:

"Ultimately, no single area of the country can make any forecast without involving the whole.....Western Area have settled for forecasting the home demand for their coal, but only after the closest consultation with other coalfields."

(Alderson, 1983: 67)

Alderson recognises that "mismatches" between supply and demand will occur but argues that:

"rewriting the 5-year Mining Plan is the last and probably the least likely of the various options that are open".

(Alderson, 1983: 67)

He goes on to outline the measures necessary to bring supply and
demand into balance, these include :

> "selective crushing underground in order to remove a particular
> seam from domestic and industrial graded coal; modifications to
> coal preparation plants, either to alter or create screening
> facilities or to extend washing facilities; blending between
> collieries; the creation of 'specialist' collieries for
> industrial and domestic coal, especially where loading
> facilities are already in existence."

(Alderson, 1983, 67)

However, this demonstrates the loose coupling between the two and the

protection of the 5-year mining plan in that matching occurs

"outside" of the extraction process itself. Production is the major

goal of the Area, sales appear to be a peripheral aim. Within the

area studied, no reference was made to the use of a "5 year Quality

Assessment" although blending did take place in the Area and appeared

to serve two purposes: the creation of more "marketable" coal and the

spread of area profit across collieries in order that certain pits

"looked" economic in terms of bottom-line profit.

This demonstrates that the de-coupling which up to now has separated

the production and economic/political issues of the industry is

coming under pressure and HQ's presence is growing in terms of the

Area, and increasing the significance of finance, marketing and

industrial relations. Within the models of efficiency espoused by

the 1984 Government, functions such as finance and marketing are

increasing in external legitimacy.

It could be argued that the "Western Area's marketing: a modern outlook" is an attempt to react to this need for external legitimacy; it would also appear that a 'tighter coupling' is required and this will create increasing conflict in the future as finance and marketing issues increase their pervasiveness into the technical core of the industry, cutting into the dominant paradigms. It appears as in the marketing case above, that the mining-line is attempting to react to these changes but in a way which "protects the technical core"; that is, the mining-line is reacting in an institutionalised fashion in the same way as it did with the discretionary cost system. However, greater pressures are being exerted by internal participants, external constituents and the government than in previous years - i.e. the climate has changed with an emphasis on "rule-governing behaviour".

Wilkins and Ouchi (1983) argue that most real organisations utilise all three forms of control, namely markets, bureaucracies and clans (Ouchi, 1980), but that some organisations, or parts of, employ the clan form of governance more predominantly than others. The clan form of control appears predominate within the mining-line of the NCB, in that this part of the organisation has developed a distinct local culture, or clan and due to its dominance and strength pervades through the collieries, areas and to a certain extent HQ. The mining-line community appears to approximate the "community-like" sharing of complex understandings implied in the anthropologists' cultural paradigms. It must be noted at this point that, in anthropology there is no consensus on the meaning of culture.

Smirchich (1983) argues that cultural anthropology is inquiry into the phenomenon of social order, just as part of organisation theory, or 'traditional' organisation theory is based upon an assumption of social order. Smirchich (1981) differentiates organisational culture in terms of the Burrell and Morgan (1979) framework of interpretative-functional, see also Smirchich (1983), and argues that a variety of research agendas flow out of the linkage of different conceptions of culture and organisation, for example, causality, prediction, meaning and the processes by which life is possible. Riley (1983) argues that functionalist's culture and the interpretative's culture which stresses "uncovering the way a particular reality works" often portray organisations as working together in a shared cohesive totality.

Riley's perspective is that organisations have subcultures and allow for rival images and competing systems of meaning, and utilises the theory of structuration as a means of studying organisational culture. The previous sections of this chapter have attempted to outline how resources were utilised to generate power and control the political culture and that alternative images do exist, or are beginning to emerge, but that until recently a relatively high level of social agreement has appeared to exist throughout the organisation, both at Area level and above. Wilkins and Ouchi (1983) suggest some of the conditions necessary to develop "thick" social understandings (Geertz, 1973) which are specific to the organisation. These shall be described and related to the context of the NCB as follows:-

1   Long history and stable membership

Schein (1981) argues that long history and stable membership is a pre-requisite for development of complex social understandings. Experience in the NCB would not deny such a claim. The life-time employment practices of the NCB provide just such a condition. This life-time employment is expected for the mining-line as the NCB is the only employer. However, these practices extend throughout the staff functions, for example, accounting, marketing expect life-time employment and staff turnover is low. The employment practices extend to a belief in the "birth right". Utilising the index of stories (Wilkins, 1979) as an index of the amount of sharing of cultural understandings, then the NCB "stories" form a way of life and the same stories are repeated up and down the mining-line and across functions. The Japanese companies which tend to exhibit

stable membership are characterised by a high level of socially
shared understandings (Abbegton 1958, Rohlen 1974, Ouchi 1981).

Wilkins and Ouchi (1983) also argue that the longer the history
of the unit coupled with stable membership, the more likely that
one generation of members will pass on understandings to
successive generations. This is also strengthened in the NCB by
the closed nature of the industry both in terms of its stable
membership, but also in terms of the fact that a high level of
membership exhibit nepotism, employees are recruited from mining
families. These give the image of historicity which, according
to Berger and Luckman (1966) is the beginning of the
institutionalisation of social knowledge, in that historic
institutions are created:

> "In other words, the institutions are now experienced as
> possessing a reality of their own, a reality that confronts
> the individual as an external and coercive fact."
>
> (Berger and Luckmann, 1966:   58)

Hence, due to the distinct recruitment policies of the NCB, its
life-time and birth-right employment practices, and its long
history serve to harden the social knowledge into a culture.
All these practices aid the mining-line in restructuring their
organisational structures.

2. <u>Absence of institutional alternatives</u>

Wilkins and Ouchi (1983) contend that:

> "culture in organisations will more likely develop when
> contradictory social institutions are absent or
> discounted."

The NCB isolates its members from cultural or institutional
alternatives to a great degree by its policy of recruiting from
the lower hierarchical positions and that promotions are from
within the institution. The recruiting of initial employees
from the mining communities improves the chances of the new
members already possessing certain values and orientations in
common with the 'shared reality' of the organisation. This
promotion from within was strengthened through the internal
participants claim of uniqueness in that the mining industry is
different from any other industry, this claim is used to
discredit orientations that seem to differ from their own. This
orientation exists throughout the mining-line and extends across
the functions, and displays itself in myths such as "there is no
alternative".

3. Interaction among members

Wilkins and Ouchi (1983) argue that collective decision-making
may be seen as another means to encourage reinforcement and
development of shared knowledge through member contact. The NCB
utilise other means which are based on their hierarchical,
centralised organisational structure and the principle of
deference which is socialised into members at an early stage.
Decision-making and accountability is narrowed to the
mining-line and the director's committee. The dominance of the
mining-line in the activities of the NCB tends to give the
appearance of "wide-spread" common interpretations, but it must
be recognised that less powerful idiosyncratic explanations and
understandings do exist but are too remote from the actual
decision-making systems to make an impact. An interesting

feature is the way in which the mining-line has subsumed the 'bureaucratic controls' for example, the accounting system into the clan control. As Wilkins and Ouchi (1983) comment, clans are likely to be concerned with external legitimacy of the organisation and this has been explored in the previous section. However, the pressure of these external participants could in the future seriously erode the clan control and re-emphasise the bureaucratic controls.

The culture within the NCB appears to be more near the paradigmatic cultures studied by anthropologists than to be found in other organisations. This could lead to problems of change; the anthropologists tend to emphasise the immutability of culture; Wilkins and Ouchi (1983) tend to stress the adaptiveness of clans and argue that questions such as "how much" and "what kind" of change is required. These are important questions, as they argue that culture is not as immutable as anthropologists believe, and that the type of resistance depends upon what is being changed.

4.7   Summary

In understanding the workings of the NCB, an understanding of the

multiplicity of power relations at work and the continual struggles

of the mining-line in maintaining dominance is imperative. This

chapter explored several phenomena which has strengthened the

mining-line dominance and allows the reproduction of the mining-line

reality to pervade through the organisation drawing upon Gidden's

Theory of Structuration. Over the years this reality has become, in

part, institutionalised and taken as an "objective" reality relating

to deeply-layered structures as outlined in Section 4.1.

Section 4.1 explores the rules and resources which the mining-line

draws upon to maintain dominance. In summary these included the

first initial definition of the organisation which stressed the prime

importance of production and gave the authority to the mining-line.

Once this definition was established, the mining-line utilised

various phenomena to continuously create and re-create their view of

reality.

These phenomena included the invisibility of the extraction process

as discussed in section 4.2. In a deep-mining situation, the

extraction process has a high degree of invisibility. It can be

argued that this invisibility has led to the use of 'multiple'

channels of information in attempting to 'open up' the visibility

of the process coupled with the "need to know" which appears to be an

important element in the process of reinforcing power relationships.

The difficulty in obtaining 'truthful' accounts of underground

activities puts the pressure back on physical observation.

It appears to be important to be seen underground; this is

rationalised in terms of the difficulty in obtaining 'truthful'

information from the pit bottom. Hence physical visits are required

to clarify the situation. However, it was admitted that despite

spending so much time down the pit, the managers saw very few causes

of the problems, only those to which their attention was drawn after

the event. This is reinforced by the way in which the managers

looked about (or didn't) as they walked about the pit bottom. This

physical observation is a ceremony which is important in symbolic

terms to reaffirm the power networks of the mining-line.

That is, the 'walk-abouts' have important ritual significance: it

maintains appearances and validates the mining-line. The need for

physical observation and its importance to control is produced and

reproduced in the mining-line. Attempts to negate the need for

physical observation are strongly resisted or taken-over and

maintained by the mining-line itself.

Examples of protecting the invisibility of the extraction process are

discussed in section 4.3 with the failure of the system of standard

costing. During 1955, the Fleck Report stressed the need for 'modern

management techniques' and examples advocated included introducing a

standard costing system. Standards of performance are still utilised

in the industry today and yet the standard costing system was

declared a "disaster". This disaster was rationalised in various

ways. For instance it was argued that the increasing mechanisation hampered the stability of standards creating frequent revisions. The unreliability of information was another argument advanced for the disaster. In addition it was argued, the existence of 'crisis-type' problems underground meant that, for example, materials were utilised in areas not designated for that particular material leading to the inability to maintain accurate material usage records. Issues such as this it is argued caused the system to fail.

Physical observation is perceived as an important element in maintaining the mining-line dominance, the use of standard-costing would have created a physically observable process to all parties concerned not just the mining-line and the process would have been programmed and predictable (Crozier, 1964). The dominance could have been transferred to the Accountants within the industry (the legal requirements of the colliery manager could be coped with structurally); the mining-line to retain its dominance must reinforce the "black-box" appearance of the mining-process, by, for example, defining the process as "not easily understood". This reinforced or created the view that to understand the process one needed to have spent time underground, know the nuts and bolts of the industry etc.

Knowledge of the precise process is difficult to acquire through the information system due to factors such as the difficulty in recording elements such as material, as specified earlier, and the difficulty in attaining the 'truth' from information hence reinforcing the need for physical visits to really understand 'what is going on'. This is a powerful ideology and reinforces the non-substitutability of the mining-line.

Although the mining-line dominates it does not extract from the need to maintain legitimacy through the use of a 'culturally conducing' information system. Around the same time, the organisation and its environment was being re-defined which stressed the need to increase coal's competitiveness by concentrating on cost reduction. This re-definition could have created a major threat to the mining-line unless it could be harnessed within the structures produced by the mining-line. The outcome of these pressures was an information system which forms the basis of the current system.

Financial control was introduced on a colliery basis (due to the difficulties of attaining face-level information). The design of a financial system on a colliery basis reinforced the power of the mining line; costs remained discretionary and the face remained as a black-box. As stated earlier, the budget used today is an imperfect articulation of the production plan, the unit of analysis for the budget is the colliery whereas for the action programme it is the 'face'. The Budget process is outlined in Appendix five and the action programme in Section 3.1.1.

The discretionary cost description holds strong today in that the dominant mining-line results in the view that there is no 'rational' way of estimating the 'right' amount of costs, yet standards of performance are utilised over the face. In the absence of an engineered standard, the amount to be spent is a matter of judgement; judgement of the mining-line.

Section 4.4 explores the way in which the mining engineers adapted a policy of mechanisation to cater for the problem of technological obsolescence that was inherited on nationalisation. This mechanisation of the faces and elsewhere below ground created a new group of professionals, the "engineers", with the potential that power could be re-distributed. Increasing tensions between the mining-engineers and engineers are observed at most meetings. However, the two functions - mining engineers and engineers - appear to be held together by the 'all in the pit together' culture and even though tensions are high, the importance of physical and engineering factors are reflected throughout all of the colliery and accountability meetings.

However, the engineers appear to have been managed in various ways to reduce this 'potential' conflict and dominance. For example, the engineers are responsible to and report to the colliery manager. The colliery manager is always a mining-engineer due to the strict legal requirements covering the job which decreases the substitutability of this position. All colliery mangers must possess a 'first-class' ticket, this 'ticket' maintains the functional split between the mining-managers and the engineers.

Engineers appear to define their situation in terms of "a world of machinery", claiming:

"It's all technical underground".

Their domain surrounds the installation, testing, maintenance and provisioning of equipment coupled with its 'safe' operation. This "world view" of machinery is reinforced by the planning system utilised and provides another example of the 'way in which the engineers are managed'. The engineers have no involvement in drawing up the action programme or the 5 year plan but utilise these documents to "plan" their own function's equipment. An interesting point is that the engineer is held to account in terms of objectives in the action programme and is judged by the colliery manager in terms of these. The day-to-day actual progression of the development of the mine and district is controlled by the Under-Managers and the Deputy Manager.

The situation between the under-managers and engineers is extremely complex, further confused through the opaqueness of job positions and responsibilities and divided through the differing definitions of the situation constructed. The Area Director has incorporated the Mechanical and Electrical Engineers of the collieries in the Quarterly Accountability meetings. This socialisation process may help towards the re-definition of the engineer's situation more towards the mining management and vice-versa. This process is also taking place at collieries on a day-to-day basis. Health monitoring of equipment is also being developed which will reduce the

'judgmental' element of the engineers job and aid the introduction of preventive, planned maintenance.

The automation programme and its stress on system engineering demonstrates, amongst other things, the responsibility of the mining-line and avoids claims of negligence (Meyer and Rowan, 1977). To retain the dominance; the mining-line must "show" that they are incorporating the "proper" elements of structure as outlined in the traditional textbooks on management.

The automation programme builds upon cybernetics (with its growing following a that time) and the use of information technologies in the design and use of MINOS and FIDO (see Chapter 3). An interesting feature of this programme is that the main input is the production plan for the mine/face, the outputs are coal and information, the secondary inputs are capital and labour. This again demonstrates the predominance of production and the secondary role played by finance, see section 4.5 on decoupling for further analysis of this phenomena.

The lead times are long for coal production and the collieries are now working with the 'highly mechanised pits which require high output levels in order to legitimate the high investment levels, hence the use of MINOS and FIDO, which are 'mining owned' computer systems established to reduce delays and convey information. Yet again, the mining-line has re-emphasised the 'need for production'. Section 4.5 stresses the decoupling between capital and revenue generating activities of the NCB.

Collieries are "profit centres" and produce profit and loss accounts but balance-sheets are not produced. Managers are not held to account for their use of capital; it is seen, at least in this (accounting) sense, as a free source of finance. Technological development does not appear to have a capital cost attached to it, in the eyes of the operating managers. Areas do not appear to be expected to manage their cash, working capital, stocks and fixed assets in any direct manner.

These are HQ concerns and are managed centrally, e.g. management of working capital and negotiation of finance, in order that economies of scale can be achieved. These are economically sound reasons, but place severe limitations on the image that Areas are increasingly espoused to hold, i.e, that of being "business centres". Instead these features of financial management are subsumed under production decisions. It was suggested to the research team that there would be no differences if Areas produced balance-sheets. This is due to the format of the present-day profit and loss account which computes profit on the basis of "saleable output". Adhering to the NCB system of attribution and the level of recognition of inter-dependencies and the problems of accounting thereby encountered. See Chapter 3 for a description of the profit and loss accounts used.

The bottom-line profit does not include any interest charges, but includes an appropriation of Area and HQ overheads (based on output). Kaplan (1984) refers to the art of producing "paper" wealth generation. This also holds with the collieries in that increased

profit can be paper manufactured with a negative effect on wealth creation through the stocking of coal. Sales are credited to all output whether sold or stocked, thereby producing paper turnover as opposed to cash inflows. The stock has a negative effect on the cashflow due to the tying up of working capital. Once again re-emphasising the importance of volume and the need to 'turn the coal'. This demonstrates that the accounting system, supported and used by the mining-line, defines the organisation of collieries and areas as "production-centres".

The format of the accounting system reinforces the view of the 'protection of production' from the short-term financial and marketing decisions, reinforcing the importance of the continuity of production and the mining-line. It also means that longer-term issues of wealth creation are not articulated within the shorter-run orientation of Area financial policy and it can be argued justifiably is not (yet) a part of the dominant paradigm at collieries and Areas; this creates tensions, ambiguities and uncertainties at the Area/HQ boundaries.

The above demonstrates the "horizontal decoupling" in that functions outside of the mining-line are detached from Production and Engineering e.g. Corporate Policy, Finance, Marketing and Industrial Relations respectively.

Conventional organisation literature views "loose coupling" as undesirable, however, the NCB appears to have utilised de-coupling to manage varying types and degrees of uncertainty and complexity. It attempts to isolate production and technical concerns from the political and economic. (Berry, et al., 1985). This is because:

"... if there is a break-down in one portion of a loosely coupled system then this break-down is sealed off and does not affect other portions of the organisation."

(Weick, 1976: 223)

This allows the collieries to pursue the continuity of production, whilst finance, marketing and HQ copes with the changing environment. The use of "saleable output" as the basis for crediting revenue to the colliery profit and loss account is an example of the decoupling of marketing and finance; the problems created by the volume of production are coped with by HQ and the productive core is protected from what might be short-term fluctuations or 'fads of fashion'. The accounting system is absorbing these uncertainties at area level and below and legitimating attention to production. However, these uncertainties require managing at some level and this appears to take place at Board level and at the Department of Energy where issues (such as finance limits, cash resources,) are discussed and approved. This area of interaction between the Board and the Department of Energy provides an area for further research.

Section 4.6 explores how the socialisation process and the closed nature of the NCB aids the mining-line in creating and re-creating their view of life.

Wilkins and Ouchi (1983) argue that most real organisations utilise all three forms of control, namely markets, bureaucracies and clans (Ouchi, 1980), but that some organisations, or parts of them, employ the clan form of governance more predominantly than the others. The clan form of control appears predominate within the mining-line of the NCB, in that this part of the organisation has developed a distinct local culture, or clan and due to its dominance and strength

pervades through the collieries, areas and to a certain extent HQ. The mining-line community appears to approximate the "community-like" sharing of complex understandings implied in the anthropologists' cultural paradigms.

Section 4.6 explores some of the conditions necessary to develop "thick" social understandings such as those present within the mining-line of the NCB. These conditions revolve around long history and stable membership; absence of institutional alternatives and interaction amongst members. The interaction amongst members is managed by narrowing decision-making and accountability to the mining-line and the directors' committee.

Throughout the chapter, the implicit view is one of a dominant mining-line. Dominance which is only reinforced through the power struggles and that even though the industry appears highly institutionalised and stable, organisational contradictions do exist. The multiple power relations and struggles are unequal within the NCB, for certain groupings these power relations are shifting in nature.

The "shared world view" created is that of the mining-line within the NCB, this can be considered as an "Image" with its root source in the occupational culture of the organisational members of the mining-line. Organisational culture is an institutional phenomenon in structuration theory; that is part of the deeply-layered structure that form the framework of the organisation. The "taken for granted" knowledge or mutual knowledge of the mining-line is explored in Chapter 5 through the principles and working rules of the occupational culture.

OCCUPATIONAL CULTURE OF THE MINING-LINE

5.0   Introduction

5.1   The Principles of the Occupational Culture of the Colliery
        Manager

5.2   The Working Rules of the Occupational Culture of Colliery
        Managers

5.3   The Working Practices of the Principles and Working Rules of the
        Colliery Manager's Culture

        5.3.1   A Day in the Life of a Colliery Manager: Working
                  Practices

        5.3.2   Quarterly Accountability: Working Practices

        5.3.3   A Day in the Life of an Under-Manager: Working
                  Practices

5.4   Discussion and Analysis (of Section 5.3)

        5.4.1   The Working Practices of the Colliery Manager

        5.4.2   The Working Practices of Quarterly accountability

        5.4.3   The Working Practices of the Under-Managers

5.5   Summary and Conclusion

Chapter 4 argues that the organizational culture of the mining-line

provides the dominant context within which work and the environment can be

seen. Therefore it is important to understand the principles, working

rules and working practices that form the occupational culture of the

mining-line.

This chapter analyses the occupational culture of the mining-line through

the use of an interpretative paradigm, the premise of which is that

culture can be described and compared in distinct, personality-like

patterns of integrated principles.

The next three sections will develop the concept of occupational culture

utilised by P.K. Manning (1979) to understand the meanings generated by

police officers in both London and in the USA. He argues that:

> "The occupational culture, like all cultures, is a mode of adaptation
> to the uncertainties and vicissitudes of collective life. As such,
> it contains an image of the basic concerns of the group, the
> principle ethics and bodies of manners, rituals, ethics and ideology,
> the strategies and tactics of the work, including notions of good and
> bad work, various bodies of folklore and legend and a set of
> principles that organise the work"
>
> (P.K. Manning; 1979 : 124)

Manning analyses occupational culture into three "nesting" elements and

argues that these provide the source and order to the environment of the

occupation in question. They therefore provide a framework around which

organisational work is legitimated within the meanings generated.

The three nesting elements are the Principles; the Working Rules and the Working Practices.

The "principles" are abstract in nature and provide the guidance and constraints to the working rules. These principles provide an insight into the "image" of the organisation as reproduced by the mining-line. The principles are translated into the everyday negotiated bases for the mining-work by the "working rules".

The actual working practices are concrete instantiations of the principles and the working rules. The nesting quality of these three elements is shown in Figure 5.1.

PRINCIPLES   WORKING RULES   WORKING PRACTICES

GUIDING AND   CONCRETE INSTANTIATIONS

CONSTRAINING   OF THE PRINCIPLES AND

                                         WORKING RULES
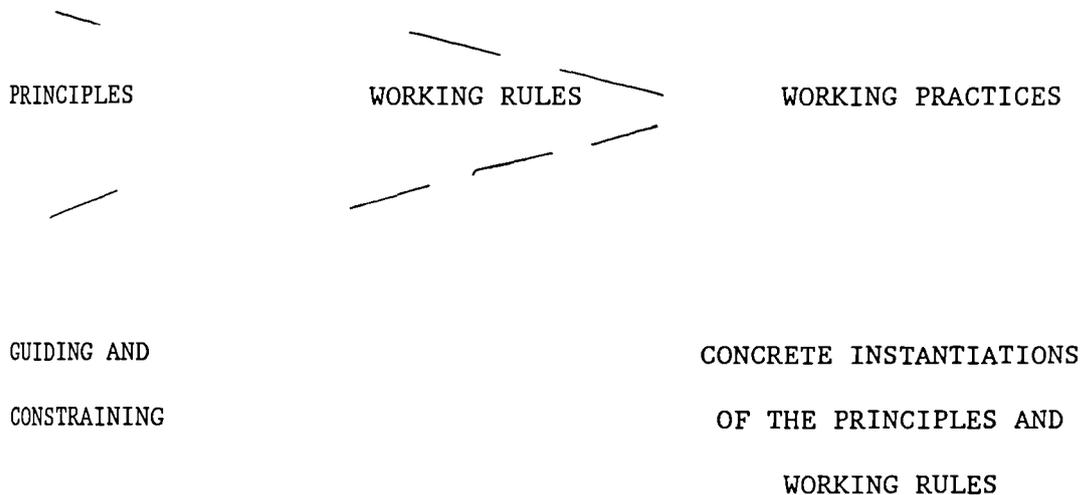
FIGURE 5.1: THE THREE CONSTITUENT ELEMENTS OF OCCUPATIONAL CULTURE

This framework of analysis is utilised within this chapter to develop an understanding of the occupational/organisation culture of the mining-line and therefore provides an insight into the dominant context within which work and the environment are seen. The focus for the analysis of the occupational culture is the colliery manager but is equally applicable to the Area Director due to the well-defined institutionalization process of the NCB.

