European Construction Retaining the Competitive Edge: Conference Proceedings

European Construction Institute

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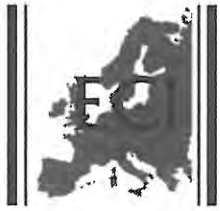

CONSTRUCTION IN EUROPE

European Construction: Retaining the Competitive Edge

A CONSTRUÇÃO EUROPEIA

Mantendo a Liderança Competitiva

Papers presented to the 6th European Conference

17-18 November 1994

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CONTENTS

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OPENING ADDRESS

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Chairman
European Construction Institute

GRANVILLE T B CAMSEY FEng

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European Construction Institute

BIOGRAPHICAL DETAILS

PERSONAL INFORMATION

Name: Granville Thomas Bateman Camsey
Born: 1936
Status: Married - two children

ACADEMIC QUALIFICATIONS AND AWARDS

"Clayton Fellowship"	Institution of Mechanical Engineers
MSc (Birmingham University)	Nuclear Physics & Reactor Technology
Postgraduate Diploma	Thermodynamics, Birmingham University
Higher National Diploma	Mechanical Engineering, Salford C.A.T.

PROFESSIONAL MEMBERSHIP

FEng; FIMechE: FInstE; FInstD; CIMgt; ARTCS
Freeman - City of London (1987)
Liveryman - The Worshipful Company of Engineers (1987)
Member - Engineering Council (1992)
Fellow - Royal Academy of Engineering (1992)

APPOINTMENTS

Executive Director, National Power plc
Managing Director - Group Technology, National Power plc
Non-Executive Director EA - Technology Ltd
Non-Executive Director - Tejo Energia (Portugal)
Vice Chairman, Hubco Limited (Pakistan)
Director - National Power International Ltd

PAST APPOINTMENTS

1988-1990	Chief Executive National Power - Thermal
1987-1988	General Manager and Managing Director (Elect) China Light and Power, Hong Kong
1985-1987	Director of Production South Eastern Region, CEGB
1960-1985	Training and early career in Nuclear Power Station Operations and Reactor Engineering

OPENING ADDRESS

Granville T B Camsey FEng
Chairman
European Construction Institute

Let me extend to all a very warm welcome to our sixth European Construction Institute Conference. It is fitting that our conference this year all about *"Retaining the Competitive Edge"* should be held in Lisbon. Portugal currently represents some of the most interesting major construction opportunities in Europe, particularly those deriving from the European Union Structural and Cohesion Programme.

Specifically, a major civil engineering project - a toll bridge over the river Tagus - represents one of Europe's largest privately-financed infrastructure projects.

Trafalgar House group led the successful consortium (and I am pleased that representatives of the group are here with us today) a consortium which, incidentally, represents Portuguese, British and French companies.

The bridge linking Lisbon and Southern Portugal also has a link with our guest after-dinner speaker this evening, Antonio Cardoso e Cunha Chairman of ExpoLisboa-98 and formerly Energy Commissioner for the European Union). The construction consortium has promised that the bridge will be completed in time for Expo '98 and as such will be a highly impressive shop window for the best technology and construction creativity Europe can offer.

Another project, on a smaller scale but of more than mere passing personal interest to me, is the Pego power station project North of Lisbon on the Tagus River. The Tejo Energia consortium, led by National Power and representing Spanish, French, British and Portuguese interests, is completing construction. This business venture represents a superb example of how the parties concerned can and have worked together to meet the aspirations of the government regarding their privatisation vision, the demands of the consortium shareholder to participate profitably in the development European energy strategy and the needs of the project for both secure and inventive solution to financing problems. The transfer of a power station from the State utility to new owner and operation without any significant problems in contract, programme or construction performance is a credit to the company.

A third major project has recently been announced. The Portuguese consortium Transgas will build a gas pipeline and gas distribution network through Portugal. Yet another example of how Portugal is prepared to break the mould to the advantage of investors, owners, construction related businesses and the customer.

Moving from a Portuguese perspective, I would now like to turn to Institute business.

As Chairman, it is gratifying to be able to report that in the past year, the Institute has steadily increased its strength. Since our beginnings in 1990, membership has grown. But, more importantly, most of our present enquiries are coming from European organisations.

We have concluded a bilateral agreement with ANIMP of Italy and, in the next year, we hope to establish regional centres in Germany and France. The next step must be to establish a formal presence here on the Iberian peninsula.

With all the cumulative expertise and representation now residing within the Institute's membership, we are becoming increasingly better known by the EU and national Governments. Indeed, we are extremely honoured by the presence here

today of many distinguished guests. I particularly welcome Sr. Eng Luis Fernando Mira Amaral, Portuguese Minister of Industry and Energy and Mr Stephen Wall, the British Ambassador, to our gathering.

The Executive Committee and I hope you will all hear much of interest in our efforts to contribute to a dynamic and competitive construction industry in Europe - one that serves the needs of clients, suppliers, contractors, Governments, consultants and academics alike.

The conference - our sixth - has been wholly built upon the comments arising from last year's event in Florence.

Delegates told us they wanted the Institute to address the compelling issues currently facing the construction industry in Europe, for example:

- do international clients avoid placing business in Europe because it is seen as red-tape-and-regulation bound?;
- is there an in-built lack of competitiveness within the industry?; and
- is Europe a high cost place to do our business?

We listened. We learned - but more importantly, we have acted. And so you will find that the structure and theme of this conference has been specifically designed to address these strategic issues.

Peter Koch, Chairman of Session One, launches straight into the important question of competitiveness and will address the issues at all levels - the EU, industry generally, the construction industry particularly and at company level.

Session Two examines the role of the European Union in enhancing (or handicapping?) the construction industry's competitiveness.

Session Three looks at the practical routes towards advancement and improvement - both technological and managerial.

Through this direct approach, we hope that everyone here will leave this Conference with positive and bullish ideas on how to retain the competitive edge, though I am bound to say it occurs to me that many might even just be pleased to attain it.

And on that positive note, ladies and gentlemen, let us get down to business. I would urge all attendees to be robust, critical, challenging, candid, incisive and trenchant in the discussion periods. Only by a refreshingly frank and free exchange of ideas and views will we be able to grapple with the essential issues and find fitting solutions.

Now please join me in welcoming our keynote speaker, Sr. Eng Lúis Fernando Mira Amaral, Portuguese Minister of Industry and Energy.

KEYNOTE ADDRESS

Lúis Fernando Mira Amaral

Portuguese Minister of Industry and Energy

KEYNOTE ADDRESS

Lúis Fernando Mira Amaral

Portuguese Minister of Industry and Energy

THE CHALLENGES OF THE DECADE

1. Strong and Weak Points

- Massive unemployment
- Poor competitiveness compared with the USA and Japan
- New International Division of Labour
  (Domestic Solidarity « - - » External Solidarity)
  (Welfare State « - - » Opening up Markets to Developing Countries)
- Consequences of Technological Progress
  (Destroys jobs but creates new opportunities)
- Economic Growth with few new jobs
  - New Development Model
- Extremely rigid labour market policies
  (reform of the Welfare State and of the European Social Model)

2. Open Europe

- In a World Trade Organisation geared to the globalisation of markets and the strategies of economics (to be defended in the framework of GATT and the Uruguay Round)

3. New Development Model

- Reform of fiscal and parafiscal systems, with a reduction of taxation on companies and labour (which penalise labour intensive scenarios) and the creation of taxes on consumption (for example VAT to pay for social services) and on natural resources (so as to make use of such resources more efficient, and at the same time protect the environment).
- Reform of the Welfare State in the areas of education, health and social security.
- Reform of the labour market in order to increase the flexibility and mobility of human resources.
- New productivity gains together with a better quality of life and the creation of new jobs.
- A dynamic concept of the distribution of work, with an increase in the supply of jobs to meet new requirements of a qualitative nature.
- Forecast growth in the supply of labour = 0.5 to 0.6% per year
  Increase in productivity per capita = 2% per year.

  GDP growth > 3% in order for unemployment to fall

  Productivity in the service sector in the EC > Japan and the USA

Services as percentage of GDP in the EC > Japan and the USA

4. Unemployment

4.1 Net job creation from 1970 to 1990
USA - 28.8 million Japan - 11.7 million EC - 8.8 million

4.2 Structure of unemployment in Europe
a) 16% under the age of 25
b) 1 in 5 (under 25) unemployed for 2 years
c) 45% unemployed for more than 1 year
d) 28% unemployed for more than 2 years)

5. Routes to Recovery

- Investment in rail and air transport
- Automobile sector (Ecological vehicle and new materials)
- Telecommunications and computer sector:
  (the digital revolution, the ground-breaking combination of voice (telephone), image (TV) and text (fax))
- Environment (air and water quality)
- Organisation of urban clusters to make it easier for people to get around

6. Competition within the Triangle

- Foremost industrial companies
  - Aeronautics - USA
  - Food - USA
  - Automobile - Japan
  - Chemicals/Pharmaceuticals - Europe
  - Oil - USA
  - Computers - USA
  - Consumer Electronics and Photography - Japan
  - Steel - Europe
  - Textiles and Clothing - Europe

- Gains and losses in the export market in the 80s
  EC - 3.7% USA + 2.2% Japan + 0.5%

- Number of highly skilled workers
  Europe - 39% USA - 75% Japan - 76%

7. The new International Division of Labour

7.1 Characteristics
- Globalisation of markets;
- Globalisation of corporate strategies;
- Attraction of developing countries (Asia - China - Latin America - Eastern Europe);
- New paradigm of international competitiveness;
- Importance of R and D and innovation.

7.2 Essential problems
- Fierce competition within the Triangle;
- Accelerating relocation and its consequences:
  - due to the difference in wage costs between the Triangle and NICs/developing countries and the rigidity of the European social model.

- NICs and developing countries are still unaffected by environmental concerns and so have lower production costs.
- opportunities for high-tech and low wages (Latin America, India, ASEAN, China).

• The trend towards relocation takes two forms:
- Foreign Direct Investment in the most attractive countries (China, India, ASEAN and Mexico);
- Development of low-cost subcontracting in Hungary, Poland and the Czech Republic. Subcontracting in these countries has grown three times more than European Industrial Output.

7.3 Domestic solidarity < - - > External solidarity
(For Europe, external solidarity means opening up European markets more to the outside; for reasons of European industrial competitiveness, greater openness to the outside implies reform of the Welfare State, which threatens domestic solidarity - > managing the trade-off between the two types of solidarity).

- Effectiveness of Community Trade Policy against state aids and dumping;
- Reciprocity in opening markets;
- Bringing the frequently undervalued exchange rates of countries in Asia and the Pacific into line;
- The possibility of ultimately inserting clauses on the environment and on social protection into a world trade agreement;
- Respect for human rights and animal protection.

FREE AND FAIR TRADE

THE WORLD ECONOMY

The Major Trends

1. Mega Trends on the World Scene

- The population of Western Europe as a percentage of world population will fall from 9% in 1990 to 6% in 2015.
- 33% of the European population will be over 65 in 2015, as against 25% in 1990.
- Consumers will become more demanding in terms of service, quality and variety. The life cycle of products will become shorter.
- Technological changes (particularly in the areas of advanced materials, biotechnology and flexible production) will create new opportunities for growth.
- The spread of technology will become more rapid in the next decade.
- Education standards will continue to rise.
- The trend towards individualism will become more marked.
- The savings rate will remain high in Asia (but low in the USA and Europe).
- Capital will increasingly move to countries/regions where returns are high.

- The labour market in the majority of countries outside Europe will function in such a way that the price of labour will reach a level sufficient to encourage employment.

- The link between ecology/the environment and the economy will become closer.

- In the majority of countries, levels of state intervention will be low; such intervention will put the emphasis on the effect of goods and services such as education, technology and infrastructure.

- There will be a decline in the effectiveness of traditional monetary and fiscal policies as a result of the growing openness of national economies.

- The number of regional blocs (along the lines of the EC and NAFTA) will increase, as will the number of members of existing blocs.

- The process of structural adjustment among companies in the USA, Japan and the developing Asian countries will continue to be rapid.

- The level of investment by companies in Japan and the developing Asian countries will continue to be high.

- Big companies will continue to disinvest and refocus themselves around their core businesses.

- The scale of investment required in some sectors will encourage co-operation between companies in different countries/regions and in related industries.

- There will be an increase in the number of industries in which competition is global.

- The number of companies based in Japan and the developing Asian countries and competing on a global basis will increase.

- The main competitors of companies based in Europe will be companies located in the USA and Japan. New companies in the developing Asian countries will bring greater competition in the future, and will concentrate more and more on high-technology, high-growth sectors.

  Competition on the basis of low costs will increasingly come from other parts of Asia, and Central and Eastern Europe.

- Exchange rates will continue to be volatile in both real and nominal terms.

The context in which companies will have to compete will be unpredictable, and for this reason strategic decisions should not be based on a single scenario. Rather, it will be important to identify the patterns common to different scenarios and to detect shocks and alterations so as to be able to adjust rapidly to them with the greatest degree of flexibility.

2. The New Paradigm of International Competitiveness

The new paradigm calls into question classical theories of international trade based on a country's wealth in natural resources.

In the longer term what is decisive for competitiveness is the way in which use is made of the resources which are increasingly available on the market as a result of the mobility of factors in a context of globalisation of economies.

It is especially important to develop strategies for:

Adding value, and Innovation, to achieve differentiation in relation to others.

In a global economy the following are available on the market:
- Raw materials
- Technology
- Capital
- Labour

(more cheaply if a company is prepared to relocate)

To continue to base competitiveness on a model founded on cheap labour would have dramatic consequences and would put us in a very disadvantageous position vis-à-vis less developed countries in terms of
- Price of the end product
- Location of the production base in Portugal

Developing in a competitive manner means putting the emphasis on Dynamic Competitive Factors and Entrepreneurial Efficiency, and detaching this model from the choices taken in past decades when we competed on price and relied on the competitiveness of cheap labour.

EUROPE'S GLOBAL COMPETITIVENESS

Session Chair: Peter Koch

Head Government and EC Relations
Shell Internationale Petroleum, Maatschappij BV

PETER KOCH
Head of Government and EC Relations
Shell Internationale Petroleum Maatschappij BV

BIOGRAPHICAL DETAILS

Name:	Peter Koch
Born:	24 November 1942
Marital Status:	Married - two children
Nationality:	German
Education:	Lawyer - University Hamburg
Joined Shell:	1 December 1973

Group Experience

1973 - 1977	Deutsche Shell Hamburg Assoc. Industrial Relations, Labour/Social Law
1978 - 1979	Harburg Refinery Personnel Manager
1979 - 1982	Head Office Deutsche Shell Head Industrial Relations
1983 - 1987	Public Affairs Representative of Deutsche Shell for Government Relations in Bonn
1988 - 1991	Colas - Bauchemie (Subsidiary of Deutsche Shell) Executive Manager
1991	Shell International European Central Office, The Hague Head Government and EC Relations

EUROPE'S GLOBAL COMPETITIVENESS

Peter Koch
Head of Government and EU Relations
Shell Internationale Petroleum, Maatschappij BV

It is with great pleasure of course that I open Session 1 on Europe's Global Competitiveness of this conference. The issue of European competitiveness has never disappeared from the political agenda and competitiveness has been one of the most frequently used words in the political debate of last year. I should be inclined to say that competitiveness has been the 'word of the year' during the last twelve months. What is wrong with Europe's competitiveness and what can be done about it? Let me quote Nicolo Machaevelli. Reflecting on the increasing political and economic difficulties of Florence, he said "in the beginning the disease was difficult to diagnose but easy to cure but now that the disease has progressed it is the other way round, it is easy to diagnose but extremely difficult to cure".

In the course of this session we will look at this disease and throw some light both on the diagnosis and the means to cure. We will do so from various different angles starting with the more horizontal approach by looking at our subject from the viewpoint of industry. Thereafter we will hear the views of the political side of the table. The presentation about the US perspective of international competitiveness and the presentations focusing on the European construction industry, will show how this industry can maintain and improve its position in the global construction market.

The European Union finds itself in a global environment which in the last decade has proved to be increasingly competitive. The good old times unfortunately where Europe was considered, at least by the Europeans themselves, as the centre of the globe, have definitely gone. At present we are confronted in the EC of course with the traditional Japanese strength which I do not need to explain here. Their traditional trade balance surplus, as compared with the European trade balance deficit of 70 billion ECU, speak for themselves. We see further the phenomenon, which has been mentioned by the Minister, of the so-called Asian miracles with the Asian tigers and dragons characterised by high increase of productivity, admirable diligence, alongside modest personal demands. To date the tigers and dragons have been the smaller countries like Singapore, Hong Kong, Taiwan and South Korea, but increasingly the heavyweights like China, India, Thailand, Indonesia and others have gained momentum. If they are going to combine a high increase of productivity, technological innovation, free market principles, with their virtually inexhaustible resource of cheap labour, we can easily imagine that what we have witnessed so far was only a fairly light breeze as compared with the potential storm which may come down the path in the future.

Furthermore we see the phenomenon of emerging Eastern Europe. The countries of Central and Eastern Europe, although still fighting their painful way from a centrally planned economy to free market systems, have already changed some competitive patterns in Europe and will increasingly do so. Skilled labour is available at low prices, at low cost, on the other hand huge resources, e.g., energy and agricultural products, will unavoidably seek their way into the European markets and thus influence our macro economic environment. On the other hand we have already witnessed the tendency of western industry to transform production capacity from west to east thus making use of the differential in wage levels.

We now turn to the west because we see the United States with their sophisticated high tech potential at lower wage levels as compared with Europe as well. We see the so-called little Americas, as in Latin America, with impressive economic records over

the last years still speeding up and still having a lot of space for development. We see them join forces in the NAFTA region, for example, aiming at creating an even larger entity and exploiting the advantages that come with it. Good old Europe in the middle of all that. Exaggerating a little, one could say Europe is between high tech and low cost which could easily manoeuvre us to the situation between hammer and anvil - an uncomfortable place to be. The emergence of these new markets has put the mature markets of Europe under stress. Stress, as we know from biology, has a negative and a positive side. The positive aspect is that stress may be a stimulus, freeing extraordinary strength as a kind of fighting spirit.

IMPROVING EUROPEAN COMPETITIVENESS - AN INDUSTRY VIEW

Eberhard Meller

Director
Representation of the Federation of German Industries (BDI)
at the EU in Brussels

EBERHARD MELLER

Represesentation of the Federation of German Industries (BDI)
at the EU in Brussels

BIOGRAPHICAL DETAILS

Born: 1945

Studies in Law and Political Science at the universities of Heidelberg, Berlin, Lausanne and Geneva. Legal "State Examinations" in 1969 and 1974; Doctor's degree in 1973.

Subsequently trained at the Deutsches Institut für Enwicklungspolitik, Berlin; Adviser (Referent) at the Federal Ministry of Economics (Energy Division); Principal Administrator at the International Energy Agency; OECD, Paris.

From 1983 to July 1991 Director of the Environment Policy Department, Federation of German Industries (BDI), Cologne. As representative of German industry, member of the Jury "Umweltzeichen" ("Blue Angel Scheme", the German Eco-Label System), member of the Environment Committee of Union des Confédérations de l'Industrie et des Employeurs d'Europe (UNICE), Business and Industry Advisory Committee (BIAC), and International Chamber of Commerce (ICC). Numerous publications on energy and environmental policy issues.

Since July 1991 Director of the Representation of the Federation of German Industries to the European Union in Brussels.

Tasks of the BDI Representation:

- providing information on political processes and developments in the European Union,
- commenting on and influencing the work of the European institutions, especially the Commission, the Council of Ministers, the European Parliament and ESC,
- participating in the preparation of BDI interventions,
- liaison with UNICE, as Permanent Delegate,
- bilateral coordination with parallel European associations on questions of European policy,
- regular contacts with the representations of other German associations and companies as well as of the German Länder.

IMPROVING EUROPEAN COMPETITIVENESS - AN INDUSTRY VIEW

Eberhard Meller
Director
Representation of the Federation of German Industries (BDI)
at the EU in Brussels

INTRODUCTION

Competitiveness affects us all: we are all influenced by it and we all have a part to play in shaping its future. Without competitiveness there can be no sustained growth or job generation. Europe's loss of competitiveness is undeniable. But its importance to Europe's future economic and social success has not been taken on board.

My findings, remarks and conclusions are based on UNICE's Report *Making Europe More Competitive - Towards World Class Performance* which was published in its final version in May this year.

- It traces the decline in the competitiveness of Europe during the last twenty years.
- It analyses the causes of decline.
- It describes what is likely to happen in the future if there are no major changes in the way in which Europe competes.

