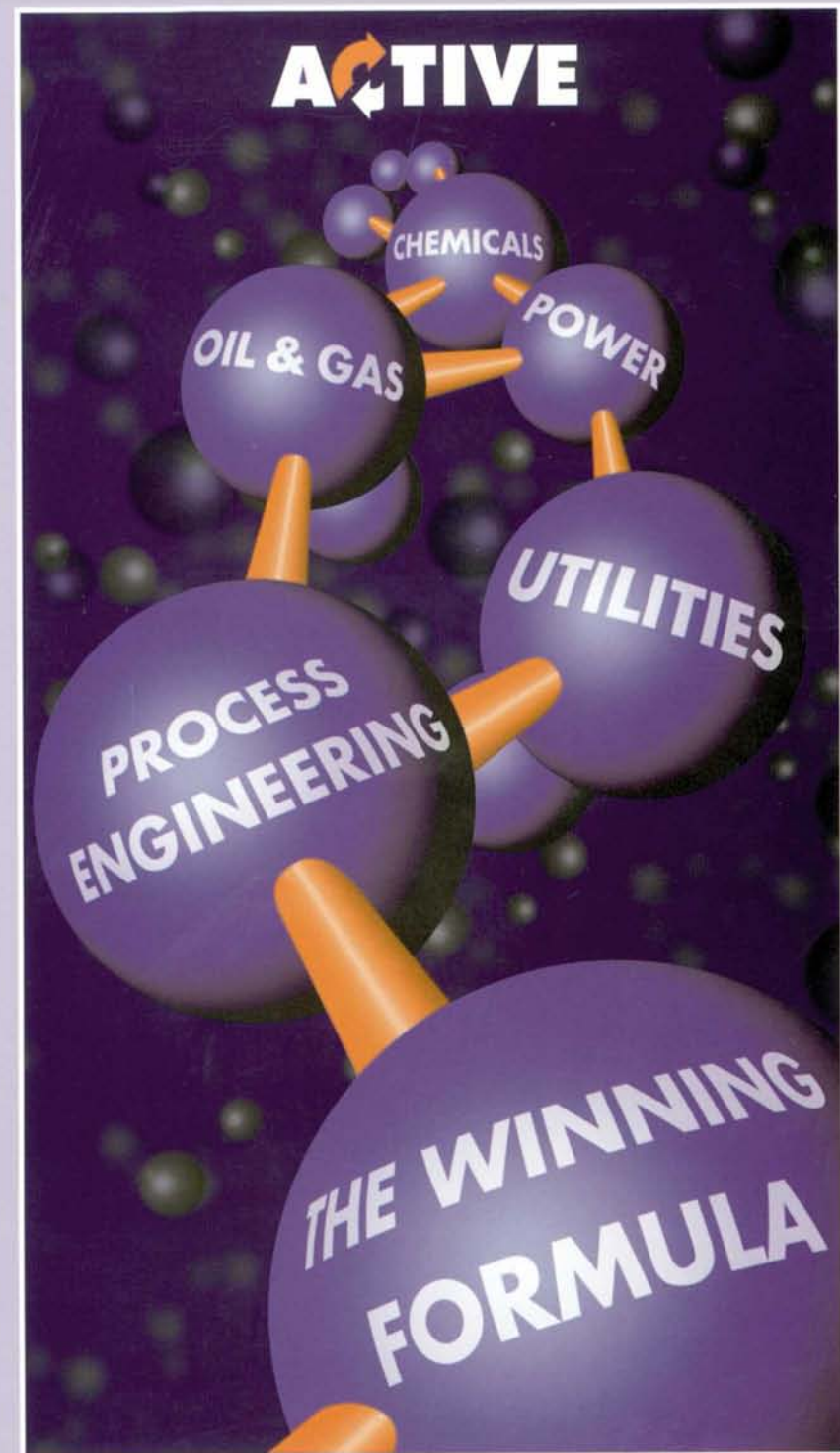