To become an Area Director one must have been brought through the ranks of the colliery and served as a colliery manager. Hence, the Area Directors have similar modes of adaptation to the uncertainties and vicissitudes of collective life. Hence they share, with the colliery management, the basic concerns of the group, the principle ethics and bodies of manners, rituals, ideologies and the strategies and tactics of the work including notions of good and bad work. They share the bodies of folklore and legend and a set of principles that organise the work. The main difference in outlook between an Area Director and Colliery Manager is due to how the Area Director has to deal with the uncertainties created by the HQ concerns such as economic financial limits. This creates contradictions in the working practices of the Area Director as he struggles to maintain the mining-line occupational culture and the need to absorb business uncertainties.

Section 5.1 and 5.2 outline the basic principles and working rules of the occupational culture of the mining line with a summary produced in figure 5.2 and figure 5.3 respectively. These principles and working rules provide the back-cloth to the way in which the colliery management approach their work. Section 5.3 applies these principles and working rules to three cameos of the working practices of the colliery manager; under-manager and an accountability meeting. Section 5.4 discusses and analyses the three cameos presented in section 5.3 in order that the commonality and application of the principles and working rules can be seen in working practice through the everyday lives of the colliery and area management.

5.1 THE PRINCIPLES OF THE OCCUPATIONAL CULTURE OF THE COLLIERY MANAGER

Figure 5.2 summarises the ten basic principles of the occupational culture of colliery managers. These principles and the working rules have been built up from the research interviews and observations of the management within the mining-line, in particular, colliery managers and under-managers.

Principle A refers to the problematical relationship which exists between the formal and informal reports of the extraction process and the actual physical events. The problematical nature of these relationships has been discussed in various sections, for example, Chapter 4 and Chapter 3. These records and the physical events are treated as two phenomenologically independent matters. They are two parallel but disjointed strips of experience. Section 4.2 and 3.4. discuss the ambiguous relationships that exist between the extraction processes and the reporting systems. The reporting systems, both quantitative and monetary, reveal only little of what has been happening in the mine during the period, whether it be hours, days or months, under consideration. As outlined in 4.2: 3.3 and 3.4.1 various alternative sources of information/reporting systems are utilised. The testing of the information appears to be part of the "walk-about" rituals described in 4.2.

Principle B refers to the formalisation of decisions and that decisions formulated away from the event, or experience of the event or the people involved are perceived as being untrustworthy. The decision-maker should have a strong coupling with the event or experience of such or better still have been there on the ground at the time in order that the

decisions taken are perceived as being trustworthy. This coupling is
performed through the "detailed nature" of information that flows up
through the hierarchy to the decision-makers. The belief is that you can
only "control if you know everything". The consequences are that the
management system revolves around operational data and the chances of
information overload are high. Information of a more aggregate nature and
relating to strategic issues are not the concerns of the colliery manager.

Principle C extends principle B and refers to the centralised nature of
the NCB in that decisions made by the Area Director are deferred to, that
is a centralised, hierarchical management system operates, even though the
decisions made in context may be superior. This principle applies to
colliery managers in their domain of collieries and their colliery
management.

This centralised, hierarchical style displays itself in constant attempts
to portray one's knowledge of mining in order to abide by principle B.
The Quarterly Accountability meetings are full of explanations of the Area
Director displaying his knowledge of mining-related events (that is, the
"flexing" of the mining-muscle) and are supported by frequent "walk-about"
rituals.

The essence of principles B and C is encapsulated in principle D in that
formal rules, abstract knowledge related to mining and general principles
are necessary but must be coupled with experience. Experience is viewed
as the "best teacher" in the understanding of the mining industry. Long
apprenticeships are entered into and provide a strong socialisation
process.

All colliery managers and Area Directors have served this apprenticeship in the industry; this experience is seen as necessary to understand the "nuts and bolts" of the industry. Built into this reliance upon experience is the ideology that "nothing is happening that has not happened before". The belief is that the present systems have previously coped with environmental fluctuations effectively and that present pressures are little different in magnitude or circumstances; experience related knowledge will handle the situations in the future.

Principle E relates this experience led management style to notions of stability and continuity. Principle D refers to the need to "gain experience" in terms of technical mining skills and management skills. These skills are acquired during the "apprenticeships" whilst managers hold certain "key" junior management roles, especially that of under-manager. The result is that the methods relating to concerns of accountability, delegation of decision-making and the gathering of information are remarkably uniform, both hierarchically and between collieries.

The systems and methods of the NCB appear to be uniform, well-understood and very stable. They are monolithic in nature with the result that there is a consistency in role expectations throughout the NCB. This stability and continuity culminates in the belief that "there is no alternative"; that the occupational culture, socio-political environment as perceived by the culture and technology of the UK coal getting process pre-determines the management system of the NCB. Hence, a standardised and deterministic view of management is contained within the principles of the occupational culture with its barriers to change. Experimentation and divergencies

from the norm by lower levels of management, especially colliery managers
and below, are fraught with difficulties. Creativity is not a principal
of the occupational culture unless introduced by top-management. This
resistance for change creates a dichotomy between the pressures for
changes being placed upon the industry, by the government, and the
stability of the management systems and the expectations regarding their
continuity.

The standardised and deterministic view of management is referred to in
Principle F in that work is viewed against a programme, a formal set of
priorities or objectives established for that time period and to which a
colliery manager and team are held accountable. This programme is the
Action Programme which is discussed in 3.1.1 and is technical in nature.

Principle G extends principle F to the specific objectives of the colliery
managers. Colliery managers work to attain two major objectives: to "turn
the coal", that is to maximise production; and to attain the "bottom-line"
profit figure displayed in the budgets.

At Colliery Manager level the first link is made between finance and
production. The colliery manager is viewed as a general manager : as such
the role involves finance related concerns. He is held to account both to
the Action Programme and to the finance related figures in the F23 -
profit and loss account. This relationship between production and finance
is depicted as being one way, that is production to finance. The link
used is that:

"If you get production right, finance falls into place".

The link back, finance to production appears to be considered the concern of Area Directors and Senior Management. They communicate these financial parameters for production, for example, no overtime, planned maintenance, no spending above budget levels.

The idea of "correct production" entails the more detailed work similar to that of under-managers. For example, maximising the use of men during normal shifts, and the maximisation of machinery with maximum output. This results in a detailed interventionist style of management with the consequence that colliery managers and senior line managers appear to be "frustrated under-managers".

The financial considerations are considered by emphasis on total unit costs and the associated but frequently erroneous belief that maximum output is the most efficient way to control costs. No reference is made to cost-volume relationships, cash-flows or return-on-investment

Principle H refers to the belief that people cannot be trusted, if not checked, policed and controlled they will break rules, manipulate information. This notion of distrust can be seen throughout the management operations and systems. The accountability meetings and the financial information compiled appear to fulfil a "policing" role more than a "decision-making role". Information is multiple-sourced so that superiors can check out and compare stories of the same event. This multiple sourcing is partly a consequence of the complexity of the process, in terms of the geological uncertainty, technological sophistication and the multiple images created of the under-ground processes, however, it also gives the impression that management distrusts the reports of lower management.

Principle I highlights the "masculine" images of the mining-management. Work is viewed as a vehicle to demonstrate strength, status and domination. This is coupled with the belief in the "need to know". Information is transmitted down through the organisation on a "need to know" basis which tends to reflect status.

Principle J refers to the safety related issues of the industry which maintain a privileged position in that safety "is of the uppermost priority". Regardless of the present events, safety issues serve as an acceptable criteria for the avoidance of the formal set programmes. Safety is also used to "help to maintain" the dominance of the mining-line (see Chapter 4) and to justify the present wide-spread cross-checking of operational data.

FIGURE 5.2

THE BASIC PRINCIPLES OF THE OCCUPATIONAL

CULTURE OF COLLIERY MANAGERS

A: EXTRACTION RELATED EVENTS REPORTED IN FORMAL AND INFORMAL REPORTS BEAR A PROBLEMATICAL RELATIONSHIP TO THE ACTUAL EVENTS. THE RECORDS AND THE EVENTS ARE TWO PHENOMENOLOGICALLY INDEPENDENT MATTERS. THEY ARE TWO PARALLEL BUT DISJOINTED STRIPS OF EXPERIENCE.

B: FORMALISATION OF DECISIONS MADE ON THE GROUND, FOR EXAMPLE, THOSE REPORTED IN FORMAL REPORTS, ARE UNTRUSTWORTHY UNLESS ONE HAS EXPERIENCE WITH SUCH EVENTS, KNOWS THE PEOPLE INVOLVED OR BETTER STILL WAS THERE ON THE GROUND AT THE TIME.

C: DECISIONS MADE BY THE AREA DIRECTOR ARE DEFERRED TO i.e. A CENTRALISED, HIERARCHICAL STYLE, EVEN THOUGH THE DECISIONS MADE IN CONTEXT MAY BE SUPERIOR.

D: FORMAL RULES, ABSTRACT KNOWLEDGE RELATED TO MINING AND GENERAL PRINCIPLES ARE NECESSARY BUT MUST BE COUPLED WITH EXPERIENCE WHICH IS SEEN AS THE BEST TEACHER IN THE UNDERSTANDING OF THE GENERAL RULES OF THE MINING INDUSTRY.

E: THE RELIANCE UPON EXPERIENCE ENCOURAGES NOTIONS OF STABILITY AND CREATES RESISTANCE TO CHANGES.

F: WORK IS VIEWED AGAINST A PROGRAMME, A FORMAL SET OF PRIORITIES OR OBJECTIVES ESTABLISHED FOR THAT TIME PERIOD AND TO WHICH THE COLLIERY MANAGER AND TEAM IS ACCOUNTABLE. WORK IS IN THE MAIN VIEWED AS TECHNICAL.

G: COLLIERY MANAGERS WORK TO ATTAIN TWO OBJECTIVES, THESE ARE TO "TURN THE COAL", i.e. TO MAXIMISE PRODUCTION AND TO ATTAIN THE "BOTTOM-LINE" PROFIT FIGURE DISPLAYED IN THE FORMAL PROGRAMME, i.e. THE ACTION PROGRAMME AND BUDGETS, AND EXPECT TO BE HELD ACCOUNTABLE FOR SUCH.

H: PEOPLE CANNOT BE TRUSTED, IF NOT CHECKED, POLICED AND CONTROLLED THEY WILL BREAK RULES, MANIPULATE INFORMATION.

I: WORK IS VIEWED AS A VEHICLE TO DEMONSTRATE STRENGTH, STATUS AND DOMINATION.

J: REGARDLESS OF THE PRESENT EVENTS; SAFETY EVENTS SERVE AS AN ACCEPTABLE CRITERIA FOR THE AVOIDANCE OF THE FORMAL SET PROGRAMMES.

Figure 5.3 summarises the "working rules" of the occupational culture of colliery managers. The approach to the build-up of these working-rules follows the analysis adopted by Manning (1979) in describing what "good policework" requires. Manning describes the sociological components of the role of the policeman and argues that these are in part captured in descriptions of "good policework". Following the same type of analysis, the following "working rules" have been constructed by referring to the research interviews and observations to 'build-up' the requirements necessary to be "a good colliery-manager" in the opinions of the mining-line. These "working rules" are implemented within the "guidelines and constraints" set by the principles, as illustrated in Figure 5.1

The "working rules" cover issues such as the proper emotional tone; the necessary tactics (or skills); the attitudes of the colliery manager; properly guided outcomes; the expectations that colliery mangers can handle basic managerial tools; the control level required by the colliery manager.

The above six basic working rules are developed in Section A of Figure 5.3, and explored in more detail in the next paragraph. Section B summarises the achievements resulting from implementing the working rules and Section C highlights the consequences of the failure to adopt and implement the working rules.

Working rule A1 refers to the proper emotional tone that is required of

"good colliery-management". From observations of colliery managers and

interviews, the colliery manager appears to present an emotional model of

a "hard, authoritative and dominant man". Not a man to be "played with"

or "easily hoodwinked". An example of the "hard, authoritative, dominant

man" is displayed in the observation of a colliery manager reducing a

young 28 year old, graduate under-manager to tears in a meeting and

accuses the under-manager of incompetence due to his inability to account

for production cuts in a manner that satisfies the colliery manager.

The emotional model tends to indicate that the colliery manager should

have a "high level" of the "self-discipline", and "self-respect". Part of

the "hardness" of the colliery-manager can be seen in that the

colliery-manager does not give respect easily. Respect must be "gained"

or "won" from the colliery managers by adherence to the "best-practice"

management disciplines as outlined by the mining-culture. This "winning

of respect" can be seen in the above observation of handling of the

under-manager by the colliery-manager. The colliery managers criticise

heavily the failure to "follow through" issues.

The language used by the mining-line and the colliery manager reinforces

the "hard appearance" by using "colourful language" and the

colliery-manager's sub-ordinates tend to encapsulate the "emotional model"

in their reference to the colliery-manager as "boss or gaffer". For

example:

DEPUTY MANAGER: "The gaffers not spending that money."

The reference to the colliery-manager as "the gaffer" encapsulates the respect which the colliery-manager enjoys.

Working rule A2 refers to the tactics or skills that the colliery manager needs to employ for the successful accomplishment of his role. A "good colliery manager" is depicted as "knowing everything"; he should have all situations weighed up. This skill was heavily emphasised throughout the "workings" of the mining-line. The colliery-managers appear to be very meticulous and to have knowledge about what is done and what is not done about production before going into meetings such as "Production Control Meetings".

To aid in this "summing-up" of situations, the colliery manager must seek to build-up an accurate detailed mental picture of the mine. His attempts in this and his accessing of various sources of information were discussed in section 4.2 and 3.4.2.

The colliery manager must be capable of "displaying" his technical and managerial skills; he must be capable of operating as a "general manager" and as such must be capable of addressing both technical and financial information.

The technical skills, mining and engineering, are "flexed" in all encounters between the colliery-manager and his colliery management. The managerial skills are displayed in a limited perspective which appears to surround issues of "proper supervision" and "task orientated" management. That is, highly programmable management skills which involve little or no management judgement. The financial skills are very rarely displayed and usually only a "passing reference" and usually a re-iteration of the position of actual against budget with very little detailed analysis.

For example:

COLLIERY MANAGER: "August lost £1m; £600,000 more than budget."

After stating the financial scenario, as above, the solution to this position was "bringing output back to budget". Differences between reported profits and "wealth creation" are not realised.

The colliery manager must be capable of defining the problem and dealing with it; this appears to depend upon the ability of the colliery manager to apply his technical, managerial and financial skills to an accurate, detailed mental model of the coal-getting process.

The colliery-manager must also be capable of applying industrial relations tactics which display "fairness" but also incorporate a sense of "hardness".

Working rule A3 refers to the attitude of the colliery manager. He must display an undaunting determindness to seek objectives and to seek the "best practice" available and ensure the implementation of this "best-practice" from his managers.

His attitude to work is that work embraces his whole life style and includes taking leading roles in the mining community; he displays a 'father-like' figure to the community.

Working rule A4 relates to "properly guided outcomes". The "best practice" ideology of the NCB managers is based on a notion of "cause and effect" and that by the proper application of technical and managerial skills, the correct type of production in terms of output and quality will be achieved with its effect on obtaining the correct financials.

These "properly guided outcomes" incorporate the belief in deference.
Colliery management defer to the guidance of the senior line management.
The quarterly accountability meetings provide a basis for senior line
management to ensure "properly guided outcomes".

Working rule A5 refers to the expectations that colliery managers can
handle the "basic tools" necessary for their management role. The
colliery manager is "expected" to be able to apply the "best practice".

    AREA DIRECTOR: "Been to staff college and taught these
                          techniques, therefore utilise them."

Working rule A6 refers to the need for the colliery manager to control
both the environment and information to enable the implementation of
"best-practice". The belief is that the more accurate and detailed the
mental model of the coal-getting activities, the more control of the
environment falls into the hands of the colliery-manager. The accuracy
and detailed nature of the mental model depends upon the control of the
information available - see 4.2 and 3.2 surrounding FIDO and MINOS and the
subjectivity of the truth of the various information sources. This issue
is discussed in Chapter 3 and the failure of colliery management to
perceive the subjectivity of truth is also discussed.

Section B refers to what is expected to happen if the above working rules
are present:

B1 refers to the belief that if the colliery manager applies A1-6 then he
will achieve the "correct type of production" in terms of output, quality
and cost. He will accomplish work which results in a satisfactory
termination as outlined by "senior line management".

B2 is dependent upon B1 and highlights the outcome of achieving "standards of performance" which does not violate the expectations of "senior line management". Work having these characteristics does not raise too many conflicts with senior line management and adds to the promotional prospects of the colliery manager.

Section C refers to the consequences which will result if A1-6 are not applied:

C1 refers to the belief that if the working rules are not applied then unsatisfactory production, as defined by senior line management, is likely and the level of effort applied will not be consistent with expectations of senior line management regarding a "good day's work".

C2 refers to the alternative means which will have to be employed to rectify the situation created by mis-application of A1-6. These alternative means appear as threats in the quarterly accountability meetings, for example:

   threats to replace colliery management by senior line management to
   rectify the situation

and the final alternative is the removal of the colliery manager to a "staff-related role"; that is, taking him out of the "dominant, important line management" and curtailing future career prospects.

FIGURE 5.3   WORKING RULES

SECTION A   THE WORKING RULES

1:   **"THE PROPER EMOTIONAL TONE"**

"COLLIERY MANAGER SHOULD BE A HARD, AUTHORITATIVE AND DOMINANT MAN".
A HIGH LEVEL OF SELF-RESPECT, SELF-DISCIPLINE AND RESPECT FROM THE
COLLIERY MANAGER MUST BE 'GAINED'".
"LANGUAGE USED REINFORCES THE HARD, DOMINANT MODEL".

2:   **"THE TACTICS OR SKILLS REQUIRED BY COLLIERY MANAGERS"**

"A GOOD COLLIERY MANAGER KNOWS EVERYTHING".
"HE SHOULD HAVE ALL SITUATIONS WEIGHED UP".
"SUMMING-UP OF SITUATIONS DEPENDS UPON AN ACCURATE, DETAILED MENTAL
MODEL".
"MUST CONSTANTLY DISPLAY HIS TECHNICAL AND MANAGERIAL SKILLS".
"MUST BE CAPABLE OF ADDRESSING FINANCIAL DATA".
"DISPLAY 'FAIRNESS AND HARDNESS' IN DEALING WITH INDUSTRIAL RELATIONS
ISSUES".

3:   **"ATTITUDE OF THE COLLIERY MANAGER"**

"AN UNDAUNTING DETERMINDNESS TO ACHIEVE OBJECTIVES AND TO SEEK THE
'BEST-PRACTICE'".
"WORK EMBRACES HIS WHOLE LIFE-STYLE AND INCLUDES THE
MINING-COMMUNITY".

4:   **"PROPERLY GUIDED OUTCOMES"**

"APPLICATION OF BEST PRACTICE RESULTS IN CORRECT PRODUCTION".
"THE DEFERENCE RULE APPLIES TO BEST PRACTICE".

5.   **"HANDLING OF BASIC MANAGERIAL TOOLS"**

"A GOOD COLLIERY MANAGER IS EXPECTED TO BE ABLE TO APPLY BEST
PRACTICE TECHNIQUES".

6.   **"CONTROL OF THE ENVIRONMENT AND INFORMATION SOURCES"**

"MORE ACCURATE THE MENTAL MODEL OF THE PROCESS, THE MORE CONTROL
EXERCISED OVER THE ENVIRONMENT".
"ACCURACY OF THE MENTAL MODEL RELATES TO THE ABILITY TO CONTROL
INFORMATION".

SECTION B   APPLICATION OF 1-6 RESULTS IN:

1: ## CORRECT TYPE OF PRODUCTION

APPLICATION OF A1-6 RESULTS IN "CORRECT" PRODUCTION AS OUTLINED IN
TERMS OF OUTPUT, QUALITY AND COST. SATISFACTORY TERMINATION OF WORK
IS ACHIEVED.

2: ## ACHIEVED STANDARDS OF PERFORMANCE

DOES NOT VIOLATE THE EXPECTATIONS OF SENIOR LINE MANAGEMENT AND ADDS
TO PROMOTIONAL PROSPECTS.

SECTION C   FAILURE TO APPLY A1-6 RESULTS IN:

1: ## UNSATISFACTORY PRODUCTION ACHIEVED

IF THE WORKING RULES A1-6 ARE NOT APPLIED THEN UNSATISFACTORY
PRODUCTION RESULTS AND LEVELS OF EFFORT APPLIED NOT CONSISTENT WITH
EXPECTATIONS OF SENIOR LINE MANAGEMENT'S VIEW OF A "GOOD DAY'S WORK".

2: ## ALTERNATIVE MEANS

MISAPPLICATION OF A1-6 RESULTS IN THE RECOURSE TO ALTERNATIVE MEANS
TO RECTIFY THE SITUATION AND PRESSURISE THE USE OF THE WORKING RULES.
PRESSURE IS EXERTED THROUGH THREATS OF "HELP FROM SENIOR LINE
MANAGEMENT" OR "FINAL REMOVAL".

THE WORKING PRACTICES OF THE PRINCIPLES AND WORKING RULES

OF THE COLLIERY MANAGERS' CULTURE

The application of the governing principles and working rules of the

colliery managers' culture is captured through cameos providing specific

descriptions of the everyday work of the colliery manager. These

descriptions/cameos are built from the research notes of interviews and

observations. The cameos are analysed to depict the application of the

principles and working-rules;   figure 5.4 provides a summary of the

principles and the working-rules and provides the key to the notation used

in the analysis of the cameos. Three cameos are subjected to analysis:

5.3.1   "A day in the life of a colliery-manager",

5.3.2   Quarterly Accountability",

5.3.3   "A day in the life of an under-manager",

Section 5.3.1 is an application of the above principles and working-rules

to the every-day practices of the colliery-manager. Section 5.3.2

provides a further cameo to describe the workings of the culture of the

colliery-manager, but also provides an opportunity to extend the analysis

from the colliery-manager to the Area Director. Section 5.3.3 applies the

same principles and working-rules to the every-day work of the

under-manager. These three sections provide an insight into a

cross-section of the production centred mining-line and provides an

opportunity to analyse the endurance of the occupational culture, depicted

for the colliery manager, throughout this mining-line.

FIGURE 5.4.

PRINCIPLES AND WORKING RULES OF THE COLLIERY MANAGERS' CULTURE

PRINCIPLES		WORKING RULES	
A	Problematical Relationship between reports and physical extraction.	A(6)	Control of the Environment and information sources
B	Experience is a pre-requisite for good, trustworthy decisions.	A(2)	Tactics or skills required by Colliery-Managers
C	Deference to higher authorities	A(4)	Properly guided outcomes
D	Theoretical knowledge must be coupled with experience	A(5)	Handling of Basic Managerial Tools
E	Stability and Continuity	A(1)	The proper emotional tone
F	Work is Highly Programmed	A(3)	Attitude of the Colliery Manager
G	Work is seen against two main objectives re. output and bottom line profit	B(1)	Correct type of production
H	People cannot be trusted	B(2)	Achieved standards or performance
I	Work is a vehicle to strength, status and domination	C(1)	Unsatisfactory Production achieved
J	Safety events are dominant	C(2)	Alternative means

5.3.1 A Day in the life of a Colliery Manager: Working Practices

The Colliery Manager is appointed under section 2(1) of the Mines and Quarries Act 1954. His overall responsibilities cover the physical aspects of the business, the safety aspects and the financial aspects of the business in terms of the "bottom line" profit figure recorded on the colliery profit and loss account (the F23) (G;J).