But most important of all, it provides recommendations for action to reverse the declining competitiveness of Europe, and seeks to gain acceptance for these recommendations from decision-shapers and decision-makers throughout Europe.

Overview of Conclusions

The principal conclusions of the UNICE study are that:

- there is no single measure of European competitiveness: but all measures point towards a significant decline over the last two decades;
- there is no single cause of this decline: but a multitude of factors - both internal and external - are responsible for the deterioration in Europe's position;
- there is no single solution to reverse this decline and a wide range of solutions must be generated, primarily from within Europe itself;
- there is no single group who can provide these solutions.

Successful adaptation to a rapidly changing world economy requires:

- awareness and action at all levels of the economy, both micro and macro; and
- awareness and action by governments at the level of the European Union and at the level of Member States, by the Social Partners, by companies and by individuals themselves.

The Measures of Competitiveness

The most significant of the measures of the decline in Europe's competitiveness are:

- the almost continuous decline in the share of World Exports; and
- the increase in unemployment from one business-cycle to the next.

One of the principal explanations for the increase in unemployment is that new job generation has been low.

Between 1972 and 1992, net new job generation was only 0.4% per annum in the EU, compared with 1.0% per annum in Japan and 1.8% per annum in the USA.

Moreover, in the last 20 years, the majority of the new jobs in the EU have been created in the public sector - while over 90% of the new jobs created in the USA and Japan were in the private sector.

The Principal Causes

The Report concludes that the principal explanations are that:

- European costs have risen faster than in other regions, and are now higher than in Japan and the USA;
- European productivity is still significantly below the level of Japan and the USA; and
- the macro-environment had been less stable, less predictable and less favourable for business in Europe than in other countries.

The PRINCIPAL BUSINESS COSTS are labour, energy, taxes and interest payments. During the last decade, Europe has suffered adversely in almost every single area.

For example:

- hourly earnings have almost doubled in Europe, compared with increases of less than 50% in Japan and the USA; and
- non-wage costs now add an average of 80% to direct wage costs in the EU compared with only 30% in Japan and 40% in the USA so that hourly labour costs in 1992 were 20% higher in the EU than in other regions.

In the last decade, PRODUCTIVITY GROWTH has been similar in the three regions (at between 30 and 40%).

But absolute levels of productivity in manufacturing industry remain 30% lower in the EU than in the USA and 10% lower in the EU than in Japan, according to a recent McKinsey Study.

There are a number of causes for this:

- labour flexibility is poorer;
- investment levels are lower;
- industrial re-structuring is slower;
- there are weaknesses in infrastructure; and
- management practices are less supportive.

A STABLE AND PREDICTABLE MACRO-ENVIRONMENT is also essential for improved competitiveness and increased growth rates. But the macro-environment has been less stable and less predictable in Europe than in other countries in the last decade.

A single person employed in the market sector has to support 2 people in Europe, 1.5 in the USA and only 1 in Japan. This is the result not only of the large public sector in Europe: It also reflects the low level of labour force participation in Europe.

The level of the budget deficit, expressed as a percentage of GDP, has been higher each year in Europe than in the USA. And you do not need a long memory to remember the criticism that President Reagan and the United States suffered over their large public sector deficits in the mid-80s.

The Changing Environment

There are also some developments which could hasten the decline in European competitiveness still further.

In particular, there is the emergence of:

- highly dynamic, well educated and low cost economies in Asia; and

- new Eastern and Central European democracies with highly-skilled and low cost work forces.

And these trends are emerging at a time when globalisation is increasing - through the expansion of world trade, the freer movement of capital and greater technology transfers.

The Solutions
Just as there is no single cause of the decline in European competitiveness, there is no single solution.

But our common goal is a strong and competitive Europe. The foundation for which is a stable and predictable macro-environment.

And our priorities for action are:
- an efficient labour market;
- high quality education and training;
- rapid advances in technology and innovation;
- more effective inter-firm competition; and
- a more limited and efficient public sector.

Labour Market Flexibility
A more flexible labour market will improve incentives for employers to generate new jobs and for employees to accept new jobs.

This can be achieved by:
- reducing the costs of recruitment and redundancy, particularly in terms of lower non-wage costs;
- restraining the rate of growth of real wages to a level below the rate of growth of productivity, so that profitability can be improved and investment increased;
- improving the incentive system through wider after-tax wage differentials, lower minimum wages and lower unemployment benefits;
- permitting new work contracts, particularly in terms of relaxing legislation on the number of hours worked, the level of holiday entitlement and limits on weekend working.

Education and Training
Human resources together with R&D and innovation are the strongest determinants of Europe's comparative advantage and powerful engines of sustainable growth.

To improve the quality of European manpower, it is important:
- to encourage input from business to the curriculum;
- to facilitate the transition from formal education to work; and
- to encourage employers and employees to undertake continuous on-the-job training.

Technology and Innovation
Continuous adaptation requires the introduction of new products and processes, the improvement of existing products, the extension of products to new markets, and the withdrawal of products.

There is NO correct level of expenditure on R&D: it varies between sectors, over time and between firms.

But, firms should take account of global benchmarks when planning their R&D activities.

What is more important is that we should use the existing level of expenditure effectively.

Business orientation of public expenditure on R&D must be rigorously controlled, with emphasis on priority areas such as generic technology.

Mechanisms must be established to ensure that technical information is then diffused speedily.

Firms themselves must take steps to streamline their commercialisation processes.

Inter-Firm Competition and Entrepreneurship Activity
Competitiveness and growth rely on a fluid, modern and efficient industrial sector.

Continuous, rapid re-structuring from low growth to high growth sectors and from declining industries to emerging industries requires:
- a conductive environment for the entry of new businesses;
- incentives for innovation and re-structuring; and
- the timely exit of declining industries to free resources for emerging firms.

The completion of the Internal Market and the expansion of the European Economic Area are two further important conditions for improving the level of inter-firm competition.

An open trading environment with a framework of clear and effective rules building on the results of the Uruguay Round, is another important pre-condition for creating the necessary level of competition for firms in Europe.

The Public Sector
Governments need to reduce the size of the public sector, the scale of public sector deficits and the level of taxation by:
- transferring from the public sector to the private sector responsibility for many activities associated with "consumption";
- reducing unnecessary regulations and administrative burdens;
- reducing and finally eliminating state aids; and
- improving the efficiency of those activities that remain in the public sector, particularly through the greater use of market- and user-oriented decision-making structures.

The Macro-Environment
Competitiveness depends upon a stable and predictable macro-environment in which firms can prosper, with steady growth in consumer demand.

The pace towards Economic and Monetary Union must be maintained, but underpinned by a faster convergence between Member States through closer co-ordination of economic policy.

Macro-economic policy must also be co-ordinated more effectively on an international basis, so as to achieve greater exchange rate stability between major trading blocs.

Inflationary pressures must be kept under control.

Public sector deficits must also be reduced to facilitate a reduction in interest rates and an increase in investment.

Summary
The decline in the competitiveness of Europe has no single cause.

Europe needs to deal with a number of causes:
- higher costs;
- lower productivity; and
- a less stable and predictable macro-economic environment.

There is no single solution which can reverse the decline. Europe needs to generate and then to implement a number of solutions:
- to MAKE the labour market place more flexible;
- to IMPROVE the education and training systems;
- to ACCELERATE the introduction of new technology;
- to DEVELOP more effective inter-firm competition;
- to REDUCE the burden of the state; and
- to MAKE the macro-environment more stable.

No single individual or group caused the decline; and no single individual or group can reverse the decline on their own.

We need to make a number of policy changes at European and national level and we need to encourage changes in the behaviour of firms, trade unions and individuals.

But most important of all, to reverse the decline in the competitiveness of Europe, substantial structural changes must be made - STARTING NOW.

And it is precisely the solutions described in the UNICE Report and summarised in this presentation which will, if efficiently and promptly implemented, help to:
- REVERSE the decline in the competitiveness of Europe;
- CREATE additional growth; and
- GENERATE new job opportunities.

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GROWTH, COMPETITIVENESS, EMPLOYMENT - EUROPEAN POLICY TOWARDS ENHANCED COMPETITIVENESS

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BIOGRAPHICAL DETAILS

Educational Background

- Secondary School Certificate in Classics (humanistischer Zweig)
- Law degree (Assessor) University of Freiburg im Breisgau, Germany
- Postgraduate stuies in European Law, University of Geneva, Switzerland
- Diplôme d'études supérieures de l'Université de Genève
- Docteur en droit (Université de Genève) in European Law

Professional Activities

Present position

- Deputy Head of Cabinet of Dr Martin Bangemann, Member of the European commission, Brussels

Previous positions

- 1989 - 1992 Member of Cabinet of Vice-President Dr Martin Bangemann; responsible for industrial policy; industrial affairs; basic industries, international relations in the industrial and technological field
- 1986 - 1989 Member of Cabinet (Ministerbüro) of Dr M Bangemann, Minister of Economic Affairs, Bonn, Germany
- 1984 - 1986 Ministry for Economic Affairs, Bonn, general policy questions in East-West-economic relations
- 1982 - 1983 Head of the German-Bolivian Chamber of Industry and Commerce in La Paz/Bolivia

Other activities

- Lecturer at the University of Cologne (Constitutional Law and Political Theory)

Languages

- German (mother tongue)
- English (excellent knowledge)
- French (excellent knowledge)

Publications

- Dissertation: *The treaty making power of the EC in the field of trade and cooperation agreements*, Berlin, 1978.
- *External competence of the EEC and jurisdiction conflicts with Member States*, Europarecht, 1980.
- *Legal problems of the awarding of public contracts in the national, European and international field*, Recht der Internationalen Wirtschaft, 1980.
- *Government procurement - Neutral market instruments or instruments of state intervention?*, Der Betrieb, 1984.

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It is fascinating to talk about competitiveness. However it is very difficult to know exactly what competitiveness is, so the notion in itself creates a lot of discussion and confusion. The wording is not so important, the practice is important. The Institute for Management Development produces from time to time, a so-called ranking list of competitiveness. The European Union has fallen behind on this ranking list. Position 2 to 4 is taken by Japan and Hong Kong, however position number 5 is Germany, position number 6 is Switzerland and position number 32 is Italy. The European Union is no longer strongly represented in the famous *Fortunes Top Hundred* companies. In 1990 45 companies out of 100 in *Fortunes Top Companies of the World* have been European. In 1994 this figure declined to 37. All these indicators are important when we talk about European competitiveness.

The most delicate question for politicians is that the European Union companies have reduced their staff numbers whereas the Japanese companies now employ more people than in 1989. In the European Union an increase in GDP in 1994 of 2.4% is accompanied by a decrease in employment. This is the crucial political problem for politicians. How can we employ more people ?

In that context European companies are facing a series of challenges. One challenge is that the international competition is focusing increasingly on the same markets and new competitors are forcing their way into the market. The world has changed, some years ago we have thought in static terms about the famous Triad meaning Japan, United States, and the European communities. This image, this picture, is no longer true. If we talk about a modern Triad, we have to include the whole NAFTA region, and the whole Asian Pacific countries. In Europe it is not only the European Union we need to include in terms of international competitiveness, but also the European Economy Area, and perhaps one day parts of eastern Europe.

The overall global picture has changed. Some years ago we talked about the so-called four small tigers - this is not true anymore. The amount of small tigers or dragons increased and we do not have four, we are going to increase this number to perhaps 6, 7 or 8 and the markets are on the move because of geopolitical changes.

Central and eastern Europe is a chance and a risk. The risk is that we have competitors at our door. We have a ratio between wages in Germany and Poland from 1:10 so how can we compete with such companies?

Our proposition was to use the instrument of industrial corporation which means in order to avoid de-localisation, find industrial partners, who have know-how and low wages. The European Union discussed all these challenges under the heading of the so-called *White Paper on Growth, Competitiveness and Employment.* The European Union has provided four examples of what can be done to face these challenges:

(1) We can increase productivity in the European Union. The European Union cannot increase international competitiveness by significantly reducing labour costs. If you compete in some areas with countries like China, there is a wage ratio of 1:30. So you can bargain a lot with trade unions. It might be that you

are able to bring down the ratio from 1:30 to say 1:27. This does not solve the problem. It would be unrealistic for the European Union to reduce labour costs significantly. We have to look for other solutions. However, the labour costs may have developed more favourably in the European Union than in the USA and Japan. The industry is now migrating constantly to low wage countries and the whole debate begins about what is left to Europe, as a production location. Remember some years ago, people argued that we might become a so-called blue print society, i.e. no more production in the European Union, only services. The European Union said that is not a realistic approach. We need a hard core production business in the European Union and we cannot concentrate only on services and the low wage countries will focus on normal production.

Technology production needs more capital, greater research efforts and better qualified staff. Here we have to start in order to increase European productivity. In addition what we need is flexible organisation of work and production: more flexible working time, leaner production and greater use of information technology. The significance of immaterial investments is constantly increasing. That is why we are targeting so-called life long vocational and further training. The key factor of international competitiveness in the next year will be formation and vocational training. Japanese companies are investing much more money than European companies. A Japanese company located in Great Britain producing cars is paying 15% of the payroll for vocational training and there are very few European companies who are doing the same. It is untrue that Europeans have the brain drain. Europeans are very intelligent, we have the knowledge but we have to use the knowledge better.

(2) We have to make an effort at a European Union level on stronger competition. Again I quote from the Japanese companies' experience. If we ask the Japanese companies where are you going inside the European Union, a very important element is the telecommunication infrastructure for direct contacts to Japan. If we talk about competition in Europe, we have to talk about competition at a European level. The so-called relevant market is no longer national. If we have an internal market, this internal market must be reflected by those people who are applying European competition law. If two companies are merging inside the European Union, the new parameter is the relevant internal market and no longer the national market. Industrial co-operation in that context, inside the European Union, becomes vital. The European Union mergers will probably double in 1994. We have nearly one hundred cases each year. This shows that the market is going to develop inside the European Union.

The other side of the coin of competition is subvention. Here we have a task in Brussels to pay attention to ensure that there is no distortion of competition via subventions. No private company can compete with another company which receives massive subventions. No private steel company can compete with steel companies in some Member States which are heavily subsidised. If we have to strengthen our research and development efforts, then we have to look at how our main trading partners are doing business. If in some activities our main competitors are, for example, the Japanese or the Americans, we have to pay attention to what they are doing in the field of competition. There is a sort of religious debate in the European Union about the so-called pre-competitive research and development. In some fields, like aeronautic, automobile, maritime affairs, we have to come to the conclusion that our American and Japanese friends are less religious than we are and we have to reflect as well on our own philosophy.

(3) The third example is the creation of new markets. Sometimes the European Commission is attacked with the argument 'you are picking the winners of tomorrow'. That is not our approach to industrial policy. No-one can predict tomorrow's winner - the new markets only arise through demand. Mega projects have been failures in each member state. On the other hand, we have well-known unsolved problems and these problems have to do with new markets, e.g. traffic and environment. Do the Commission have a role to play in Europe? Our answer is yes. And again there is a sterile debate about what is the task of the administration and what is the task of industry. The German friends make a differentiation between 'holschuld' and 'bringschuld', which means do you have to bring something to the enterprises or is it up to the enterprises to come to the administration? That is a sterile debate. We are ready to say that the European administration has to bring something to the enterprises, especially in the field of environment and traffic. It is vital that the state should create the necessary conditions for new service markets. The greatest actual opportunities we are discussing at a European level are what we call the information society. When we started our reflections about an information society we considered whether it was worthwhile to use the same name as the Americans use. They call it the information highway. The word "information highway" does reflect the complex scenario of an information society. To simplify: "information highway" suggests hardware and we believe information society is much more complex. It is not only the production of information, but more importantly it is the intelligent distribution of information at all levels. We have a lot of information networks in Europe, but some people tell us we have to create networks between the networks, between the Member States especially. This will produce another economic revolution because you will see in your relations with your partners and suppliers this creates new forms of partnership and communication. The European Commission invited companies to identify some applications for this information society and these projects are reflected in the 'Bangemann Report' There are practical fields of application for new markets, for example, tele-working. Why should students only go to the professor as we did before? There are new forms of communication between universities and people going to university. There are other forms in the field of road traffic management, the same as air traffic management. If you go from Heathrow to Brussels you need 40 minutes but before you are waiting another 30 or 40 minutes.

We are wasting energy. Intelligent information society communications might help us to overcome these difficulties. Another field is health care networks. It might be we can link the doctors between regions like Scotland or the south of France to Universities in the capitals. This will help us a lot in economic terms but the greatest barrier is still telecommunications. As long as we have not broken up the telecommunication monopolies, we are not going to make progress in the information society.

(4) My last example, how we could increase European competitiveness, is an example linked to the internal market. I could say the internal market in itself is the best instrument for increasing European competitiveness. That is true, but it is not sufficient. In the past we have abolished borders and technical barriers, which was destructive to a certain extent. We destroyed something very important, but we have to go further and construct something in addition. Here we developed the idea of the so-called trans-European networks. We tried to link regions in Europe in different fields which are very important to the European industry. We identified a number of areas where these trans-European networks should be established. We need better telecommunication systems throughout the whole European Union, and transport. We need better, safer and cheaper transport between the Member

States of the European Union. These are some aims of the White Paper. We want to connect outlying regions with central areas. The European Commission has proposed to the Ministers master plans for the European transport infrastructure. There are budgetary constraints that we cannot overcome easily, there is a lack of extensive co-operation between public and private investors and there are problems with the authorisation and implementation of major projects. That is why we have submitted the whole dossier to the European Council in December in Essen. We have identified 14 priority transport projects at European Union level. Some examples - the Brenner access, a high speed train for combined transport, a high speed train between Paris, Brussels, Cologne, Amsterdam and London. A high speed train south, as we call it, between Madrid and Pepignon, and a high speed train east to Paris, Strasbourg, including a section between Zeebrugge and Mannheim. These plans are underway but we plan to extend it. We have a long term project which means that we want to cover those Member States which are not yet formally members of the European Union, especially in the direction of central and eastern countries. Of course financing is of importance and the required annual funding of 4 to 6 billion ECU is very high. That is why we need new forms of financing. One idea we have launched is the so-called public-private partnership. This includes the promotion of private investment by public development of mixed funding models, the creation of a regulatory framework for private investent, leasing, franchises and other models of private operation. We have proposed, which is very critical and delicate, a shortening of authorisation procedures especially in the field of environment. If we want to construct projects on a trans-European level, we have to shorten the delay. This means that we have to influence national legislation so that they are ready to give some derogations for European projects. This is a very delicate matter in some Member States.

Let me end by mentioning the form of dialogue we are trying to establish in the European Union with enterprises. To talk about international competitiveness is easy but we cannot act for companies. Sometimes we have the impression in the European Union that we are discussing projects like some Indian tribes which means there is one tribe called "the car industry" or "the aeronautic industry", I do not want to mention the construction industry. The other tribe is, of course, the famous civil servants, the administration. We are thinking to a certain extent in categories of black and white, of the good guys and the bad guys, not only in Europe, in the Member States as well. Dr Bangemann has made the proposal to overcome these debates and to try to find more synergies in the European Union. We have to find a specific European solution for a European dialogue between all economic actors. Some people call it concerted action, or structured dialogue or forum. The notion, the name is not important. It is very important that we find forms of dialogue to intensify what we want to do for our common goals and I would hope that this conference, in that context, is a contribution to this European dialogue.

THE INTERNATIONAL COMPETITIVENESS OF CONSTRUCTION - A US PERSPECTIVE

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BIOGRAPHICAL DETAILS

Fred Moavenzadeh is the George Macomber Professor of Construction Engineering and Management and the Director of the Henry L Pierce Engineering Laboratory and Head of the Center for Construction Research and Education at MIT. His professional field of interest is construction engineering and management, with a primary focus on international construction, construction finance and strategic management. He has taught the basic courses in construction, facility design, and engineering and management of infrastructures, both in the Department of Civil and Environmental Engineering at MIT and at the Graduate School of Design at Harvard University.

Over the past 25 years, Dr Moavenzadeh has directed a series of research programmes relating to construction engineering and management, both in the U.S. and in developing countries. Most recently, he conducted a major study on the globalisation of construction firms and the need for restructuring the construction industry in light of recent changes in the global market and new developments in the information and communication fields.

Dr Moavenzadeh has served as a consultant to several U.S. and international agencies, including the International Bank for Reconstruction, the Inter-American Development Bank, the United Nations Industrial Development Organization, the United Nations Centre for Human Settlements, and the U.S. Agency for International Development. He has served on U.S. and international panels relating to construction engineering and management and has authored over one hundred professional papers. His current book is entitled *Global Construction and the Environment: Strategies and Opportunities*.