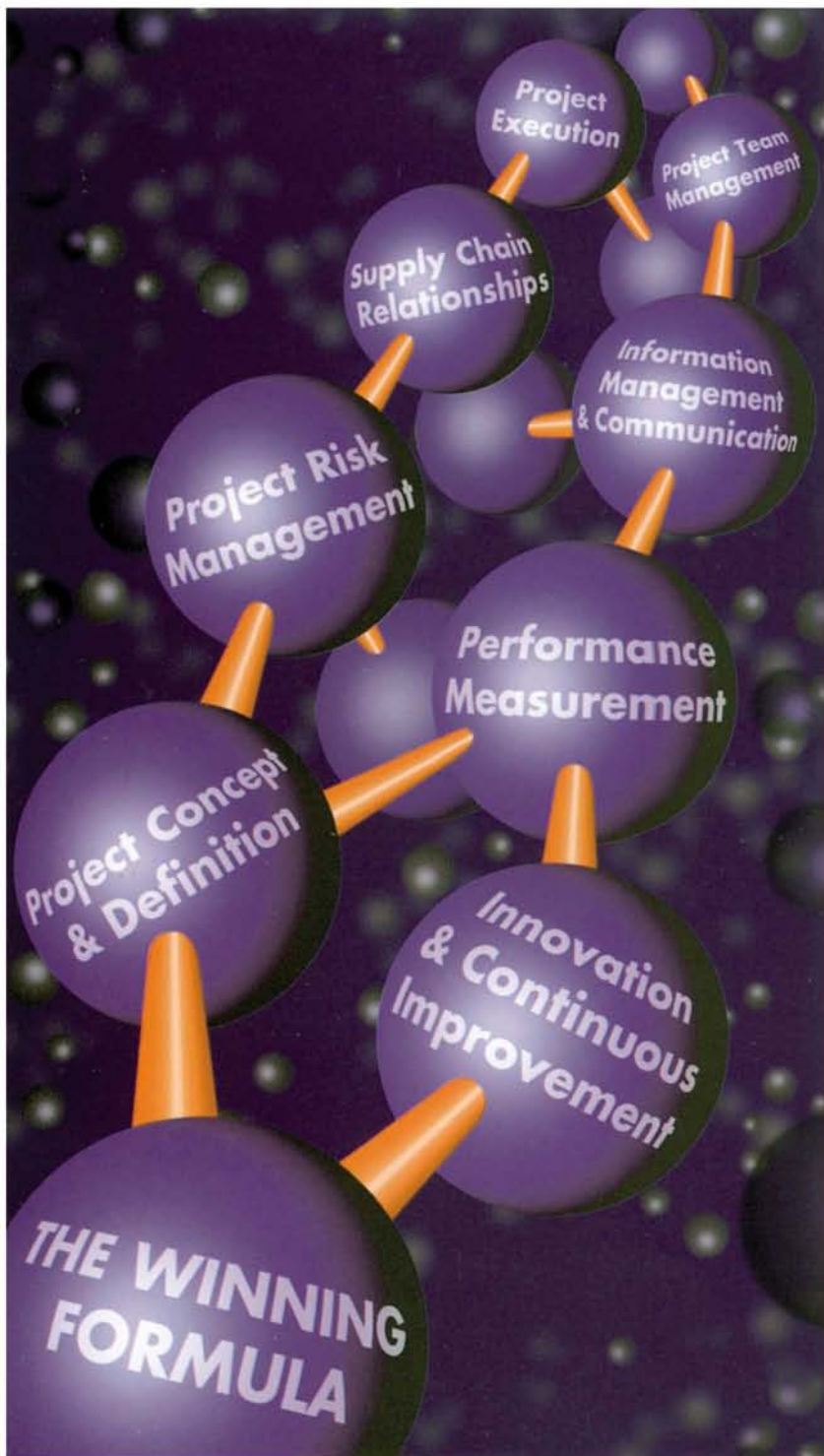