In controlling operations he is assisted by the colliery line management: deputy manager; under-managers; over-men and deputies. A typical day in the life of a colliery-manager starts at around 7-8 a.m. The first two hours of the day are "fact-gathering" times (A; A(6)). Between 8 a.m. and 9 a.m. the "daily accountability" for output takes place (G; H; B(1); B(2); C(1); C(2)). This entails visits from the deputy manager to report on output. The Production Manager (Area Personnel) rings around this time for the output figures which he then reports to the Deputy Director (Mining) (C; F; H; B(1); B(2)). These are then notified through the Deputy Director (Mining) to the Area Director.

These output figures reported to the Area Director are "smoothed" to provide safety buffers against the "expected" standards of performance (C; H; B(1); B(2)). This gives an example of the centralised, hierarchical nature of the information flows (C).

During this first hour, reports are "flowing freely" around the pit.
The colliery manager will also refer to the under-managers
"blue-book". These provide the colliery manager with a description
of "what has happened" and "what is to happen (A; A(2); A(6)), they
describe the under-managers short-term commitments and form a base
for day-to-day accountability (H; F; B(1); B(2); C(1);: C(2)).

Colliery Managers keep their own versions of the "blue book" in which
they note extracts from the above reports and information from other
daily reports such as, reports on mineworkers leaving the pit early,
surveyor's reports, etc. (A; H; A(2); A(6); A(1)).

Around 9 a.m., the colliery manager holds a series of meetings, for
example, with the Mechanical and Electrical Engineers to discuss the
short-term problems of the pit. For example, with the engineers the
discussion surrounds break-downs, machine reports, machine problems,
etc. (B; D; A(6); A(2); A(5); A(4)).

Within these first two hours of the day, the information and meetings
are of a short-term, technical nature with information flowing
upwards in an extremely detailed format (F; A(4)). For the
colliery-manager, this information allows a 'mental picture' to be
constructed of the colliery workings and provides a 'backcloth'
against which daily accountability can be achieved. However, this
information flow only provides "one version" of a mental picture,
that is, the picture which his line managers' wish to paint.

Therefore, a considerable amount of the colliery-managers working week is spent underground (A; B; D; A(6); A(2)). Chapter 4.2 describes these "walk-abouts" and discusses the limitations of such in the construction of a "mental picture". These "walkabouts" are again only of limited value, but as Chapter 2 indicates, they serve a powerful, ritualistic role.

After underground visits, the colliery manager makes notes in his "black book" (version of the under-manager's blue book) and uses these as a 'crude memoire' in daily accountability, short-term planning and interaction with the Area (F; A(2); A(4); A(6)).

Certain days of the week, the colliery managers may not go under-ground, but will be involved in various meetings, for example, project planning meetings, etc. At one colliery visited; the colliery manager arranged a weekly meeting for his "whole" line management, assistant engineers etc. These meetings caused quite a lot of confusion due to the fact that under-managers and assistant engineers felt uneasy about being on the surface and not going underground for 24 hours (F; A(3); A(4)). These meetings were attempts to build up a "team spirit" and the application of "best-practice".

Around 3 p.m., the deputy manager reports back to the colliery manager on issues such as current production, current problems and forecasts (prepared by the under-manager) on tomorrow's output (E; F; G; H; A(6); A(2); A(4); A(5); A(3)). Certain colliery managers' receive hourly reports on production output.

The colliery manager's day does not finish; he may leave the NCB premises physically around 5/6 p.m., but mentally, he remains at the pit and is on twenty-four hour call. Wherever he goes, he leaves a telephone number so that he can be contacted and often rings in to be appraised of the situation. Mining, at whatever level, is a "way of life" to the mining-line (I; A(3); A(1)).

5.3.2 Quarterly Accountability: Working Practices

Figure 5.5 represents the "usual" seating arrangements at the quarterly accountability meetings.

	Deputy Director	Area Director	Industrial Relations	Area Chief Accountant

Area
Colliery
  Marketing
Engineer
  Officer				

	Production Manager	Colliery Manager	Deputy Manager	Colliery Engineer
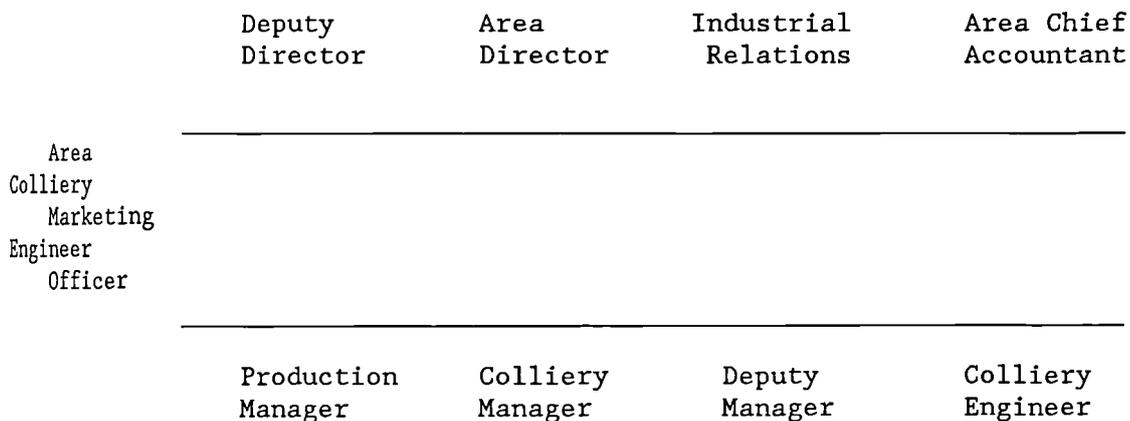
Figure 5.5 Quârterly Accountability Seating Arrangements

The seating depicted above is as normal. These meetings are so predictable even to the extent that one can predict fairly exactly where everyone will sit. The relative proximity to the Area Director Colliery Manager axis is an indication of status and influence.

The following is an account of a quarterly accountability meeting extended to demonstrate the application of the principles and working rules of the occupational culture of the colliery managers. This is also applied to the Area Director, as part of the mining-line.

Given below is a transcript of a quarterly accountability between a

colliery and the area management team:

Present : Colliery Manager, Deputy Manager, Electrical and
Mechanical Engineers, Area Director, Deputy Director
Mining, IR Managers, Marketing Manager, Chief
Accountant, Production Manager.

9.00   D.   Lets look at the physical items first, then finance
falls into place. (G).

D.   asks about progress on --- face. How is it that ---
is reported on progress, but it is well known that it
is not. How long will this face be pursued. [A;
A(6)]

C.M.   A while - but requires the pit as a whole to be
better.

D.   Can it be pulled up to 1000 tons?

C.M.   The face is as good as any in the country, but we
can't hold the first 3 metres, we've tried everything.

D.   Makes suggestions C.M. responds.

D.   asks D.M. - what about our rebels?

D.M.   They don't like it - but if it's there, they'll work
it. [I; A(1); A(2)]

D.   suggests confronting the T.U. with his proposed
methods.

D.   I've told managers that if a face doesn't do a 1000
tons/day, it can't cover costs. Tell the men we can
either pack it in or have a stable mining system [G;
F; A(3); A(2)]

9.08   70's?

D.   71's? - asks for problems.

C.M.   1st 3 metres again difficult, ground shattered,
numerous attempts with different systems. The best is
30 cuts per week, would normally expect 7 to 8 per
day. We know these seams are initially difficult to
cut. You need to give it a chance It's a good
district, well serviced, waiting to get out of the
starting blocks [B, D, A(2) A(5)]

9.10   D - New Face 1's

C.M.   If it does as planned, I'll be delighted - we've never
            seen it as a record breaker. [F; A (2)]

D.   There's something funny with the action programme - it
            suddenly drops. [F;]

C.M.   I could show you why on the plan.

9.11   D. - asks for information on scouring.

C.M.   gives detailed report on technical problems. [F;
            A(2)]

D.   gives advice on machinery and layout and transport.
            [C; A(2); A(3); A(4); A(5)]

Eng. comments.

9.13   D. - 19's

C.M.   reports - mentions incentive scheme.

D.   comments production is disappointing. [G; A(4)]

C.M.   responds that 2 single enders would resolve this.

D.   Going to the projection. I'm going to have to ask you
            for more coal. I must get it. The Area is down. [C;
            G; A(2); A(4)]

9.15   D. - Developments, 71's, 1st time, What's S.W. return?

C.M.   Explains it's 32's

D.   that's behind isn't it?

C.M.   It's the manager's mistake of hanging on to the old
            system too long. It's management failure. [E; A(3);
            A(4); A(5); A(2)]

D.   We keep trying to defy the engineering. [A(2)]

C.M. and D. - discuss workings. [B; D; A(2)]

D.   S.W. intake - what's the problem there? Deep soft -
            how's it going?

C.M.   Quite reasonable - it's got a new haulage system. It
            wouldn't let the men work while it was installed (I;
            A(1)]

D.   Why?

C.M.   It's 1 in 4 - it's like gun barrel. [J; A(2)]

D.   makes suggestions regarding how this might have been
            overcome. [C; B; D; A(4)]

D.D.M	comments, D.M. joins in.
C.M.	retorts that all the examples quoted had better back-up teams. [B; A(2); A(5)]
D.	talks about ropes and clips. [C; B; A(2)]
D.M.	comments on workings.
D.	spells out in detail how his system could be worked. Mentions it should be done anyway, but that it requires an expensive machine. [C; D; A(2); A(4)]
C.M.	asks how much.
D.	difficult to say.
D.	asks for costs per metre. States a large element of fixed costs in this. Goes on to talk about his experience of gradients in Yorks. Asks the Eng. whether he really understands the problem. [B; D; E; G; A(2); A(4); A(5)]
Eng.	responds - dialogue between Eng. and D.
D.	points out the cost of using a £1/4m. machine for driveage. £25,000 interest, then servicing and so on. [G; A(2)]
D.	moves to the new development. "Seems odd this one".
C.M.	With unlimited supplies we can do 25 metres.
D.	mentions previous problems about doors in the holiday period - no-one seems to remember.
D.	suggests monitoring. Also comments that the U.N.O. system wasn't working. Tells C.M. to get in touch with the Engineers. "First sign of anything going wrong ring the alarms. [J]
D.	Raises new face W. This one seems to stop after March - why?
C.M.	Seems unsure. Says a conveyor was being put it. [A(2); A(6)]
D.D.M	asks about scouring.
C.M.	gives information about the layout.
D.D.M.	goes through some technical details. Ascertains from C.M. what has been done. [F; C; A(2)]
D.	Mentions a need for a canopy over the belt, to stop the belt being damaged. [C; A(2); A(4)]

D.   US's - comments none of these are difficult.

D.   U'10's - they've never filled me with delight.

            Plans got out by C.M.

D.   checks progress against plan (ie. map). Considerable
            discussion of machinery and the direction of faces.
            [F; C; A(6)]

D.   suggests a new direction for the face. General
            silence. [C; A(4)]

D.   Outlines with reference to the plan, points out the
            geological faults. General silence for a very long
            time - approx. 1 minute. [C; A(4)]

C.M.   comments.

D.D.M.   asks questions about details of the plan, especially
            displacement. [A(6)]

D.   suggests that there is a parcel of reserves behind a
            fault. [C+ A(2)]

D.D.M.   suggests there may not be.

D.   suggests the absence of detailed information goes back
            to an old royalty boundary. Makes it clear that he
            does not like the existing parcel being worked. [A;
            C; A(4)]

C.M.   but it's easy.

D.M.   suggests another way of working the coal. [I]

D.D.M.   puts in another alternative. [C; I]

D.M.   responds - my method requires less funding. [C; C;
            A(2)]

D.   tells them 'now is the time for a decision'. [C;
            A(4)]

D.D.M.   backs up D's comment.

D.   asks about supplies

C.M.   responds

D.   asks about a haulage problem.

C.M.   gives progress report.

D.   what is the nature of the problem.

C.M.   harmonics - I don't understand it.

Eng. explains

D.   refers eng. to an eng. at another pit who understands such problems. [B; C; G; A(4)]

Eng. gives more details - says he will take out a piece of equipment which doesn't seem to be needed.

D.D.M.   asks why it was there in the first place. [H]

D.   asks elec. eng. about a rope problem.

Elec. Eng. explains in detail the technical problems. Considerable discussion between the eng. and the D. about pulleys [D; A(2)]

D.   The fundamental question is that ewe employ all these designers. Has the design failed.

Eng. retorts that it went out to tender.

D.   but there were other problems". Raises a whole series of points about other factors that were not considered, eg. alternative forms of haulage. [D; C; A(2); A(4); A(5)]

D.D.M.   "Why do we need variable speed - have you ever asked yourself that as an engineer". [C; D; A(4)]

D.   replies (Eng. looks very grateful that he has got off the hook).

           Broadens into a general discussion about haulage and cyclo-converters. Ends with D. asking whether more cyclo-converters have been ordered and whether problems associated with them are being tackled.

C.M.   Asks about Markham Collieries plans to use cyclos.

D.D.M.   They've had all the warnings from me.

Eng.   But now e know the problems [D]

D.D.M.   But yours is a different model. [B]

9.50   More examination and discussion of the plan (map).

D.   asks how the new under manager is shaping up.

C.M.   S--- that's his nickname - he keeps saying it.

D.D.M.   You know why he was sent there.

C.M.   He's learning the realities of life. [B; F; I; A(1); A(2)]

D.	Have you used multiple activity charts and networks for planning that face. [D; C; A(4)]
C.M.	Yes.
D.D.M.	reports on a problem of cleaning machines.
D.	We need coal - quick. [G]

Physical Plan discussion terminated.

D.	Starts examining face statistics.
D.	You planned for 5 faces, you have just over 5.5, but you are under budget. Why? [A; G; A(2); A(6)]
C.M.	Seems to be 19's, but 612's are disappointing. A combination of the two. [A.(2); A(6)]
D.	I think this. I wouldn't have a different budget. But really, I think the output/face is deplorable. We can't tolerate it much longer. I know the history. It's not a criticism of you. Can that one U/Mgr handle all that work. [B; C; Gl A(4)]
C.M.	No- he needs some assistance. [A(2)]
D.D.M	mentions offers.
D.	Why not put k--- there tomorrow. It's not just a question of mutual attraction. [C; A(4)]
Eng.	The work load is out of all proportion. I could use more. [E]
C.M.	We're not talking about an increase in numbers, but a difference in emphasis. [E; A(5)]
D.	But an under manager should always have an electrician and mech. eng. to talk to. [C; E; A(4)]
D.D.M.	You want two assistants though. I'm worried about splitting accountability.
D.	The question is whether one under manager can handle the whole job.
C.M.	I think he can cope. The engineer is worried about the physical work - not the mining engineering problems.
D.	offers help. How many deputies have you (turns to eng.)
Eng.	One
D.	What does he do?

Eng. explains.

D.   If he does all that, what doe you do? Where does he fit into the management structure? How does he relate to mining? I see you as an under manager. So where does he fit? [A(4); A(5)]

Eng.   He makes a contribution.

D.   I can't see where deputies fit into your structure.

Eng. is not clear.

D.   is it integrative ... You sort it out. Urgent action is required on getting up tons/day.

10.05   Let's look at shifting.

D.   examines output/shift.

C.M.   points out future problems.

Brief discussion.

D.   We can smell blood at --- There's no sound reason why this pit immediately cannot do 3,500 tons/day. Then 4,000. [F; G]

C.M.   It can't really drop below 3,000.

D.   the 84/85 budget is 3999. Given the state of the area, I must have this. You must catch up the backlog. This is one of the few areas I can get it. [C; G].

C.M.   We had a management meeting. We've done the motivating. [A(5)]

D.   You've got to face up to the fact that we must have systems that get output without overtime. I've been carrying ---- for 2 years. [G; A(4)]

D.D.M.   Can you accept 3,500 per day ? [G]

C.M.   Yes.

10.10 D.   O.M.S. What is your manpower? [G]

C.M.   talks of staffing. Raises a particular problem of key losses "It's not a question of number - but skills". [A(3)]

D.D.M.   suggests using a spare coal prep under manager at ----

D.   Why not advertise? What do we lose? Someone in Area might go.

	Mkt. Mgr.	We should probably advertise internally first.
	D.	Tells C.M. to liaise with IR and fill the posts.
10.13	D.	Absences you're different from other pits. Why? [E]
	C.M.	It's the weather and spring bank.
	D.	Argues that the same for all pits. [E]
	D.	Manshifts/day. You are fighting the problem of your absences all the time. How do your numbers fall? [A(2)]
	Ir Mgr.	It's quite a smooth fall. Comments on the trend. No sudden surges.
	D.	What takes the face % below budget.
	C.M.	There's one face team less. That's the really major change. Discussion between D.D.M., D. and C.M.
	D.	You are a wedge of capital shifts short. [G; A(4)]
	C.M.	We've not started 3 drift.
	D.D.M.	But this was never in budget to start with. [A]
	C.M.	Yes it is.
	D.	What would happen if we phased the budget and said half of capital available. If you don't spend it then it's lost. Can you do cash flow management for a pit? G; A(2); A(5)]
	C.M.	It would make no difference. It's just juggling balls in the air.
	Silence.	[G]
	D.	What makes this bad is that revenue shifts are down as well. [G]
10.19	D.	Capital next.
	D.D.M.	Suggests C.M. looks at a paper on the automation of cables. [D]
	D.	Asks Engs. about machinery. Some discussion about what the machines are and what ordering problems are occurring.
	D.D.M.	What does it do for £50,000?

C.M.	It saves 3 men/day.
D.	Why not cancel it?
Eng.	We need the power pack to supply the coal.
D.	When we specified its output, what did we do?
Eng.	Less than we wanted
D.	Why?
Eng.	Explains history - it was an ongoing job when they took over in this pit.
D.	Goes through each set of equipment with the Eng. asking what they are for. [D; A(2)]
D.	Comments that nearly all are orders for pumps.
D.D.M.	Tells them 10 pumps are standing idle.
D.	Hardly any of this is 'real' capital. It's nearly all replacements. It should really be revenue. No comments. [I]

10.26	D.	Proceeds and markets. Comments on proceeds down.
	Mkt. Mgr	Proceeds marginally down, due to us decreasing quality by slurry. It's offset by stocking changes. We sell the whole output at ----, but the markets are volatile. It requires heavy stocking at times.
	D.	If we up the deep mining here, everything will go right. [B(1)]

10.30	D.	Trends. Proceeds/tonne affected by 1st 1/4 and slurry.
		We must get deep mined coal. You must go some. Silence. We must do it at this pit. Silence. We want another 10,000 tons of coal [B(1)]
	C.M.	Yes.
	D.	Daily output is 3,500/day planned. This is the problem you must confront your management with. What you do on the cost side can't be altered. [G. A(3); A(4); B(1)]
	C.M.	We'd end up getting no coal.
	D.	You would end up chasing your tail on cost-cutting exercises. The key feature is always in the mining situation - getting the deep soft faces going. Then we've cracked it. That's the trick. We don't want people going slow on 19's because there's no replacement. The key is revving up the faces. [C; A(4); B(1)]

10.35	D.	Manshifts - They are more or less spot on plan except for capital.
	C.M.	I'm reasonably happy.
	D.	If we look at manpower in the next 1/4
	I.R.	Comments.
	D.	Where will you save your men?
	C.M.	Explains - There's various small things we don't talk about. We're picking off men all round. On some jobs we just don't send as many people. We've cut off the fat.
10.39	D.	OK, Let's look at the F22. Where are your opportunities for overtime reduction?
	C.M.	We've been keeping the pit open at weekends for ventilation. Now we can stop this.
	Mech. Eng.	Now this maintenance will be done on Monday mornings.
	D.	Does it mean you are stocking coal for a while?
	M. Eng.	Yes - we'll give it a go.
	D.	That's very useful.
	C.M.	We're trying to confine all overtime to time and a half.
	D.	Look at line 3, overtime shifts - 28.5% worked on face maintenance, underground 36.9. I've been arguing elsewhere that once you get to this state of play you should argue with the maintenance people, if they work Saturday and Sunday, then they can have Monday and Tuesday off. [C; A(4); B(1)]
	Eng.	But there's some work in building machinery.
	D.	Why have anyone working outside of the pit. Often this is just done because they are there. It wouldn't happen in America. [I]
	Eng.	I can't say - I haven't been to the U.S.A., but the men are burning torches.

Discussion - Eng. argues there is no alternative whereas the D. contends that all surface engineering should be cut out. [C; A(4)]

| | D. | We should cut out everything except deep mining and sales, eg. sub-contract repairs, plant pool. How much of the cutting and carving is due to whims. [C; G; A(4)] |

Eng.	Sees the need being due to the necessary modification of equipment as it arrives from the supplier.

D.   But why isn't this done at the specification stage.

D.D.M.   It's done according to the area specification. No modification should be necessary.

D.   It can't see why we need any overtime in categories 6 and 7. Silence. Why not organise it so that you do maintenance on a Friday and not in overtime. You would lose performance, but managers would realise that they have to make it up. It's what other industries do. [C; G; A(4)]

D.D.M.   Gives cost of overtime here - £19,000.

D.   The management frame of mind is that they work to budget and that is the end of it. Inc categories 15 to 20, I can see the need for overtime and constantly running plant - but elsewhere, I can't see any need. Silence. [C; E; F; G; A(4)]

D.   You two people (looks at engineers) are maintenance planners. You are not creative engineers. If you are then you are a bloody nuisance. Tells a story .... why overtime on transport? [B; C; I; A(4)]

C.M.   It's cheaper.

D.   You can satisfy me that in the future all overtime is necessarily spent? Why overtime on the surface? Silence. [G; H; C; A(4)]

Eng.   There are occasions when we have to put things in the pit. Also medical jobs.

D.   You must look at life through different spectacles. This area is the highest in the country for overtime. *Really we need to say - in this category* there's no overtime. Discusses overtime arrangements in detail with Eng. [E,F,G,A(4)]

D.   I know they won't like it, but you must explain that it is better than being on the dole. The T.U.'s argue that overtime is a sin. You must say that more men will be employed as a result. We used to run pits without overtime. [B; J; A(2)]

D.M.   But things were simpler then - there wasn't so much machinery. Thins are much more sophisticated now.

D.   But this is a 2 shift face. We could plan for maintenance being done on a 3rd shift. [B; A(5)]

D.   P---- any myself believe the men and I have a better
            reality of the real world than the T.U. and their
            leaders. Suggests confronting the men with the fact
            that the pit is facing closure. If electricians moan
            about working only 5 days a week, then ask how many
            days their friends are working. [I; A(1); A(2)]

11.02 D.   The report now. Explains the E.M.S. It's 13p
            more/shift than budget.

C.M.   Quick answer .... We're looking for sympathy -
            raises the material budget and complains that it has
            been ignored. N.B. This is the nil variance category
            that we know was 'fined' by the C.M. [G]

D. and
D.D.M.   Discussion of whether blow pipes are needed.

D.   But we must get the output. What about --- chock
            blocks.

C.M.   It's good for the Area.

D.   But only if you assume that Area workshops are there
            already.

Ch. A/c   Cost exercises show that there is not much difference
            between our chock shops and buying outside.

D.   Who are these people (in the chock block shop).

Eng.   Waifs and strays.

D.D.M.   Production refugees? [C(1)]

D.   How old are they?

Eng.   Informs.

D.   Investigate whether they can be redeployed. Next time
            we meet, I want a report. We've a shop repair dept.
            at M---- as well, haven't we? We must look at it [C].

11.08		That's everything except the projection. Summarises key points. Why is E.M.S. up in projections?
	C.M.	Can't answer. [A(6); A(2)]
	I.R.	Is it due to output over budget?
	C.M.	No.
	D.	We need to review this outside the meeting.
	D.	There's an increase in materials.
	D.D.M.	You must forget these.
	Ch. A/C	This is still a high cost pit for materials. [G]
	D.	His problem is the workings in this pit.
		Debate over relationship of materials cost to workings.
	D.	The problem is insufficient output. That's the way to get your costs down. What I'd like you to do is to re-examine this projection in the light of what we've talked about. [C; G; A(2); A(4)]
11.13		That's all I've got to say. [C]

The pattern of the quarterly accountability meetings appears standard throughout the area. Section 5.4.2 presents an analysis of a typical accountability meeting.