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It is certainly refreshing to come to a conference where the United States does not seem to be doing that bad. In my opinion, had this conference been held in the United States three or four weeks ago, the Democrats would not have done as badly as they did in the Congressional elections. It certainly confirms that the grass is always greener on the other side of the fence.

The previous speakers brought us a very interesting and challenging perspective on the macro economic situation that exists in Europe and in the world in general. The next part of the conference will try to bring that down to the level of construction to see what the implications and ramifications are to the construction industry. A similar debate has been going one in the United States for many years and in the US we have come to almost a similar type of conclusion. In order to set the stage for construction, allow me to start by defining the basic scope of the market for the construction industry. To try and see what some of the ramifications are for the construction industry in general and construction firms in particular.

The premise of my presentation is that the activities of construction industry lie in the nexus of three interactive systems; social systems, natural systems and technological systems. It is the interaction of the natural systems and social systems that create markets for the construction services and products. The social systems primarily establish a set of policies, regulations, norms and standards that influence the market of the construction industry and the behaviour of the firms within that market. The social system establishes demand for mobility energy, information, shelter and industrial facilities. These demands translate into the type of activities that we are familiar with in terms of transport, power, communication, housing, buildings and commercial complexes.

The natural systems traditionally have been viewed as a barrier to the development of construction. In other words we spend a great deal of time learning how to build a dam to preserve the water and prevent the flooding, how to build a bridge to cross major rivers or how to build a tunnel to cross the mountains. Recently the natural systems have taken a very different perspective and that perspective is basically how to protect, how to preserve and how to recover the natural assets that we have, especially with regard to the quality of the air, quality of the water and reduction of contaminants the get into the soil other areas of the environment.. This by itself has become both a barrier to construction in terms of environmental impact studies, in terms of trying to negotiate with non-government organisations that are concerned with the quality of the environment and at the same time has created a very large market opportunity for construction.

The technological systems are traditional engineering areas that we are familiar with in the form of analysis, design and construction of facilities. These systems are also undergoing major changes that I will elaborate on a bit further. In particular, I will emphasise their impact on the organisation of the construction industry and the restructuring of construction firms.

Given this as a background, basically in construction and civil engineering we are concerned with two aspects. How the demand for construction is generated, what

type of demands we have, where are they and then how the supply system is working in construction. Both of these are changing. Both the demand and the supply are changing. The change on the demand side of construction is basically represented by the change in the client and the change in the market. On the supply side the change is occurring both in the technology and consequently in the organisation of the firm that is responding to the technological change on the one hand and to the change in demand on the other hand.

Why is the client changing? Traditionally clients have basically run out of money. The clients are looking for other ways of financing their projects. Here I am referring primarily to the clients in the public sector who traditionally used to use the power of taxation and raise the capital for expenditure on the projects. At least in the US that power has become very limited. Even if we can raise the taxes, the last thing that they will spend it on is infrastructure. Most of the money goes to social services and as a result of it there is a great deal of searching for new ways of financing the projects. The same is true with regard to the Far East. The same is true perhaps with regard to Europe and that the nature of the client and its capability is changing. On the other hand the client has realised that is has substantial power and that power is primarily in the jurisdictional area. The client can provide concession, franchising, licensing, but in my opinion the most important thing that the client can do at the present time is streamlining the regulatory systems. In other words, to make life easier and to make the work productive and try to reduce bureaucracy of regulations that delay and add cost to projects. In the area of environment especially, it hinders entrance of construction firms into that market.

The markets are also changing. Geographically the markets are moving primarily towards the Far East, Latin America and eventually to the former Soviet Union bloc. At the present time in the Far East, there is reference to the small tigers or dragons and the big tigers and big dragons, the market in India, China and many other parts of the Far East is expanding at a very rapid rate. Needless to say to this audience, that only in the power sector, the estimate of the power demand for the Far East roughly about constructing one and a half times the existing power system in the United States per year for the next 10 years. Now the question of whether that is feasible, whether there is enough capital to even do one tenth of that, or whether there is enough capacity to produce that type of facility per year in that part of the world, is a major issue that challenges the construction industry in the global scale. The Latin American market is emerging very rapidly. Latin American has produced some very stable markets in Argentina, Brazil, Mexico, that are growing very rapidly and are challenging the construction industry to participate in it. Eventually the former Soviet Union bloc will get its act straight and will become similar to Latin America - a major supermarket for construction activities.

Currently demand is primarily towards energy and environment. Both of these two markets are growing very rapidly - the estimate which we have for energy is quite large, in the order of trillions of dollars. In the area of environment everybody argues that in the United States alone by the year 2000 this market will be almost 50% of the total construction market, which is at the present time about 450 billion dollars.

The estimate is that by the year 2000 we are talking about 250 billion dollar expenditure annually in the environment related areas. there are four major environmental areas at the present time in the US; hazardous waste remediation, clean water and waste water treatments: cleaning the stationary sources of the pollutants; and solid waste management. In each one of these areas the market is growing at the rate of 5 to 10% per year. There are a substantial number of specialised firms that are being developed to penetrate this market but the market offers tremendous opportunities for the construction companies to make a presence.

In the area of infrastructure, high speed trains similar to those in Europe, are being contemplated in various parts of the United States. More importantly, the issue of smart highways, and smart transportation systems are creating a new type of market for the construction industry. High technology constructions are primarily in the areas of bio-technology and micro electronics where highly specialised facilities are required for production of this type of product. One of the major areas of competitive edge is in this high technology construction, where the amount of technology that is embedded, roughly consumes about 60 or 70 cents of each dollar spent on construction. The sophistication of that technology requires a highly skilled and highly trained labour force that perhaps is more readily available in the US, Europe and Japan than in the rest of the world.

Another area that is becoming very strong in the US is in the area of retrofitting. The retrofitting in terms of hospitals, institutional buildings, hotels, office building is growing very substantially. This is an area where some degree of competitive advantage exists in the United States.

In terms of technology there is both hardware technology that is changing as well as the software technology. In terms of hardware technology we are going to see more and more automation in construction which will start perhaps with smart tools, with a move towards automated remote controlled equipment. Eventually we may get into some degree of robotics and other forms of automation. The one area that is progressing very rapidly is the notion of off-site production. In the area of petrochemical refineries, most of the construction dollars are spent on procurement of parts and facilities that are partially prefabricated and brought to the site for assembly. The same holds with regard to the power plants. In the area of building, we are seeing more and more prefabrication of semi-finished products that come to the site for assembly, e.g. in house building. The implication of this is that production is being transferred from on-site to off-site into a manufacturing facility where automation, robotics, mass production, inventory issues become crucial to the production of the parts either finished or semi-finished for construction.

In the area of software, reference has been made several times to information technology. Information technology by itself is going to affect not only the products but also the process of construction in terms of computer aided design and computer aided manufacturing. In terms of the facility itself, information technology will change the services that are needed within the buildings as well as the way those facilities are operated. Intelligent buildings are becoming very popular in the US. This starts with control of the environment within the building, but it is now extending towards control of the repair and maintenance, and projection of the repair and maintenance. The whole issue of applying vision, pattern recognition to maintenance whereby basically using a VCR camera to take pictures, connecting it to a computer system that immediately identifies to what extent the system has deteriorated, and estimate the time for next maintenance. This gives the maintenance managers an opportunity to argue for a budget on a maintenance which is not historical but which is based on demand. Similarly a smart transportation system in terms of whether it is an intelligent vehicle highway system or automated trains or other types of transport facilities are creating a new market for the construction industry.

Given these changes in the demand side as well as on the technological opportunities being made available, the question is how the construction firms are reorganising themselves to address those changing demands and new technological capabilities, and what are the trends in the organisations of construction firms. There is basically a bi-modal system that is emerging in the construction industry as a result of these changes. One is towards full service delivery. Here the firms are supposed to deliver from financing all the way up to the operation and management. We will hear a lot about this in terms of various forms of privatisation. By and large these firms have to

deliver everything to the client. The client no longer wants to get involved in the selection of difference agencies or different organisations to handle different parts of the work. The client would define simply what it needs and the rest of the job is in the hands of the company to deliver the product that produces that type of service. The second type of firms are mostly the niche players. These are highly specialised perhaps rather small firms capable of working on a global market for the particular expertise that they offer. We see a lot of this at the present time in the software companies that provide software services to the construction industry. They are relatively small, with relatively low capital, but they work on a global basis. They provide services all over the world to clients. We see similar niche players developing in the environmental area. These companies have one technology, do one type of clean up job, but they are highly specialised in that and it you are dealing with that type of toxic waste that is the company to go to: a small company, distributed globally, providing service to the global system.

The full service firms by nature obviously have to be global and they are global in three different dimensions. One is the traditional dimension of geographical market. They obviously have to work on a global basis in order to maintain the size that they need to satisfy the bureaucracy they have established. In addition to the geographical market these firms are globalising their internal organisation. They are going where they can do a particular type of work the cheapest. For example, several US firms have established design offices in Singapore, or Taiwan or Korea where 90% of the routine design will be done in those design offices. This is because the labour is cheap, the facilities can be used 24 hours a day and therefore dollar per volume of output is relatively low compared to the same design office had it been in Los Angeles or in New York. Thirdly, their procurement is also external. That means that they buy not only materials and equipment on an international basis but they also buy services on an international basis. there is no difficulty in a company that is headquartered in San Francisco, buying financial services out of London, cement from Greece and design from Singapore. This type of globalisation, in terms of external services has created a tremendous opportunity for these firms, they outsource immediately what they need. That means they have to have a very good network of information on who is doing what, where and how, so that the can plug into that service quickly. They can at the same time, unbundle themselves; for example a large firm may have a very significant highly automated procurement office. For the firm to maintain that procurement capability, it has to undergo substantial investment. It cannot use all the potential of that procurement in-house and therefore is willing to provide procurement services to other firms for a fee. Therefore other firms who cannot afford to have such an elaborate procurement service, can subscribe to the services that this firm provides. This is something similar to what most of the airlines do. American Airlines developed a reservation system that became large enough that it had excess capacity. It could then sell to the other airlines who could then use that service to provide similar types of service to their customers. Many construction firms are beginning to provide similar types of service to other construction firms in order to unbundle their services, to sell it piece by piece to the different types of organisations so that they could reduce their overhead and operating costs.

The organisation of these large firms are going to be either full integrated and centrally managed - this is the traditional way that at the present time large scale firms operate in the US (Bechtel, Ralph M Parsons Corporation, Fluor Daniel, Stone & Webster). They are basically fully integrated and centrally managed firms but this is going to change towards a network of independent and complementary firms. The large firms are going to have tremendous overheads and therefore in order to reduce that overhead, they have to distribute themselves. They cannot distribute themselves easily and reduce the overhead, without making a group of independent firms. The second model that I am proposing is that a very large number of companies on a global basis will enter into agreement with each other to follow a certain protocol of co-operation. Through that protocol of co-operation they become interdependent

among themselves, each firm is privately owned or owned separately. Each firm operates in its own market and each firm is entitled to get whatever project it wants. Collectively they are committed to each other and that type of collective commitment creates a network of firms that provide substantial levels of service to the clients. If you look for example, at a financial institution with a design firm, with a consulting firm, with a contractor and with a group of subcontractors they form a network of firms. Each subcontractor could be working in five different projects but it will also provide services to this network. The contractor could be doing the same thing, the bankers could be doing the same thing. They will provide many other services but they also commit themselves to providing necessary services to this network of firms. This type of information technology, will not have the headaches of a very large overhead or a highly hierarchical organisational structure. It will be a flatter organisation each independent in its own right, each having its own entrepreneurial instinct, each dies or lives on its own strengths but they are committed to co-operate with each other in certain areas.

Finally, I believe that we will see a system of franchised firms, these are the small firms that are very familiar with the local condition. For example, in the United States we are talking about several thousand bridges in need of repair. Total estimate for this repair is in the order of 20 to 30 billion dollars Therefore, the size of the market is relatively large but when you divide it by the number, the average repair job is about a few million dollars per bridge. Trying to negotiate a million dollar contract for a corporation the size of Bechtel or Parson involves at least 1 or 2 million dollars overhead and therefore they will not be able to participate in this million dollar project. The local contractor who is interested in working in that market does not have the know how, does not have the backup support in terms of what is wrong with the bridge, how to prepare its bid, how to protect itself, where to secure the resources that are needed for the repair of this particular bridge, so they will shy away from bidding. If the two come together, the large parent company provides all the backup materials and all the backup information. The small company is willing to pay for that service whenever it needs it and pays also a franchise fee. The large company can procure on a larger scale, have access to the capital at a lower interest rate, can provide access to insurance at a very low rate, can provide access to bonding for these companies and therefore when you put all of that package together you will find that the small company will benefit by 20 or 25% by joining this type of operation. As a result it is willing to pay 5 or 10% of its total volume as a fee. If this system is expanded globally it becomes almost like the McDonalds of the construction companies. You will have a very large distribution of very small firms that have committed themselves to work under a certain type of arrangement and agreement for which they are willing to pay a fee. If any one of them goes bankrupt, the parent company has no obligation to them and therefore they are independent in their own right.

Let me say a few words about the environment as a market. First of all the size of this market is very large. There are two ways that companies are looking at it. One is what are the services that are required in this market? Second, how does one structure oneself to respond to this service? In terms of services, one needs to know what types of expertise is required? What type of relationships have to be established? In terms of the structure one looks at how, from the corporate point of view, one has to structure oneself to address this and how to organise projects.

In the US, the clients prefer turnkey contracts and projects. They prefer contracts with a fixed price rather than with a cost plus. They are looking for value beyond the low price services.

Many of these markets are regulatory driven and involve many government agencies. The responsible agencies are experimenting with various forms of contracting. For example, the US Army Corps of Engineers have developed total environmental

restoration contracts. These are relatively large contracts, larger than 100 million dollars and they are basically not a single project, they are multiple projects, so the job is primarily contract management as against project management. There is no longer minimum bidding practice in this job, it is mostly becoming a negotiated fixed cost type of contract. To give you some examples, the size values of the total environmental restoration contracts of the US Army Corps of Engineers, ranges from 150 to 300 million dollars that companies have been able to secure over the past year.

What type of expertise is required? Contract management, project management, technological knowledge and health and safety of the workers. How do you get this type of capability? Again it is the issue of how do you develop a partnering system and a relationship system. At the present time most of these firms are coming together with the client, designers and subcontractors and trying to provide an overall package that meets the clients needs. Clients are actually helping the contractors to put this type of package together and again clients are working very heavily in trying to streamline the regulatory systems within which this environmental work is taking place. Let me give you a couple of examples, Morrison Knudsen and Stone & Webster came together and they won one of these contracts for 300 million dollars. I do not believe either one of them could do it by itself. Perland, a very large environmental firm in the US owned by Perini Corporation, just couldn't cope with it as a single firm; it did not have an adequate support system to get into any of these jobs. Lots of these companies that were formed to work as a single company are now rethinking their strategy to work, partnering with other firms in order to get into that type of market.

What is the corporate structure for this type of work? Many companies are very much concerned with the liability of these types of projects especially if you are dealing with hazardous waste. Suppose that a contractor enters into a contract in a hazardous waste remediation project. He takes the material out, processes it and then deposits it somewhere else. Even though he has done his job on this site, by depositing the material somewhere else he has become liable. Twenty years from now, the company is still exposed. The situation is similar to what we are doing today with a company that put the waste there 20 years ago. So as a result of this they are trying to find ways to limit their liabilities. One is to develop a subsidiary. The second one is to develop a functional division with a limited liability, the third one is to form a separate organisation. In all of these cases we have some degree of risk exposure. For example, corporate veils. If a parent is not part of the day to day operation, the parent has nothing to do with that corporation except ownership. Creditors are not misled as to who is actually liable for that work and subsidiaries handle and make all the decisions. Subsidiaries basically have a separate insurance policy, separate office, telephone and everything else to make itself completely independent from the parent company. The parent and subsidiary do not exchange assets, liabilities, equipment or people. So it is literally having a completely separate activity but under the same ownership. For example, in 1988 Perini Corporation created Perland as a subsidiary under a completely different corporate veil, the name was different, the place was different, the telephone number was different, the liability was different, but Perini had 100% ownership. In 1993 Morrison Knudson consolidated all its environmental activities into a separate division called Environmental Services. Again the Environmental Services has a complete separate liability, a separate insurance and separate activities of its own.

The way these companies are handling risk involves risk avoidance, risk transfer, risk share, risk retention and loss prevention. They are trying to organise themselves in such a way that the risk when it is distributed in these different types will cost the corporation the least. Basically the way that they are doing this is by putting a very efficient contract management system, a very different project management system than the traditional project management. Substantial attention to the health and safety and a great deal of emphasis on relationships between the clients and the contractors.

They have to form themselves structurally very differently from the traditional construction companies, and finally they rely on insurance.

The system of construction at the present time in the US is in transition. The transition is in terms of the market and in terms of the organisation. We are finding various firms to try and experiment with various types of organisations but in my opinion the organisation that will emerge is going to be the network of firms or a franchising system.

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HOW TO WIN IN THE GLOBAL CONSTRUCTION MARKET

Neville Simms

Group Chief Executive
Tarmac plc

NEVILLE SIMMS
Group Chief Executive
Tarmac plc

BIOGRAPHICAL DETAILS

Mr Simms, aged 49, gained a BSc in Civil Engineering at Newcastle University and was awarded a Master of Engineering degree by the University of Glasgow.

His career in construction began in 1966 when he joined Consulting Engineer Ove Arup and Partners, designing hospitals and other building work. In 1969 he moved into the contracting side of the construction industry, joining AM Carmichael Limited of Edinburgh and, in 1970, Tarmac Civil Engineering, part of the Tarmac Group.

He became Contracts Manager for Tarmac National Construction in 1976, Director of Operations in 1980, and a Director of Tarmac Construction the following year.

In 1984 Tarmac Construction International was formed by combining Tarmac National Construction and Tarmac International, and Mr Simms was appointed Joint Managing Director, responsible for all the Group's major building and civil engineering works in the UK and overseas.

The following year he was appointed Managing Director of Tarmac Construction's Regional Operations, responsible for projects carried out by the company's then 20 area offices throughout the UK.

In January 1988 he was appointed Chief Executive of Tarmac Construction itself and in March 1988 became a main Board Director of Tarmac plc. On the 14 February 1992 he was appointed Group Chief Executive of Tarmac plc, the UK's largest Quarry Products, Housing and Construction Group and in March 1994 became Deputy Chairman in addition to his role as Group Chief Executive.

Mr Simms is a member of the Institution of Civil Engineers, the Institution of Highways and Transportation, and a Companion of the British Institute of Management. He is a past Chairman of the National Contractors Group of the Building Employers Confederation, a former member of the Overseas Project Board of the DTI and of the Environment Task Force of the Building Employers Confederation. He also sits on the 'Better Made in Britain' Committee for Construction and the recently set up Treasury sponsored, Private Finance Panel, created to stimulate private finance and management and private/public partnership for projects previously funded by the public purse. During 1994 he joined the Midlands Industrial Council (M.I.C.) and the Construction Procurement Group. Mr Simms is a Governor of Brooklands School, Stafford.

He is Co-Chairman of the Members Assembly of TML, the contractor building the Channel Tunnel, Président du Conseil de Surveillance de l'Enterprise, Nicoletti, Nice and a Non-Executive Director of Ruberoid plc.

Born in Glasgow, Mr Simms now lives with his wife and son in the West Midlands.

HOW TO WIN IN THE GLOBAL CONSTRUCTION MARKET

Neville Simms
Group Chief Executive
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INTRODUCTION

Earlier speakers put forward their views about how competitiveness could be improved across the broad spectrum of European Industry and we have just been given a US perspective of the international competitiveness of construction. My task now is to focus on the European Construction Industry and suggest how we in Europe can win in the global construction market.

Clearly, my talk will draw upon my experiences in the UK and at Tarmac, but I believe that these experiences, particularly in recent years as many of us have refocused, restructured and redirected our businesses, are applicable across national boundaries.

But first a few words to focus our minds. The European construction industry is facing changes in its markets. Competition is increasing internationally and demand is rising for activities such as design, financial engineering, construction, operation and maintenance to be the responsibility of one party.

At the same time, the threat that foreign companies will attempt to penetrate the European market is growing thereby demanding the development of new technologies and management tools to avoid European companies becoming merely sub-contractors to the mega international contractors of the future.