# ACTIVE

## *PRINCIPLES*





## **Introduction**

### **THE ACTIVE PRINCIPLES**

- 1. Effective Project Concept and Definition**
- 2. Effective Project Team Management**
- 3. Effective Supply Chain Relationships**
- 4. Effective Information Management and Communication**
- 5. Effective Project Risk Management**
- 6. Effective Innovation and Continuous Improvement**
- 7. Effective Project Execution**
- 8. Effective Performance Measurement**

### **IMPLEMENTING THE ACTIVE PRINCIPLES**



**ACTIVE** - 'Achieving Competitiveness Through Innovation and Value Enhancement' - is an initiative aimed at improving the performance and competitiveness of capital projects in the onshore process, energy and utility industries within the UK. Some recent studies have shown that the UK is seen by some international companies as less competitive in the execution of major projects. With ever increasing competitive pressures, many companies operating internationally are looking elsewhere for investment opportunities which will give them cost-effective, reliable plants constructed to meet ever increasingly rigorous environmental and safety standards. Following its launch in

1996, the **ACTIVE** Initiative is seeking to address those concerns by changing adversarial behaviours and applying better practices in the delivery of capital projects.

The rewards are considerable since a more competitive industry will attract capital investment into the UK as well as enabling the supply chain to benefit from increased competitiveness overseas. The **ACTIVE** vision is for a world class UK process engineering and construction industry, with satisfied clients and thriving contractors and suppliers. It is not just about improving returns for client operating companies.

**ACTIVE** was established in 1996 as a limited term initiative not only to define the necessary principles and practices for radical change within the industry, but also to demonstrate the effectiveness of that approach on selected real life projects from within the industry. The learning and experience from those 'pilot' projects will then be used to champion change throughout the industry.

## *Introduction*



**ACTIVE** is an industry-led initiative being owned by fifty or so stakeholder companies representing a cross section of operators, contractors and supplier organisations in the country. **ACTIVE** is also backed by the Department of Trade and Industry who, apart from an overall concern for UK industry competitiveness, are particularly concerned to ensure that the views of the entire supply chain, many of whom fall into the category of Small and Medium Sized Enterprises (SMEs), are fully taken into account in the **ACTIVE** initiative.

Success from the **ACTIVE** initiative will only be maximised if change is implemented across the entire supply chain, including the many smaller suppliers and sub-contractors supporting the industry. The application of **ACTIVE** principles and practices can bring benefits

to small companies as well as large especially in terms of improved supply relationships, more opportunities for repeat business and the development of innovation to mutual advantage.

**ACTIVE** has adopted three key themes for delivery:

### **Implementation Education Communication**

Working Groups from across the industry have defined the **ACTIVE** principles and practices which are necessary if the benefits and rewards are to be seen. Implementing these improved working practices across the industry will only be achieved by a programme of communication and education throughout the supply chain.

The output of the Working Groups has resulted in the **ACTIVE** Principles, which are described below, together with a set of supporting Value Enhancing Practices (VEP's) which are contained in the **ACTIVE** Workbook. For more details of the Workbook and VEP's, please contact the **ACTIVE** Secretariat. The **ACTIVE** Principles and VEP's constitute the primary tools by which **ACTIVE** will achieve its objectives.

Since improvement is a continuing activity and to help the dissemination and widespread adoption of these principles and practices, **ACTIVE** has created a network called Inter-**ACTIVE** to ensure that best practice is captured, developed and maintained throughout the industry. Further details of the Inter-**ACTIVE** network can be obtained from from the **ACTIVE** Secretariat.

# **Introduction**



## THE ACTIVE PRINCIPLES

The **ACTIVE** Initiative is underpinned by a set of principles which provides the foundation for an industry culture characterised by co-operation, trust and commercial efficiency. The adoption of these principles and their integration into the day-to-day working of the industry are essential steps to achieve the **ACTIVE** vision. The dramatic changes required by **ACTIVE** are both extensive and deep. Changes in attitude and behaviour are necessary, both within organisations and at the contractual interface with others, in order to remove adversarial practices and replace them with a willingness to work as a team behind aligned objectives.