Key

D.	Director
D.D.M.	Deputy Director Mining
C.M.	Colliery Manager
D.M.	Deputy Manager
Eng.	Engineer
IR	Industrial Relations Manager
Mktg Mgr	Marketing Manager
Ch A/C	Chief Accountant

5.3.3 A day in the Life of an Under-Manager - Working Practices

A typical day for an Under-Manager starts at around 6am. and finishes around 5pm. The Under-Managers work "long-days". 10 to 12 hours actually on the NCB premises and then "on-call" for 24 hours per day. The Under-Managers whole life is dedicated to work and the general impression is that they enjoy work, the long days of 10 hours are questionable as a certain amount of this time is spend "waiting around". [A3]

There appears to be a reluctance to "go home" which is based upon his responsibilities; his inner feeling of the need to "be around just in case" and the distrust of subordinates to handle situations. This is summed up in the following quote:

> "I have a responsible position here - anything goes wrong, I'm responsible (on the wall)"
>
> (Under-Manager)
>
> [I; H; A(2); A(1)]

The Under-Manager uses the first two hours of his day, for example, from 6am to 8am in surveying a number of reports which outline "what has happened" in his part of the mine since he left the day before. He leaves about 5pm but will regularly 'phone the pit during the early evening.

A number of informal meetings are held during this first two hours. The night-shift overmen provide a verbal account of the night-shift to support their written reports. The overmen maintain a "Report Book" which is the overmen's 'official' account of all the underground activities. The report book specifies what has happened; what has broken down; what has been repaired; what has been produced etc. It is an on-going history of the problems of the mine. It also includes solutions to the problems not yet solved. At the meetings between the Under-Manager and the Overmen certain of these problems are also discussed. [A; B; C; A(6); A(2)].

This Report Book plus the verbal discussions forms a short-term on-going accountability system which ensures that things 'get done'. [E; F; H; A(4); A(2)].

As well as the Report Book, the Deputies maintain the Deputies' Reports which are of a highly technical nature relating to one face. It includes an account of manpower used for the calculation of incentives and issues relating to safety [F; J; A]

The overmen and Under-Manager maintain their own 'black books' in which they record comments from the above reports and from the verbal discussions. These 'black books' are a type of aid-memoire to the on-going accountability process. [A; A(6)]

The assistant Mechanical and Electrical Engineers report each morning
to the Under-Manager on delays, problems from the day before,
urgencies, expected jobs to be performed, jobs to be performed
between shifts, etc.   The Assistant Engineers do not appear to have
any 'official' book, but the Under-Manager notes extensively in his
"black book".   [A; F; H; A(6)]

These manual "reports/books" run in parallel with the computerised
systems, for example, FIDO.   These manual reports often do not tally
with the computer sheet on delays [A]

The Under-Manager's job is operational planning and control.   He
plays an important role in administering the day's work.   An
important initial task is the deployment of men.   During the morning
meetings, the day-shift is signing on, once the number of men is
known, the Under-Manager and Overmen can deploy these men to various
tasks.   In this way, the mine is "set-up" for extraction on the shift
and to cope with urgent tasks.   [A(5)]

The underground materials officer checks in with the Under-Manager to
ascertain what the Under-Manager wants down the pit today and what he
wants tomorrow.   Material can be a limited factor due to the
difficulty in taking materials underground.   Therefore, careful
material planning is important to the smooth running of the mine.
[F; A(2); A(4)]

The Under-Manager has an important co-ordinating function pooling the
specific or fragmented knowledge of the overmen, deputies and
engineers and reporting these to the colliery manager.   [A; A(2);
A(6)]

This gives an example of the multiple-channels of information which are used in the day-to-day control processes. [A; A(6)]. The daily output figures are reported to the deputy manager who reports these to the Area on a smoothing basis:

We don't want to show large differences from day to day"
(Deputy Manager)
[G; H; B(1); B(2)]

After these morning meetings, the Under-Manager relaxes until he is expected in the mine, usually around 9am. The Under-Manager is responsible for all activities in his part of the mine. In the 3 to 7 hours he normally spends in the mine each day, he visits one of the major activities, for example, maintenance, development or extraction. Generally speaking this means that he sees each activity once a week. [A; B; A(2); A(6)]

At the beginning of his stay underground, he spends quite a lot of time on the telephone discussing topics with the people on the surface. The rest of the time is spent on the move, speaking with people was either carried out walking past them or standing still for less than one minute. The topics discussed were of a technical nature and involved things going on. [F; B; A(2)]

The people in charge of both development and extraction were addressed as a matter of course. This implies that a formalised hierarchy is well developed and understood. [C; A(4)]

The underground control clearly resides with the men. On one visit, the cutting machine had broken down causing a long delay. The Deputy and Under-Manager stayed on the face, but clearly were not expected, or invited, to tend or supervise the repair. When the deputy used the intercom to check the progress, he was told to "mind his own business" and that "the less he pushed his nose in, the quicker the fault would be rectified". [F; I]

Around 12.30, the Under-Manager deploys the men, via the telephone, for the next shift. He surfaces around 1pm and holds an informal meeting with the Overmen about the day's problems, a replication of the morning meetings, but on a smaller scale. [A; B; C; H; A(2); A(3)]. After this, the Under-Manager returns to his office to solve issues that he "realised" underground [E; F; B; A(4)]. The rest of the day is spent on issues such as overtime, special projects, etc.

The Under-Manager's concern with finance is related to materials spending:

> "My finance limits itself to general control with materials costs".
>
> (Under-Manager)

The Under-Manager's role is based upon physical processes [E; F] and is de-coupled from the financial implications. The financial implications are built into the physical processes through the assumption that if production is right, then finance is alright [G]. Finance is not the concern of the Under-Manager; his concern is with the physical processes. The Area Director sums this position up with the following quote:

"The Under-Manager regards finance as a mystery".

(Area Director)

Finance appears to "belong" to upper management from colliery
managers upwards. [C; A(4)].

In summary, the Under-Manager's day is based upon tradition [E] and
concerns the smooth running of the present production system [F;
A(4)]. They appear to have problems in discussing finance. Their
work contained no surprises or activities not seen before; their role
appears to be programmed and predictable. [E; F; A(4); A(2)]

5.4 DISCUSSION AND ANALYSIS

The three cameos portray the relevance of the principles, and working rules of the colliery manager's culture throughout the mining-line from Area Director down to Under-Manager.

5.4.1 The Working Practices of the Colliery Manager

5.3.1 illustrated the working practices of the colliery managers. The overall responsibilities of the colliery manager depict the main objectives of the work; output and bottom line profit and the safety concerns which dominate the working practices. The cameo illustrates the problematical relationship between physical events and reports and the efforts that they colliery managers go to, to gain control of the environment and the information sources.

The 'daily accountability' illustrates the major concern of the output and the "need" to constantly monitor people to ensure the correct type of production and standards of performance are achieved. The early morning accountability is reported to Area which demonstrates the "deference" to higher authorities coupled with the view of work being highly programmable and of a technical nature. The cameo highlights the "smoothing" of reported output which demonstrates the principle that "people cannot be trusted" and their desire to achieve the correct type of "reported" production and meet the performance expectations of the higher-line authorities.

The use of the Under-Manager's blue book and the Colliery Manager's black book demonstrates the problematical relationship between reports and physical events with the reliance on multiple channels of information. The use of these books illustrates the application of skills which require the Colliery Manager to "know everything", to be able to be hard, authoritative and dominant and to use the available information to build up "accurate" mental models of the mine and situations.

The early morning meetings include technical discussions which illustrate the use of principles governing experience and the need to couple theory with experience in order to make trustworthy decisions. These discussions also illustrate the highly programmed, technical nature of work. These discussions entail the application of skills which involves the constant display of managerial and technical skills; the ability to define problems and deal with them; the need to apply 'best practice' to achieve the correct production; the ability to use the basic managerial skills and the importance of maintaining "accurate" mental models to exert control over the situation. This also illustrates the programmable approach to work.

The colliery manager spends a considerable amount of time underground and "notes" issues/events in his "black book". These activities demonstrate yet again the problematical nature of information, the use of experience to provide trustworthy decisions; the importance of using skills such as "technical and managerial skills"; the need to have all situations summed-up; the ability to properly guide outcomes which relates to the highly programmed nature of work.

Throughout this cameo the problematical nature of information is illustrated, the need to use experience to make trustworthy decisions; the programmability of work and the stability and continuity aspects of work are illustrated time and time again. The application of the working rules, such as "the need for properly guided outcomes", the need to control the environment and information sources and the application of the required skills are demonstrated time and time again.

5.4.2 The Working Practices of Quarterly Accountability

The quarterly accountability can be seen as "testing" that the principles and working rules of the occupational culture are being applied in the every day working practices. The "testing" is performed by the area line management, mainly the area director and the deputy director (mining). Throughout the cameo, the principles and working rules of the colliery managers occupational culture can be seen to apply to the working practices of the area director and the deputy director (mining).

Throughout the cameo, the use of deference is highly visible with the area director constantly making detailed decisions and offering suggestions for properly guided outcomes. The distrust of people is highly visible throughout the cameo and the need to appear "hard and dominant".

The process of the quarterly accountability appears to be "testing" the occupational culture of the colliery manager; within this pushing for the application of a notion of "best practice". The area management place emphasis on the "correct" type of production accompanied by the achievement of expected standards of performance. These are seen to be achievable by applying the working rules contained within the cultural principles.

The technical nature of the work and the role of finance is displayed throughout the cameo and is "summed up" by the opening comment by the director. Throughout the cameo, the technical and planned nature of the work is displayed whereas when finance is raised, it is only scantily discussed and the discussion quickly reverts back to the technical issues. An interesting issue was raised when the area director asked the colliery manager:

D   ".....Can you do cash flow management for pit?"

C.M.   "It would make no difference....."

The colliery manager's reply represents their concepts of finance : the bottom-line profit figure which relies upon obtaining output. This issue also demonstrates that the area director's role introduces the new ideas and practices into the area, that is creativity is a function of status. It is an example of the "flexing of status and domination". Creativity presents the major difference between the occupational culture of the colliery managers and that of the area directors.

5.4.3 The Working Practices of the Under-Managers

The under managers apply certain of the colliery manager's

occupational culture principles and working rules throughout their

working practices. In particular, principles such as H; people

cannot be trusted, which is part of the reason for the "long-delays"

on the NCB premises. Stability and continuity, principle E is

clearly portrayed with the under manager relying upon experience,

principle B, to provide the properly guided outcomes, working rule

A(4). This stability and continuity is also demonstrated through the

highly programmed nature of work, principle F and the technical

nature of the work. Judgement at this level is minimal and

creativity is non-existent. Judgement and creativity "belong" to

higher management, see section 6.4.2 and principle C, deference to

higher authorities, is apparent in areas requiring these two skills.

The use of multiple reports is apparent demonstrating the application

of principle A in that reports and physical events bear a

problematical relationship. This is also seen through the

application of "part of" the skills required by a colliery manager,

namely the "need to know" what is happening in their particular part

of the mine and the application of working rule A(6) to attempt to

gain "control" (in a technical interest sense) of the environment and

information sources.

The under manager's role therefore, applies certain parts of the occupational culture principle and rules of the colliery manager. The main difference appear to be in principles in such as D; the colliery manager is expected to be able to apply theoretical knowledge with experience whereas the under manager is "experience" led. Principle G, for the under manager only relates to production concerns, that is, the concern for output and in their terms the correct type of production (B(1) refers to maximum output at the right quality.

In the working rules, the under manage only appears to apply certain of the tactics required by the colliery manager and the properly guided outcomes and basic managerial tools required by the job are gained through work-experience, that is as cameo 5.3.2 indicated:

    C.M.   "He's learning the reality of life".

5.5 Summary and Conclusion

One of the central themes contained within Chapter 4 is that the organizational culture of the mining-line provides the dominant context within which work and the environment can be seen. Therefore to understand the management control systems utilised within this environment one needs to be able to describe, explain and analyse the source and order of the mining-line environment. This source and order is described, and explained by analysing the mining-line culture into the three nesting elements of principles, working rules and working practices. The concept of principles, working rules and practices of occupational culture is outlined in section 5.0.

Section 5.1 and 5.2 outlines the basic principles and working rules of the occupational culture of the mining-line. These principles and working rules have been constructed using the research interviews and observations of every-day management practices within the mining-line. The ten basic principles are contained in figure 5.2, in section 5.1.

These principles portray the mining-line image of work. An image of a work environment which is production orientated with accountability being two-fold both in terms of tonnes of coal and bottom-line profit generated. However, the main emphasis is on production and the need to exert control over men, machinery and the underground environment. These principles portray an image of a "tough" environment that

needs to be controlled through both experience; knowledge

and planning. Hence the need to have "on the ground"

experience, detailed formal plans and a centralised,

hierarchical management structure which has overall knowledge

at its apex. The "toughness" of the physical environment is

demonstrated by the superiority of safety. Safety events serve

as an acceptable criteria for the avoidance of the formal set

programmes.

Section 5.2 moves the analysis on a stage and outlines the working

rules which are applied within the ten basic principles. Figure

5.3 outlines the six basic working rules in Section A and Section B

outlines the consequences which result from applying those working

rules whereas section C outlines the consequences resulting from

failure to apply these working rules correctly.

The six working rules are the skills required from a member of

the mining-line. Skills that cover technical, management and

emotional issues. If the members of the mining-line apply these

skills correctly then the correct type of production at the

correct standard of performance will ensure. It gives the image

of a programmed approach to work and that failure to apply the

programme results in 'failure'. Failure means that unsatisfactory

production is achieved and repeated failure will result in "final

removal" from the mining-line. Hence there is a definite image

built up that failure is unacceptable. One cannot learn through

one's mistakes and hence a non-creative environment ensues.

Section 5.3 describes three cameos; a day in the life of a colliery

manager, an Under-Manager and a quarterly accountability meeting.

These are subjected to analysis in section 5.4 by applying the

principles and working rules. All of the three cameos presented

demonstrate a management control system which is based upon, to

a certain extent, common principles and working rules of the

occupational culture of the mining-line.

These principles and working rules of the mining-line portray

a technical interest in that the concern is with extending

and rationalising power of control over the objects or objectived

processes of both nature and society. For example, the principles

emphasise the need to produce coal through controlling both the

physical environment and the human resources. The physical

environment is controlled through knowledge, experience and

formalised planning whereas the human resources are controlled

through adopting a programmed hierarchical management style in

which decisions from the top are deferred to and expectations

or skills and performance are learnt through the dominance of

the culture and the rituals of work. This technical interest

is at the very core of the NCB line management culture.

The lower levels of management are 'experience' led, as people

progress through the line they are expected to be able to couple

experience with technical theory. A tool of status is the ability

to handle financial issues. These are introduced in a limited

sense from colliery manager up to Area Manager and surround short-

term accountability to a budget figure. They are displaying

'budget-constrained' behaviour. The problematical relationship

between the budget and the physical plan is not entered into and

may not be recognised (Section 3.2.1 and 4.2)

Throughout this thesis, the aim is to set the context and to explore

the "dominant" culture of the mining industry. The idea of a

"dominant" culture follows the belief that, as with other

organisations, the NCB is a multi-cultural organisation, but the main

difference is that the NCB has developed an occupational culture

which is the dominant form of control (see Chapter 4 and 5). In this

type of organisation, organisational performance cannot be adequately

nor accurately understood without a comprehension of the dominant

culture of the organisation: the rules and resources its members

utilise to produce and reproduce their social world. Chapter 4

explored conditions which encourage the development of a dominant

clan or cultural form of control and Chapter 5 explored the

principles and working rules of the mining-line occupational culture.

As outlined in Chapter 4 the mining-line is capable of producing

and reproducing their social world by being adaptable. They take

into their world the changes in management ideologies in attempts

to remain dominant and portray the image of efficiency and

legitimation. This is especially relevent at the Area Director and

levels below. Chapter 6 explores the way in which the mining line

adapts and portrays images of change.

STRUCTURE OF SIGNIFICATION

6.0   INTRODUCTION

6.1   ANALYSIS OF SEMIOTICS

6.2   SEMIOTIC MODEL FOR THE MINING-LINE

6.3   SUMMARY AND CONCLUSION

INTRODUCTION

Chapter four provides an analysis of the dominance of the mining-line

of the NCB in the decision-making process. It is the mining-line that directs

the organisation in terms of its financial welfare (within societal

and governmental constraints and operating welfare). In

understanding the internal workings of the NCB, an understanding of

the multiplicity of power relations at work and the continual

struggles of the mining-line in maintaining dominance is imperative.

Chapter four explores several phenomena which have strengthened the

mining-line dominance and allowed the consistent reproduction of

the mining-line reality to pervade the organisation. This analysis

draws upon Gidden's Theory of Structuration. Over the years, the

consistently reproduced mining-line reality has, in part, become

institutionalised and stable. The "shared world view " created by

the mining-line can be considered as an "image", with its root in

the occupational culture of the mining-line which is part of the

deeply-layered structures that form the framework of the

organisation. This occupational culture is explored in chapter

five. Chapter five recognises the continual struggles involved

in reproducing the mining-line frame of reference and recognises

the importance played by institutionalisation in forming "deeply-

layered" structures. However, external pressures, societal

and governmental, are exerted on these structures. Hence organizational

contradictions do exist which provides a form for change and shifting power

relations.

The mining-line has to be capable of absorbing these contradictions to
ensure the continuation of their dominance. They absorb these contradictions
in two main ways. Firstly, by absorbing these tensions at HQ and area
level, leaving the colliery free to pursue the "turning of the coal".
Secondly by being capable of portraying the image of being "rational" and
"well-managed" by adopting, for example, best practice techniques and
creating the atmosphere of a "commercial industry" through the technique of
"switching domains".

This chapter explores through the use of semiotic analysis the way in which
the mining-line attempts to "switch domains" to create this image of
rationality and efficiency. Section 6.1 gives an analysis of semiotics and
section 6.2 describes the semiotic analysis of the mining-line. That is,
the set of signs that the managers utilise to communicate the image of
an efficient, well-managed, flexible and profitable commercial-like
organization. Section 6.3 provides a summary and conclusion.

ANALYSIS OF SEMIOTICS

Semiotics defined as the study of signs or systems of signs concerns the principles by which signification occurs. Signification refers to the processes by which events, words, behaviours and objects carry meaning for the members of a given community; and to the content they convey.

Barley (1983) refers to semiotics as the study of how communication is possible, since all communication involves shared codes. (Communication is one of the three elements of interaction (Giddens 1976) along with domination and morality). According to Barley, the essence of semiotics is the isolation of systems of signification and the rules that govern their use. Hence, semiotics is concerned with how meaning is constructed. Geertz claims that a semiotic analysis should search for the repetitive, interpretative structures that infuse a culture's everyday life.

At the core of semiotics is the notion of a sign. Barley (1983) investigates "how a funeral director understands funeral work". (Barley; 1983). His initial task was to uncover the signs that have relevance for funeral directors. Barthes (1967) argued that a sign is understood to be the relationship between or the union of a sign-vehicle and the signified, the notion or content conveyed by the sign-vehicle. This coupling between the sign-vehicle and the content is "arbitrary" in that the same sign-vehicle can signify alternative contents and that similar contents can be conveyed by alternative sign-vehicles. The coupling taken is a property of the culture and

hence the importance of systems of significance in the analysis of how members of the culture structure the meaning of their world. Both Geertz and the cognitive anthropologists argue that in order to study culture, a researcher's task is to discover the relevant expressions, contents and rules that bind the two, so as to be able to portray the signs by which members of the culture make sense of their world.

Barley (1983) also comments that a semiotic analysis of an interpretative system considers the processes by which expressions are linked to their contents and outlines the processes of metaphor, metonymy and opposition for understanding how meaning is created within a culture. Geertz (1973) claims that all rhetorical forms are useful in gaining an understanding of how meaning is created and re-created in culture. Barley (1983) uses metonymy, metaphor and opposition to understand the process of signification.

Signs can signify by metonymy, metaphor or opposition. Metonymy is a figure of speech which consists in substituting for the name of a thing, the name of an attribute of it or something closely related. For example, 'truncheon' may signify 'authority'. Barley (1983) argues that 'signs' signify by metonymy when expressions are related to contents by contiguity or juxtaposition.

Metaphor is the figure of speech in which a name or descriptive term is transferred to some object different from, but analogous to, that to which it is properly applicable. For example, crown signifies a 'brand of margarine'. Metaphor signifies by similarity or analogy. Similarity between two signs typically arises when both show one or more denotations or connotations.

Barley (1983) argues that the crucial difference between metonymy and metaphor as semiotic processes can be summarised by the following rule of thumb:

> "metonymical signification occurs when expression and content
> are both part of the same domain or context, whereas
> metaphorical signification mixes domains or contexts .....
> the term "domain" can refer either to a semantic context,
> ..... or to a domain of physical objects and attributes."

(Barley, 1983; 397)

Hence, a profit and loss account is metaphorical in that it represents by marks on paper, a host of attributes of a content belonging to another context, for example, the transformation process

Signs may signify through opposition. Opposition is the act of placing one thing in contrast with another; the condition of being opposed or contrasted. Barley (1983) comments that:

> "The mechanism of opposition suggests that we know what
> something means, in part, by knowing what it does not mean."

(Barley, 1983, 397)

As outlined earlier, signs contribute to systems of signification or codes. Eco (1976) decomposes codes into four components: a set of expressions; a set of contents; rules for coupling expressions to contents, and a set of alternative responses contingent on the combination.

Barley (1983) argues that:

> "The last element is crucial for the study of cultures; societal
> organisational, since its inclusion transforms the definition of
> code from that of a set of signs into a general model for social
> action: behaviour becomes a function of interpretations of a
> situation."

(Barley, 1983, 397)

Group members will act similarly to the degree that they share the

same codes for inputting meaning into the world. These are complexly

structured codes and any sign can trigger a denotation and a

succession of connotations into a 'chain of signification'. For

example, a given sign becomes an expression for a second content

which in turn becomes an expression for a third and so on. It is

these "chains of signification" that people must learn in order to be

socialised into the group. (Schutz 1964; Berger and Luckmanns,

1966).

A chain of significations can be decomposed into its two major parts,

the denotative code and the connotative code.

> "The denotative code refers only to contents immediately
> associated with the sign vehicles themselves ....
>
> ... The connotative code is particularly germane to the
> semiotic analyses of cultures, for it is in the connotative code
> that the researcher finds those redundancies of interpretation
> that bind together the denotative codes undergirding diverse
> arenas of action and social life."

(Barley, 1983, 298-9)

Barley (1983) refers to the redundancy at the connotative level "a theme" and argues that themes imply a message or interpretation that runs through numerous activities and acts as the cultural glue for attributing coherence and consistency to a myriad of separate actions and events. Hence, these redundancies provide the threads to what otherwise appears as "separate activities", that is, the redundancies provide the 'perspective' which forms the mutual knowledge/background.

Barley (1983) summarises as follows:

> "One sometimes senses that organisational theorists lay too heavy an emphasis on overtly symbolic phenomena as indicators of cultural processes. Clearly, logos, stones, colourful terms and arcane rituals are symbolic in nature, and it is reasonable to identify and study them. From the semiotic perspective however, terms, tales and totems are but lit candles hovering above both the icing and the cake of culture. A semiotics of culture urges the realisation that anything can be an expressive sign capable of signification. Once we recognise the pervasiveness of signification, we are no longer constrained to look for cultural phenomena in overtly symbolic and can focus on how members of an organisation or occupation interpret a wide range of phenomena."

(Barley, 1983, 409)

To understand how people interpret their work, it is necessary to discover domains of objects, events and actions into which people segment the flow of their work. Spradley offers the following definition of a domain:

"Any symbolic category which includes other categories ... all members of which will share at least one feature of meaning."