In that context, let me start by giving you my definition of what I mean by winning in the global construction market.

- I mean improving the competitiveness of individual businesses in the European construction industry so that they can meet and beat their competitors on a world-wide stage.

Underlying this definition is my assumption that each company will have as its primary objective the maximisation of financial returns to its shareholders rather than, say, the maximisation of market share or employment, although, I accept, that they are alternatives which suit differing national approaches.

But what are the factors that can have an impact on international competitiveness and affect that return to shareholders?

Factors affecting international competitiveness

Firstly, there are **national factors** over which individual businesses have little control. for example:

- differences in government policy, legislation or taxation;
- the varying priorities in the move towards private investment in public infrastructure and services;
- the culture and method of operating within a country.

In their different ways these national factors can provide opportunities or create barriers and they need to be recognised and accounted for when a flexible strategy for improving competitiveness is being established.

Secondly there are the **business factors** that individual companies can do something about which I will return to later.

National Factors

So let us consider the **national factors** in a little more detail.

Firstly, the **impact of differences in government policy and legislation** in so far as they distort and destabilise the construction industry. And here I have two examples.

The first was the announcement by the United Kingdom's Chancellor of the Exchequer in March 1988 that he intended to change the rules about mortgages held by joint owners of a property with effect from August 1988. The notification gave a market that was already booming an additional boost so that, when it came, the resultant fall was even more dramatic. The announcement itself was ill judged and not foreseeable but we at Tarmac could probably have appreciated its impact earlier if we had then had the systems in place, which we now have, to continuously measure key macro-economic factors.

The second example is a comparison of how public construction is managed in the UK and Japan. In Japan, one of the most important ministerial posts is that of the Minister of Construction who is responsible for the overall control of the construction of public works projects, reconstruction and maintenance projects in the public sector and the supervision of all infrastructure and government building construction. The combination of all these activities and the importance the Japanese Government attaches to construction and raising the standard of living of its people, which incidentally includes a ten year two trillion pound investment programme, is in stark contrast to the British way of spreading the responsibility for construction across many departments and opening and shutting the expenditure tap more or less at will.

Both of these examples highlight the risks to a business of being too dependent upon one construction market and consequently highlight the requirement for some geographical diversification if a business is to have a solid base on which to found its competitiveness. And here I suggest that some of the UK plant and material producers were more perceptive than many UK civil contractors in the latter half of the 1980's when they saw that the UK market could not be relied on. As a result material producers diversified geographically and when the UK recession came they were able to ride it with less serious damage.

The next national factor to highlight is the move towards **private investment** in public infrastructure and services something which, of course, is not exactly new.

More than 150 years ago the pioneering engineers of Great Britain built the country's canals, trunk roads and later the railways with private, not public money. Some hospitals were provided by philanthropic and wealthy industrialists and the infrastructure was created by the business sector for the business sector. Today there are still a few old toll bridges dotted around the British Isles and of course a few new ones. Looking elsewhere, in France for example, they have had a toll road network, created in partnership with the private sector, for over 20 years. Now, in the UK, and many other countries, the pressures on public finances and the unlikelihood that Government can satisfy both the spending demands and the aspirations of the general public in health, education and transport, means that the time for private investment, in activities more recently funded from the public purse, has come again.

The emphasis of the private finance initiative in the UK is on promoting efficiency and improving services, as well as stimulating fresh flows of investment, by harnessing the private sector's entrepreneurial skills and management disciplines into new partnerships with the public sector. Whether the fresh flows of investment will

be additional to or replace the existing provision cannot at this stage be precisely defined, but there inevitably will be a net gain to help fill any existing and, more importantly, potential funding gap in the future. What is of far more long term importance though, is that the private finance initiative will encourage government to change from being a service provider to being a service purchaser and that in the long run should reduce the role of government itself.

As a result of the expertise and experience to be gained in the UK, opportunities will be created for UK business to open up new markets and to export that expertise and experience. The UK construction industry can still, I believe, be in the forefront of these developments most particularly because we have the great advantage of the City of London and the access that provides us and our clients to the capital markets.

My third point is the **culture and method of operating** in a country which can only really be understood and addressed by being there, preferably in partnership with a local organisation.

However, the topic of partnership is more appropriately covered during my discussion of business factors that affect competitiveness so let us move on to these.

Business Factors

So how might we improve the international competitiveness of our businesses? I believe that there are at least five important factors to grapple with:

- strategic planning;
- continuous process of performance improvement;
- partnership;
- the application of new technology; and
- a real desire to satisfy customers.

Firstly, **strategic planning**
When strategic planning arrived on the scene in the mid 1960's, corporate leaders embraced it as the best way to devise and implement strategies that would enhance the competitiveness of each business unit. True to the scientific management pioneered by Frederick Taylor, this one best way involved separating thinking from doing and created a new function staffed by specialists: strategic planners. Planning systems were expected to produce the best strategies as well as step-by-step instructions for carrying out those strategies so that the doers, the managers of business, could not get them wrong. As we now know, planning did not exactly work out that way as strategic thinking and strategic planning became confused. Planning cannot generate strategies, but, given viable strategies, it can programme them and make them operational. Whilst ensuring that the programmes produced are flexible enough to adapt to changed circumstances one must not underestimate the time and effort required to put them into operation. I think that the words of Mr Yoshiro Obayashi, the Chairman of Obayashi, are worthy of being quoted here when he said "Our vision has set the direction. Our management is aware of the company's priorities and has begun the time consuming process of aligning every employee and every subsidiary company towards our goals".

At Tarmac also, we have a vision of what we want to be, where we want our business to go and we are now pushing through the implementation using amongst other things **continuous performance improvement** programmes which brings me to my second point.

I am aware that this is a topic that Paul Le Blond of BAA is scheduled to cover but there are a couple of general points I would like to make now.

The first is that continuous performance improvement is continuous. Key tasks have to be identified, the programmes developed have to be monitored, deadlines have to be set and momentum and focus has to be maintained. As Mao Tse Tung said "A journey of ten thousand miles begins with a single step". If we are to improve the competitiveness of our businesses we must make sure that the steps that follow are taken too.

My second point is that continuous performance improvement involves continuous change. We must ensure that the people in our business are involved and understand why we cannot remain the same. And from personal experience, I know it is a difficult message to get across. Change is not easy as the philosopher Maeterlink said "At every crossway on the path that leads to the future, tradition has placed against each of us 10,000 men to guard the past". How true that is, but we must get past the past to have any change of improving our future competitiveness.

My next point is about **partnership**, as I mentioned earlier, and here I would like to distinguish between a partnership which is set up for a one off project and a partnership which is a long term commitment to a market or a country. As an example of the first, the construction of the Channel tunnel would have been impossible without a genuine partnership of groups and individuals pooling their skills, knowledge and enthusiasm. From the first idea proposed in 1820 which saw horse-drawn carriages, lit by oil lamps, galloping through a tunnel, it took over 160 years for the existing scheme to take off.

But then in 1981 the first part of a UK partnership was formed - using incidentally as its basis, an original design by then owned by Tarmac! The pros and cons were discussed with a speed and originality of thinking never before achieved. As this example indicates, a modern partnership is not necessarily permanent. It is fast moving, helping people with different skills to come together to meet a specific challenge and then dissolve and separate when the job is done.

The second form of partnership is one that is focused on obtaining local knowledge in pursuit of geographical expansion or marrying technical know-how with other required expertise. In the UK, for example, to address the new requirements of Design, Build, Finance and Operate roads a number of groupings have been formed by companies which all bring something unique to each group; certainly to ours. One of the benefits of these groupings is the opportunity to pool talents and energies and to generate real and fresh ideas that would not be possible for one partner alone. That is partnership.

The fourth important business factor is the **application of new technology**. Even simple projects today are increasingly sophisticated. Technological advances, for example in energy management systems, have made new demands on those who are responsible for designing, constructing and maintaining a building. Information technology and the associated systems must be used to ensure that, in the construction phase too, the right information is where it is needed at the right time, and that the flow of communication between project team members is seamless.

But, new technology is not just information technology, and I believe that there may well be a lesson to be learned from the major Japanese construction companies who spend something like half a percent of their sales revenue on research and development compared to 0.1% in the USA and an hardly measurable amount in the UK. Generally speaking the Japanese research is not basic research, but product development which will, they hope, provide them with a unique product, system or design that can act as a marketing tool to retain existing clients and attract new ones; or, it provides assurance that the contractor is providing the best possible product to his valued long term clients; or, perhaps it promotes a worldwide industry image of being at the cutting edge of building technology. If we, in the UK, are to improve our

competitiveness and attractiveness we must, as a minimum, increase our expenditure on product and service development and certainly in Tarmac we are doing that right now.

And finally **satisfying customers** and creating a business which listens to and works closely with its clients over the long term and strives continuously to improve productivity, quality and real value for money. And here I draw upon recent research undertaken by The Business Round Table Ltd who have compared construction performance and cost in the UK with mainland Europe and found, amongst other things, that:

- the mainland European contractor's greater authority on site allows him to deal with problems more expeditiously thereby reducing to a minimum any loss of time.

- the more liberal approach to the use of standard designs in mainland Europe allows a wider use of system building and with it a saving of cost.

- in many cases the customers' requirements in the UK lead to over specification of services with resultant cost penalties.

- the number of staff required on mainland European sites is about half the number used in the UK, resulting in fewer interfaces, less confusion and reduced costs.

- and finally, there is very little encouragement given to site supervision in the UK to seek ways to improve productivity and to put their new ideas into practice.

It is essential, and here I speak as a UK contractor, that these messages are heard and acted upon if the competitiveness of UK construction is to be improved.

And so, to summarise my comments about what companies themselves can do to improve their competitiveness, it is clear that they must seek every opportunity to listen and talk more to their customers if they are to increase efficiency and reduce costs. Only by identifying and implementing the right strategic direction and by adopting an attitude of continuing performance improvement, aimed at improving productivity, quality and value for money can they expect to secure a winning position in the international construction market.

Conclusion

And so in conclusion let me reinforce the points that I have made.

If European construction companies are to win in the global construction market they must recognise that there are national factors which they cannot control but which they must recognise and incorporate into their strategic thinking.

With respect to the business factors that are within the control of individual companies, I highlighted five key factors that they must get right if they are to have any chance of winning in the global construction market and they are:

- firstly, it is essential that every company has a **strategic plan**, a road map, that converts their vision of the future into reality utilising the critical success factors which each has clearly identified.

- secondly **continuous performance improvement** programmes should be implemented to enable every business in the portfolio to welcome and manage change, so that improving performance is accepted as a regular activity.

- next is making the right **partnership**, which can provide the opportunity for a business to broaden its offer, to provide the additional services that its clients want and to extend geographical boundaries.

- fourthly I mentioned new **technology** - probably the next decade's most important factor in reducing cost by improving the design and management of construction projects. To win in the global construction market modern information technology and communications systems will need to be kept constantly at the cutting edge. It will also be necessary for us, in the UK, to invest more than we are already doing in research and more particularly, development.

- and last but not least we must be more **customer friendly** - the commissioning of a construction project must not only achieve the time, cost and quality aspects expected by the customer but, dare I say it, should be an enjoyable experience. To achieve this objective requires all our employees to be free to increase their personal input into the process.

That finishes my presentation except for one final point, the final piece of the jigsaw. To win one must wholeheartedly commit to the game.

It is not possible to know the outcome of a new venture of this magnitude at the beginning; certainly not in our industry if one is affected by even as few factors as I have touched on. Winning in the Global Construction market will require strong leadership, stamina, flexibility and no small measure of luck - I wish a good measure of them all to each of you and to the teams who work with you.

DISCUSSION
EUROPE'S GLOBAL COMPETITIVENESS

Chairman: Peter Koch, Shell Internationale Petroleum

Question 1 Chris Marchant, British Gas
I have been fascinated by the presentations in session 1, starting with the keynote address by the Portuguese Minister of Industry and Energy. The message appears to be that in order to be successful, and retain its competitive edge, the European construction industry has to be more focused on delivering what the customer wants. Much has been said about the need for R&D and training, but they are no good unless they are focused on what the customer wants now and in the future, and aimed at making radical improvements. In the UK, far too much of this type of debate and research are academically pursued rather than being customer focused and I suspect that the same is starting to happen more in Europe. How we can ensure that the work that we do in these areas is truly focused on the customer ?

Neville Simms, Tarmac
This is an important development which has only appeared in the last 10 years and has started to mature in the UK. For the first time ever, the Tarmac Group has gone out and surveyed its customers. We surveyed our employees which was itself an original step, and after that we were brave enough to go out and survey our customers. That was revolutionary, but I would like to make a more fundamental point. The construction industry has a number of mature customers, and British Gas would obviously fall into that category. But most construction work is done for immature clients, people who do it once or not often. It is at that interface that we as an industry should do something. Customers like British Gas and National Power are mature and equal in the exchange that goes on between a big construction company and a client company. But in the area where a person impacts with the construction industry maybe only once in their lifetime we have to become a much more customer -friendly and customer-oriented industry. The strong focus on customers differs according to whether the client is a mature customer or one of the bulk of the customers out there.

Question 2, A Delegate
My question is directed to Dr Weissenberg and relates to the difference between words and deeds. The words heard at this first session about reducing the public sector share of GDP and dismantling public sector monopolies are all very well, but the reality is somewhat different. Politicians in many Union countries are still focused on national competition issues rather than competition issues of the Union. The Commission itself is perceived as being more concerned with regulation than deregulation. In many cases these regulations reflect the structure of the Community in the 80s rather than the markets which the Union faces today. In this respect the quotation by Maeterlinck about 10,000 men guarding the past used by Neville Simms is particularly appropriate. The ECI has compiled a manual [*Guide to European Community Directives*, Publication TF009/1] summarising the single market legislation of the European Union.

Dr Weissenberg, European Commission
Let me say, if I may be blunt, we consider the internal market not as an operation of regulation but one of deregulation. The European Union has the choice whether to regulate 12 markets, i.e. with 12 different sets of national legislation, or to have one European legislation instead of 12 in order to achieve an internal market. We consider that deregulation, not regulation. - Let me give you an example which was raised during the subsidiarity debate, drawn from the car industry. It was argued, in Great Britain and elsewhere, that different national regulations should be accepted on car admission. If you want to register a car you need an admission. We replied that the issue had nothing to do with subsidiarity. Ask a car maker in Europe what he wants and he will say economy of scale. He does not want to produce to 12 different national standards. Car manufacturers asked for single European Legislation, and the consumer is happy, about it too. Somebody living in Palermo who wants to sell his car in Great Britain does not need to go again through British legislation, and vice

versa. There are many examples proving that the internal market is something that brings less bureaucracy and less regulation.

Question 3 Karlheinz Zachmann, EC Commission
The system of environment restoration contracts described by Professor Movenzadeh sounds very attractive. Can European contractor's enter the US market or is it a closed shop?

Professor Moavenzadeh, Massachusetts Institute of Technology
The market in the US is at present wide open and several European companies are operating in the US environmental market. They are bringing technology to the US as well as financing. Unfortunately, a couple of the major financing projects undertaken by the Europeans in the environmental area were not so successful because of the regulatory systems that were put in place in the US after the projects were undertaken. Take the case of Swiss companies that were financing a 200 million dollar incineration plant. By the time the incineration plant was finished and ready to operate, the legislation changed and required that incineration plants should be subject to the same environmental restrictions as power plants. The plant is not yet operational. But to return to your question, the market is wide open and quite a few alliances have been developed between European and the US companies.

Question 4 Mark Lane, Masons
I want to pick up on Dr Weissenberg's definition of deregulation. While it contains a measure of truth in certain respects it is a slightly distorted view of what deregulation and regulation are all about. In certain cases you are replacing 12 sets of rules with one, and I agree that that would amount to a simplification in that regulatory area. But it is equally true that a large number of these 130 plus directives which appear in the ECI guide to EC construction directives impose a regulatory regime in EC countries where none existed before. For these contractors that have to operate that system, it is an increase in regulation. You only have to look at the procurement regime. Those who have to deal with it would probably take the view that there has been a very significant increase in the amount of regulation that applies to the letting of contracts, without any appreciable benefit in terms of cost reduction. So your definition of deregulation is perhaps a little narrow. The other point I want to pick up on is one of the environment. In relation to the pan-European infrastructure and transport projects, you talked about the need to shorten the delay in the debate on environmental issues. How does that measure up with the idea of subsidiarity ?

Dr Weissenberg, European Commission
Let me take the first point in which you are completely right. In some cases in member states the overall result is more legislation. When we first started to harmonise, we tried to harmonise everything until 1987 leading to such famous examples as the length in centimetres of the European chicken. This notorious total harmonisation all over the European Union was stopped. It was simply nonsense and everybody agrees that it was exaggerated. When we took a different approach and adopted a court of justice rule, cassis de Dijon by which a product which circulates freely in one member state can circulate all over the European Union. That was an important step, reducing our need for harmonisation to only essential requirements. The rest was up to industry for standardisation.

Let us be honest about harmonisation and subsidiarity. I can give you examples of areas in which the European Commission does not want to harmonise, but where member states, including Great Britain and Germany, are asking the European Commission to propose legislation for the Council of Ministers. The problem is a more complex one. It is not only within the European machinery itself that people are eager to decide what to harmonise next. Some member states are also asking us to harmonise. And the Rome Treaty requires the Commission to ensure the free

circulation of goods and services, and if this can only be done by harmonising essentials and requirements, then we have to do it.

As far as the environment is concerned, may I first make a general remark. Even today industry sometimes sees environment regulation as a threat to competitiveness. Two years ago we discussed the problem in Brussels and decided that it is less and less true. Environment requirements may become a factor stimulating additional competitiveness under certain conditions. One problem is that those who produce laws in the capital cities of the European Union change the rules too rapidly. That was certainly the case in the past. The European Commission stated that a good industrial policy means a predictable framework for enterprises. If you are putting a high standard in your environmental legislation, industry will accept that. But industry cannot accept the requirements being changed every year. That was our contribution to industrial policy.

The question of trans-European networks has nothing to do with subsidiarity. No member state can develop them no its own. The trans-European network is the best example of a problem that cannot be resolved by individual national responsibility. The national high-speed trains have implications for the whole of Europe. If, for example, two big member states, France and Germany, are spending money on two high speed trains inside the European Union, our task was not only to fill in the missing links. Our task was to say, let's think European. If you think modern European, then you have to develop the high-speed rail network on a trans-European scale, extending also to countries of eastern Europe which are not members of the European Union.

Question 5 Granville Camsey, National Power and ECI
Dr Weissenberg is the first member of the Commission who has encouraged me enormously, notably by his example of how a state cannot be successful if it thinks of its transport and high-speed train in isolation, and how the European Union can add enormous value to Europe as a whole. Professor Moavenzadeh drew attention to the opportunities for the niche market player, and the need for large enterprises to network and to change organisationally by banding together. Let me just accept that as a good idea. Neville Simms then suggested that franchising an in-house competence which is of enormous value to the corporation but perhaps not fully used is a means of bringing greater business and increasing shareholder value. Again that is a very good idea. But a paradox lies in the fact that both notions imply selling intellectual property and providing other companies with the knowledge, research or other means by which they can succeed in competition with you. The inevitable outcome of that is decline unless you put other new business in place and can guarantee some other market leading edge potential. I am arguing that you are selling your seed corn.

Professor Moavenzadeh, Massachusetts Institute of Technology
If I understand the question, your concern is that by networking and sharing information a firm may lose its competitive edge in terms of the know-how that is embedded in the firm itself. That is not quite appropriate to the types of model I discussed. Let me explain it in the following way. There are a large number of issues that are of interest to a group of firms collectively. These issues will affect them all uniformly to their own advantage or disadvantage. These firms have traditionally banded together either to promote that particular area of interest or to fight some particular legislation or other activity that it may influence. In this area they have recognised that it will not affect their core competence. In the type of networking that I was referring to similar situations exist. Individual competencies are complementary and therefore are not competitive. If, for example, a firm needs financing for a project and has a relationship with a financial institution, the firm does not need to go each time to a different financial institution and make an arrangement for a particular project. It will draw from the same financial institution which it has established

precedence. In that situation there is no question of learning each other's secrets or trying to poach the other's competitive market.