It will be noted that the **ACTIVE** principles are largely focused on management practices since, without

commitment to change from key managers and decision makers within companies, it will not happen. This not only applies to 'front line' project staff but also to senior company managers and managers of supporting functions such as legal, finance, purchasing and human resources. Indeed, project staff can often see the benefits of new ways of working but are unable to implement them because of constraining company policies or internal functional politics.

The **ACTIVE** principles seek to go beyond procedural solutions. Most companies have well developed procedures, sometimes to a high degree of prescription, which set out ways of achieving results. Unfortunately, the mere specifying of a procedure or process does not, in itself, guarantee results. What is also necessary is a change in the behaviours, attitudes and

relationships of those involved. This is why the performance of many projects is only mediocre despite slavish adherence to project or company procedures. The **ACTIVE** principles seek to address this by considering such aspects as team effectiveness, contractual relationships, communications, continuous improvement and risk management which depend much more on how individuals interact to achieve a common goal, creating a high performance 'can do' culture in an effective way.

The effectiveness of this approach has already been demonstrated elsewhere, notable in the off-shore industry, but change in behaviour is always difficult to achieve quickly and the on-shore process, energy and utility sectors still have much to do to achieve the radical improvement that **ACTIVE** is seeking.

# Active Principles



The eight **ACTIVE** Principles are:

### 1. Effective Project Concept and Definition

The construction of an engineering project is part of a business investment process which should be the responsibility of an appointed project owner or sponsor. For the definition and execution of the capital project the project owner should ensure that a managed project process is in place with appropriate stage gates to control the process and a project manager appointed.

At the outset of the project, the project manager should ensure that a process of concept development and definition is thoroughly completed. This must identify the commercial and technical objectives for the project, tested against the business drivers, and clearly present the success criteria against which the

project will be judged

In this process, key questions to be addressed are:

- **Why** is this project being considered?
- **What** is the scope and boundaries of the project?
- **How** will the project be executed?

An essential requirement is that all key project team members, whether from within the project owning organisation or external in the supply chain, should be involved at an appropriate stage in this process. This is necessary to ensure a common understanding of project goals, reinforced by an alignment and commitment to those goals by all those involved in the project or with a stake in the outcome.

While this process will probably entail a series of iterations and evaluation of

options as proposals are tested against business objectives, it is important that the outcome should include a clear, unambiguous statement, agreed by all parties, on project objectives, scope and implementation strategy before the actual implementation proceeds.

In the front end definition process, the scope of the project must be established in sufficient detail to assure the sanctioning authority that the investment objectives can be delivered and that the proposal represents value for money at an acceptable level of risk. At this stage it is important to employ value enhancing practices which challenge assumptions, consider alternative innovative solutions and rigorously test the technical basis of proposals. Techniques such as risk assessment and value analysis are critical at this stage.

It is important that the outcome of this definition process provides a clear and unambiguous brief of requirements to those who have to execute the project, who themselves should be fully involved in the definition process. The scope documents should not only state what is included in the project, but also that which is excluded from the scope.

The implementation strategy should address all the key aspects of the project implementation process and should, as a minimum include strategies for:

- Project management and control
- Project organisation and resourcing
- Communications
- Information Management
- Safety, health and environmental policy
- Procurement
- Co-ordination procedures

- Innovation and application of technology
- Management of key external interfaces

In developing these strategies, it is essential to fully involve the project execution team since it is these strategies which will form the basis of all subsequent activities to achieve the completion of the project. Together with the project scope, they form the basis for the project work breakdown structure, schedules, resource plans and cost estimates on which the project will be authorised.

### **Supporting Value Enhancing Practices:**

Project Process  
Project Definition and Objectives  
Project Planning  
Value Analysis  
Safety, Health and Environment  
Information Management Strategy  
Procurement Strategy

# *Active Principles*



### 2. Effective Project Team Management

The effectiveness of a capital project will be determined largely by the people involved and how closely they are working to common, aligned objectives. This includes personnel from contractors, consultants or suppliers working on the project as well as in-house staff.