This one feature of meaning is generally guaranteed by the cover term. The domains are then elaborated by the use of saturation (Glaser and Strauss, 1967) so that no new elements could be elicited to include in that domain. Barley (1983) comments that as the domains multiply and become saturated, commonalities between particular domains emerge.

This type of semiotic analysis, as presented by Barley (1983) is only used in the NCB research site to understand the "switching of domains" which the members of the mining-line seek to create. The flow of their work is not further segmented into "domains" and "elaborated". The interpretation of the mining-work is further elaborated through the principles and working rules of the occupational culture of the colliery managers in Chapter 5 which seeks to understand the meaning of their world.

Throughout the research project, members of the NCB attempted to create the atmosphere of a "commercial industry". These commercial industry models are underlying strategies that organise the execution of many different activities. The managers seek to create a set of

FIGURE 6.1. SEMIOTICS OF MINING WORK
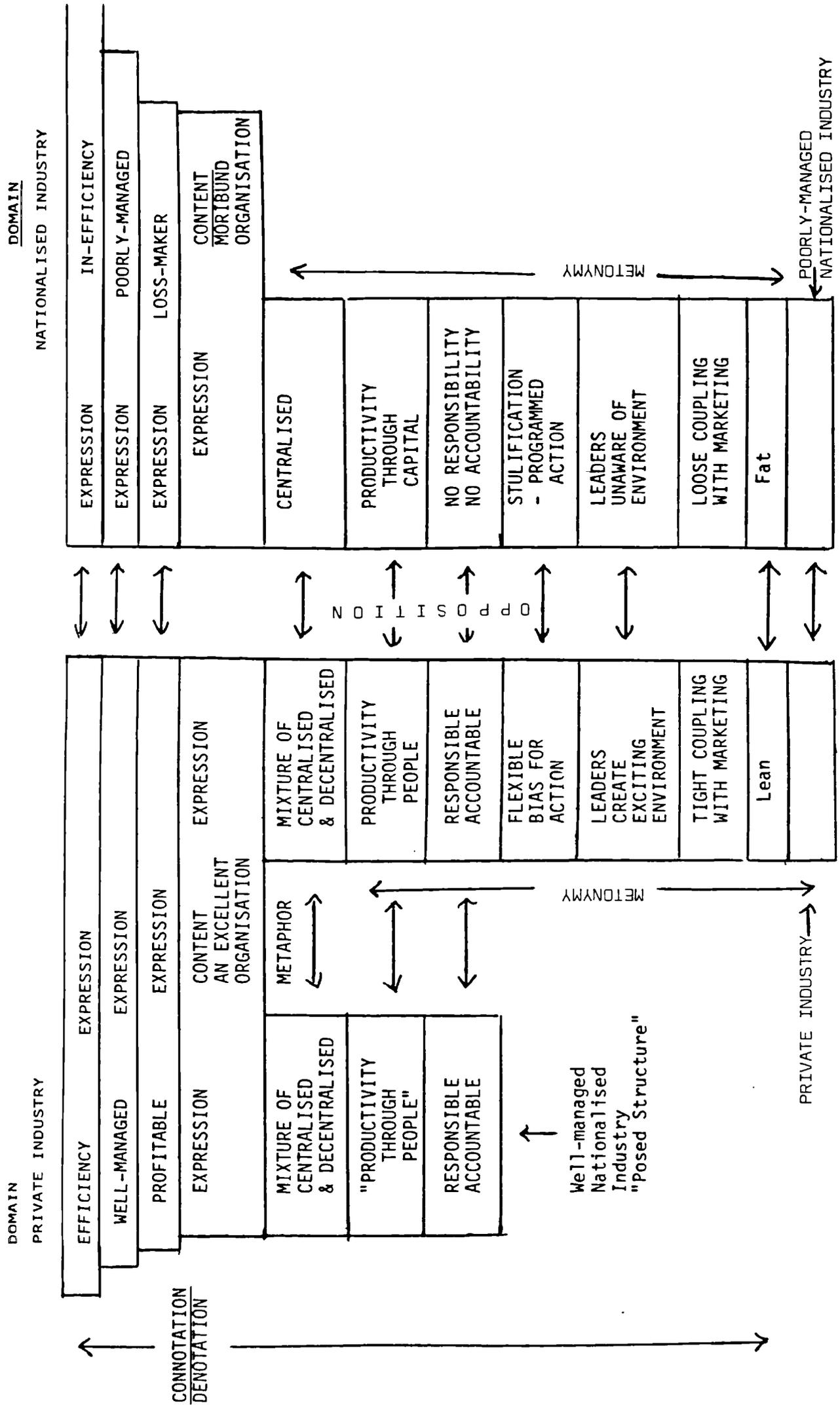
signs to communicate the image of an efficient, well-managed,

flexible, profitable commercial-like organisation. The managers seek

to create metaphorically the system of metonymical signs that are

taken as indices of "excellent organisations". The code is

metaphorical because the signs are created on a nationalised industry

which might be signified by a moribund organisation. The managers

are "running" from the image of inefficient management which is the

popular belief of nationalised industry management. This popular

belief is portrayed in the following comments:

> "Any large commercial organisation of course produces accounting
> statements for management, indicating the financial performance
> of individual production units. For this purpose we and they
> develop appropriate accounting conventions....."
>
> (Harrison, 1985, 1)

The above comment demonstrates the "need" to be seen in the same

light as "other large commercial organisations".

Figure 6.1 shows the code of an "excellent nationalised industry".

This code is built upon an opposition between commercial and

nationalised industry, shown by the two domains. Opposition is the

act of placing one thing in contrast with another, for example,

setting a commercial industry in contrast to a nationalised industry.

As Barley argues:

> "The mechanism of opposition suggests that we know what
> something means, in part, by knowing what it does not mean."
>
> (Barley, 1983, 397)

Hence, in the everyday world a commercial industry and an ill-managed nationalised industry are marked through anti-thetical attributes but the idea of "management" is to suggest that these two have attributes in common. Therefore, management creates a metaphor by arranging for the industry to be associated with cues or expressions normally associated with "excellent, commercial organisations".

In terms of figure 6.1, the "managed" industry shifts semantic domains to become aligned with its opposite to provide for legitimacy. Chapter 4 explored the importance of legitimacy (Meyer and Rowan, 1977) and the need to be seen to be utilising "proper" management control systems, that is creation of metaphors which are associated with "excellent, commercial organisations". Examples of these attempts are seen in the NCB attempts to "externally prove" that their working principles are financially sound, for example, Harrison (1985) publicly attempts to defend the rationales behind the whole of the NCB planning system suggesting that decisions, for example, on pit closures are financially sound. Behind this rationalising is the "fear" that the public adopts the image of a "poorly-managed, inefficient" nationalised industry and Harrison is at pains to create the industry to be associated with cues of efficiency, and rationality; that is, shifting the domain in the public eye.

Another example of attempts to "switch the domain" in the public eye is that the NCB publicise their grand Strategic Model (Plackett et al., 1982) which has a series of advanced technical properties, but it is noteworthy that not once did managers in this study make reference to this model as an important element in the planning procedures. The modellers themselves recognised their advisory and peripheral roles.

The denotations, outlined in Figure 6.1, are intended to produce the desired image of a well-managed industry. Hence the metonymical metaphors are read to signify: an excellent organisation; a profitable organisation; a well-managed organisation, and an efficient organisation.

These are diagrammed as the connotative code. At each level the connotations are antithetical to impressions or interpretations which management presumes would be elicited by a nationalised industry, as discussed above. These impressions are: a non-excellent organisation; a non-profitable organisation; a poorly-managed organisation; an inefficient organisation.

> "Signs have no meaning unless they are contrasted with other
> signs in a system."
>
> (Barley, 1983: 404)

This connotative level involves the theme of "an excellent organisation" and this theme runs through numerous activities and acts as the "externally-legitimate" cultural glue for attributing coherence and consistency to a myriad of separate actions and events. The importance of efficiency and productivity to the NCB management was outlined in Chapter 2.

This theme comes from "outside pressures" and provides a method of

rationalising action but may be "at odds" with the principles of the

colliery managers' occupational culture as outlined in Chapter 5.

This theme is the "theme of the staff college" and the internal

courses are in part attempts to integrate and recognise as such this

externally legitimate theme into the culture of the "mining-line".

In this view, the appearance of being "rational" and "well-managed"

may exist in spite of the fact the accountability-meetings serve to

reinforce the mining-line frame of meaning (Cyert and March, 1963;

Feldman and March, 1981; Meyer and Rowan, 1977) and the only

indications, apart from staff college, of such concerns reaching the

Colliery Manager are the "orders" he receives to limit/cut spending,

to produce further economies on overtime-pay. These attempts to

appear 'rational' and 'well-managed' can be seen in the following

quote:

       STAFF MANAGER   "I think they should state quite clear
                           objectives ..... but .. the senior part of
                           the accountability decides too much ...."

The above quote contains the apparent paradox that they want further

guidance, but also freedom to manage in their own terms. This

demonstrates the conflict that exists behind the 'need to be seen' as

rational and logical and the taken for granted knowledge of the

mining-line culture.

This "rational", "well-managed" or "excellent organisation" is the anchoring for the HQ Finance frame of meaning and signals a pressure for change which is only partially recognised by the Colliery Managers. The concerns of the Board to initiate a closure-programme to "make the industry viable" (Financial Times 7.6.85) may put the colliery managers in a situation where they have to prove the viability of individual collieries. At present, the appearance of being an 'excellent' organisation exists in spite of the fact that the Area and Colliery accountability meetings serve to reinforce the mining frame of meaning. How these accountability meetings and mining frames of meaning will survive the "finance" orientated frame of meaning is uncertain and overt conflicts will probably occur until the clan adopts or absorbs these pressures or is "moved-over".

Hence, the purpose of "switching domains" is to suggest that nationalised industries, that is the NCB, has attributes in common with commercial organisations.

Thus a metaphor is created by arranging for the NCB to be associated with cues or expressions normally associated with "an excellent commercial organisation", that is the content.

The code also functions by metonymy. Certain indices exist that are taken as "signs of excellence" (Peters and Waterman, 1982) mixture of centralisation and decentralisation; flexible bias for action; responsibility and accountability; productivity through People; leaders creating exciting environments; tight coupling with marketing; lean organisation.

Again, these indices signify by opposition, in that indices of a

"moribund organisation" are: centralised organisation; stultification

through Programmed Action; no responsibility or accountability;

productivity through capital; leaders unaware of environment; loose

coupling with marketing; fat organisation.

A metaphor is created because these indices of an 'excellent'

commercial organisation are built upon the structure of a nationalised

industry. Hence, the NCB is 'posed' to suggest that the NCB and the

excellent commercial industries have attributes in common. Therefore,

in terms of figure 6.1, the NCB in its 'posed' state shifts semantic

domains to become aligned with its opposite.

However, not all of the indices of an "excellent" commercial model

organisation can be simulated and hence the "posed metonymical

structure" is shorter than the stack associated with the "excellent,

commercial organisation ". The code's rule might be stated as:

"Provide structures or systems to simulate metaphorically the
metonymical system of expressions used as typical indices of an
excellent organisation."

The "posed" stack of metonymical indices consist of: mixture of

centralised and decentralised organisational structure; productivity

through people; responsibility and accountability.

The "indices" which cannot be simulated at present are:

D   FLEXIBLE BIAS FOR ACTION;

E   LEADERS CREATING AN EXCITING ENVIRONMENT;

F   TIGHT COUPLING WITH MARKETING;

G   LEAN ORGANISATION.

A   <u>A Mixture of Centralised and Decentralised Organisational</u>

<u>Structure</u>

The organisational structure of the NCB decentralises the
responsibility for production to the Areas and then to the
Collieries. The structure appears to be a mixture of
centralisation and decentralisation with the areas bearing the
responsibility for production, however, the following comment
brings into focus the centralised nature of the industry.

HQ IR

> ".... N. Derby do not know the sum of the industry,. We
> were trying to find out how we could reduce capacity.
> We're pushing much harder at pursuing a strategy for the
> industry".

HQ staff see themselves as "strategy" makers to ensure that the separate areas are all pushing in the right direction. Hence, HQ are seen as the integrators by providing and transmitting the necessary strategy:

HQ IR

> "... We're trying to plumb behind the mind of the person and the Director is trying to plumb behind the mind of the board."

> "... Our means of spreading the gospel is not confined to just a series of meetings."

> "... It's essential when you are dealing with distinctive personalities - otherwise it would allow power to be displaced. If there were no formal meetings and standards and it was done on a face to face basis then there would be fragmentation of the industry ..."

The HQ model portrayed fits into the planning and control model espoused by Anthony and Dearden (1976):

STRATEGIC PLANNING AND CONTROL   MANAGEMENT INVOLVED

                                        TOP, HQ MANAGEMENT

MANAGEMENT PLANNING AND CONTROL   AREA MANAGEMENT

                                        AND COLLIERY

OPERATIONAL PLANNING AND CONTROL   COLLIERY MANAGEMENT
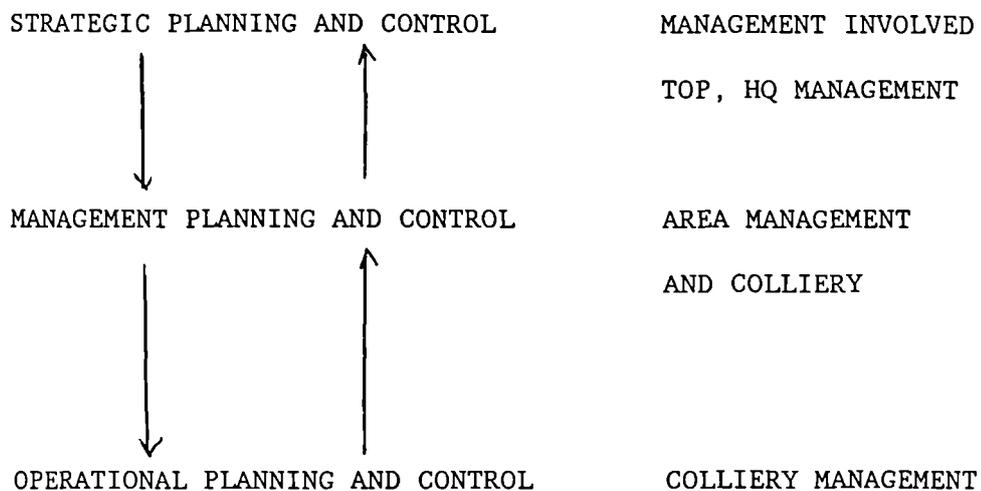
This model "fits" with the functionally orientated management control systems and the notions of "best management practice".

However, the experience of the Area Management relates that this

model is normative rather than descriptive of what actually

happens:

CHIEF ACCOUNTANT

>"Back to Chicken and Egg and depends on HQ attitude, do
>they require maximum output/depressed output - never came
>clean on that."

Chapter 4.6 described the "decoupling" of the control systems

both horizontally and vertically and referred to the "lack of

direction" of the Area. But, the public image, that is the

normative statements give the impression of an organisation that

is highly coupled through strategy.

B   **Productivity Through People**

One of the main measures of performance used by the NCB is the

"saleable output per man-shift" (OMS). Since OMS is related to

coal produced rather than coal sold, and to shifts worked rather

than shifts paid for, it is a measurement of man effort and not,

if one takes the view that it includes matching supply and

demand and reducing non-productive man-shifts, a measure of

management efficiency (MMC Report, 1983). Trends in the OMS are

publicly reported in the annual accounts and gives the

impression of an improved manpower management over the years.

The NCB monitor both the productivity (through OMS) and the

earnings rate component of costs - EMS (earnings per manshift)

(see Chapter 3). The improvement in overall revenue OMS

nationally has been achieved by a variety of actions: major

investment in access, and concentrating production on better faces, better pits or better Areas which has been assisted by: investment in plant and machinery; improved technology in plant and machinery; and implementation of an incentive scheme and improved use of manpower.

Hence, the notion of OMS gives the impression that increased productivity is being achieved through people whereas capital investment is also being used to increase productivity. The cost of this 'productivity through capital' is "hidden". The NCB uses a measure of unit cost to assess the performance of its collieries, but fails to include in this a full consideration of the cost of capital used. This use of "unit cost" reflects the cost-reducing aspects of the result of the investment such as improved labour productivity, but <u>not</u> the related additional costs of finance required which could offset the savings from labour productivity increases. This is one consequence of the colliery being a "profit centre" and not looked upon as an "investment centre".

c <u>Responsibility and Accountability</u>

The notions of responsibility and accountability are well entrenched within the processes of the NCB. Chapters 2, 3, and 4 refer to these notions of responsibility and accountability at area and colliery level.

HQ IR

> "... The real job is to mine coal - the rest is constraints.

That is, coal is to be mined within the EFL (external financial limit) and within a certain level of unit cost and the only way perceived to decrease unit costs is to maximise output.

The actual experience is that the F23 (Profit and Loss Account) is a "constraints" document and secondary to the production of coal. However, externally the presence of financial systems legitimises the organisation. It is the vehicle to demonstrate that the NCB management are financially accountable and responsible and to give the impression that even though they are a "loss-making" concern requiring Government funding of £ 875M (in 1983/84) they are using "rational", "best-practice" management techniques. As Chapter 4 indicated, the NCB are at pains to demonstrate that their decisions are financially sound.

> "The F23 is primarily an accountability document used by the NCB management for three main purposes; to see changes in the trend of results and performances for each activity over a period of time; to permit comparisons of actual results with operational budgets which we prepare on a similar basis; and to highlight activities with poor results where an in-depth review of likely future performance is required."
>
> (Harrison, 2: 1985)

The above uses the F23 (Profit and Loss account) as an index of an excellent organisation which is intended to give the impression of a "well-managed, efficient organisation" that is seeking profitability.

The above ignores issues such as: the production orientation of
the dominant clan; the capital costs of improved labour
productivity; the transfer-pricing issues between NCB and its
main customer, the CEGB which allocates the profits and losses
between the two and; the issue of the world market for coal, a
market price for coal and the market prices for alternative
fuels. (See Berry et al., 1985).

The indices which are not simulated are:

D   Flexible Bias for Action

The industry works on programmed action based on experience.
The flexibility is socialised out of the process. The
socialisation process builds action based upon experience and an
accepted method of working which becomes instinctual.

E   Leaders Creating an Exciting Environment

The leaders protect the production core of the industry (see
Chapter 4) in order that the uncertainties of the market and
finance do not impinge upon production.

DDA   "In this business, if somebody has exceeded his
         budget, you can't stop the pit."

         "re-writing the 5 year mining plan is the last and
         probably the least likely of the various options that
         are open"

         (Alderson, 1983: 67)

Alderson in the above quote is recognising the "mis-matches" between supply and demand, but is arguing that these are not allowed to influence or change the 5 year Mining Plan.

The DDA quote demonstrates the loose coupling which exists between finance and the extraction process, in that continuity of production is paramount. The Alderson quote demonstrates the loose coupling which exists between marketing and production and the protection of the five year Mining Plan in that matching occurs "outside" of the extraction process itself.

The environment produced is one of stability and certainty which can be responded to through programmable action which requires no creativity and can be (and is) approached in a mechanical way, with very little, if any, opportunity for management growth or development through reflexive methods.

However, the stable environment is created through the technical problems involved in mining and the concept of "need to know" based upon responsibility and continuity.

COLLIERY MANAGER	"nothing is happening ... that has not happened before"
PRODUCTION MANAGER	"The colliery manager is responsible for everything ... he ought to know everything..."
DEPUTY MANAGER	"Never mind your books, get down there and .... get the machine going, before someone comes in and tells us what to bloody do."

Pressure is utilised to create programmable action and a stressful environment. Pressure based upon technical knowledge, need to know and the need to succeed.

F   **Loose Coupling with Marketing**

Section 4.6 discusses the loose coupling between marketing and

production extensively.   The summary to section 4.6 recognised

that Alderson (1983) is an attempt to react to the need for

external legitimacy.   In that:

> "Ultimately no single area of the country can make any
> forecast without involving the whole .... Western Area have
> settled for forecasting the home demand for their coal but
> only after the closest consultation with other coalfields."
>
> (Alderson, 1983:   67)

However, he also recognises, as in E above, that marketing

cannot interfere with the 5 year Mining Plan: reinforcing the

de-coupling that exists between marketing and production.

G   **Fat**

The NCB is seen as being top heavy.   This growth and

over-staffing of top management is seen as an honest but well

meaning attempt to be more efficient by encouraging more staff

specialists.   However, this issue is now being managed and

management redundancies are inevitable especially given te

contracting size of the industry in terms of the closure of the

"uneconomic tail".

In terms of 'switching of domains', the Area Director, in all

conversations attempts to represent the organisation as being

analogous to a 'well-run and efficient commercial organisation'.

Attempts to both internalise the need to adopt to a private-market

model as outlined in Chapter 2 and to portray impressions to the

outside world that they have adopted to this model.   Hence,

they are absorbing potentially conflicting frames of meaning to

both legitimise their dominance and to continue reproducing their

social world.   This is an important issue, because at this time the

NCB was and is going through a change in management ideology

through governmental pressures.

The semiotics of mining-work is schematically shown in figure 6.1

(Page 261a).   Figure 6.1 shows the code of an "excellent

nationalised industry".   This code is built upon an opposition

between commercial and nationalised industry, shown by the two

domains.   Opposition is the act of placing one thing in contrast

with another, for example, setting a commercial industry in

contrast to a nationalised industry.

In terms of figure 6.1 the "managed" industry shifts semantic

domains to become aligned with its opposite to provide for

legitimacy.   Chapter 4 explored the importance of legitimacy

(Meyer and Rowan, 1977) and the need to be seen to be utilising

"proper" management control systems, that is creation of

metaphors which are associated with "excellent, commercial organisations". Examples of these attempts are seen in the NCB in attempting to "externally prove" that their working principles are financially sound. For example, Harrison (1985) publicly attempts to defend the rationales behind the whole of the NCB planning system suggesting that decisions, on, say, pit closures are financially sound. Behind this rationalising is the "fear" that the public adopts the image of a "poorly-managed, inefficient" nationalised industry and Harrison is at pains to create the industry to be associated with cues of efficiency, and rationality.

The denotations, outlined in Figure 6.1, are intended to produce the desired image of a well-managed industry. Hence the metonymical metaphors are read to signify: an excellent organisation; a profitable organisation; a well-managed organisation, and an efficient organisation.

These are diagrammed as the connotative code. At each level the connotations are antithetical to impressions or interpretations which management presumes would be elicited by a nationalised industry: these impressions are a non-excellent organisation; a non-profitable organisation; a poorly-managed organisation; an inefficient organisation.

This connotative level involves the theme of "an excellent organisation" and this theme runs through numerous activities and acts as the "externally-legitimate" cultural glue for attributing coherence and consistency to a myriad of separate actions and events. The importance of efficiency and productivity to the NCB management was outlined in Chapter 2 and in Chapter 4.

This theme comes from "outside pressures" and provides a method of rationalising action but may be "at odds" with the principles of the colliery managers' occupational culture as outlined in Chapter 5. The appearance of being "rational" and "well-managed" may exist in spite of the fact that the accountability-meetings serve to reinforce the mining-line frame of meaning (Cyert and March, 1963; Feldman and March, 1981; Meyer and Rowan, 1977) and the only indications of such concerns reaching the Colliery Manager are the "orders" he receives to limit/cut spending, to produce further economies on overtime pay.

This demonstrates the conflict that exists behind the 'need to be seen' as rational and logical and the taken for granted knowledge of the mining-line culture. Tensions and conflicts that are created in the attempts to move the organization further along the normative-imperative continuum to produce an organization that is 'rule-governed' and "acceptable to society". These tensions and conflicts are mainly absorbed at HQ and Area level, leaving the colliery free to pursue production according to their own working practices.