Let me extend this argument to two firms that are rather similar but operating in different markets. In the United States we have a large number of regional firms. These firms have work of the order of 200 to 500 million dollars annually, operating in Boston, Cleveland, Chicago, Texas, or wherever. By and large they have similar clients with similar requirements. At present these firms have no mechanism to learn from one another or to provide a better service to the client. Take the example of a client like the Hilton Hotel chain which builds hotels in all these different regions. If these contracting firms could come together collectively and develop a set of agreements and protocols among themselves that service Hilton Hotel, Hilton Hotel will save money by signing a single contract with that group of firms. Whenever it wants to establish a hotel, the particular firm in that particular region will serve that hotel. It is not the secrets of the firms that are being shared. It is market information that is being shared. The same principle would apply if the group of firms wanted an improved elevator system. Individually the firms cannot put pressure on Otis hotel elevators to develop a better hotel elevator system because each one buys only five or six elevators per year. Collectively, however, the firms have a purchasing power of several hundred elevators a year and Otis will listen to them and will produce the type of facility they need. So it is in that domain that I believe co-operation can be developed. Individual secrets would remain secrets.

Neville Simms, Tarmac
I agree, and I am prepared to take the argument a stage further. I don't believe that there are many secrets left in this world certainly not at the level that I operate at in the construction industry where heavy building materials are used. There is expertise and experience, but they are not pure secrets. A useful way of doing business is to capitalise on that, and I am quite prepared to sell the secret, if it is deemed to be a one of the management technique or build-up of expertise over the decades. It is a spur. Here in Europe we are a low growth economy, and can't compete on wages. Very soon we won't be able to compete on knowledge and services unless we stay ahead in these areas. There is no greater spur to be further ahead on knowledge and services for the developed Western world than to pass the knowledge and services you have on to the other economies and move on from there. That is exactly what we have to do. There is help to be gained from the fire behind as well as the carrot in front.

Question 6 Joseph Chriqui, GEC Alsthom
Mr Simms said in his presentation that his industry must be more customer friendly. Does that mean that civil work industry is planning to move away from their alleged desire to improve their poor record on claims.

Neville Simms, Tarmac
I can give you a simple answer, which comes down to turnkey projects. One of the ways in which a full service contractor will deal with his customer is through a turnkey contract. That is an eminently sensible way for a client to buy his business and is much more clear cut than it was before.

Question 7 Eberhard Reuss, Mannesmann
Towards the end of his presentation, Professor Moavenzadeh elaborated on an instrument often used by American companies to limit their liabilities, namely to form a daughter company or independent company which is wholly owned by the holding. This might not be feasible everywhere. In Germany, where wholly owned companies consolidate their annual turnover in the holding's annual account, the holding company would automatically be liable for all the obligations and liabilities of the wholly owned company and such procedure would not help to limit its liabilities. I am not sure whether this also applies to other European countries.

Secondly, may I ask if it is better to offer the client a liability treasure box which is rather empty or a liability box which is full but has a restrained policy about entering into liabilities?

Professor Moavenzadeh, Massachusetts Institute of Technology
I am not familiar with the regulations system in Germany so I cannot comment on the nature of liability there. On the question, of the treasure chest, ironically that many clients would like to deal with an empty chest because it is not the client who will eventually sue the contractor for the work that he did, it is the public. In other words, highly qualified contractors are not at present getting involved in highly risky environmental projects. Those who are involved either do not know what they are doing or the cost will be very high. So the client wants to encourage the experienced contractor to enter into the market, knowing that this experienced company is very concerned about the future liability and future law suits by NGOs or any public group against its performance. It is therefore understood between the client and the contractor that by separating the activity and putting it outside the reach of the potential public suers, this will encourage the knowledge and know-how of that contractor to be brought to bear on the project and the cost to the client would be low.

Question 8 Jim Grevatt, UK Dept of the Environment
I would like to come back to the question of very large companies using networks and franchises. It seems to pose interesting questions for clients, particularly public sector clients, over pre-qualification, insurance and liability. Are there any signs that public sector clients have begun to come to terms with these new concepts?

Professor Moavenzadeh, Massachusetts Institute of Technology
The US Army Corps of Engineers, which is a public agency would be very interested in having that type of network for its environmental reclamation programmes. They have to clean up thousands of sites in different locations. They cannot enter into separate agreements with thousands of different firms and would like to see that type of pattern developing, with a shared set of standards and strategies so that firms learn from one other and work together in the restoration of those sites.

Neville Simms, Tarmac
Government has been, maybe unwittingly, complicit in what has been happening. Most major contractors do not now keep their own workforces. They take on board small subcontractors. They carry the full responsibility and provide the insurances and bondings, and so a network is already being used. It is an extension of that network one stage further offshore, depending on where the assets of the various business are going to be held and so on. It will be some time before we finally work out what the relationship of the mother hen and its chicks will actually be. In some instances, the mother hen will take a large slice of the risk and the reward, in other cases it will take a small slice of the reward and smaller risk. But the British government has already taken a quite significant move down the line of smaller chicks doing the work and the mother hens still carrying all the risk.

Question 9 Bob Scott, BP Exploration
I believe Professor Moavenzadeh suggested that there is a trend for clients to look towards having projects done on a fixed price basis. Speaking as a pretty large client, that seems to me totally contrary to the whole notion of continuous improvement. I can understand why some clients would wish to have a fixed price at the outset but there seems to be a paradox and if you are serious about continuous improvement, it is something that occurs throughout the life of any project. Does Professor Moavenzadeh have any views on this statement ?

Professor Moavenzadeh, Massachusetts Institute of Technology
The notion of the fixed cost on environmental projects is becoming rather popular simply because cost plus or any other type of contracts have lost their meaning when you get into an environmental project. In my opinion the fixed cost does not have anything to do with this notion of introducing new technology or improving productivity. As productivity increases and the firm becomes comfortable with its profit margin, it becomes willing to lower that profit margin to something that the market bears and therefore will not rule itself out of the competition with its competitors who also could enter into the same fixed cost competition with him. So on a project by project basis it is comfortable for the client to know what the upper ceiling is rather than going into a very open-ended contract.

Peter Koch, Shell Internationale Petroleum
I will make my summary of this first session very short, and restrict myself to three remarks. Two watchwords summarise the session. One is high-tech and the other is change. A thread running through the presentations has indicated that these may be the words to watch in future. An economy at the threshold of the 21st century will be defined by its capability in high-tech sectors. This is not a new realisation and has been relatively true of earlier periods, but in our times of highly sophisticated technology, where computers are about to speak, TV sets about to listen and telephones about to transmit pictures, high-tech is no longer something you can take or leave. We do not have an alternative option. That is also true of course for the construction industry, especially in a continent where we have to live with high wages and high costs.

The second watchword is change, pinpointed especially in the contributions of Professor Moavenzadeh and Mr Simms. Clients have changed their behaviour. Markets have changed the rules of the game, both geographically and as far as the types of market are concerned. The environment, infrastructure and high-tech are the areas to concentrate on. We would be well advised to adapt our organisations and behaviour to these changes.

My third remark is directed to the political side, which I would like to see tackled in actions, not words. The competitiveness of Europe has been dealt with in hundreds of speeches dozens of reports and the work of numerous committees and groups, such as those of Christopherson and Bangemann. I don't think we need any more of them, especially as these international committees work in time-consuming and cumbersome ways. I heard a somewhat cynical remark the other day on the slow progress in one of these groups. 'If Moses had been a European committee,' said the critic, 'the poor Israelites would still be in Egypt'.

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EUROPEAN CONSTRUCTION COMPETITIVESNESS - THE ROLE OF THE EU

Session Chair: Ronald LeBright

Chief Executive Europe
ABB Lummus Crest Inc.

RONALD LeBRIGHT
Chief Executive Europe
ABB Lummus Crest Inc.

BIOGRAPHICAL DETAILS

Ronald LeBright has thirty five years experience in the process plant contracting industry. He currently holds the position of Chief Executive Europe with ABB Lummus Crest Inc.

Ron was educated at Stevens Institute of Technology where he attained a Master of Engineering Degree. He spent two years on active service with the US Air Force where he rose to the rank of Captain. He started work in the construction industry as a Senior Engineer with MW Kellogg. He has since held senior positions including that of President and Chief Executive Officer with many leading companies in the industry and has been responsible for major projects built in several parts of the world.

Ronald is a member of the American Society of Chemical Engineers, the American Management Association and the Presidents Association.

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EUROPEAN CONSTRUCTION COMPETITIVENESS - THE ROLE OF THE EU

Ronald LeBright
Chief Executive Europe
ABB Lummus Crest Inc.

The earlier conference session has examined the question of Europe's global competitiveness. They have taken an international perspective on how the construction competitiveness is viewed and how the competitiveness can be improved. This has been considered from an industry point of view and from that of an international contractor. We have also discussed and reviewed European policy and the impacts of policy relative to competitiveness. In this session we want to continue to examine the role and policies of the European Union mainly in relation to assisting its construction industry to compete, to retain its domestic market share and hopefully to increase its international market share. The question we will focus on is does the EU and its policies facilitate the competitiveness of our industry recognising the unique features which we have.
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EUROPEAN CONSTRUCTION COMPETITIVENESS - THE ROLE OF THE EU

Karlheinz Zachmann

Head of Construction Unit
Directorate General III/D-3 Industry, European Commission

KARLHEINZ ZACHMANN
Head of Construction Unit
Directorate General III/D-3 Industry, European Commission

BIOGRAPHICAL DETAILS

Karlheinz Zachmann was born in 1936 in Mannheim, Germany. He studied business economics at Mannheim University and graduated in 1963 as Diplom-Kaufmann.

In 1964 he entered the services of the European Commission. For three decades he has been in charge of a great variety of initiatives for technical harmonisation in view of the elimination of technical barriers to trade. For about 15 years he was especially in charge of the mechanical industry where, besides technical harmonisation, he also handled matters related to industrial policy.

Since 1989 Kh Zachmann has been head of the Construction Unit in Directorate General III - Industry. The primary tasks of this unit are the technical harmonisation of provisions with respect to construction products, the development of strategic policy and likely actions as a follow up to the strategic study of the construction sector, and the study of needs and possibilities for harmonisation action with respect to responsibility and liability in the construction sector.

The unit is also involved in a multitude of other actions and initiatives putting forward the position and viewpoint of the construction sector. A close and permanent contact is kept with the relevant European federations and associations.

EUROPEAN CONSTRUCTION COMPETITIVENESS - THE ROLE OF THE EUROPEAN UNION

Karlheinz Zachmann
Head of the Construction Unit
Directorate General III/D-3 Industry, European Commission

It is a well known fact, which I hardly need to develop in great detail before this audience, that the construction sector, comprising all sub-sectors and branches, is besides informatics and telecommunications, the second most important industrial sector within the European Union. On the other hand the construction industry, comprising contractors and manufacturers of construction materials and products, counting for more than 1.8 million enterprises, is composed to about 97% of SMEs. Construction, being active from the local level up to world wide projects has also a very high multiplicator effect but is also extremely sensitive to all kinds of fluctuation of our economy.

The Commission, I can assure you, is aware of the importance of this sector. That is why, in the frame of its communications programmes and actions, construction is fully included and duly taken into consideration.

Before the EU Treaty of 1991, industrial policy meant for the Commission only the orientation and reorientation on a non-formalised basis all the available funds, programmes and initiatives to cope with needs and constraints of industry and especially of some of its most sensitive sectors such as coal and steel, textiles and shipbuilding.

Now, for the first time in Community history there is a formal base for a common industrial policy by recognising industry in EU Treaty. But the question then is, how can and must we develop and push such a common industrial policy? In fact in the spirit of the Union Treaty industrial policy is understood primarily as the concept of competitiveness policy.

This is fully in line with the political orientations of the Commission laid down in its communication of 1990, where, in addition to the principles of a competitivity policy, it is expressly stipulated that this will be a horizontal policy rather than sectoral policies, an approach of concertation rather than of unification, a policy based on the correct functioning of market forces rather than of interventionism. Without doubt, the construction sector has to be aware of these principles and the general frame set out.

After 1992, when more or less the Internal Market had been achieved, fulfilling the 1985 programme set out in the specific White Paper, the apparent and fundamental crisis of our economy led the Commission to make the Member States of the Union aware of the need for concerted action with respect to growth, competitivity and employment. Under the title of these 3 key words the Commission presented its statements, visions and suggested strategies and likely remedies in a White Paper of 1993 to the European Council at Corfu.

By way of formal conclusions, the Council gave its support for an industrial competitivity policy favouring growth and employment.

In this respect the Council approved the proposals of the Commission to proceed to a series of specific orientations and analysis such as:

- to place European enterprises into a global and independent concept of competition;
- to exploit the competitive advantage of dematerialising the economy
- to favour stable industrial development;
- to lay great stress upon the intangible factors of competitivity such as management, organisation, know how, human resources, education and training, quality and quality assurance, research, development and innovation as well as the rapid diffusion of the results thereof;
- to favour the introduction by industry of new technologies and informatics;
- to encourage necessary structural adjustments;
- to create a better environment for the setting up and functioning of SMEs, not least by deregulation and adaptation of legal provisions, as well as to stimulate and better the relation between large enterprises and SMEs (e.g. subcontracting).

Furthermore the European Council advocated a reinforcement of competition within the Internal market and the availability of means for strengthening of emerging markets.

Faced with such a general catalogue of recommendations and suggested actions and measures, it is quite clear that all industries and branches, and certainly not least the construction industry, are directly concerned and implicated. I can see therefore hardly any of the items cited where there is not a direct interest and concern for the construction industry and its enterprises. But what is up to now the real effect? As far as the Internal Market is concerned, I dare say that the legal harmonisation, be it technical, be it free movement of capital, goods and persons, is quite advanced, but still a lot more has to be done. In this respect I remind you of the awaited "secondment" of Workers Directive. On the other hand Directives such as that on construction products or Directives on public procurement are still too recent to give a real evaluation of their effects.

However, the Commission as well as the Member States, are aware that now, when most of the 1985 White Paper Programme is completed, the assessment and control of application and likely adaptation and simplification of Community rules are indispensable. That is why special initiatives for application surveillance and for deregulation are being launched and a series of studies on specific industrial sectors are planned with a view to completing and verifying the assessments of the well known Cecchini-Study on the costs of non Europe.

Without doubt qualitative assessments are easier to achieve than the often requested cost-benefit analysis, especially when no useful statistical bases exist or at least are not made known.

For the time being, though, as it stands now, neither the construction industry as a whole nor a specific branch are the subject of the emerging pilot studies.

Coming back to the conclusions of the Council on the White Paper on growth, competitivity and employment: this sets out, with respect to competitivity issues, 3 major directions

- deregulation, simplification and coherence of Community legislation,
- creation of an adapted environment for SMEs and
- building up the Trans European Networks.

The industry as a whole on the one hand as well as national and branch federations on the other have reacted to these conclusions and orientations. On the one side they approve recommendations and efforts for the strengthening of industrial competitivity, especially with respect to research and development, education and training. On the other side they stress from their point of view the need for real

deregulation, revision of taxation policies, consideration of reduction of social and labour costs and of augmentation of labour force flexibility. Here, I think, big and small enterprises of the construction industry share this view. What is more all concepts, I have to remind you, have to be understood under the general concept of non-interventionist and market forces based on political setting of the framework conditions.

Following a formal invitation from the Council to the Commission to present orientations and actions with respect to the strengthening of the industrial competitivity, the EU Directorate General III, in collaboration with industry have worked out several months ago a communication on industry competitivity policy which was presented by Commissioner Bangemann to the Council, EP and ECOSOC as well as to the Committee of Regions. This means in fact that the debate on the White Paper orientations will go on with a view to setting in the near future priorities and a relevant action plan.

According to Mr Bangemann, despite the progress already made in some industrial branches - e.g. automotive and shipbuilding - a lot of effort by industry and the authorities has still to be made.

The said Communication put the accent on 4 priority actions:

- to promote non-material investments such as know how, modern education and training, especially up to date methods of management and marketing, quality assurance and multi-disciplinary market assessments and use of research results, and to develop an integrated concept for intellectual property, etc.

- to develop industrial co-operation especially cross-border and cross-sector co-operation, in particular in the field of research and development, the creation of adequate communication structures such as Forums and Round Tables and co-operation arrangements with 3rd countries, especially eastern European countries;

- to strengthen competition within the Internal Market of the EU as well as in 3rd markets. The counterparts of "free trade" are "fair competition" and "fair trade". In this respect all Community efforts must be made for opening up markets that are still closed. Here certainly we can quote as a good example Japan when thinking of the construction sector. Furthermore via an "Industrial Assessment mechanism" any problems or obstacles to free trade with 3rd countries can be defined and tackled. On the internal EU side a strengthening of competition and subvention control mechanisms as well as taxation harmonisation and simplification will be on the programme;

- to modernise the role of public authorities by advocating an active deregulation policy and by eliminating barriers to free circulation and industrial activities, by favouring administrative co-operation between Member States especially with respect to the functioning of the Internal Market and by taking advantage of the structural financing instruments of the EU to anticipate and accelerate necessary industrial changes.

When presenting this communication and the large range of actions and measures suggested and intended, Mr Bangemann stressed that the catalogue is not exhaustive but primarily dictated by the availability of means and by priorities ahead.

What is more, this communication is based on the integrated approach of information exchange, co-ordination and co-operation between the Commission, the Member States, industry and social partners. Only under this hypothesis can the wide range of measures and actions by tackled and may lead to rapid tangible success.

This is also the message to the construction industry, its managers and its federations and associations, which will need in the future, I dare say from now on, much more activities of assistance, information and co-ordination to achieve, than has ever been the case before - if industry is to be able to demonstrate its maturity in self-administration and self-regulation. The challenge is high and could easily be lost by passivity, of short sight and irresponsibility in view of the fundamental needs of our society.

At this moment there are silver linings on the economic horizon for recovery and a lot of politicians and economists could quickly forget the priorities of actions set out. President Delors in September 1994 underlined that even when we pass this most recent crisis, nothing will be as it was before. All our industries - I dare say also the construction industry - have to adapt to the structural and fundamental changes we are seeing, be they economic, social, ecological or technical. Neglecting these could be disastrous should a new crisis come.

The challenge is thus also high for the construction industry as a whole. With all its SMEs it must know better where it stands. That is why already in 1991 - even before the White Paper on growth competitiveness and employment, DG III and its construction service launched a strategic study of the construction sector.

This is not the place to develop the execution and the findings of this well known study, which has already been presented on an earlier occasion of an ECI meeting. Therefore only a few remarks need be made:

According to the Atkins report, the basic characteristics of the construction market can be described as follows:

It is heterogeneous in almost every important respect. It consists of separate nations with old and highly developed cultures. The creation of the single market seeks to remove those differences which restrict trade. However, at present the EC construction industry consists of many very different local industries, each of which reflects a distinct local culture.

As you may be aware, as regards Europe, there are strengths and weaknesses that can be summarised in a nutshell, as follows.

Strengths: Europe produces world class architecture. Its construction industry consists of separate national industries, some of which have distinct strengths, e.g. consistent quality. Some large contractors are emerging, mainly as a result of mergers and acquisitions. Much innovation comes from the manufacturers of materials and components. The single market will enable diversity to become a strength rather than a weakness, by stimulating change and innovation while retaining variety. Its concern with environment is creating advantages in environmental technologies.

Weaknesses: The EC has too few world-beating construction firms. Many, but not all, countries have too many weak and uncontrolled very small firms which bring down average quality levels. Fragmented markets have prevented the development of industry standards for products, and many product sectors are unable to take advantage of economies of sale. Very often the tradition, legal and bureaucratic environment is too rigid, not giving sufficient economic flexibility.

This study, which fits in well with the general Commission reflections on growth, competitivity and employment, is aimed to be primarily a tool for the industry and their relevant associations, to take the necessary strategic measures in order to cope

not only with the short run crisis but also with the medium and long term likely developments.

Following the findings of the consultant, the competitiveness of the European construction sector, compared to other countries, is not to be seen as a real problem at least for the moment. EC industries on the whole are as good as those anywhere in the world, and in many ways much better. Europe has a very diverse and attractive built environment, although with many severe needs for urban renewal, infrastructure and housing improvement. Europe's contractors and consultants are successful world-wide - much more so than Japanese, and US firms which compete only in a few activities (heavy engineering, contracting and high-rise commercial projects). There are some lessons to be learnt from both the USA and Japan on major projects: the economies of standardisation of components and designs in the USA, rigorous management of time and quality performance in Japan. At the level of the great mass of small local projects, however, each has a sector adapted to local conditions.

The level of import penetration in construction is not a major problem either, although it is seen to be so by some sectors of the construction products industry in some countries.

There is, however, a belief in several countries that the industry is not giving as good a service as it could, because of low skills and training, poor cost and time performance in project management, problems of building defects and a slow adoption of new techniques.