Key elements necessary to achieve team effectiveness include:

- Clear leadership of a focused integrated team.
- Effective selection processes for recruitment of staff and placing of contracts.
- Team capability through inclusion of the necessary skills and competencies.
- Clarity of roles and responsibilities within the team.
- Effective and timely communications throughout the team.

- Common understanding of project aims and how each individual effort contributes to those aims.
- A 'no blame' culture with a readiness to learn from both success and failure.
- Motivation to achieve the result and recognition of individual contributions.
- Contractual arrangements which foster team integration.

It is the responsibility of the project manager to direct and manage the project to achieve these necessary elements. The key is to establish a results orientated team culture from the outset, harnessing the skills of all team players to achieve commitment and ownership. Team building and regular involvement of the team in decision making and review are important ways in which this can be achieved. The contractual arrangements must also facilitate an integrated team approach and alliance or partner type contracts are commonly effective in achieving this result.

To ensure that all the team are working effectively, it is essential that everyone shares a common understanding of the desired results, both final and interim, and a clear understanding of personal roles in achieving these. While critical success factors should be clear and demanding, targets should be realistic with agreed milestones.

To ensure effective motivation of all the team, incentives, including both personal and corporate reward incentives, should be considered. Disincentives should be used with care since motivation by fear can destroy trust and work against achievement of project objectives.

The competence 'mix' of the project team needs careful assessment. Shortcomings in capability should be redressed by appropriate training and education programmes which should be built into the project schedule.

**Supporting Value Enhancing Practice:**  
Project Team Organisation



### 3. Effective Supply Chain Relationships

Project relationships should be focused on encouraging the whole supply chain to act in unison to achieve clearly stated project goals. Overall supplier contribution in terms of broader project benefits must be recognised rather than judgement being based solely on price. Within the context of the project objectives, innovation should be fostered and an equitable sharing of risk and reward should be incorporated into the commercial relationship.

Within the process industry it has only recently been recognised that to achieve business competitiveness, project performance is as important as superior product and process technology. For projects to be successful the entire supply chain must be aligned to project

objectives, while proper apportionment of risk and reward should provide the opportunity for all participants in the supply chain to benefit.

All members of the supply chain, whether owner/operators, contractors or suppliers, should work together to maximise value rather than seeking to move cost or risk up or down the supply chain. In this way competitiveness for both buyers and sellers can be improved.

Supply chain relationships develop over the life cycle of the project. The framework established at the outset of the project to define the relationship should provide the basis for prompt resolution of problems as they emerge and provide an effective and timely way of meeting mutually beneficial objectives.

The application of this **ACTIVE** Principle will benefit all parties through a more equitable apportionment of risk and reward, greater clarity of project objectives, active participation in the creation of value throughout the supply chain and elimination of unnecessary cost. Where appropriate, these objectives may be achieved through an alliance partnership or risk and benefit framework agreement in which the parties formally take a stake in the project outcome, sharing risks and benefits in line with their stake.

Key elements for supply chain improvement are:

- Establishing clear targets and objectives.
- Alignment of objectives between buyer and seller.
- Effective and open communications between all parties.
- Establishing a relationship appropriate to the business being conducted.
- Encouraging innovation within the constraints of the project objectives.

With these elements in place, the effectiveness of the supply chain will contribute to the long term performance of the industry. Confidence between buyers and the sellers will, over a period of time, develop into trust thereby creating effective and long lasting relationships which benefits all parties.

The changing demands of buyers can be accommodated by an efficient and responsive supply chain provided there is proper recognition of the effort and resources needed to deal with the challenge.

Only by striving to create a value based supply chain with a vision to create a globally successful industry which encourages reinvestment, will the long term future for the industry be assured.