CHAPTER 7

SUMMARY AND CONCLUSION

7.0   INTRODUCTION

7.1   THESIS SUMMARY

7.2   FUTURE RESEARCH IMPLICATIONS

      7.2.1   ACADEMIC AND PROFESSIONAL TEACHING

      7.2.2   RESEARCH OPPORTUNITIES.

This study is concerned with providing an improved understanding of Management Accounting and accounting systems in practice: from within the context of an organization. This improved understanding is imperative to ensure an improvement in both the teaching, design of systems and practice of both management and accounting.

This so called 'conventional wisdom' of Management Accounting has evolved through an era where the focus was on control of organizations: control of both the physical and human. Control within the conventional wisdom, relates to the provision of accurate, timely and relevant information so that the decision-makers are made aware of divergences from plan and can act rationally to instigate action to achieve the goal(s). A central assumption being that management is confronted by an objectively knowable, empirically verifiable reality that presents demands for action.

Control is more complex than this simple model suggests since management and their accounting systems and practices exist in organizational contexts and these systems and practices obtain their meaning in part, from the organizational contexts in which they are situated. Hence ontological issues are important to understand the practices and systems used by management. Management does not live in an objectively knowable world that is neutral from values, attitudes, and ideologies. Management create their own reality which by interaction becomes a shared reality existing within the work-place.

If one accepts that reality is inter-subjective and not objective,
then this holds various consequences for the use of accounting systems.
Managerial practices are no longer value free. The consequences on
Management Accounting are major. Under the conventional wisdom one
has to be able to 'model' the objective reality and demonstrate
technical excellence, with the "new wisdom" one has to be able to
understand how the subjective reality is constructed. The key
variables to be reported upon are a function of the dominant order
that exists within the organization. The outcome(s) to be achieved
is influenced by the dominant order and the conflicts that exist
within and around the organization. In Giddens terms one has to be able
to understand the structures that people utilise in interaction: the
signification, power and morality properties. Only by understanding
these elements can a Management Accountant interact within the
organizational context to influence the outcome.

Management Accounting becomes an integral part of a social science and in
order to design systems and influence action, management accountants
need to be capable of understanding the subjective reality that they are
part of and helping to sustain or change within their particular
organization.

Hence management and their accounting systems exist in organizational
contexts and one needs to understand these contexts in order to
influence action. This thesis used a case-study based research conducted
in the North Derbyshire Area of the NCB to demonstrate the importance of
understanding management systems and practices from the organizational
context in which they are situated.

The importance of the organizational context on the understanding of
Management Accounting is demonstrated through the case study.
Specifically the case study explored primarily the colliery to area
relationships and to a lesser extent the area to Head-quarters
relationships within the NCB and by examining the way
in which accounting is utilised within each of these relationships.

Section 7.0 highlights the importance of understanding the
organizational context in order to further one's understanding of the
practice of management and accounting. Chapter one argues that the
main assumptions contained within the 'conventional wisdom' of
management accounting are based upon functionalist paradigms with
the emphasis being on knowledge gained through scientific endeavours.
Behind these functionalist paradigms and epistemology lies an
assumption on ontology. The implicit ontological assumptions stress
an objective, all knowable world that is capable of control. One of
the main arguments in Chapter One is that it is this basic assumption
that lies behind the gap that exists between theory and practice.

Section 1.2.1 highlights that social reality is less concrete and
deterministic than the concrete world belonging to the 'conventional
wisdom' of accounting and that accounting researchers must recognise
that they are really social scientists (Morgan, 1983). However,
section 1.2.1 demonstrates that multiple and fiercely divided
paradigms exist in accounting and that each paradigm stands alone and
exists in a world of its own: oblivious of the inter-relationships and
influences each have on one another. It can be argued that such
parochialism is counter productive to the future development of
accounting. Section 1.2.1 concludes that better understanding
of existing practices is necessary which means using naturalistic
research to describe and understand accounting based upon ontological
assumptions of a subjective reality.

Section 1.3 highlights that to be able to understand the management

accounting practices in an organizational context, it is necessary

to understand how social realities are formed and maintained.

Section 1.3 outlines the complexity involved in the negotiation

and re-negotiation of the 'spatial-temporal' reality. It is this

'spatial-temporal' reality that is the basic underlying ontological

assumption that is applied throughout the case-study. The factors

creating a spatial-temporal reality are outlined in section 1.3.

The model portrayed in Figure 1.3 is arguing that certain features

of a temporal-spatial reality could belong to an objective reality,

for example the physical process of extracting coal; the physical

resources that are brought to work (computers, machinery); the

physical accounting system; aims and purposes; control mechanisms.

All of these features are brought to mould a social subjective

reality into a "spatial-temporal" reality that has purpose, that

can initiate action and produce goods, wealth, continuity. That is,

it gives the appearance of being a concrete entity that belongs in

space and time. However, it is only through the application of

naturalistic research that one realises that it is not one reality

being guided towards the aims of the organisation. It is a series

of multiple realities: all of which are being interpreted by

differing groups of individuals: a series of social subjective

realities and objective realities intertwined and creating a

continuing existence.

Hence, a certain degree of continuity is preserved through the
operation of rule-like activities, for example, the social
realities of organisations are preserved to a certain extent by
the power structures, the control mechanisms, influences and aims:
these tend to give the appearance of an objective reality, but
the fundamental character of the social world is embedded in the
network of subjective meanings that sustain these rule-like actions
that lend it enduring form. This notion of an objective reality is a
component part in the thought process and reasoning that is used to
build an 'individual's model or models of the working of reality:
that is, it impinges upon the 'pure' subjective notions of reality.
The process is a complex reconstruction; the operation of rule-like
activities gives the impression of concrete ideas based upon a given
order and that reality is ultimately the same for every observer.
However, reality is not the same for every observer, hence emphasis
in certain scholarly quarters is on understanding how social order is
constructed by human beings in ways that are meaningful to them and
as such the knowledge generated is "substantive theory" (Glaser
and Strauss, 1967). It must be recognised that "theory" may come
to form part of the reality that the theory purports to describe:
thereby fashioning the individual's thought processes and their
perception of a 'pure' subjective reality; the influence of this
theory and present-day ideologies on outside influences and on the
interpretation of "rule-like" activities must be recognised.

In this way, the "spatial-temporal" realities are demonstrated as complex processes depending upon : Individual reasoning and imagination; outside influences which construct "shared realities" that is a concept of "being in the world"; human action and inter-action with continuity being preserved through "rule-like" activities; signification process of the above inter-actions and individual reasoning that relies in part on present-day theory and ideologies of society.

In this way, the inter-relationship of all the six categories in Figure 1.2 (page 25) in determining a concept of a "spatial-temporal" reality can be portrayed as a reality that has aspects of the "human imagination", of social construction and symbolic discourse and of objectivity through its on-going "rule-like" activities and negotiated order. But all of these aspects rely to a greater and lesser extent upon the ability of individuals to reconstruct or sustain a notion of reality.

This thesis is built upon notions of a "spatial-temporal" reality and the need to understand the methods used to create this subjective "spatial-temporal" reality in terms of the individual's subjective experience of an agreed or negotiated social order.

Section 1.3.1 outlines Giddens Theory of Structuration. This thesis is

not a test of Giddens' theory, it uses this theory due to the insights

gained through describing the workings of the NCB and from reading

Giddens and exploring the processes creating the building of a

'spatial-temporal' reality.   Giddens argues that:

> "An ontology of time-space as constitutive of social
> practices is basic to the conception of structuration which
> begins from temporality and thus, in one sense, history"

(Giddens, 1984 : 3)

This is the most basic similarity to the 'temporal-spatial' reality

outlined in section 1.3. in which social practices are ordered

across time and space and only 'exist' in terms of the structuring

properties which 'lend' them 'systematic form'. In structuration

and in the 'temporal-spatial' reality, time-space is fundamental

to the production and reproduction of social life. Time is perhaps

the most enigmatic feature of human experience.

In creating a social reality, human beings interact and apply a 'stock of

knowledge' to understand the interaction. As Giddens notes:-

> "The vast bulk of the stocks of knowledge in Schutz's phrase,
> or what I prefer to call the mutual knowledge incorporated
> in encounters, is not directly accessible to the
> consciousness of actors. Most such knowledge is practical
> in character : it is inherent in the capability to 'go on'
> within the routines of social life"

(Giddens 1984 : 4)

As stated in section 1.3, one of the crucial assumptions of

naturalistic research methods is the capability of human beings

to bring to their consciousness the mutual knowledge that they

utilise in making sense of being in the world. As highlighted

some can, some find it more difficult.

Giddens brings together three elements in the process of interaction:

signification, domination and legitimation. Throughout this thesis the

importance of power to the creation of a dominant social reality is

demonstrated. To understand the management and accounting systems as

used within the Area and Colliery of the NCB, there is a need to

understand the culture of the mining-line. The mining-line being the

dominant frame of meaning. Hence, since power and the ability to build a

dominant frame of meaning is a central feature of an Area and/or

Colliery, there is firstly a need to explain how this domination occurs

and re-occurs.

Section 1.4 outlines the research methods utilised in explaining the use

made of management and accounting systems within the Area and/or

Colliery. In summary, the research project consisted of two major

phases. Phase One which consisted of semi-structured interviews and

reading of various documentation. The purpose of this phase was to

build a description of the management control systems and credibility

with the managers. Phase Two consisted of further interviews and

observations of accountability meetings and "shadowing" managers through

their work day. The primary puspose of this phase was to describe the

process of accountability from the coal-face management to as high up the

organization as possible. By describing these processes, it was possible to, firstly, gain a deeper understanding of 'social realities' within the organization and secondly to understand how these 'social realities' impinged upon the use and design of accounting information systems.

To understand the social reality created and re-created within the Area and Collieries of the NCB and the dominant nature of this reality then a description of the NCB in terms of the context in which the management see themselves existing requires to be explored and described; (i.e. the history in terms of its origins and the process adopted from its origin to-date coupled with an understanding of the physical process of coal-getting and the surrounding information systems need to be understood.) This is contained in Chapter 2 and 3.

Chapter two recognises that a number of models can be brought into play to describe an organization. In terms of the NCB, two models are introduced, the economic model and the socio-political-economic model. Each of these characterisations of the NCB are required for problem-solving in order to maintain the viability of the NCB.

The market or economic model articulates two main systems; firstly, the British Economy and secondly, the 'Rest of the World' economy with the possible interactions between the two. These two main systems and their interactions are main concerns that are frequently articulated by the Area and HQ management of the NCB.

Within the British Economy system, the UK energy industry is depicted

as a sub-set: the NCB being a sub-set of this UK energy industry.

Section 2.1 concentrates on coal and the NCB. It highlights the

differing historical periods through which the mining industry has moved.

From periods in which the modern world depended upon coal as the primary

and only source of energy to the present-day in which coal competes, in a

four-fuel economy, with gas, oil, and nuclear energy. The increasing

concern for efficiency and technical control depicted in the

development of the coal industry since nationalisation can be

interpreted as a reaction to the interactions of these systems on

the NCB: the UK energy industry with its increasing competition and

the British Economy with its increasing emphasis on market forces and

bottom-line profit. These factors are all felt by and articulated by

the mining community. Section 2.1 outlines the plans and changes that

the NCB management have evoked in response to the above concerns.

The economic model outlines the concerns of the NCB management, however,

section 2.4 describes the socio-political-economic model. This model

recognises that the world must cope with the problem of energy depletion,

but at the same time it must maintain socio-political stability. Section

2.4 outlines two paths that can be taken in the future evolution of the

energy system: the soft-path which advocates the exploitation and

exploration of "regionally available energy" which are very efficient

in satisfying end user demands or the hard path that provides for

"world wide" supplies of energy. These paths are not yet concerns

internalised with the management of the NCB, but will have future

implications on all energy related industries in the next decade.

Section 2.4 depicts the increasing complexities that are yet to be faced by the energy industry.

The above models provide a description of the intricate ties that exist between the NCB and the wider society: in terms of the economic model, the UK and the World as seen by the NCB management. However, it provides an over concern with the systems adaptation to external forces and external power dynamics and neglects the internal power dynamics and social clan interest and conflicts that exist within the NCB and the impact these have had on the systems adaptation. These are explored through chapters 3, 4, 5 and 6.

Chapter 3 provides a detailed description of a deep mining area of the NCB, North Derbyshire, in terms of its physical, information and control systems. These descriptions are provided in order that an appreciation can be gained of the analysis that follows in chapters 4, 5 and 6.

Section 3.1 provides a description of the deep mining area of North Derbyshire. The description depicts the deep mining areas as "profit-centres" with the accountability system working through the well defined line-staff management structure. The North-Derbyshire deep mining area has eleven collieries that are managed as "production-centres" that are held to account to a "bottom-line" budgeted profit that is fixed in nature despite changes to physical plans. Section 3.1 outlines the primary purpose of a colliery and describes the three inter-related activities of coal production: winning coal from the face; haulage to the surface and the preparation of coal to produce

a marketable product with the associated systems required to perform these activities: a management system, a physical and a financial control system; a safety system and an Industrial Relations System.

Section 3.1 recognises that the colliery management are held to account for meeting the planned performance as laid down in the physical action plan, known as the Action Programme. Section 3.1.1 describes the Action Programme and recognises this document as being the key short-term physical plan of the colliery and that day-to-day controls; in terms of FIDO (Face Information Digested On-line); IMPACT (In-built Machine Performance and Condition Testing) and MINOS (Mine Operating Systems) systems are implemented to ensure that action is implemented to deliver the planned output. These day-to-day controls are described in sections 3.1.2; 3.1.3 and 3.1.4 respectively.

The performance of the colliery is reviewed through the Accountability System that works down through the 'line' of the NCB from the Board through to the Colliery. Section 3.1.5 describes the Accountability System. The accountability system that is utilised between the colliery management and the area management is performed through the colliery/area quarterly acocuntability meetings. Section 3.1.5 focuses on this key meeting utilising sections of transcripts from these meetings. These transcripts describe the technical content of these making plain the important decision criteria that if physical production concerns are correct then finance automatically falls into place.

Section 3.2 outlines the financial information systems utilised within

the colliery and area. The main financial control system is provided

by the Budget. Section 3.2.1 describes the Budget as being a static

financial evaluation of a rolling eighteen month action programme. Both

documents are therefore utilised to communicate the main objectives

but as tactics change within the action programme then the budget

becomes only a partial description of the physical workings. The

objectives and tactics included within the budget and action programmes

during the research period are discussed in section 3.2.1.

Sections 3.1 and 3.2 describe the physical process and its associated

information systems and control systems both physical and financial.

Section 3.3 attempts to provide a more dynamic description of how

these physical processes and information/control systems interact by

providing a detailed schematic of the 'daily process of coal-getting'.

Section 3.4 outlines the day-to-day control processes within the

colliery. All of the systems outlined in sections 3.1; 3.2 and 3.3

depend upon human action and inter-action. Section 3.4.1 and 3.4.2

describe the daily human action and inter-action of two key personnel

in the colliery hierarchy: the Under-Manager and Colliery Manager

respectively. The day-to-day control process surrounding the

extraction processes rests with the Under-Manager and his overman and

Deputies. The overall control processes and accountability rests with

the Colliery Manager.

Hence the colliery levels are regarded as "Production Centres" although there is increasing pressure to be a "business unit". The NCB maintains, as far as possible, relatively stable conditions within these centres and the management functions are broken down into specialisms and routines. The technical methods, duties and responsibilities attached to each task and post are clearly defined and a high value is attached to loyalty, local knowledge, experience and skills which are self-reinforcing through the "Culture (and myths) of the Industry".

The structure of management control utilised stresses the hierarchical form of control, authority and communicaton which is reinforced through the assumption that the location of relevant knowledge is at the "top" of each level, for example, Colliery Manager, Area Director, the Board - apparently the only man who knows or should know "all" about the organization is the "man at the top". This is reflected by the prestige and aura of mystique with which these roles generally seem to be regarded.

This hierarchical form of control is displayed in the MINOS philosophy. MINOS works on the concept that the effectiveness of management control is directly correlated to the amount of information available. Over-abundance of information can be problematical. Burns (1984) highlights how other industries that have developed highly centralised information systems have also developed communication problems and that information saturation can be as unproductive as information scarcity.

The management control system used at the colliery level is similar
to that used at the Area level, the line being utilised to exercise
accountability for the performance of the colliery manager. The
colliery manager is responsible to the Area Director for carrying out
the Action Programme, for fulfilling the stringent legal requirements
and for obtaining the profit levels set out in the colliery budget.

The colliery manager is held to account to production managers and
ultimately to the Area Director at various meetings throughout the
financial year. The accountability process and the accountability
documents are outlined in section 3.1.5.

Section 3.1.5 describes the periodic accountability between the
colliery/area. To the colliery management team, the idea of
accountability is a "taken for granted" part of their world and
is continuous in nature. The meaning of accountability is
associated with responsibility, it is the system which ensures
that the colliery management are held responsible for the
performance of the colliery as a whole and it is viewed as periodic
"reckoning" or "explanation" of these responsibilities by reference
to the achievement or non-achievement of a "correct" level of
production. "Correct" seems to imply notions encompassing both
physical and financial implications. Financial being described in the
colliery budget. Correct production involves maximising output per
man-shift even in a depressed market. Viewed from a production units
point of view this is probably the correct strategy but in an
overabundant market it leads to growing stocks with the associated
investment costs.

The influence diagram of figure 3.3, depicts the colliery as a production
centre as well as a "profit centre". As described in section 3.2, the
colliery is seen as a "profit centre" with its own financial objective
in terms of the "bottom line" profit figure. This "bottom line" profit
figure has a complex relationship with performance appraisal and
accountability. The relationship depicted on the influence diagram is
simplistic in nature and portrays functionalist assumptions; a more
complex portrayal would involve the development of an understanding of
the mining-line frames of meaning. This understanding is developed
in Chapter 5 by investigation of the principles and working rules of
the mining culture(s).

Section 2.1 traces the production and organization changes that have
taken place in the NCB since nationalisation. It highlights that the
form of organisation structure adopted was one of "line-staff".
This line, was, and still is, the dominant core of the industry and
relates to the mining aspects of the organisation. Chapter 4.0 explores
the ways in which the mining-line has maintained and strengthened
its domination over the industry; enabling the production and
reproduction of the 'mining-line reality'. Power, being one of the
important elements in Giddens Theory of Structuration which is outlined
in Section 1.3.1.

A major issue in the production and reproduction of 'social reality'
is the power dimension inherent in the ability of an individual to
create his/her own reality in that:

"what passes for social reality stands in immediate relation to
the distribution of power".

(Giddens 1975:113)

Within the context of the NCB, domination by the mining-line is an

important concept to understand, since the spatial-temporal reality

portrayed is that "belonging" to the mining-line. The mining-line

has drawn upon many varied rules and resources to ensure

domination and to a certain extent has created a view of the world

which is no longer questioned at area and colliery level. The area

and colliery display very similar cultural traits with area personnel

being "frustrated under-managers": having the desire to "get back" to the

important task of "mining the coal".

Section 4.1 explores the rules and resources which the mining-line draws

upon to maintain dominance. In summary these included the first initial

definition of the organization which stressed the prime importance of

production and gave the authority to the mining-line. Once this

definition was established, the mining-line utilised various phenomena

to continuously create and re-create their view of reality.

These phenomena included the invisibility of the extraction process as

discussed in section 4.2. In a deep-mining situation, the extraction

process has a high degree of invisibility. It can be argued that this

invisibility has led to the use of 'multiple' channels of information in

attempting to 'open up' the visibility of the process coupled with the

"need to know" which appears to be an important element in the process of

reinforcing power relationships. The difficulty in obtaining 'truthful'

accounts of underground activities puts the pressure back on physical

observation.

It appears to be important to be seen underground ; this is rationalised
in terms of the difficulty in obtaining 'truthful' information from the
pit bottom. Hence physical visits are required to clarify the situation.
However, it was admitted that despite spending so much time down the pit,
the managers saw very few causes of the problems, only those to which
their attention was drawn after the event. This is reinforced by the
way in which the managers looked about (or didn't) as they walked about
the pit bottom. This physical observation is a ceremony which is
important in symbolic terms to reaffirm the power networks of the mining-
line.

That is, the 'walk-abouts' have important ritual significance: it
maintains appearances and validates the mining-line. The need for
physical observation and its importance to control is produced and
reproduced in the mining-line. Attempts to negate the need for
physical observation are strongly resisted or taken-over and
maintained by the mining-line itself.

Examples of protecting the invisibility of the extraction process
are discussed in section 4.3 with the failure of the system of standard
costing. During 1955, the Fleck Report stressed the need for 'modern
management techniques' and examples advocated included introducing a
standard costing system. Standards of performance are still utilised in
the industry today and yet the standard costing system was declared a
'disaster". This disaster was rationalised in various ways. For instance
it was argued that the increasing mechanisation hampered the stability of
standards creating frequent revisions. The unreliability of information

was another argument advanced for the disaster. In addition it was
argued, the existence of 'crisis-type' problems underground meant that,
for example, materials were utilised in areas not designated for that
particular material usage leading to the inability to maintain accurate
material usage records caused the system to fail.

It is argued in chapter 4.0 that a more powerful reasoning for its
failure lies in the threat it posed for the dominance of the
mining-line. Physical observation is perceived as an important
element in maintaining the mining-line dominance, the use of
standard-costing would have created a physically observable
process to all parties concerned not just the mining-line
and the process would have been programmed and predictable
(Crozier, 1964). The dominance could have been transferred to the
Accountants within the industry (the legal requirements of the
colliery manager could be coped with structurally); the mining-line to
retain its dominance must reinforce the "black-box" appearance of the
mining-process, by, for example, defining the process as "not easily
understood". This reinforced or created the view that to understand
the process one needed to have spent time underground, know the nuts
and bolts of the industry, etc.

Knowledge of the precise process is difficult to acquire through
the information system due to factors such as the difficulty in recording
elements such as material, as specified earlier, and the difficulty in
attaining the 'truth' from information hence reinforcing the need for
physical visits to really understand 'what is going on'. This is a
powerful ideology and reinforces the non-substitutability of the
mining-line.

Although the mining-line dominates it does not extract from the need to maintain legitimacy through the use of a 'culturally conducing' information system. Around the same time, the organisation and its environment was being re-defined which stressed the need to increase coal's competitiveness by concentrating on cost reduction. This re-definition could have created a major threat to the mining-line unless it could be harnessed within the structures produced by the mining-line. The outcome of these pressures was an information system which forms the basis of the current system.

Financial control was introduced on a colliery basis (due to the difficulties of attaining face-level information). The design of a financial system on a colliery basis reinforced the power of the mining line; costs remained discretionary and the face remained as a black-box. As stated earlier, the budget used today is an imperfect articulation of the production plan, the unit of analysis for the budget is the colliery whereas for the action programme it is the 'face'. The Budget process is outlined in Appendix five and the action programme in Section 3.1.1.

The discretionary cost description holds strong today in that the dominant mining-line results in the view that there is no 'rational' way of estimating the 'right' amount of costs, yet standards of performance are utilised over the face. In the absence of an engineered standard, the amount to be spent is a matter of judgement; judgement of the mining-line.

Section 4.4 explores the way in which the mining engineers adapted a policy of mechanisation to cater for the problem of technological obsolesence that was inherited on nationalisation. This mechanisation of the faces and elsewhere below ground created a new group of professionals, the "engineers", with the potential that power could be re-distributed. Increasing tensions between the mining-engineers and engineers are observed at most meetings. However, the two functions - mining engineers and engineers - appear to be held together by the 'all in the pit together' culture and even though tensions are high, the importance of physical and engineering factors are reflected throughout all of the colliery and accountability meetings.

However, the engineers appear to have been managed in various ways to reduce this 'potential' conflict and dominance. For example, the engineers are responsible to and report to the colliery manager. The colliery manager is always a mining-engineer due to the strict legal requirements covering the job which decreases the substitutability of this position. All colliery managers must possess a 'first-class' ticket, this 'ticket' maintains the functional split between the mining-managers and the engineers.

Engineers appear to define their situation in terms of "a world of machinery", claiming:

"It's all technical underground".