There is also a specific problem of the vulnerability of small consumers to poor workmanship and business practices, particularly in those countries which do not have strict regulation of small builders and good control by architects or other technical control arrangements. Conversely, where strict regulation exists construction is often prohibitively difficult or expensive for small jobs.

On the supply side, the main concerns of firms in the sector can be summarised as:

- recruitment and skills problems, partly resulting from poor working conditions on site and a poor industry image;
- poor profitability, partly a result of characteristics of the market which lead to cut-throat competition resulting in inadequate investment in training and research;
- increasing costs due to stricter environmental, health and safety, and trade legislation.

A main question is, what is the competitiveness of the construction sector and industry?

The objectives of the study are to provide an analysis of the competitivity of our industry, to forecast construction activity in the 2000-2010 horizon, to evaluate the impact of the completion of the Single Market and other Community legislation and policies and to assess the need for new technologies. Its principal aim is to provide suggestions and recommendations to help the Commission and industry itself in setting up adequate future strategies for these sectors.

The study comes to the same conclusions, by and large, as the general Commission position on growth, competitivity and employment and the new Communication on industrial competitivity. The study is primarily intended to be a tool for the construction industry and their relevant associations. They should be put into a position to take the necessary strategic measures to cope not only with the short term

problems of the current crisis but also and especially to cope with the likely medium and long term developments.

The strategic study itself does not mean that now all will be well and at ease. Not at all. The study, its findings and recommendations have provoked within all parties and circles concerned an in in depth discussion and has led sometimes even to very critical reactions, especially with respect to the role of general contractors and the role of subcontractors, the likely declining position of independent architects and engineers, and with respect to the likely need for harmonisation of legal provisions concerning liability and guarantee.

The study, I am sure, will not quickly be put aside to gather dust or the bookshelf. A discussion and consideration has to be provoked which, as also this meeting shows, has started and will continue for some time. On the other hand, I think that even before the end of this year we must, in DG III, complete the overall assessment of the reactions and comments received and start to determine priorities of action.

In this respect we need the close and permanent co-operation and input from the industry and other circles concerned. Furthermore likely actions, be they from the EC, be they by co-ordination of Member States or be they by industry initiation via the relevant European Associations, must be placed in the greater context of the overall competitiveness policy for which at European level only the framework will be set, giving at each level to each entity its responsibility. Here the construction industry and all its different branches have to face a big challenge.

There is more for the construction sector than just the new incentives via the Trans European Networks, which count for 68 billion ECUs over the coming 5 years. As far as transport networks are concerned, ten projects have already been selected and it is expected that in this respect a final decision is taken at the European Council of Essen in December 1994. There is also the tremendous market for environmental work and the refurbishment of our towns.

Before any action from the side of the Commission and its services is taken, we consider it necessary to reassess findings, comments and priorities together in the framework of a future seminar or workshop. Afterwards there might be a specific communication from the Commission, as has already been the case for some other industrial sectors.

Following Mr Bangemann's suggestion, there may further attention given to the setting up of some sort of Construction Forum, preferably by using the already existing structures for the dialogues between the EC and the construction industry.

Neither the study nor the White Paper on competitiveness nor the paper on industrial competitivity will lead to a sectorial European construction policy.

But what we shall strive to achieve is a well structured and well organised dialogue, information, co-ordination and co-operation for the sake of this important sector of our economy.

The train has departed. Certainly it has not yet reached the next station or to use another picture: the new house has not yet got its roof, but the structure is underway and shows its shape.

Let's go on to construct Europe instead of demolishing or dismantling it by short sighted separate actions.

The future will know if we have succeeded or not.

EUROPEAN COMPETITION POLICY - DOES IT HELP CONSTRUCTION?

João Vaz de Araujo Franco

General Director
Siemens SA

JOÃO VAZ DE ARAUJO FRANCO
General Director
Siemens SA

BIOGRAPHICAL DETAILS

9 de Agosto de 1932, Lisboa
Casado com Henriqueta dos Reis dos Santos Bento Franco, 4 filhos.
Licenciado em Engenharia Electrotécnica (IST)

Administrador da Siemens desde 1975.

Foi admitido nos quadros da MOTRA em 1955, tendo nesta Empresa ocupado sucessivamente os cargos de Director dos Departamentos Técnicos (1965/67), Director Geral (1967/69), Vogal do Conselho de Administração (1969/73) e Presidente do Conselho de Administração (1973/86)

Foi Vogal do Conselho de Administração da INDELMA de 1975 a 1992.

Entre 1969 e 1971 pertenceu à Comissão Instaladora do Grémio Nacional dos Fabricantes de Material Eléctrico, de cujo Conselho Geral foi Presidente entre 1972 e 1974.

Entre 1974 e 1976 pertenceu à Comissão Instaladora da Associação Nacional dos Industriais de Material Eléctrico e Electrónico, tendo pertencido à respectiva Direcção entre 1976 e 1984.

Foi Presidente do Conselho Geral da ANIMEE entre 1984 e 1990, tendo desempenhado entre 1987 e 1990 o cargo de Presidente da Mesa da Assembleia Geral daquela Associação.

Foi Director da CIP - Confederação da Indústria Portuguesa entre 1975 e 1978; entre 1981 e 1990 e entre 1990 e 1994.

Actualmente é Presidente do respectivo Conselho Fiscal.

1984: Curso de Auditor de Defesa Nacional

Bundesverdienstkreuz 1. Klasse

EUROPEAN COMPETITION POLICY - DOES IT HELP CONSTRUCTION?

João Vaz De Araujo Franco
General Director
Siemens SA

Vou tentar, de uma forma muito rápida, expôr o ponto de vista de alguém que é originário de um País em que a Indústria de Construção é "A Indústria", um País em que uma ponte sobre o Rio Tejo equivale quase a 2% do P.I.B. (o orçamento do Ministério das Obras Públicas, Transportes e Comunicações é 1,7% do P.I.B.), um País cuja segunda cidade é Paris! (ali vivem quase 600 mil Portugueses, quase todos trabalhando na Construção).

Quais são as razões que diminuem a competitividade das Empresas de Construção na Europa?

A meu ver, são exactamente as mesmas que afectam as restantes indústrias europeias e as medidas que forem úteis para o conjunto da Indústria também, o são para a Indústria de Construção.

Correndo o risco de repetir o que eventualmente já aqui tenha sido dito, são as seguintes as causas que afectam globalmente a Indústria (também indicadas num estudo feito pela UNICE: Making Europe more Competitive - The UNICE Competitiveness Report 94).

1. **Envolvimento macro-económico instável e imprevisível**
   Todos nós podemos ver isso pela leitura das páginas económicas dos jornais.

2. **Peso do Estado muito elevado**
   O consumo público na Comunidade era de 36% do PIB em 1970; foi de 46% em 1980 e de 52% em 1993.

3. **Mercado de trabalho pouco flexível**
   As leis laborais e a sua rigidez tornam os custos do trabalho muito elevados, sem grande benefício para os trabalhadores. No princípio dos anos 70, o desemprego na Comunidade era metade do desemprego nos Estados Unidos e agora é 50% superior!

4. **Infraestruturas deficientes**
   Esta deficiência é bastante mais notória nas regiões periféricas da Comunidade mas a sua competitividade e eficiência está longe de ser satisfatória no conjunto da Europa.

5. **Competição inter-firmas limitada**
   A competitividade inter-firmas é o principal incentivo para melhorias técnicas e organizacionais. É necessário deixar crescer as firmas capazes e deixar morrer as incapazes.
   Isto aplica-se mais aos sectores dominados por empresas estatais.

6. **Comércio internacional limitado**
   A C.E. é maior potência comercial do mundo. Uma grande parte do emprego na Europa está dependente do comércio internacional.
   As últimas negociações do GATT e do Uruguay Round mostraram todas as dificuldades existentes.

7. **Inovação e desenvolvimento tecnológico incipientes**
   Está demonstrado que o factor mais importante (não é o único mas o mais importante) para a boa "performance" de uma firma é a qualidade dos seus produtos e serviços.
   O atraso das firmas europeias em relação às japonesas ou às dos E.U.A. é evidente,
   no investimento em R&D
   na difusão das novas tecnologias
   no tempo necessário para comercializar as novas tecnologias
   etc

8. **Dificuldades para o aparecimento e o crescimento das pequenas e médias empresas**
   Estas dificuldades são provocadas quer por factores exteriores como Burocracia, Regulamentação quer por factores próprios da Empresa: Pequena Capacidade Financeira, Falta de Informação, etc.

9. **Investimento baixo ou pouco eficiente**
   É um facto, quando comparamos com o Japão ou com os E.U.A. O aumento do investimento não significa porém por si só uma melhoria.

10. **Rendibilidade baixa**
    É um facto também quando comparado com o Japão e com os E.U.A. Não há uma razão única mas várias: alto nível de juros na Europa, em alguns sectores e em alguns países existência de um comprador único (normalmente o sector público). Em alguns sectores e em alguns países existência de concorrência por parte de empresas estatais sem qualquer preocupação de rendibilidade, etc.

Estes problemas são genéricos, aplicam-se a todas as indústrias e portanto também à Indústria de Construção. Estão todos interligados e é impossível actuar num sem actuar nos outros. Por outro lado, a resolução de todos estes problemas seria a resolução dos problemas de todo o sistema produtivo Europeu.

É evidente que as consequências não são as mesmas para a Indústria da Construção e para a Indústria do Calçado ou do Automóvel.

Posso importar um Automóvel do Japão ou um Tapete da China

Não posso importar uma Ponte sobre o Rio Tejo.

Também todo o processo técnico-comercial das Actividades da Construção é bastante diferente do do Automóvel ou do Calçado. Os Lobbies comerciais e financeiros; o domínio dos circuitos comerciais post-construção; o domínio da tecnologia da produção dos produtos finais no caso de instalações fabris; são elementos muito fortes para a protecção da Indústria Europeia da Construção.

Parece-me, pois, que as Empresas de Construção são comparativamente bastante competitivas, o que quer dizer na realidade, <u>estão comparativamente bastante protegidas</u>.

E o futuro?
Bom, o futuro a Deus pertence. Nós podemos dar-LHE uma ajuda, porém.

Como?
Resolvendo a pouco e pouco os problemas que atrás foram apontados, tendo em atenção que uma medida proteccionista que não seja temporária, especificamente para uma determinada indústria, podendo dar bons resultados a curto prazo, será bastante prejudicial a longo prazo por adulterar as leis económicas.

Em meu entender, no entanto, para a Indústria da Construção Europeia e para a competição interna na C.E. são bem vindas todas as políticas que incentivem a qualidade e a segurança quer através das especificações e das garantias exigidas quer através da formação de pessoal (muito especialmente a nível de Gestores e Quadros).

Para a competição externa à C.E. convém não esquecer porém que ultrapassados os limites do bom senso, os custos sobem rapidamente e a competitividade baixa.

Mesmo internamente à C.E., é necessário pensar em termos globais e não tentar políticas de protecção inter-Europa. As recentes medidas que se pretendem impor nos contratos de subcontratação são o exemplo típico da ajuda que, em meu entender, não queremos ou melhor dizendo, não devíamos querer, pois vão tornar a Indústria Europeia globalmente menos competitiva e não nos podemos esquecer que 2/3 do mercado da construção está fora da C.E. (50% no sector dos grandes complexos industriais).

Concluindo e voltando à pergunta inicial, em minha opinião a resposta deverá ser

SIM.... MAS....

EUROPEAN COMPETITION POLICY - DOES IT HELP CONSTRUCTION?

João Vaz De Araujo Franco
General Director
Siemens SA

I shall try to be as brief as possible in explaining the point of view of a person who comes from a country in which the Construction Industry is "The Industry", a country in which a bridge over the River Tagus represents almost 2% of GDP (the budget of the Ministry of Public Works, Transport and Communications is 1.7% of GDP), a country whose second city is Paris! (which houses almost 600,000 Portuguese almost all of whom work in Construction).

What are the reasons which reduce the competitiveness of construction companies in Europe?

In my opinion they are exactly the same reasons which affect other European industries and measures which are of use to industry as a whole will also be of use to the construction industry.

While running the risk of repeating what has already been said, the following are the reasons which have a global effect on industry (also set out in a study carried out by UNICE: Making Europe More Competitive - The UNICE Competitiveness Report 1994).

1. **An unstable and unpredictable macroeconomic environment**
   This is obvious from reading the economic sections of newspapers.

2. **Major State involvement**
   Public consumption in the Community was 36% of GDP in 1970, 46% in 1980 and 52% in 1993.

3. **A relatively inflexible employment market**
   Employment laws and their inflexibility have the effect of making labour costs very high without a great deal of benefit to workers.
   At the beginning of the seventies, unemployment in the Community was half the unemployment of the United States and is now 50% higher!

4. **Defective infrastructures**
   This deficiency is much more noticeable in the regions of the periphery of the Community but competitiveness and efficiency are far from being satisfactory in Europe as a whole.

5. **Limited inter-company competition**
   Inter-company competition is the main incentive for technical and organisational improvements. Capable firms must be allowed to grow and the incapable ones left to disappear.
   This applies more to sectors dominated by State companies.

6. **Limited international trade**
   The EU is the largest world-wide commercial power. A large proportion of employment in Europe depends on international trade.
   The last Uruguay Round GATT negotiations showed the existing difficulties.

7. **Embryonic innovation and technological development**
It has been shown that the most important factor (not the only but the most important factor) for the good performance of a company is the quality of its products and services.
The backwardness of European companies in comparison to the Japanese or the USA is obvious,
in investment in R&D
in the dissemination of new technologies
in the time required for marketing new technologies
etc.

8. **Difficulties in the appearance and growth of small and medium size companies**
These difficulties are both the result of external factors such as bureaucracy, regulatory aspects, as well as factors pertaining to the actual company: limited financial capacity, lack of information, etc...

9. **Low or relatively inefficient investment**
This is a fact in comparison with Japan or the USA. An increase in investment does not, however, on its own, signify an improvement.

10. **Low profitability**
This is also a fact in comparison to Japan and the USA. There is no single reason but several ones: high interest rate levels in Europe, the existence of a single buyer (normally the Public Sector) in several sectors and countries. The existence of competition from State companies in several sectors and countries without any concern for profitability, etc...

These are general problems and apply to all industries and therefore to the Construction Industry. They are all interrelated and it is impossible to take action in one sector without taking action in the others. The resolution of these problems would also, on the other hand, signify the resolution of the problems existing in the whole of the European production system.

It is obvious that the consequences are not the same for the Construction Industry and the Footwear or Automobile Industry.

I can import an automobile from Japan or a carpet from China.

I cannot import a Bridge over the River Tagus.

In addition, the whole of the technical and commercial process involving construction activities is very different from automobiles or footwear. Trading and financial lobbies; the domination of post construction trading circuits; the domination of production technologies for finished products in the case of industrial installations are very important elements for the protection of the European Construction Industry.

I therefore consider that construction companies are more competitive in comparison which means that, in reality, they are more protected in comparison.

And the future?

The future is in the hands of the Almighty although we can give HIM some help.

How?

By gradually resolving the problems listed above taking into account that any protectionist measure which is not a temporary one for a specific industry may

produce short term results but will do considerable harm in the long term by adulterating economic laws.

In my opinion, however, for the European Construction Industry and internal competition within the EU, all policies which encourage quality and safety either through specifications and the requirement for guarantees or through staff training (particularly on a management and senior management level) are welcome.

For competition outside the EU it should be borne in mind that when the limits of good sense are exceeded, there is a rapid increase in costs and reduction in competitiveness.

Even inside the EU it is necessary to think in global terms and not attempt to introduce inter-European protectionist policies. The attempt to impose recent measures in subcontracting contracts are a typical example of aid which, in my opinion, we do not want or rather we should not want because they will have the effect of making European industry globally less competitive and we cannot forget that 2/3 of the construction market is outside the EU (50% in the case of major industrial complexes).

In conclusion and returning to my initial question, in my view the answer should be

Yes..... **But...**

FINANCIAL SUPPORT FOR EUROPEAN CONSTRUCTION PROJECTS - THE FINANCIAL MARKETS AND THE EUROPEAN INVESTMENT BANK

Rosamund Blomfield-Smith

Assistant Director
J Henry Schroder Wagg & Co

ROSAMUND BLOMFIELD-SMITH
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BIOGRAPHICAL DETAILS

Rosamund Blomfield-Smith graduated from Bristol University and, after a period with the Financial Times Group and another merchant bank, joined J Henry Schroder Wagg & Co in 1979. She is now an Assistant Director in the Project Finance Department of Schroders and has been responsible for the development of Schroders' project finance activities in Portugal and other southern European countries. She has been the team leader for a wide range of financial advisory assignments undertaken by Schroders in recent years including advice to governments (she was responsible for Schroders' work in advising the Portuguese government on the early stages of development of a possible LNG project at Setubal) and the private sector (she is the team leader for the financial advisory work which Schroders is undertaking in support of Lusoponte, the group which has secured the concession to build, own and operate the Second Crossing of the River Tagus in Lisbon). She is a member of the Board of the National Rivers Authority.

Rosamund Blomfield-Smith has published numerous articles on subjects relating to project finance. She speaks French, Italian, Spanish, Arabic and reads Portuguese and German.

FINANCIAL SUPPORT FOR EUROPEAN CONSTRUCTION PROJECTS - THE FINANCIAL MARKETS AND THE EUROPEAN INVESTMENT BANK

Rosamund Blomfield-Smith
Assistant Director
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The title which I have given my paper is a little different from the one printed in your programme. That does not imply any change on my part as to the subject matter to be addressed. I simply wanted to emphasise that I am speaking from the perspective of a financial adviser, advising clients as to how they should finance the major projects they want to undertake, how far the financial markets will rise to the challenge presented by such projects, what the role of the European Investment Bank (EIB) might be within the overall financial 'package' and how far the EIB, in turn, can be expected to 'fill the gaps' in the financing arrangements. I should emphasise that I hold no brief for the EIB; that will become very clear later on in my talk when I shall make some suggestions as to how I believe the EIB could better play a role in encouraging and promoting major development projects in Europe.

Major construction projects come in many guises and, from the point of view of the construction industry, the traditional guise of a public sector tender often has much to recommend it. Prices will be keen but, at least in northern European countries, risks will be relatively low, with the government normally a reliable and punctual payer. I know that is not always the case in some of the southern European countries where construction companies can find themselves acting as bankers to their government to an alarming degree. In any case, and whatever the merits and demerits of public sector contracts in any particular market, the fact is that there are fewer and fewer such contracts. In almost all the countries of the European Union (and, rather arbitrarily, I am going to confine my remarks to projects in the European Union) the trend is towards the Build-Own-Operate/Build-Own-Transfer/concession based arrangement for the implementation of major development projects. It is these projects which present the financing challenges and, because the UK has been so much at the forefront of the move towards privatisation and private sector finance for infrastructure projects, it is in connection with these projects that British merchant banks such as my own have been active, right across Europe, as financial advisors.

The BOT Model

The BOT model - and I shall use this phrase loosely to cover the whole range of concession-based arrangements (Build-Own-Operate, Build-Operate-Transfer etc) - is now so well-known that, for almost all the audience here, I imagine it is superfluous to describe it. However before I go on to discuss some of the financing problems associated with this model, I think it is important that we are all familiar with the basic structure and I am going to take two minutes of the time allotted to me to describe it.

A BOT structure involves the establishment of a single purpose company, normally capitalised at a very low level, to undertake the project. Typically, though certainly not necessarily, a high proportion (often 100%) of the equity of the project company is held by companies which also have another interest in the project. The project company enters into a concession agreement with a public sector entity, setting out the terms on which it is permitted to build and operate the facility and the support, if any, which the public sector will give to it. The project company lets a construction contract for the construction of the facility and, normally, enter into an operating and maintenance agreement with an entity which has experience in the operation and maintenance of facilities of the type involved. (The importance of the O & M

agreement varies: for a toll road project, which does not require a very high level of operating expertise, the project company may undertake the O & M itself but in the case of, for instance, a power station, where the financial viability is crucially dependant on the quality of the operator, the O & M agreement is as important as the construction agreement. Finally, the project company enters into financing agreements which provide for lending institutions to advance funds to finance the construction of the project and for those loans to be repaid out of the cash flow of the project. It is fundamental to the BOT structure that the shareholders of the project company provide no guarantees for this borrowing.

How far have the financial markets risen to the challenge of providing finance for these BOT - type projects and what role do EU institutions such as the EIB have to play?