### **Supporting Value Enhancing Practices:**

Procurement Cycle Management  
Supplier Selection  
Contract Dispute Resolution



#### 4. Effective Information Management and Communication

Capital projects require the generation and handling of large amounts of information, much of which is required subsequently in the operation and maintenance of the facility. The effective management of information during the life cycle of a project will do much to improve communications and increase project performance in terms of both time and cost.

During project execution, unnecessary duplication and regeneration of information should be avoided which not only saves time and resources but reduces opportunities for errors. Information must be provided in a timely way to project participants, relevant senior managers and others who need to know, thereby improving communications within the supply chain.

The requirements for project handover to operations and maintenance at the time of project completion should be established at the outset of the project, covering information content, format and timing. The compilation of this information must be managed throughout the execution of the project to ensure handover with the minimum of effort and delay.

Key activities to achieve effective management of information include:

- Early mobilisation of appropriate personnel from client and contractor to agree the information requirements of the project.
- Preparing a project information management strategy at an early stage of the project.
- Communicating that strategy to everybody involved.

- Using the most appropriate information technologies to generate, transmit, index, store and communicate documents and data.
- Agreement throughout the supply chain on essential information and documentation requirements, the responsible parties and timing requirements.
- Avoiding unnecessary documentation and needless circulation.
- Presenting information in a concise and clear way to those who need to use it at each stage of the project.
- Collating information which can be handed over and transferred into operations and maintenance systems with maximum efficiency.

**Supporting Value Enhancing Practices:**  
Information Management

# Active Principles



### 5. Effective Project Risk Management

The process of project risk management is a structured way of managing exposure to risk throughout the life of the project and beyond. These risks are not only technical risks but also include commercial and human risks. Uncertainty at the outset of any investment is usually high and hence the adoption of a managed process to identify, understand and analyse the likely risks before they occur will allow for their subsequent mitigation and management throughout the implementation of the project.

Risk assessment considers both the likelihood of events occurring and the possible consequences. If the identified risks are unacceptable, ways of mitigating or reducing those risks can be sought and contingency plans made. In some cases, risks can be eliminated completely whilst other risks are completely external

to the project and there is little scope for reduction. Since the risk profile will change with time as the project develops, reassessment of risk should continue throughout the life of the project as part of the risk management process.

Within contractual relationships on the project, the aim should be for specific risks to be managed by the party best equipped to deal with that risk at least cost. The potential benefits available to each of the parties in a contractual relationship should reflect the degree of risk borne by each party. Proper management of risk in supply chain relationships should encourage and reward effective innovation and performance.

Key elements of a project risk management process should include:

- Establishing at the outset of the project an efficient risk management programme to monitor and manage risks throughout the life of the project.

- Ensuring personnel are trained to identify key risk areas as the project proceeds.
- Identifying all known risks at an early stage of the project and establishing a risk register describing the nature of the risk, probability of occurrence and impact should it occur, along with methods for its elimination, mitigation or management.
- Having in place a process for monitoring, updating and reviewing the risk register throughout the life of the project.
- Within supply chain relationships, identifying and agreeing the risks to be borne by each party balanced against the potential benefits. The risk/benefit balance should be reflected formally in the contracts between the parties.

#### Supporting Value Enhancing Practices:

Project Risk Management  
Risk and Benefit Framework Agreements



## 6. Effective Innovation and Continuous Improvement

In order to survive in a competitive environment, it is essential that companies innovate. Innovation should not be confined to product technology but should be apparent throughout the business process including the capital project process. While this is desirable it is not easy to achieve since many current practices in the industry discourage innovation. However, for the industry to move forward to greater competitiveness, traditional practices must be challenged and, if found lacking, replaced by more effective solutions.

From the start of a project, teams should consider innovative alternatives to achieve the business and project objectives which challenge existing assumptions. Significant benefit can be achieved by channelling innovation

towards improving operational systems, technology and plant performance. The application of innovative solutions to both project engineering and project management can significantly enhance the performance of a capital investment.