Their domain surrounds the installation, testing, maintenance and provisioning of equipment coupled with its 'safe' operation. This "world view" of machinery is reinforced by the planning system utilised and provides another example of the 'way in which the engineers are managed'. The engineers have no involvement in drawing up the action programme or the 5 year plan but utilise these documents to "plan" their own function's equipment. An interesting point is that the engineer is held to account in terms of objectives in the action programme and is judged by the colliery manager in terms of these. The day-to-day actual progression of the development of the mine and district is controlled by the Under-Managers and the Deputy Manager.

The situation between the under-managers and engineers is extremely complex, further confused through the opaqueness of job positions and responsibilities and divided through the differing definitions of the situation constructed. The Area Director has incorporated the Mechanical and Electrical Engineers of the collieries in the Quarterly Accountability meetings. This socialisation process may help towards the re-definition of the engineer's situation more towards the mining management and vice-versa. This process is also taking place at collieries on a day-to-day basis. Health monitoring of equipment is also being developed which will reduce the 'judgemental' element of the engineers job and aid the introduction of preventive, planned maintenance.

The automation programme and its stress on system engineering demonstrates, amongst other things, the responsibility of the mining-line and avoids claims of negligence (Meyer and Rowan, 1977).

To retain the dominance; the mining-line must "show" that they are incorporating the "proper" elements of structure as outlined in the traditional textbooks on management.

The automation programme builds upon cybernetics (with its growing following at that time) and the use of information technologies in the design and use of MINOS and FIDO (see Chapter 3). An interesting feature of this programme is that the main input is the production plan for the mine/face, the outputs are coal and information, the secondary inputs are capital and labour. This again demonstrates the predominance of production and the secondary role played by finance, see section 4.5 on decoupling for further analysis of this phenomena.

The lead times are long for coal production and the collieries are now working with the 'highly mechanised pits which require high output levels in order to legitimate the high investment levels, hence the use of MINOS and FIDO, which are 'mining owned' computer systems established to reduce delays and convey information. Yet again, the mining-line has re-emphasised the 'need for production'. Section 4.5 stresses the decoupling between capital and revenue generating activities of the NCB.

Collieries are "profit centres" and produce profit and loss accounts but balance-sheets are not produced. Managers are not held to account for their use of capital; it is seen, at least in this (accounting) sense, as a free source of finance. Technological development does not apear to have a capital cost attached to it, in the eyes of the operating managers. Areas do not appear to be expected to manage their cash, working capital, stocks and fixed assets in any direct manner.

These are HQ concerns and are managed centrally, e.g. management of

working capital and negotiation of finance, in order that economies

of scale can be achieved. These are economically sound reasons,

but place severe limitations on the image that Areas are increasingly

espoused to hold, ie, that of being "business centres". Instead these

features of financial management are subsumed under production decisions.

It was suggested to the research team that there would be no differences

if Areas produced balance-sheets. This is due to the format of the

present-day profit and loss account which computes profit on the basis of

"saleable output". Adhering to the NCB system of attribution and the

level of recognition of inter-dependencies and the problems of accounting

thereby encountered. See Chapter 3 for a description of the profit

and loss accounts used.

The bottom-line profit does not include any interest charges, but

includes an appropriation of Area and HQ overheads (based on output).

Kaplan (1984) refers to the art of producing "paper" profit or improved

"paper" return on investment rather than "real" wealth generation. This

also holds with the collieries in that increased profit can be paper

manufactured with a negative effect on wealth creation through the

stocking of coal. Sales are credited to all output whether sold or

stocked, thereby producing paper turnover as opposed to cash inflows.

The stock has a negative effect on the cashflow due to the tying up of

working capital. Once again re-emphasising the importance of volume and

the need to 'turn the coal'. This demonstrates that the accounting

system, supported and used by the mining-line, defines the organisation

of collieries and areas as "production-centres".

The format of the accounting system reinforces the view of the   .

'protection of production' from the short-term financial and

marketing decisions, reinforcing the importance of the continuity

of production and the mining-line. It also means that longer-term

issues of wealth creation are not articulated within the shorter-run

orientation of Area financial policy and it can be argued justifiably

is not (yet) a part of the dominant paradigm at collieries and

Areas; this creates tensions, ambiguities and uncertainties at the

Area/HQ boundaries.

The above demonstrates the "horizontal decoupling" in that functions

outside of the mining-line are detached from Production and

Engineering e.g. Corporate Policy, Finance, Marketing and Industrial

Relations respectively.

Conventional organisation literature views "loose coupling" as

undesirable, however, the NCB appears to have utilised de-coupling to

manage varying types and degrees of uncertainty and complexity. It

attempts to isolate production and technical concerns from the political

and economic. (Berry, et al., 1985).   This is because:

"... if there is a break-down in one portion of a loosely
coupled system then this break-down is sealed off and does
not affect other portions of the organisation."

(Weick, 1976: 223)

This allows the collieries to pursue the continuity of production, whilst finance, marketing and HQ copes with the changing environment. The use of "saleable output" as the basis for crediting revenue to the colliery profit and loss account is an example of the decoupling of marketing and finance; the problems created by the volume of production are coped with by HQ and the productive core is protected from what might be short-term fluctuations or 'fads of fashion'. The accounting system is absorbing these uncertainties at area level and below and legitimating attention to production. However, these uncertainties require managing at some level and this appears to take place at Board level and at the Department of Energy where issues (such as finance limits, cash resources,) are discussed and approved. This area of interaction between the Board and the Department of Energy provides an area for further research.

Section 4.6 explores how the socialisation process and the closed nature of the NCB aids the mining-line in creating and recreating their view of life.

Wilkins and Ouchi (1983) argue that most real organisations utilise all three forms of control, namely markets, bureaucracies and clans (Ouchi, 1980), but that some organisations, or parts of them, employ the clan form of governance more predominantly than the others. The clan form of control appears predominate within the mining-line of the NCB, in that this part of the organisation has developed a distinct local culture, or clan and due to its dominance and strength pervades through the collieries, areas and to a certain extent HQ. The mining-line community appears to approximate the "community-like" sharing of complex understandings implied in the anthropologists' cultural paradigms.

Section 4.6 explores some of the conditions necessary to develop "thick" social understandings such as those present within the mining-line of the NCB. These conditions revolve around long history and stable membership; absence of institutional alternatives and interaction amongst members. The interaction amongst members is managed by narrowing decision-making and accountability to the mining-line and the directors' committee.

The dominance of the mining-line in the activities of the NCB tends to give the appearance of "wide-spread" common interpretations, but it must be recognised that less powerful idiosyncratic explanations and understandings do exist but are too remote from the actual decision making systems to make an impact at colliery or area level.

In summary the above illustrations refer to the self-perpetuation of power; if this is so, then once power is strengthened and the process institutionalised, then organisational change is made more difficult. Pfeffer (1981) gives a well demonstrated account of the institutionalisation of power and the reasons for the stability of major power distributions in organisations. However, as Foucault points out, power relations are the object of unceasing struggles; therefore struggles are continuing in order to maintain the above stability.

Therefore, it can be argued that organisations consist of multiple power relations which are in continual struggles in order that a dominate image of reality can emerge; in the case of the NCB these power relations have become institutionalised which gives the image of stability: an image of a concrete reality.

"... social knowledge once institutionalised exists as a fact,
as part of objective reality and can be transmitted directly on
that basis. For highly institutionalised acts, it is sufficient
for one person simply to tell another that this is how things
are done".

(Zucker 1977 : 726)

Hence, "shared world views" are developed which legitimise and

institutionalise the present practices and structures of the

"dominant parties". Within the NCB the "shared world view" of the

dominant mining-line has been legitimised and institutuionalised

over the years. Thus, in the NCB, a strong sense of stability and

continuity can be perceived. The processes of management as outlined

above tend to reinforce these images of stability even though the Area is

in a "decline" situation in terms of the age of its collieries and the

extent of its resources; and conflicts/tensions are being absorbed at the

Area/HQ boundary.

As stated earlier one of the main elements within structuration is

power which is facilitated into structure through domination. Within

the context of the NCB, domination of the mining-line is an important

concept to understand since the spatial-temporal reality portrayed

is that 'belonging' to the mining-line. Therefore it is important

to understand the principles, working rules and working practices

that form the occupational culture of the mining-line.

Chapter 5.0 analyses the occupational culture of the mining-line

through the use of an interpretative configurationist paradigm, the

premise of which is that culture can be described and compared in

district, personality-like patterns of integrated principles.

> "The occupational culture, like all cultures, is a mode of
> adaption to the uncertainties and vicissitudes of collective
> life. As such, it contains an image of the basic concerns of
> the group, the principle ethics and bodies of manners, rituals,
> ethics and ideology, the strategies and tactics of the work,
> including notions of good and bad work, various bodies of
> folklore and legend and a set of principles that organise the
> work"

(Manning; 1979 : 124)

The occupational culture is described in terms of principles;

working rules and working practices: three nesting elements that

provide the source of understanding and order the environment or

reality of the mining-engineer.

The "principles" are abstract in nature and provide the guidance

and constraints to the working rules. These principles involve

an insight into the "image" of the organization as reproduced by

the mining-line. The principles are translated into everyday

negotiated bases for the mining-work by the "working rules".

The actual working practices are translations of the principles and

working rules.

The focus for the analysis is the colliery manager but is equally

applicable to the Area Director. The institutionalization process is

well-defined. To become an Area Director one must have been brought

through the ranks of the colliery and served ones time as a colliery

manager. Hence, the Area Directors' have similar modes of adaptation to

the uncertainties and vicissitudes of collective life. Hence they share,

with the colliery management, the basic concerns of the group, the

principle ethics and bodies of manners, rituals, ethics, ideologies and
the strategies and tactics of the work including notions of good and bad
work. They share the bodies of folklore and legend and a set of
principles that organise the work. The main difference in outlook
between an Area Director and Colliery Manager is due to how the Area
Director has to deal with the uncertainties created by the HQ concerns
such as economic financial limits. This creates contradictions in the
working practices of the Area Director as he struggles to maintain the
mining-line occupational culture and the need to absorb business
uncertainties.

Section 5.1 outlines the ten basic principles of the occupational
culture of colliery managers: these are summarised in figure 5.2
and cover issues such as deference to Area Director; reports bear
a problematical relationship to the actual events; need on the ground
experience to make decisions; technical/abstract knowledge must be
coupled with long periods of experience; experience encourages
notions of stability and creates resistance to change; work is
programmable and technical; two main objectives in work are "turning
the coal" and attaining "bottom-line profit", work is a vehicle to
demonstrate strength and domination; people cannot be trusted therefore
must be policed and controlled and the over riding issue is safety.
Safety issues over ride everything including output.

Section 5.2 outlines the "working rules" of the occupational culture
with a summary given in figure 5.3. These working rules cover items
such as the proper emotional tone required, the tactics or skills
required, the use of properly guided outcomes, the need to apply best
practice and the need to control the environment and information sources.

Applying those working rules in the correct way will result in "good work" as measured by the correct level of production at the expected standards of performance. Failure to apply these working rules correctly results in "poor work" as measured by unsatisfactory levels of production achieved with the ultimate sanction of being removed from the line position into a staff role. The notion of "good and poor" work is summarised in section B of figure 5.3.

These principles and working rules provide the back-cloth to the way in which the colliery management approach their work. Section 5.3 applies these principles and working rules to cameos of the working practices of the colliery manager; under-manager and an accountability meeting. All of the three cameos demonstrate a management control system which is based upon, to a certain extent, common principles and working rules. These principles and working rules portray a technical interest in that the concern is with extending and rationalising power over the objects or objectived process of both nature and society. This technical interest is at the very core of the NCB line-management culture.

The lower levels of management are 'experience' led; as people progress through the line they are expected to be able to couple experience with technical theory. A tool of status is the ability to handle financial issues which are introduced in a limited sense from colliery manager up to Area Director and surround short-term accountability to a budget figure. The problematical relationship between the budget and the physical plan is not entered into and may not be recognised (see section 3.2.1 and 4.2).

Throughout this thesis, the aim is to set the context and to explore the "dominant" culture of the mining industry. The idea of "dominant" culture follows the belief that, as with other organisations, the NCB is a multi-cultural organisation, but the main difference is that the NCB has developed an occupational culture which is the dominant form of control (see Chapter 4 and 5). In this type of organisation, organisational performance cannot be adequately nor accurately understood without a comprehension of the dominant culture of the organisation: the rules and resources its members utilise to produce and reproduce their social world. Chapter 4 explored conditions which encourage the development of a dominant clan or cultural form of control and Chapter 5 explored the principles and working rules of the mining-line occupational culture.

As outlined in Chapter 4 the mining-line is capable of producing and reproducing their social world by being adaptable. They take into their world the changes in management ideologies in attempts to remain dominant and portray the image of efficiency and legitimation. This is especially relevent at the Area Director and levels below.

Chapter 6.0 uses semiotic analysis (which is described in section 6.1) to demonstrate the way in which the mining-line attempts to provide images of being efficient and legitimate by understanding the 'switching of domains' which the members of the mining-line seek to create. Briefly, semiotics is the study of signs or systems of signs by which signification occurs. Signification refers to the processes by which events, words, behaviours and objects carry meaning for the members of a given community and the content they convey.

A chain of significations can be decomposed into its two major

parts the denotative code and the connotative code.

> "The denotative code refers only to contents immediately
> associated with the sign vehicles themselves ....
>
> .... The connotative code is particularly germane to the
> semiotic analyses of cultures, for it is in the connotative
> code that the researcher finds those redundancies of
> interpretation that bind together with the denotative codes
> undergirding diverse arenas of action and social life."

(Barley: 1983: 298-9)

That is, semiotics is concerned with how meaning is constructed.

In terms of 'switching of domains', the Area Director, in all

conversations attempts to represent the organisation as being analogous

to a 'well-run and efficient commercial organisation'. Attempts to both

internalise the need to adopt to a private-market model as outlined in

Chapter 2 and to portray impressions to the outside world that they have

adopted to this model. Hence, they are absorbing potentially conflicting

frames of meaning to both legitimise their dominance and to continue

reproducing their social world. This is an important issue, because at

this time the NCB was and is going through a change in management

ideology through governmental pressures.

The semiotics of mining-work is schematically shown in figure 6.1

Figure 6.1 shows the code of an "excellent nationalised industry". This

code is built upon an opposition between commercial and nationalised

industry, shown by the two domains. Opposition is the act of placing one

thing in contrast with another, for example, setting a commercial

industry in contrast to a nationalised industry.

Hence, in the everyday world a commercial industry and an ill-managed nationalised industry are marked through anti-thetical attributes but the idea of "management" is to suggest that these two have attributes in common. Therefore, management creates a metaphor by arranging for the industry to be associated with cues or expressions normally associated with "excellent, commercial organisations".

In terms of figure 6.1, the "managed" industry shifts sematic domains to become aligned with its opposite to provide for legitimacy. Chapter 4 explored the importance of legitimacy (Meyer and Rowan, 1977) and the need to be seen to be utilising "proper" management control systems, that is creation of metaphors which are associated with "excellent, commercial organisations". Examples of these attempts are seen in the NCB in attempting to "externally prove" that their working principles are financially sound. For example, Harrison (1985) publicly attempts to defend the the rationales behind the whole of the NCB planning system suggesting that decisions, on, say, pit closures are financially sound. Behind this rationalising is the "fear" that the public adopts the image of a "poorly-managed, inefficient" nationalised industry and Harrison is at pains to create the industry to be associated with cues of efficiency, and rationality; that is, shifting the domain in the public eye.

The denotations, outlined in Figure 6.1, are intended to produce the desired image of a well-managed industry. Hence the metonymical metaphors are read to signify: an excellent organisation; a profitable organisation; a well-managed organisation, and an efficient organisation.

These are diagrammed as the connotative code. At each level the
connotations are antithetical to impressions or interpretations
which management presumes would be elicited by a nationalised
industry: these impressions are a non-excellent organisation; a
non-profitable organisation; a poorly-managed organisation; an
inefficient organisation.

This connotative level involves the theme of "an excellent organisation"
and this theme runs through numerous activities and acts as the
"externally-legitimate" cultural glue for attributing coherence and
consistency to a myriad of separate actions and events. The
importance of efficiency and productivity to the NCB management was
outlined in Chapter 2 and in Chapter 4.

This theme comes from "outside pressures" and provides a method of
rationalising action but may be "at odds" with the principles of
the colliery managers' occupational culture as outlined in Chapter 5.
The appearance of being "rational" and "well-managed" may exist in spite
of the fact that the accountability-meetings serve to reinforce the
mining-line frame of meaning (Cyert and March, 1963; Feldman and March,
1981; Meyer and Rowan, 1977) and the only indications of such concerns
reaching the Colliery Manager are the "orders" he receives to limit/cut
spending, to produce further economies on overtime-pay.

This demonstrates the conflict that exists behind the 'need to be seen'
as rational and logical and the taken for granted knowledge of the
mining-line culture. Tensions and conflicts that are created in the
attempts to move the organization further along the normative-imperative

continuum to produce an organization that is 'rule-governed' and

"acceptable to society". These tensions and conflicts are mainly

absorbed at HQ and Area level, leaving the colliery free to pursue

production according to their own working practices.

One of the main conclusions reached through this research project is that

the traditional definition for management control, that is,

> "... a set of practices designed to ensure that
> individuals, organizations and societies satisfy
> their goals"
>
> (Anthony 1965)

is not an adequate description for current working practices.

The above definition is based upon objective assumptions regarding

ontology which are elaborated upon, explained and criticesed in Chapter

One. It fails to recognise the subjective nature of the world, its

conflicts and confusions. It fails to recognise that management control

practices can be evaluated as power systems (Robson and Cooper, 1989).

Throughout this thesis, power is seen as a central component within

social interaction and hence management control systems. This thesis,

utilised Giddens' theory of Structuration to explore the way in which

frames of meaning (Giddens' 1976) are produced and reproduced within an

organizational setting. Chapter One outlines Giddens duality of

structure. Giddens suggest there are three forms of structure within the

processing of structuration (1984, P29); signification (meaning);

legitimation (morality), and domination (power). When people act, they

draw from these structures.

Domination is the medium through which power is exercised and thereby structures of domination are produced and reproduced. A major feature of NCB management is the domination of the mining-line. Chapter 4.0 outlines the ways in which the mining-line has continued to be able to produce and reproduce their social reality as the dominant order. This pattern of domination is sustained in two ways.

Firstly, legal requirements specify that a colliery manager must be a mining-engineer. This is due to the considerable safety problems and attendant legislation covering the industry. However, this legal requirement is not inevitable; colliery managers in the FDR and USA are not necessarily mining engineers. Secondly, when investment did not expand with demand for output in the early twentieth century then probably circumstances favoured an organizational structure directed to the purpose of 'turning coal' so as to extract as much as possible from a fixed level of investment. In this production orientated situation the mining engineers came to form the dominant managerial line of the industry.

A major consequence of the domination of mining engineers, particularly at Area and colliery level, is that the structures of signification and legitimation reflect the occupational culture of the mining engineers (Capps, Hopper et al, 1989). This occupational culture is explored in Chapter 5.0. The symbolism of this culture permeates the structures of signification. The frames of meaning centre around 'turning of coal'. Communication is based primarily on 'manshifts'; 'tonnage' etc, all of which are important in defining the craft of coal extraction (Capps,

Hopper et al, 1989: P 224). The accounting model focuses on production accounts (output, labour productivity etc) which reflect the concerns of managers with coal extraction. Coal extraction is perceived as long-term and stable despite the ambiguities which exist in the mining industry. Potential 'alternative courses' of action are evaluated in technical terms and technical feasibility which emphasises the 'close to production' character of mining management.

This emphasises the importance of power to the ability to create and re-create a social reality. The social reality stands in relation to power. The main conclusion to this thesis is that power is central to management control practices. That in order to understand management control practices in organization, then one has to explore what are the sources and effects of power. This thesis has explored the sources of power in an area of the NCB; it has demonstrated how power is gained and reproduced (Chapter 4.0) and it has demonstrated the effects of power in that a dominant social reality can be produced and has explored the occupational culture attached to that reality (Chapter 5.0) with its consequences on frames of meaning and taken for granted knowledge.

A major consequence of failing to recognise power and the possibility of resistance has major practical consequences. It is likely to lead to incomplete prescriptions for the design or modification of management control systems which will, in turn, render problematic the designer's expectations of the effects of the proposed change (Robson and Cooper, 1989:80). However, it is not just the recognition of power, it is also analysing and understanding the working practices of the dominant order which is imperative to the design and influence of management control Systems.

7.2 FUTURE RESEARCH IMPLICATIONS

7.2.1 Academic and Professional Teaching

This research thesis has as a major consideration the improvement of both academic and professional teaching. The majority of academic and professional teaching concentrates on the 'conventional wisdom' of accounting. This teaching provides the practitioner with a stock of techniques available to 'control' the outcomes of an organisation. Hence the conventional wisdom of existing management accounting and the teaching thereof provides a set of techniques which practitioners think ought to be used in practice with no regard to organisational contexts. The emphasis is on technical excellence and use of best practice.

Control is more complex than the simple model portrayed in the 'conventional wisdom'. Management and their accounting systems and practices exist in organisational contexts and these systems and practices obtain their meaning in part, from these organisational contexts. Hence ontological issues are important to understand the practices and systems used by management. Yet some academic and nearly all professional teaching portray the subject area as a set of techniques to be mastered and administered irrespective of the operating environment. Hence these techniques are taught without recognition of the ontological and epistemological assumptions in which they are embedded.

If one accepts that reality is inter-subjective and not objective,
then this holds various consequences for the use, design and teaching
of accounting and accounting systems. Under the conventional wisdom
one has to be able to 'model' the objective reality and demonstrate
technical excellence, with the 'new' wisdom one has to be able to
understand how the subjective reality is constructed. The key
variables to be reported upon are a function of the dominant order
that exists within the organisation. The outcome(s) to be achieved is
influenced by the dominant order. Only by understanding these
elements can a Management Accountant interact within the
organisational context to influence the outcome. Hence the need for
management accounting teaching, at the academic and professional
level, to recognise and teach the basic assumptions regarding
ontology. That is, an attempt to provide an understanding that the
text-books only represent one available accounting frame of meaning,
the conventional wisdom and that multiple frames are utilised within
organisations. All of which have strands of the conventional wisdom
in that techniques such as variance analysis is widely used in
companies but its use is embedded in the more general management
system of the organisation.

Such an approach to teaching management accounting would be assisted
by a new set of text-books which do not simply outline the techniques
available to the practitioners but which discusses ontological issues
and attempts to discuss the criteria for choice of a management
accounting system.

7.2.2   Research Opportunities

The conclusions raised in this thesis can only be put forward as being tentative. It is only one study and represents a "snap-shot" or cameo of a management control system in practice. The conclusions challenge the theoretical framework which lies behind the 'conventional wisdom' of management accounting but at the present time the state-of-the art in management accounting research makes general prescriptions for practice impossible. Further research is required to increase our understanding of management accounting practices both at the marco organisational level and the micro level looking at specific elements of the management accounting system, for example, investment appraisal processes; budgets and budgetary control.

Within the context of the NCB, replication of the case-study contained within this thesis would be useful to ascertain the robustness of the conclusions reached. At the more macro level, a study into the influences that are brought to bear on management accounting practices due to the intricate ties that exist between the NCB, the government and society would be a useful area of research.

Our understanding of management accounting practices is embryonic and until we have better understanding then it is extremely difficult and dangerous to make prescriptive statements regarding the usefulness of new or revised accounting methods, such as activity based costing. Hence, all research opportunities that provide improved understanding of management accounting in an organisational context should be encouraged. In this way our knowledge base will improve and new generations of text-books can be developed that help the practitioner in designing a management accounting system that fits the organisation concerned.