There are two categories of funding required for projects of this type, equity and debt, with a third type, grant funding, sometimes also required. I shall focus on debt finance, where the EIB plays an important role, but shall also say a few words about grant and equity funding.

Grants

Let me begin with grant funding. There are some projects which simply do not yield enough revenue to service debt in an amount which represents a significant proportion of the capital cost of constructing the project. It is sometimes possible to fill the gap with equity or with other types of funding provided by shareholders. However when the anticipated revenues of a project are very low by comparison with its capital cost, funding a high proportion of that capital cost by means of equity will mean that the returns on it are so low that, in practice, no investors will be forthcoming. In such cases, the only option is some form of public sector support. This can take the form either of an on-going subsidy of operating costs or of a subsidy of capital costs.

It is frequently said that, when a project is not financially viable and requires support of this kind, it is not a suitable candidate for BOT treatment. That simply is not so and there are plenty of examples of joint public/private sector BOT projects in which a national government has provided either an operating subsidy or an up-front grant towards capital costs. I cannot bring to mind an instance in which EU funding has been used to provide a project with an operating subsidy and the institutional framework is currently probably not well-suited to the granting of support in this way. However there are certainly cases of EU grants going in to BOT projects to subsidise the capital costs. Indeed there is an excellent example here in Portugal where the new bridge to be built across the river Tagus will be receiving a substantial EU grant and certainly could not have been financed on a BOT basis without such a grant.

Equity

Turning briefly to the question of equity funding, we come to one of the main problem areas in the development of the BOT model. The problem arises from the fact that most BOT projects are infrastructure projects, often providing a monopoly service. Governments are therefore usually keen to ensure that investment in the project company is not excessively profitable. The investment will, however, be quite high risk: the company will, after all, be a greenfield venture entering into obligations to repay a very large amount of debt out of the cashflow to be yielded by an asset which, at the time when the equity is committed, exists only on the drawing board.

Of course there are many safeguards and, indeed, if such safeguards are not in place banks will not lend to the project company. Nevertheless the risk/reward ratio of the investment is such that it is often very difficult to attract investors other than those

who will also benefit from the project in another guise, constructing it, or operating it, for instance.

In practice, much of the investment has come from the construction companies. Some construction companies regard a long term investment in a toll bridge or a sewage works, for instance, as a useful hedge against the cyclical nature of profits in the construction industry but, in my experience, the great majority take the view that they are in the business of construction and not toll-road owning (or whatever the case may be) and will subscribe only the minimum equity necessary to win the concession and secure the construction work. Personally I see nothing wrong with this attitude but it does mean that, when combined with the limits on the funds available for investment caused by the weakness of the balance sheets of many construction companies, the number of such projects which can be funded will be limited.

It is quite difficult to see what either national governments or the European Union institutions can do to help with this problem. National governments can help at the margin by ensuring that returns on the equity in BOT projects are not constrained by regulation at too low a level; they can reduce risks by, for instance, controlling competition but it must be said that, even when a project is operating in a very low risk monopoly situation (such as an estuarial bridge crossing), investors can be very hard to find because of their perception of the construction risk.

If the trend towards BOT projects is to continue, it may well be that the EU will have to develop the ability to either provide or guarantee seed capital for some of these projects. There are precedents for this in the activities of the World Bank's private finance arm, the I.F.C. As of now, however, the only solution is normally a mixed group of shareholders, most of which are either participating in the project in another guise or come into the general category of trade investors.

Debt

Now let me turn to debt finance and the role of the European Investment Bank in particular. Most BOT projects are infrastructure projects with a long economic life, rarely less than 25-30 years and often, as in the case of a bridge or a railway for instance, nearer 100 years. It is not normally possible to find sources of debt with maturities as long as the economic life of the asset but many infrastructure projects are only viable if they are financed with loans that have very long maturities and a substantial grace period after completion of the project during which to build up it can build up its financial resources before starting the repayment of principal.

Commercial banks have, to some extent, risen to this challenge and for a well-structured project in some parts of the EU will sometimes lend for 17-18 years. Maturities in excess of that are almost always difficult in the commercial market, however, as are grace periods longer than six months or so after completion of the project. Another problem of BOT financing is that fixed rate debt which, depending on the basis of the revenue stream, can be an important way to control risk in a project financing can also be difficult from the commercial market.

Both in relation to maturity and in the provision of fixed rate funding the EIB can play an important role. For suitable projects, the EIB will make loans available with a twenty year life, measured from drawdown of the funds. This means that for a project with a construction period of 3-4 years, some of the debt will have a final maturity of 23-24 years from signature. Grace periods for the repayment of principle can also be long by comparison with the commercial markets: in my experience ten years from signature before the first repayment is not unusual for a large project. Similarly, where the requirement is for fixed rate finance, the EIB can play a key role, with both fixed and floating rate loans normally available in all major European currencies. An additional point, which is not crucial to the financial viability of a project but which

can give a welcome boost to a tightly-structured project is that the EIB charges no fees to its borrowers.

Faced with these clear advantages, the first thought of a financial advisor seeking to optimise the financing arrangements for a project is to maximise the involvement of the EIB. There are, however, some disadvantages which can limit and, in extreme cases, completely negate, the advantages of finance from the EIB.

Firstly the EIB will not finance 100% of the cost of a project. Theoretically I believe its limit is 50% of capital costs but for many projects the limit can be much lower than that. 30-35% of capital costs is not uncommon as a ceiling. These limits do not in any way negate the value of EIB funding but they do mean it is normally necessary to structure a mixed financing package, of which the EIB forms only part.

A more serious problem is that the EIB is less willing than the commercial bank market to take the risks associated with a project financing, however well-defined and well-controlled these may be. It is almost unknown for the EIB to take the completion risk of projects and, even in the operating period, the EIB is normally reluctant to take a risk on the project and the project company.

The normal way of dealing with this problem is for a bank or, more usually, syndicate of banks to take the risk on the project and to provide their guarantee to the EIB. This guarantee obviously has a cost but, because of the competitive rates which the EIB lends, the combined cost of the EIB loan and the bank guarantees is often no greater than a loan from those same banks.

The problem lies elsewhere. If the EIB insists on a full guarantee from the banks for all amounts due to it for the whole duration of its loan, the benefit of the long final maturity and grace period associated with an EIB loan will be lost. This is because, reasonably enough, banks will not make guarantees available in support of loans which have a longer maturity and grace period than the loans which they would, themselves, be prepared to make available. This means that for a project to which, for the sake of example, the EIB might in principle be prepared to make available a loan with a final maturity of 24 years but to which commercial banks were only prepared to lend, for example, 15 years, the project would not be in a position to take advantage of the 24 year loan and would, in practice, only be able to take a 15 year loan from the EIB, to its considerable detriment.

In recent years the EIB has shown a willingness to take a measure of risk on the project company normally by permitting some or all of the bank guarantees to fall away gradually after a point early in the operating life of the project at which it is able to demonstrate compliance with key technical requirements (often simply completion of the project) and, pre-established financial ratios. This increased willingness on the part of EIB to take so-called 'project risk' is, in my view, an absolutely crucial step towards their playing their intended role of acting as a catalyst or stimulant to the provision of other sources of funding.

If, as seems likely, major projects are to continue to be implemented on a BOT basis, and, indeed, the trend gathers momentum, there is potentially a key role for the EIB. However the extent of its influence and the value of its support will, I believe, be fundamentally a function of the extent to which it is prepared to take an increasingly positive attitude towards project risk and dispense with, or cut back drastically, its requirement for bank guarantees.

In what other ways might the EIB be able to play an ever more helpful role than it does today? I believe there are several areas. Some of them would imply major changes. Others are of a more technical nature but would, nevertheless, make all the difference to the raising of finance for a major BOT project and hence, ultimately, to

whether it can proceed or not. For instance a willingness on the part of the EIB to finance a larger proportion of the capital costs of a project than at present would be helpful. In many cases a combination of the very long term finance made available by the EIB and the shorter loans available from the commercial banks is, in combination, sufficient to allow the project company to service its debt. I think it is reasonable to expect that the EIB will always prefer that there be some involvement of the commercial banking sector but, where the financial viability of a project is marginal, a larger proportion of the long-maturity EIB finance in the overall package could make the difference between a project being financeable or not.

Simply a willingness on the part of the EIB, in cases where a project has a very long economic life and an extended pay-back period, to lend for periods even longer than those which it is currently prepared to consider could be very helpful. There are also other more technical improvements which the EIB could make and which I do not think will be of general interest here, such as a greater ability to lend floating rate funds at interbank rates.

I understand the EIB are, in fact, reviewing some of the items I have mentioned and that we may well see increased flexibility on their part. I would sum the situation up as follows: the EIB can play a key role in the financing of a BOT project, as one of several sources of finance. For this reason, it will normally be wise to maximise the extent of, and optimise the terms of, the EIB involvement before turning to other sources of finance. However I believe that, by making some fairly small changes to the terms of its involvement in BOT projects, particularly in relation to its requirement for bank guarantees, the EIB could make an even greater contribution, as a Community institution, to the much needed development of the infrastructure of the EU.

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REGULATED/DEREGULATED MARKETS: WHAT'S BEST FOR CONSTRUCTION?

Graham Mather MEP

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BIOGRAPHICAL DETAILS

Graham Mather is President and co-founder of the European Policy forum, launched in April 1992. He is Member of the European Parliament for Hampshire North and Oxford.

Prior to founding the European Policy Forum, he was General Director of the Institute of Economic Affairs and head of the Institute of Directors Policy Unit. By training a lawyer, he was educated at Hutton Grammar School and New College, Oxford, where he was an open scholar.

Graham Mather writes, broadcasts and lectures widely on economic, business and public policy issues. His specific research interests include competition policy, the labour market, industrial relations, and European constitutional issues. In the field of public administration he has delivered papers and lectures to the Royal Institute of Public Administration, the Institute of Local Government Studies and the Association of First Division Civil Servants. He served as a Member of the Monopolies and Mergers Commission from 1989-1994. He is a Visiting Fellow of Nuffield College, Oxford and Vice President of the Strategic Planning Society.

He is also a member of the European Parliament's Social Affairs and Employment Committees.

REGULATED/DEREGULATED MARKETS: WHAT'S BEST FOR CONSTRUCTION?

Graham Mather MEP
President
European Policy Forum

The language of deregulation is now a single currency in the European Union.

The Delors White Paper on Growth Competitiveness & Employment emphasises a deregulated approach, as does the Flynn White Paper on Social Policy.

Yet underneath this language is a profound challenge: is the shift of rhetoric to be matched by action, or will Europe continue to under perform its US and Japanese rivals in its economic growth and in the performance of its labour markets?

The record in these areas is not encouraging.

First, the European Union is not yet adept at measuring regulatory costs themselves, and some of its policy approaches are at odds with the rhetorical commitment to deregulated markets.

The US has more experience. In an interesting study Professor Thomas Hopkins highlighted that in 1992 proposed new regulatory activity was projected to increase business compliance costs by at least $15bn annually.

Of the 25 costliest new regulations, environmental initiatives were by far the foremost with 69% of total costs. But occupational health and safety regulations came next at 14%: including in particular material handling and construction and use standards.

Diagram 1 (p 92) is Hopkins' projections of regulatory costs up to 2000. It is sobering for this audience that environmental and social regulations are markedly on the upswing.

Some economists believe that assessment of compliance costs is unnecessary and that the GNP growth rate provides a good enough measure of the social costs of regulation.

Here Europe's model has clearly performed less well than the US or Japan.

UNICE's recent report on European competitiveness highlighted the analysis of the Netherlands Central Planning Bureau, which concluded that,

- the stress placed on co-ordination mechanisms between social partners and government;
- the heavy emphasis on income distribution issues and the strong desire for reduced risk and uncertainty

had created rigidities, weakened incentives and hampered individual adaptability and inventiveness.

Various policy programmes during the 1980s had strengthened the driving forces from the perspective of the free market economy, but it was doubtful whether the changes had yet been substantial enough.

Construction cannot benefit from loose monetary or fiscal policies if they lead into a cycle of boom/bust, or unsustainable growth followed by policy-induced recession.

Nor can lobbying for increased public spending succeed if voters are at the top end of their preparedness to allocate tax finances. And we all know that in much of Europe past public sector borrowing is constraining current and future capital initiatives.

Judged by OECD data on potential output, growth performance of the EC since the mid 1980s has not strengthened, if compared with a longer historical period.

So what does the shape of a deregulated policy for a dynamic market look like for the future?

Industry and Competition Policy

The opening up of public procurement markets is clearly of benefit to the construction sector. Although the publication for tenders in excess of EU 5m for building and civil engineering and in excess of ECU 200,000 for supplies has become mandatory, in the opinion of the OECD there is as yet little quantitative evidence to show whether public procurement systems have genuinely opened up to competition as the information systems provided for in the directives have been installed only recently.

One thing is clear. The fruits of liberalisation will only be available if legal access for redress is available. Access to justice and judicial co-operation and more information and training programmes to enhance the ability of national courts and legal professions to apply Community law are important.

There may be a clear tension between industrial policies which favour existing large suppliers, and competition policies which seek to open up markets in the interests of customers. One challenge here is that the European Commission as currently structured seeks to perform both roles. That is why there is increasing interest in restructuring the Commission's competition policy role into an independent free-standing agency - a "Eurokartellamt". Such an agency would not face a daily conflict of interest in seeking both to enforce competition and boost industry. It would also allow for less detailed supervision from the Council of Ministers, which is likely under existing arrangements to continue to supervise the Commission's work in this area closely.

It must be said that there seems to be emergent concern that the Commission takes relatively few substantive decisions on the abuse of a dominant position by particular firms. In 1992 for example 27 decisions were made, compared with 1,523 cases handled.

State Aids

A related point concerns the level of EC subsidisation of its industries and the availability of state aids. *Diagram 2* (p 93) shows Europe's level of subsidisation to be markedly higher than either the United States or Japan.

Again, there is a sharp division between the number of state aid cases which come to the attention of the Commission and those which end with a negative final decision. In 1992, for example, 459 cases were notified but only 8 final decisions reached.

Again as the OECD study highlights, "For many subsidy schemes to the agriculture, fishing, coal and railway sectors large amounts of state aids can be granted over which Community control is limited, and a higher degree of national subsidisation is allowed to the ever increasing part of the Community area defined as facing regional problems".

The evidence appears to be that subsidisation and state aids are at a higher level in Europe than in her main competitors but that these have not led so far to a better performance in terms of growth or, for that matter, employment.

The prospects for a reduction of subsidisation and state aids depend primarily on the economic philosophy adopted. Enlargement of the Union will make for more net contributor economies and place impossible burdens on the existing forms of heavy EC spending programmes such as the Common Agricultural Policy.

Labour Markets

The star job creators, the US and Japan, have taken very different routes. In the United States the economy favours a high labour content. So even where growth is slow jobs can multiply - especially in the service sector. In areas like personal health care at home the Bureau of Labor Statistics, famed for its assessments of job creation zones, points to the coming wave.

Japan, in stark contrast, traditionally creates employment by high growth with relatively few people: in other words, by a productivity miracle.

Europe, by and large, has created few jobs in the private sector in the past two decades (*Diagram 3* p 94). Job creation has been concentrated in the public sector. And just as the Union shapes up to try to improve its record, downsizing will arrive. In the EU's sluggish national bureaucracies and its state owned enterprises hundreds of thousands of jobs are challenged by the imminent arrival of competition. As open procurement, competitive tendering and market opening arrive, so a searchlight will point to massive hidden unemployment of workers who don't really have all that much to do at work.

Job creation concentrates policy makers' minds. So however much they may hope to see more jobs in manufacturing, the European Commission's massive look at Employment in Europe recognises that "industry cannot be regarded as a major direct source of employment growth in future years".

The US will continue to agonise over whether it is comfortable with low value-added McJobs in hamburger chains - but will continue that way. Japan will agonise over whether the productivity miracle can continue: but its habits will change only slowly as cultural pressures soften its economic cutting edge.

But in 1995 the focus will be on Europe, sitting uncomfortably between the two models. Which way will its citizens choose?

On the one hand EU leaders talk proudly of the distinctive European model. "Social Europe" seeks to guarantee its citizens solidarity and welfare on a generous scale. Can the price - taxes and social security contributions which account for 40% of Community GDP - be reduced? To put it another way, a single male European worker may take home less than 55% of what it costs his company to employ him. Can employers' minds be shifted from the high gross cost - perhaps by new, less visible innovations like carbon taxes? And even if the tax burden can be shifted can the incentives be concentrated on the lower skilled end of the labour market to soak up enough of the jobless and make the EU target of 15m jobs by the end of the century credible?

Small wonder that some politicians seem to be giving up the effort before it has begun. They want simply to redistribute the jobs. People in Europe work too long, they argue: in the UK, for 55% of men the normal working week in 1992 was over 40 hours. So let's cut working time by law. Some work unsocial hours: again, in Britain, over 40% of men say they sometimes work on Saturdays. Perhaps this can be discouraged and more jobs result.

The issue comes to a head over part-time work. Is it a means of allowing workers - especially women - to choose a job and terms which suit their preferences? Or could

such 'atypical' work be brought more firmly within a regulated labour market and its terms and conditions approximated to those of full time employees? The question divides policy makers, just as does the question: what do part time workers really want? Are they frustrated full time employees unable to find a real job, or is it genuinely their preference to work in a more flexible environment? Should they be levelled up until they meet the full timers' working shorter hours, or left alone lest the consequence of upgrading is fewer jobs overall?

Perhaps the safest answer is to do nothing which risks interfering with a complex mix of choices, skill levels, market pressures and economic realities. Construction projects and new starts depend on the working of the complex interaction of the market overall.

Regulatory Competition

Another principle which we should establish is that of regulatory competition. It is noteworthy that the great engine of the free market economy, the United States of America, operates without a developed federal labour law. There are stark differences between rustbelt and sunbelt states in their labour codes: between Right to Work states and heavily unionised states.

Europe should learn from this lesson. Yet in the proposed new directive on the posting of workers it is proposed that tens of thousands of British employees working in Europe stand to lose their jobs under a controversial new European law being pushed by France and Germany.

Many British companies that win European contracts by paying British rates to their employees stationed abroad, will be prohibited from doing so under the new law - putting those jobs in danger. Self-employed workers will also be affected. The construction industry was the starting point for this initiative, but the latest draft directive would go much further.

According to a report by Leonard Doyle in the Independent, the new law is aimed at stopping the practice of so-called 'social dumping' whereby employment agencies hire workers from lower-wage countries to undercut local employees. Under the directive, which could be adopted as early as December, it will be illegal for a foreign worker to be given a job at less than the going rate of pay and conditions negotiated by collective bargaining in the host country. Companies wishing to send employees to work abroad will have to register with a liaison office in London. They will be told the exact terms and conditions - including working hours, rest periods, minimum paid holidays, minimum pay rates, overtime and other perks - to which they must adhere.

'This directive is vital if we are to have industrial peace in the single market', said a senior German source., 'You cannot have low-wage workers coming into countries upsetting the balance and not expect consequences'. The Department of Employment recently warned employers at a symposium that the directive was likely to be adopted despite strong opposition from Britain and Portugal. 'We consider it unwelcome', an official told the employers. 'It will impose unacceptable costs on employers and interfere with flexibility in the market place, and it does not take sufficient account of the differences between individual countries'.

The proposal is a striking example of the way in which some elements in the Union are seeking to create a federal labour law, imposing highly regulated terms and conditions, with no element of regulatory competition.

1996 and Redesign

Europe is approaching its most profound stage of development since the Treaty of Rome, at the Inter Governmental Conference in 1996.

It seems to us at the European Policy Forum that business has a legitimate right to be involved in this process.

As my colleague Frank Vibert has highlighted (*Diagram 4* p 95) many possible agenda items are of high importance to business.

These extend beyond the issue of monetary union to many questions which affect the climate for business in the Union: the way the Commission works; budget procedures; tax powers; social and environmental rights; subsidiarity and external commercial policy.

It is encouraging that business voices are beginning to be heard in the preparatory discussions for 1996 in a way that was not the case for Maastricht. I hope that ECI, too, will continue to put forward its views on some of the subjects raised at this conference in the context of 1996.