This culture of innovation and continuous improvement should also extend throughout the supply chain. Innovation should be encouraged at all stages of the project process from feasibility to completion. New ideas which facilitate the achievement of project objectives should be properly rewarded while confidentiality and intellectual property rights are upheld. This entails changing many traditional contractual arrangements which often discourage or do not properly reward innovation.

The benefits of technical innovation are greater at the conceptual stage of a

project before implementation commences. Much can be gained by developing cost effective options during the project definition phase, particularly through the involvement of contractors or suppliers with special expertise, or when a novel design is being proposed. Use of novel or complex technology, such as complex control systems, can sometimes be difficult to manage with increased uncertainty of project outcomes. It is important, therefore, that the application of new technology is properly assessed beforehand in terms of risk and that development programmes are not allowed to create disruptive changes during project execution.

Innovation and continuous improvement also have a significant part to play during the project execution phase where imaginative solutions can often yield benefits in terms of time, cost or



technical effectiveness. Aspects of project implementation such as contracts, site working practices, safety, design methods, project organisation, trouble shooting and communications are areas where there is often scope for innovative ideas to improve methods of achieving the project goals.

All phases of the project life cycle will benefit from exploiting the integrated experience and capability of the project team, whilst ensuring that efforts are focused on improving, in practical achievable increments, the methods and procedures adopted.

Lessons learned as the execution of the project proceeds should be captured through a process which encourages those involved to feed experiences forward for the benefit of future projects. This process should be ongoing beyond

the end of the project to ensure operational experience is also captured. Lessons learned at the early developmental stages of is at this stage that the biggest opportunity projects are often of most value since it for value enhancement exists. It is often beneficial to hold periodic 'peer' reviews with other projects, including projects from other companies, to share learning and experience.

Key activities in developing continuous improvement on projects are:

- Defining and targeting specific areas where improvement can be achieved.
- Setting specific improvement objectives and, where possible, benchmarking the outcome.
- Establishing a 'challenge' culture on projects where the project team can challenge and test assumptions within the constraints of the project objectives.

- Establishing an effective process for capturing learning and ensuring it is applied on future projects.
- Reviewing options and selecting methods by which improvements can be achieved, establishing the most practical means to implement these.
- Continually monitoring performance against agreed objectives and targets.
- Reviewing progress and ensuring that all positive feedback is channelled towards further performance improvement.
- Holding periodic 'peer' reviews with other projects to share learning.
- Reviewing operational experience on the plant one year after start up.

### **Supporting Value Enhancing Practices:**

Continuous Improvement  
Innovation and Intellectual Property



## 7. Effective Project Execution

The effectiveness of the execution stage of a project will depend greatly upon the quality and thoroughness of the project definition and the extent to which the project objectives, scope, strategy and execution plan have been defined. The way in which a project is subsequently managed through the execution stages can be crucial to delivering an effective project but this depends upon an effective project process being in place.

The key methods for improving project execution include:

- Effective control of schedule, costs and changes to scope and the timely provision of competent resources needed to deliver the project.
- An efficient detailed design and specification process which ensures the project will meet its objectives and deliver a plant which can be built and operated in a cost effective manner.
- Ensuring that supply chain relationships work effectively and that contractors, subcontractors and suppliers operate as part of the team with true alignment to project goals.
- Early evaluation of key construction issues especially interfaces with existing plant operating areas. Most importantly this should include issues of site safety.
- Ensuring hand over processes operate seamlessly at the various interfaces. It is particularly important at handovers to ensure that costly and time consuming duplication of checking, testing and inspection is eliminated.
- Efficient site organisation and effective materials management.
- A strong, consistent and effective safety, health and environmental policy applied throughout the project.
- The implementation of an effective communications strategy within the team as well as across other key project interfaces.
- Maintaining sound processes for monitoring, reporting and reviewing progress.