APPENDIX ONE

<u>LIST OF INTERVIEWS</u>

P. Ashley	-	Colliery Accountant - Arkwright
J. Banner	-	Mechanical Engineer - Arkwright
G. Bramley	-	Under-Manager - Arkwright
P. Davis	-	Senior Mining Engineer P. & S.
G. Godfrey	-	Area Chief Engineer
R. Greaves	-	Electrical Engineer - Shirebrook
J. Hadfield	-	Under-Manager - Shirebrook
J. Hallan	-	Area Marketing Manager
A. Healey	-	Colliery Manager - Arkwright
R. Horton	-	Deputy Director (Mining)
H. Housely	-	Head of Cost Control
D. Jenkins	-	Deputy Director (Admin.)
G.J. Kemp	-	Head of Capital Expenditure
A. Marshall	-	Colliery Cost Accountant - Shirebrook
A. Merrington	-	Production Manager
K. Moses	-	Area Director
A. Dorrington	-	Area Industrial Relations Officer
S. O'Donoghue	-	Chief Planning Accountant
J. Rogers	-	Senior Mining Engineer
W. Steel	-	Colliery Manager - Shirebrook
J. Town	-	Area Chief Mining Engineer
D. Wardle	-	Area Cost Accountant
A. Wilgoose	-	Head of Capital Projects (Mining)
D. Wilson	-	Assistant Planning Accountant

J C. Boaden	-	Liaison and Sales Planning
P Brookes	-	Regional Planning Manager
M Cuttonden	-	Regional Marketing Director
C Frost	-	Marketing

HOBART HOUSE

R Grainger	-	Planning Accountant - National
S Medley	-	Deputy Director General - Finance
R Ormerod	-	Central Planning
N Smith	-	Deputy Director Manpower (IR)

APPENDIX 2

NCB DOCUMENTATION RECEIVED AND STUDIED

NCB 1980/81 Report and Accounts

Economic Objectives of the NCB (HQ paper - 28.2.82)

Area Procedures for Cost Control and Accountability (Area paper - 1982)

Colliery and Area Budgets and Projections (Area paper - 1982) with appendices, 67(1A), Pol (71), Area Pol (71)1.

Control of Investment - N. Derby. Area (32 Area paper) includes appendices

Investment Decisions on Major Capacity - related Projects: Relationship to Supply and Demand. (HQ paper - undated)

NCB - Cost Control
(MMC paper)

Budget actuals for Area and Collieries 1977 - 1980

Programme for Preparation of 82/83 Budget Estimates

Area Committee Structure

Area Organisation Charts

F22 and F23 Budget Summaries

Colliery Plan Reports

Area Operating Results 1976 - 81

Computer Programmes Utilised in Budget Preparation

Pol 71(1) and Area Instruction on Colliery Planning

Budgeting and Accountability for Mining Activities - MMC paper

Organisation Chart of NCB

NCB Organisation - Company Structure

Internal Audit Report EMC (80/81) 23

'Area Profile' paper for MMC

Details of personnel in senior colliery managerial positions

Siddall on Coals Future. NCB Chairman's address to NUM conference July 82

NCB Guide to Library and Information Services

New Mines from Old - NCB PR Dept.

Conciliation Procedures in the Coalmining Industry - Outlining of agreements between NCB and NUM, April 76.

Annual Bulletin of General Energy Statistics for Europe - UN 1982

Maps of NCB Areas and Coalfields (March 79)

List of NCB publications, 1982 PR Dept.

Facts and Figures: Britain's Coal Industry, NCB PR Dept.

NCB - Books on Coal - PR Dept.

N. Derby Area Report - Individual Collieries Quarter ending 27.12.80

Coal in N. Derby - NCB PR Dept. 1981

Paper on NCB strategic Model. Plackett, Ormerod, and Toft, European Journal of OR 1982.

THE INTERVIEWING PROGRAMME

AIMS

To interview a cross section of NCB Area Managers to solicit:-

a) Specific information on careers, positions, structures of control.

b) Information on orientations, attitudes and organisational cultures.

c) Perhaps most importantly - managerial perceptions of how planning and control generally operates and particularly the operating and capital budgeting. What are their attitudes to the controls and their development? What are the major issues and problems perceived?

METHOD

Semi-structured interviews. The following questions are intended as a guide and checklist, but it must be stressed that interviewers should use their skill and judgement in framing additional questions and probing interesting areas in the course of the interview.

Interviewing will be done in teams of three. Two interviewers and one member taking comprehensive notes.

It is important that reports of each interview are submitted to the co-ordinator, Trevor Hopper, within 24 hours. It is hoped to provide time and facilities at the NCB for this to be carried out.

THE INTERVIEW

A. INTRODUCTION

It is essential that interviewers explain to interviewees who they are, why they are there, and what they are to do and why. Invite questions. Try and settle the interviewee and establish a rapport.

    i)   <u>Who we are</u>

        Names, positions, institutional affiliations, brief description of the MCWG.

    ii)   <u>Why we are here</u>

        How the research project arose.
        Major aims are academic.
        <u>Not</u> doing consultancy, or an internal or external management audit. Interviews are confidential. However, a general report to NCB Area Management in September on general problems associated with budgets. Research aims. To understand how management planning and control is believed by NCB managers to operate at various levels of the organisation, why it has developed in such a fashion, what are the current problems associated with it. An especial, but not exclusive focus on operating and capital budgets.

iii)   <u>Our Methods</u>

This is an exploratory study. The interview is <u>confidential</u>, but we shall in September be submitting a report to NCB managers with a view to formulating more detailed specific research proposals.

Exploratory study in two parts;

a)   specific background information, e.g. the technology of mining, organisation structures;

b)   Semi-structured interviews, of which this is one, trying to find out more about NCB managers and how they see the planning and control methods used.

B. <u>Who is the person being interviewed?</u>

<u>Aims</u>   To secure a picture of the type of people employed in managerial positions, their careers, attitudes, aspirations and orientations.

<u>Who is the interviewee</u>?

i)   <u>Name</u>

ii)   <u>Position</u>

iii)   <u>Responsibilities</u>

Could you briefly describe what the responsibilities of your present position are?

iv)   <u>Career</u>

What previous jobs have you had at the NCB and elsewhere?

v)   <u>Qualifications/Training</u>

What qualifications and training have you had pertinent to your present job?

vi)   <u>Organisational</u> - Who do you work with -

a)   Who is your immediate superior?

b)   Who are your immediate subordinates?

vii)   <u>Performance Appraisal</u>

a)   How do you know what you should be doing in this job?

b)   Who has the most influence over what you do?

c)   How do you know if you are doing your job well or not?

viii)   Attitudes/Orientations

        What do you like most about your present job?

        What do you worry about in your job?

        If you could, how would you change your job to make it more
        satisfying for yourself?

C. PLANNING AND CONTROL

    Aims   To build a description of the overall planning and control
             processes of the NCB as it relates to and is perceived by the
             manager, and to trace their significance to him and what he
             perceives the major problems associated with them to be.

    1. Planning

        i)   Can you describe how in your area of responsibilities
                planning is carried out in the short run, the medium-term
                and the long run?

        ii)   If not already covered

                How is the planning related to other functions within the
                Area, and outside, at HQ and Region?

        iii)   Have these planning methods changed significantly in the
                last two years? If so, how?

        iv)   Can you recall any major problems arising out of the
                planning over the last two years? If so, please could you
                tell us about them?

        v)   How, if at all, would you like the planning to be altered
                to make it more effective?

    2. CONTROL

        i)   Once the plans have been formulated, how is contr l
                exercised? For example, who measures actual achievement,
                how does he do it, who gets this information, what action
                is taken on it?

        ii)   Have these control methods changed significantly over the
                last two years? If so, how?

        iii)   Can you recall any problems which have arisen out of these
                control methods over the last two years?

                If so, please could you tell us about them.

        iv)   How, if at all, would you like the control methods to be
                changed in order to make them more effective?

D. Financial Planning and Control

Aim   To get the manager's perception of how the operating and capital budgeting procedures actually operate, their significance to him and his job. What problems and issues are associated with them, and if possible, their relationship to the planning and control methods previously described.

Now we would like to turn to the financial aspects of planning and control.

1. Operating Budgets

i)   Please could you describe how the operating budgets for your area of responsibilities are derived?

ii)   Have these procedures altered significantly over the last two years?

iii)   Can you recall any significant problems that have arisen during the preparation of budgets over the last two years?

If so, please could you tell us about them?

iv)   How, if at all, would you like the preparation of budgets to be changed to make it more effective?

v)   Once the budgets have been prepared, how is the information on actual performance measured, who gets this information, how is it acted upon?

vi)   Have these methods altered significantly over the last two years?

vii)   Can you recall any major problems that have arisen over the feedback of budget information over the last two years?

If so, please could you tell us about them?

viii)   How, if at all, would you like the feedback of budgeted performance to be changed in order to help you manage more effectively?

2. CAPITAL BUDGETS

i)   Please could you tell us how capital budgeting is carried out for items relating to your responsibilities?

ii)   Have these methods change significantly over the past two years?

iii)   Can you recall any major problems arising form the way this is carried out over the last two years?

iv)   How, if at all, would you like these capital budgeting procedures to be changed to make them more effective?

E. GENERAL VIEWS ABOUT THE NCB AND THE AREA

Aim   This is a fairly general, catch all section, that endeavours to solicit opinions about the NCB, current problems and pre-occupations, and how it is managed. It is hoped that as well as giving useful contextual information, this section may also reveal insights not currently envisaged.

Now we would like to ask you about your view of the NCB and this Area more generally. What you see as the major problems confronting them and how you think they might be resolved.

1. NCB

    i)   What do you see as the major threats confronting the NCB over the next decade?_

    ii)   How do you think they may be resolved?

    iii)   What do you think its major opportunities are over the next decade?

    iv)   Do you think they will be exploited?

2. AREA

    i)   What do you see as the major threats confronting this Area over the next decade?

    ii)   How do you think they will be resolved?

    iii)   What do you think its major opportunities over the next decade are?

    iv)   Do you think they will be exploited?

F. SWEEPER QUESTIONS

Aim   To pick up points and issues not covered previously but felt to be important by the subject.

We have been trying to build up from you a picture of how planning and control takes place at the NCB and at your level of operations. What you think of it, what are some of the major problems associated with it, and how it might develop?

Do you feel that there is anything else which is important to these issues that we have not already talked about.

Thank you for your cooperation

APPENDIX FIVE

DESCRIPTIONS OF LINE MANAGEMENT, SURFACE OPERATIONS MANAGEMENT

AND THE FINANCE FUNCTION

COLLIERY MANAGER

The Colliery Managers are appointed under Section 2(1) of the Mines and Quarries Act 1954 and are required by that Act to hold the appropriate certificates of competence. Hence, by tradition and backed by legislation, the colliery manager is a mining engineer holding a "first class ticket".

His overall responsibilities cover the physical aspects of the mine, the safety aspects and the financial aspects of the business in terms of the budget. In controlling production operations underground he is assisted by line management, which includes:

DEPUTY MANAGER

The post of Deputy Manager, although not a statutory appointment has to be filled by a person appointed as an Under-Manager. The Deputy Manager assists the Colliery Manager in controlling production operations underground. He is assisted in this role by a number of under-managers each responsible for a particular section of underground workings.

UNDER MANAGERS

Under Managers must be qualified mining engineers and are appointed under Section 6(1) of the Mines and Quarries Act 1954. The Under Managers are assisted in their tasks of maintaining planned output, deploying manpower and controlling expenditure within the budget by the Overmen and Deputies.

OVERMEN AND DEPUTIES

The Overmen and Deputies must be qualified to an appropriate level and the Deputies have primary responsibility for safety matters.

SURFACE OPERATIONS

Surface operations are generally the responsibility of a surface superintendent. The operation of the coal preparation plant (CPP), which washes and grades all coal for the market, is usually under a subordinate CPP manager.

ENGINEERS

The two engineers, mechanical and electrical, are statutory appointments under sections 11 and 13 of the Mines and Quarries Act 1954. They are responsible for the maintenance, repair and development of surface and underground facilities in their fields. The safety engineer is appointed to read statutory inspection reports on behalf of the colliery manager, as provided for in Section 10 of the Mines and Quarries Act 1954.

THE COLLIERY COST ACCOUNTANT

The colliery cost accountant, shown as colliery cost clerk, has a line of responsibility to the colliery manager and a functional responsibility to the finance function at Area.

The colliery cost accountant provides a "score-keeping" role to line-management to assist in controlling expenditure within the budget and an "information-providing" role to Area finance to assist in compiling the overall Area results. It is not a management accounting role that covers planning, control and decision-making. The role is limited to assisting in the control of spending to budget by adopting a score-keeping role and providing management with up-dated "spend against budget". The planning aspects of the job are limited to "number-crunching" to build up the budget in financial terms.

The limitation of this role is part of the history of the NCB and highlights the methods utilised to maintain the mining-line power networks.

APPENDIX SIX

PARTIAL MECHANISATION

Under partial mechanisation, a cycle of five operations was spread over three shifts:

A: Preparation Shift;

B: Coaling Shift;

C: Repair Shift.

A   The Preparation Shift

Cuttermen used coal cutters to make 25cm undercuts to a depth of as much as 2m along the entire length of the face. The undercut was cleared out by "gummers" following the coal cutter along the face. All along the face, borers drilled holes into which explosives were placed. At the end of the shift, the coal was shot off the face by shotfirers.

B   Coaling Shift

This shift was devoted entirely to filling off the loosened coal on to the conveyor. Every 100m of the face employed between 10 and 20 fillers or strippers who were required to shovel however much coal had been loosened, otherwise work was held up on the next shift.

C   The Repair Shift

The conveyor was dismantled, moved forwards to the extent that the

face had been advanced, usually 1-2m and re-assembled by the

conveyormen. Packers also worked this shift to build new props to

provide a working area for the next preparation shift and for

removing the supports to collapse the old working areas into the

waste.

In the study by Scott et al. (1963), it was the fillers and packers

whose "morale" was lowest, in contrast to the cuttermen and nippers

who still worked in small stable teams performing tasks relatively

independent of others.

The rigidity of these three shift systems meant that difficulties

encountered in one shift could disrupt the whole cycle. Hence labour

relations problems amongst the fillers would affect the repairs shift

which would affect the preparation shift.

Pressure was on to develop a continuous system of mining that allowed

coaling on every shift. The Reid Committee recognised the importance

of this objective:

> "mechanised loaders, and machines which simultaneously cut and
> load the coal, represent a revolutionary development in mining
> technique to the greatest importance to the future of mining".
>
> [Reid Committee (1945: 54)]

Fine et al argue that power loading:

"did not by itself radically transform conditions of control over the labour process. It merely joined together what were previously separate tasks, cutting and conveying, whilst eliminating the intermediate task of handfilling.

[Fine et al (1983: 16)]

However, according to Burns et al:

"..... power loading had a profound and, from the miners viewpoint, a positive impact upon work organisation. Power loading altered the division of labour, introduced new skills, and returned more control over the labour process to face workers. Whereas the three shifts system had entailed a division of labour between shifts and between groups on the same shift, power loading re-unified face workers around the ASL".

[Burns et al. (1984: 13-14)]

NCB COLLIERY BUDGETARY CONTROL PROCESS: PLANNING

The primary document for the budgetary control process is the "Action Programme" which is a physical blue-print of the actual faces within the colliery reflecting the production by months over an eighteen month period. The Action Programme is under constant review and is updated every quarter. In previous years, the October Action Programme provided the foundation for the financial budget of the coming financial year. Over the last financial year, 1983-84, the budget reflected the conditions built into the January Action Programme.

At colliery level, the Action Programme is utilised to build up the following main sections of the budget system:

Advance Related Materials

Other Materials

Repairs

Planned Jobs

Power, Heat and Light

Plant Hire

Advance Related Materials

This budget is built-up by the Underground Materials Officer with the assistance of the Colliery Cost Accountant. It is built upon the formula:

Items of material cost per metre advance x metres of advance

= Total materials items cost for the budgeted year.

The first step in the above formula is the extraction from the Action
Programme of the "metres of advance". At Bolsover colliery, the Cost
Accountant compiles this information by face on a "Materials Advance" report.

The Materials Budgeting programme identifies the alternative material schemes
which have evolved over the years for differing seams. The Underground
Materials Officer identifies those alternatives that are suitable for next
year's extraction. This report is updated to reflect current costs, deletions
of alternatives and any other changes.

If there are no suitable alternatives then a "Specification of Materials"
input form is built up specifying item descriptions, quantity per metre and
September prices.

The metres of advance, which was relaxed by seven per cent last year, 1982-83,
plus the specified alternative numbers are input through the Material Building
System.

The material building system, the updated materials budgeting system plus the
specification of new alternative schemes are merged to produce the "Three part
Material Consumption System":

Part I: Monthly advance and quantities of material items

Part II: Financial Evaluation of Part I

Part III: Summary of monthly, quarterly and yearly costs of face advance
            and development

The colliery cost accountant transposes the information form Part III onto the "F6 Material Inputs".

Other Materials and Repairs

Each spending officer involved with "other materials" and repairs builds up his budgets on Revenue Expenditure Sheets utilising last year's results plus the Action Programme.

From the Revenue Expenditure Sheets, the colliery cost accountant identifies and codes up the "other material" items and transfers these onto the "F6 Material Inputs". These are all at September prices and the inflation factor, which is notified by Area, is shown as a one line entry (applied to all costs).

The elements of cost on these Revenue Expenditure Sheets which relate to either "Central or Outside Workshop Repairs" are input through the "Repairs Budget Submission".

Before the input of the F6 and the Repairs Budget Submission documents, the overall budget figures for material and repairs have gone through a pruning system at colliery level and the final figure requires the colliery manager's approval.

The output from the above input documents is the "Total Materials Document - MD60", there is a transfer of information between this system and the system producing the Profit and Loss Account, F23.

During January a meeting is held between an area team and the colliery to discuss the Material and Repair budgets. Before this meeting, the colliery

cost accountant prepares the FP4a for materials and the FP4b for repairs. These forms give an analysis of the actual spending for the first eight months, the planned spending for the next four months, the current year's projection, the new planned budget and the resulting variances between projection and the new planned budget. They provide the basis of discussion between the area and the colliery in the justification of the variances.

In March, as a result of the above meeting and the Directors Committee, memos arrive from the Deputy Director Mining for materials and the Chief Accountant for repairs. These memos highlight the "agreed" cuts, the material relaxation factor and any other cuts required. The material and repairs budget is now an approved budget which is input and is finally transferred to the F23 phased by months.

Planned Jobs:

In November, the FP(19) which shows the budget shifts is completed and sent to area finance planning. The FP(19) is built up from the Action Programme: Average Manning and Manpower Summary, with guidelines from Area on beginning and ending manpower, total overtime shifts and the area updated non-deployment factor phased by months.

The FP(19) goes before the Area team (Area Director, DDM and Chief Accountant) for acceptance or change. Once the FP(19) is accepted, it provides the basic information to build up the planned jobs system.
Section (1) of the FP(5) is completed showing, from the Action Programme, "men on books" both capital and revenue men and "output" in terms of daily face output, daily development output and lifted slurry. The normal

revenue shifts are input from the FP(19) after having deducted the capital
shifts from the Capital Budgeting System (an area produced system).

From various statistics compiled by the colliery cost accountant from weekly
wages print-outs the Wages Section, showing EMS by categories of workers, and
the Allowances Section, showing the allowances per period for the mineworkers
average normal week, are completed. Similar information is input for
officials. The Allowances Section is backed up by FP(5) 1a and 1b relating to
mineworkers and officials respectively.

Section (2) of the FP(5) shows by weeks the respective working and effective
days. The overtime alternatives are identified each week and the officials
bonus shifts.

Section (3) of the FP(5) shows the breakdown of the overtime alternatives.

The output from FP(5)1, FP(5)1a and 1b, FP(5)2 and 3 is the "planned jobs"
print-out. This provides the labour cost and output related information on
the F23.

Plant Hire

The yearly underground plant-pool turnaround print -D90 is produced. The
engineers and the cost accountant update this document to reflect the next
year's requirements and set-up any new districts and plant hire additions.
This is input into the computer and an "Updated Plant Pool Analysis for
Underground" is produced and checked.

The surface and third party plant pool items are highlighted and budgets established. A "Pit Summary of Surface and Third Party Plant Hire" is produced.

The above two documents along with plant hire charges which are input by area are merged to produce phased plant hire budgets which are transferred onto the F23.

Power, Heat and Light

The Electrical Engineer budgets the electricity demand and completes Input Form 2 part A. Part B is completed by the colliery cost accountant with advice from area on the "sales" figure. Part B contains information on boiler fuel, other fuels and "sales of other fuel" to area. The completed Input Form 2 is sent to area for agreement. Once the power, heat and light budgets are agreed, then the "Power, Heat and Light estimate by months, quarters and for the year" is produced. These figures are reflected by months on the F23 - Profit and Loss Account.

By the beginning of the financial year, an agreed budget should be installed and working. This budget will also include allocations for both area and HQ overheads plus various other colliery costs.

B Actual Costs

As outlined in the MMC Report, 1983. The NCB has a standard colliery profit and loss account, the F23, which brings together all the cost items under major subjective headings of:

- 342 -

Wages;

Wage charges;

Materials and Repairs;

Power, Heat and Light;

Salaries and related expenses;

Other colliery expenses;

Overheads and Services;

Depreciation

and relates these to Net Proceeds to calculate a "bottom-line" profit.
The procedures for planning, budgeting, monitoring and accountability are
all interlocked and the format of the F23 is used throughout.

WAGES
Wages are related to shifts worked by industrial staff on revenue
operations at collieries and includes incentive bonus payments and
allowances.

WAGES CHARGES

Wages charges are mainly employers national insurance contributions,
holiday provisions, service bonus, sick pay payments, concessionary fuel
and housing, travelling allowances, payments to pension funds, and
protective clothing.

MATERIALS AND REPAIRS

Materials and repairs is the largest item of operational expenditure other
than wages. The major items are timber, adjustable supports,

other steel, belting and plant and machinery spares. The expenditure includes revenue expenditure on major projects, coal face mechanisation projects and large engineering items.

Repairs includes charges from NCB's workshops and from outside contractors for repairs to buildings, plant and machinery. Hire charges for Area plant pool equipment is also included in this category.

POWER, HEAT AND LIGHT

Power, heat and light cover the cost of purchased steam, electricity, compressed air, gas, coal and methane used for power and heat generation, and of other fuels, e.g. diesel fuel and coke for space heating.

SALARIES AND RELATED EXPENSES

Salaries and related expenses are the monthly salaries of non-industrial staff below Area level. These include overtime payments, payments in lieu of notice and excess rent allowances of transferred staff. The related expenses include the NCB's contributions for national insurance, superannuations and pensions.

GROSS SOCIAL COSTS

Gross social costs relate to specific redundancy and pension payments, transfer and travelling allowances and the provision of concessionary fuel to industrial and non-industrial staff resulting from

non-deployment and redundancy associated with the closure of collieries.
Any governments grants in respect of gross social costs are recorded as
social grants on the Area operating results not on the individual colliery
operating results.

OTHER COLLIERY EXPENSES

Other colliery expenses include road and rail transport charges; surface
damage costs, central coal preparation plants, coal stocking, dirt
disposal, pumping charges, rents and rates payable, area service costs
including early retirement and redundancy costs, closure expenses and
insurance.

OVERHEADS AND SERVICES

Overheads and services include central revenue expenditure, research and
development and other HQ costs. The expenses of Area departments and the
operating costs of services provided for collieries are also included.
These costs are allocated on the basis of net operational expenditure,
output and manpower.

DEPRECIATION

The deprecation charge relates mainly to plant, machinery and equipment.
This includes plant pool equipment and the additional depreciation of
fixed assets necessary to write off any remaining book values when a
colliery is closed.

NET PROCEEDS

Net proceeds for a particular colliery are calculated from pit-head list price for the quality of coal produced less an allocation of market rebates that the industry has to bear. The net proceeds relates to "saleable output" as opposed to sales; therefore the bottom-line profit figure calculated is a theoretical profit as opposed to an accounting profit which matches revenues and costs.

The majority of the accounting procedures are completely computerised. The computer systems are based upon a data-base concept. The computer is used to build up and present the revenue budgets, which are automatically phased and transferred for comparisons with actual results on the integrated accounts system.

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