### Supporting Value Enhancing Practices:

Project Control  
Design Effectiveness  
Constructability  
Standards and Specifications  
Project Handover and Commissioning

# Active Principles



### 8. Effective Performance Measurement

Measurement is key to improving project performance and it is important that measures are established for the various stages of the project process. The starting point for measurement must be the objectives and critical success factors for the project. From this starting point, measures should be defined which will relate activity and progress to the achievement of those goals. Since what you measure is what you will get, measures must be defined with care as the choice of inappropriate or sub-optimal measures may drive the project in the wrong direction.

Definition of measures is often not a simple task. 'Hard' measures, which can be determined by collecting statistical data and using objective measurement

are usually the easiest to obtain but are often less useful indicators of performance than 'soft' measures which measure more subjective aspects such as behaviours, relationships and capability. The skill is to find hard measures which are good indicators of the softer issues which drive project performance.

For capital projects, there are two types of measures which need to be defined: output measures which measure whether project objectives have been achieved, and indicator measures which measure factors which will strongly influence whether the required outputs are likely to be achieved.

Typical examples of output measures include:

- achieved costs
- safety performance

- completion date
- product quality
- plant flowsheet rate

Typical examples of indicator measures include:

- quality of definition
- project organisation and project process
- supply chain effectiveness
- design productivity
- use of value enhancing practices
- control of changes
- progress against schedule

Although output measures are the ultimate yardstick of project performance, they are often not available until late in the project when remedial action may be too late. Indicator measures, however, can be used as the project progresses as



predictors of likely outcomes at each of the stage gates in the project process. Indicator measures, therefore, represent a powerful project management tool which can be used for controlling the project and for assuring the project owner on the likely achievement of the project goals.

The use of effective measures on projects and the collection of common, consistent data opens the way for benchmarking performance. Benchmarking is a comparative process which uses previously achieved measures of outstanding performance to set challenging standards for improvement on subsequent projects.

The process is based upon measuring current project performance and comparing results with known benchmarks or standards which represent the best in

that particular field. It is well established as a powerful technique for driving improvement based upon measured results rather than intuition or perception.

Since performance benchmarking is concerned with competitiveness, it is usual within the industry for benchmarking to be carried out by a neutral third party organisation operating under confidentiality agreements with participants to preserve anonymity and avoid potential breaches of competition law. Benchmarking can be undertaken at different levels to drive performance improvement in specific areas. Key areas for benchmarking on capital projects are:

- Project Performance
- Supply Chain Performance
- Design Effectiveness

**Supporting Value Enhancing Practices:**

Performance Benchmarking  
Contract Monitoring and Measurement



### IMPLEMENTING THE ACTIVE PRINCIPLES

**ACTIVE** is seeking to demonstrate that these principles will deliver benefit to projects as a means of encouraging changes in working practices throughout the whole industry and providing feedback for further improvement. Although **ACTIVE** principles can be applied to any size or type of capital project and can be implemented at any point in the project, maximum benefit will be gained by adopting **ACTIVE** Principles at the conceptual phase since it is at this stage that the greatest scope for value improvement exists. The benefits to the project of applying **ACTIVE** principles will be dependent on the project objectives and may result in shorter timescales, lower capital costs or enhanced plant performance depending

on project imperatives. It is also recognised that current practice in companies across the industry will be at different points on the **ACTIVE** learning curve and hence the potential for improvement will vary from project to project.

To go about implementing **ACTIVE** principles on a project, the following implementation process is suggested:

- Determine the objectives and key success criteria for the project and identify where adopting **ACTIVE** principles will help their achievement.
- Decide how **ACTIVE** principles can be applied on the project in key areas.
- Establish a review process for periodically testing the effectiveness of application of **ACTIVE** principles.
- Ensure that learning is captured throughout the project and fed back for the future.

For further information about **ACTIVE**, the Inter-**ACTIVE** network, or for further copies of this booklet, please contact the **ACTIVE** Secretariat.







**ACTIVE**

CHEMICALS

POWER

OIL & GAS

UTILITIES

PROCESS  
ENGINEERING

THE WINNING  
FORMULA

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