Diagram 1
Annualised Regulatory Costs, 1977-2000, by Category, in Billions of 1991 Dollars

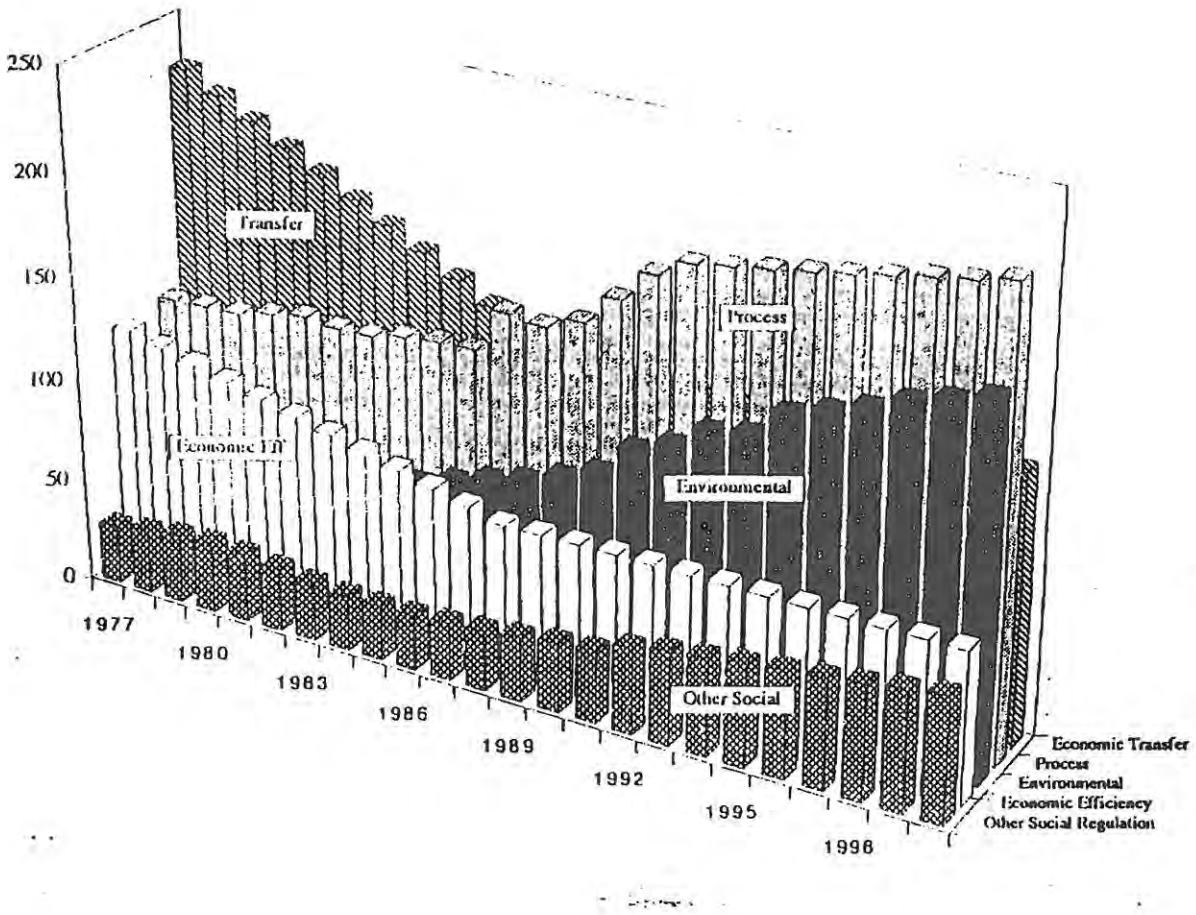
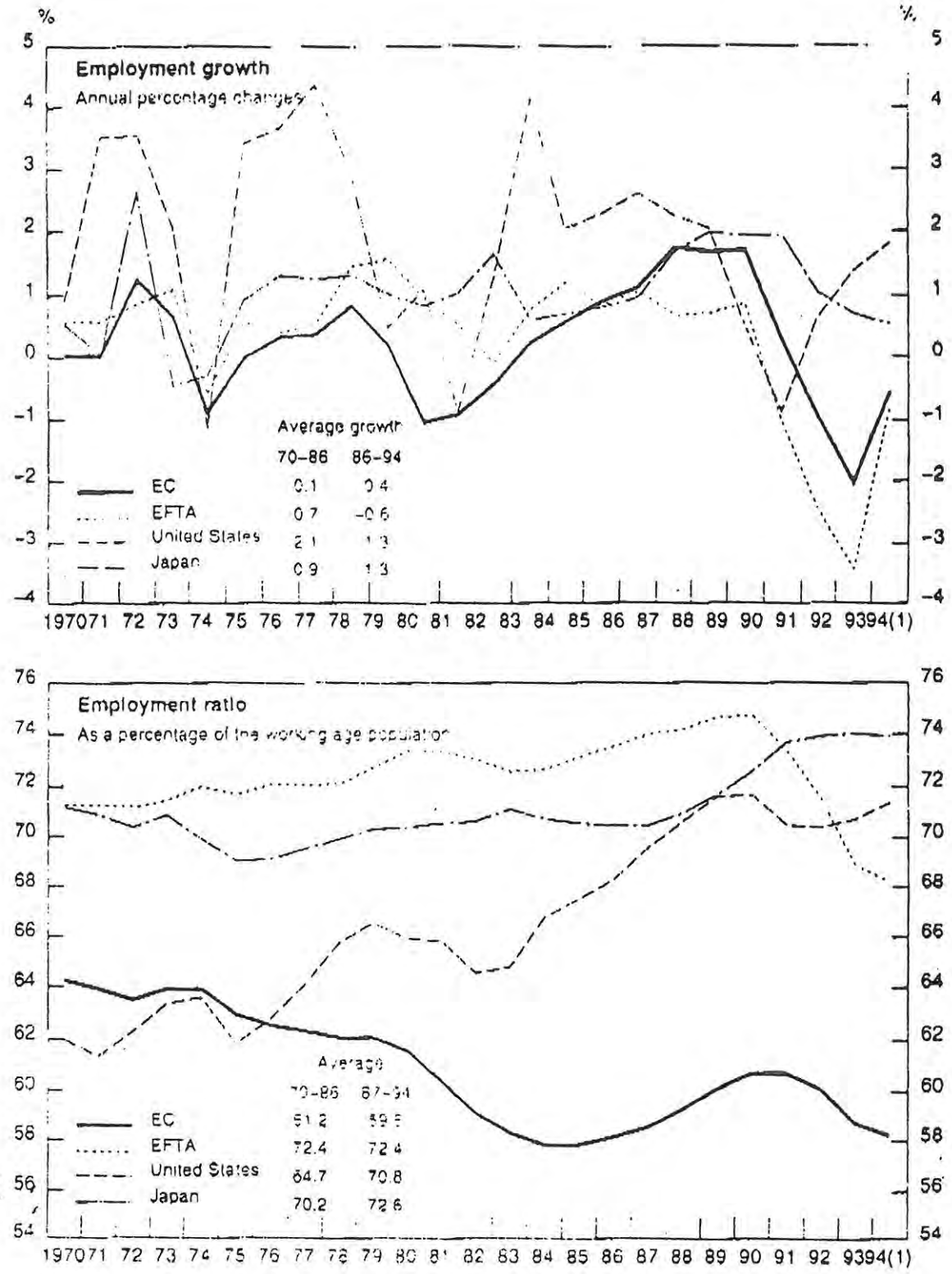
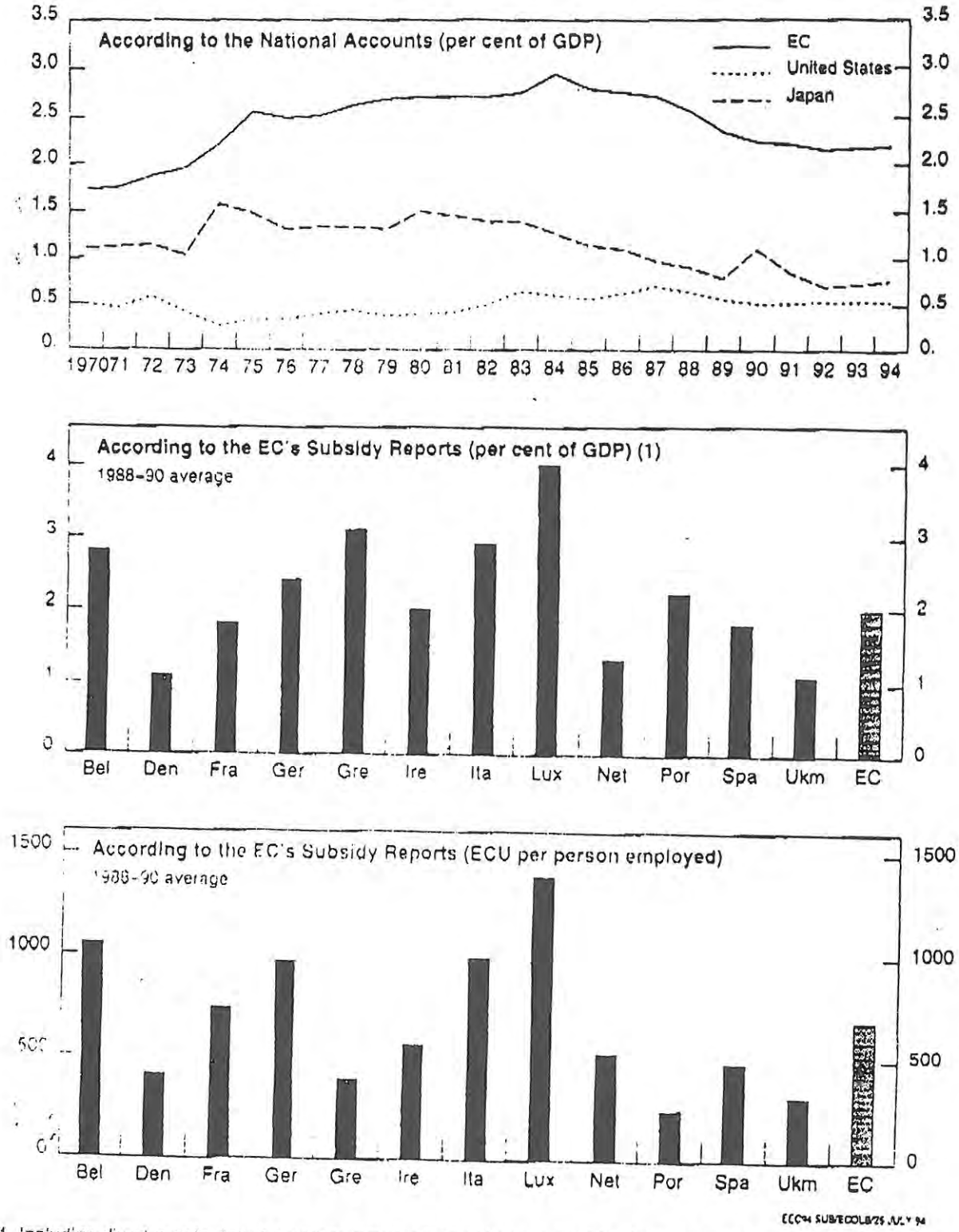


Diagram 2 Labour Market Performance



1. OECD estimates.
Source: OECD.

Diagram 3 Subsidisation



1 Including direct grants, tax reductions, equity participations, and aids elements contained in soft loans, tax deferrals and State guarantees but excluding EC subsidies.

Sources: OECD; EC (1992), Third survey on State aids.

Diagram 4 1996: Possible Agenda Items

Item	Area of Business Interest	Priority for Business
CFSP/ESDI	(NB Procurement Rules)	LOW
Treaty Format		LOW
Council Procedure	Changes in Voting Procedures; Member State Balance	MEDIUM
European Parliament	Extension of Powers; Co-decision	MEDIUM
Court of auditors	Powers, Procedures	MEDIUM
European Court of Justice	Competencies	MEDIUM
Commission	Managerial Role	HIGH
Monetary Union	Start of Stage 3	HIGH
Fiscal Constitution	Budget Procedures; EU power to tax	HIGH
Rights/Citizenship	Social & Environmental Rights	HIGH
Competencies	Social Framework/ Environmental/Industrial Policy	HIGH
Exercise of Powers (Subsidiarity	Edinburgh/Sutherland	HIGH
External Commercial Policy	Trade Instruments; Negotiating Procedures; "New" Trade Issues; Relations with WTO; Disputes; Extra Territoriality	HIGH

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DISCUSSION
EUROPE'S GLOBAL COMPETITIVENESS - THE ROLE OF THE EU

Chairman: Ronald LeBright, ABB Lummus Crest

Question 1 Mark Lane, Masons
I would like to raise two points. The first concerns small and medium-sized enterprises and the second, although there is a certain interrelationship, concerns subcontractors. Karlheinz Zachmann mentioned that the Commission was keen to create a better environment for the setting up and functioning of SMEs by deregulation and, the adaptation of legal provisions. Could you give some nuts and bolts as to precisely what lies behind that thought ? Secondly, you mentioned that the Atkins report had led to debate on the role of subcontractors. Could take you that point a little further and outline some of the issues.

Karlheinz Zachmann, European Commission
There is a general principle running through all the Commission and Community policies in connection with SMEs. In all our initiatives we see whether there should be easier provisions for small and medium-sized enterprises when establishing regulations. There are now also the so-called deregulation initiatives, which concern not only regulations having their origin in Community acts but will also focus on existing national regulations. That is the mission of the group set up and supported by the Commission and the Council, intended to cover matters such as tax formaliti declarations, statistics, quality assurance schemes, down to providing a better hearing for the voice of small and medium-sized enterprises in European standardisation. In the technical committees for voluntary standardisation in CEN or in CENELEC normally only the large companies are represented and the SMEs just to take on board what may be very complicated standards requiring many tests and no means for small and medium-sized enterprises to implement the standards at their own level at lower costs. The question of subcontractors is a big issue and very complicated. Contractors may sometimes be subcontractors and normal subcontractors may occasionally be independent contractors. There is no firm borderline as in manufacturing industries like the motor car industry, where you know that the company that produces spare parts is always a subcontractor. In the construction field, it is more complicated, but SMEs are normally considered subcontractors in even medium-sized projects. A tendency was noted in the Atkins report for the more powerful contractors to forge links with subcontractors which might not be very profitable to the profit margins of the subcontractors. We are studying the matter to see if there is really a problem and looking at possible means, not just regulatory but perhaps codes of practice, to improve the relationship between general contractors and subcontractors. Subcontracting is one of the items being looked keenly at as part of the general direction of our work on small or medium-sized enterprises.

Question 2 Granville Camsey, National Power and ECI
Both Karlheinz Zachmann and Graham Mather have raised some questions which the European Construction Institute ought to take on board and respond to. I am hoping that my colleagues in the audience will indeed do so and I will undertake to arrange that we do respond. I have two questions. Let me first observe that the great advances in Europe did not spring from competition. I offer as example the arts, the great seats of learning and religion. None of these three successful endeavours sprang from competition. Why, then, is competition good for you? I would like an answer from each member of the panel. My second question is this. If jobs can be created, how and by whom, and will they last?

Graham Mather, Member of European Parliament & European Policy Forum
I think that competition is good for you. It is the only guarantee of freedom of choice. Without competition you may indeed have a highly developed cultural or economic model - there were plenty of them east of the Berlin wall but you have no chance of testing, comparing and in the end displacing that model without a competitive framework. That trade off is eventually a political question rather than an economic question. But competitive models at least give you that opportunity. They provide a means of measuring and disaggregating the way in which services are provided. In a

single unified model of economic activity you may by happy chance lose the cost of contracting, according to the COSE theorem which recognised that there are costs in dealing with lots of little businesses and subcontractors. You may lose those costs in the economics of one big firm. But it may also lead to monopoly, cartelisation and lack of incentive to innovate through the lack of constant testing. That's why I approve of competition.

Secondly, and more briefly, jobs. The European Union would like to see 15 million jobs created. I go back to the horrible statistic that in the last two decades the United States managed to create over 30 million jobs in the private sector, in a relatively deregulated market, while we in Europe created 2.5 million over the same period in a relatively regulated market. My recommendation would be for regulators and partitions to step aside and let companies and businesses create those jobs.

Karlheinz Zachmann, European Commission
I think that competition is necessary for economic growth, development and the whole future. If we take it in a very wide sense, competition has always been a driving force in many fields. But we have to provide a transparent frame and good rules for competition because it might otherwise turn out to be what we now see in Yugoslavia where competition is between religions and powers. In ancient times, it might have had another name, but it was competition. I would caution you against competition which is as cut throat. We may lose the benefits of democracy life via a cut throat competition so that in the end we are ruled by only monopolies.

The second question - can jobs be created? Yes. We are confident of that provided that everybody plays the game and does not go to third countries to manufacture at low prices without considering the social and moral conditions under which labour costs are sometimes lowered. You can read in the press how children are still being employed around the world. Provided too, that there are good rules worldwide, where the bad boys are slapped on the wrists for social dumping. It is too easy for Europeans to say we have to adopt the US system. We have our own traditions and perhaps some problems that the USA hasn't, but they have problems of their own. I wouldn't want that we get them here in the internal European market.

Rosamund Blomfield-Smith, J Henry Schroder Wagg & Co
First of all, why is competition good for you? I am not a great believer in dogma and I do not think that competition is good for you in every walk of human endeavour. I do think that it has a tremendously important role to play in the economic sphere, widely and broadly defined, for two reasons. One, there is no greater stimulus to activity of every kind and no greater incentive than competition and two, there is no better measuring tool, a point that Graham Mather touched on. A great many of the decisions that have been taken in the European Community in recent years and will be taken over forthcoming years involve the comparison of things which are sometimes very difficult to compare. Resort is all too frequently to cost benefit analysis. This type of analysis is almost always flawed or at least open to question in one way or another. It is as good as the data you put in. To my way of thinking, competition can play a very important part in deciding what enterprises and projects go forward and which do not.

The second question about jobs is crucially linked to the first. If we are to increase employment, as Europe so rightly wants, we have to ensure that competition applies to the greatest possible extent. In particular, and I suppose you might expect a British speaker to say this, we have to be careful that social and workplace policies do not result in a decrease in competition, both in Europe's competitiveness internationally and in competition between the states, to the point where those vital jobs are not created.

Ronald LeBright, ABB Lummus Crest
I find it hard to envisage a world without competition. Even if a world existed where people find themselves quite comfortable and successful, they would still try to find a way to compete in something. There is no way to step away from competition, nor there should be a desire to do so. I don't believe that we could serve ourselves from a socio-economic point of view. Nor, more realistically, could we insulate ourselves such that we wouldn't need to compete with the balance of the world. I also believe that competition and generating jobs are one and the same. In order to achieve the amount of employment which is required here in Europe, we will need to be truly competitive.

Question 3 Jim Grevatt, UK Dept of the Environment
I should like to reassure Mr Mather that in the government we take our role as sponsors of industry seriously. It is one of the important jobs of the sponsors to query proposals for regulations. I can't pretend that we have as many sponsors as we have regulators, but we are trying.

Graham Mather, Member of European Parliament & European Policy Forum
It is clear that in the UK government, there is an attempt to shift from a purely regulatory role to one of understanding the business community and representing its needs. That is a significant step forward. It is part of a process in which business techniques are beginning to operate within government, which is an exciting development. We have with us privatised companies who were once government owned and are now operating in a strictly contractual commercial sense. I would like to raise the stakes a little by asking if we can't run government in the same way. Can't we have competing systems within government? Can't we have contract acquisitional skills right at the heart of government? In New Zealand, for example, they have started to do that. It is rather like contracting for a project. You contract with the officials each year for the outputs they are going to deliver. Then you can compare and assess and if necessary change the team. That will not only lead to better government, it will also lead to more enriching careers for people because there will be an interchange between the techniques of business and management and the techniques of public administration, which were once seen as entirely different. I believe they can come together to the benefit of both.

Question 4 Stuart Reynolds, W S Atkins
Let me add a piece of information. We' have heard about the Atkins report, but I have recently discovered that since we completed the Atkins report the European Commission has published another report on the construction sector which was commissioned by DGXII under the FAST programme looking at the future of the European industry in the context of research and technology development. This study tries to compare European countries in terms of the degree of government regulation of the construction industry. It is written by academics who are in favour of regulation, which may bias the results. But the results of their analysis are nonetheless interesting. The report gives a series of indicators to measure four things. First, what is called the static allocative efficiency of the industry, secondly its dynamic efficiency, thirdly the stability of the market and the industry, and fourthly the level of social equity. On those measures, when they look at static efficiency they find, contrary to the findings of the Atkins report, that Great Britain is the most efficient construction industry in Europe because it has the lowest wages, a highly mobile labour force, low levels of unionisation, a high percentage of self-employed, low rates of profit and, in particular, very low house prices, which is partly because we have the lowest housing standards in Europe. But when they look at dynamic efficiency, they conclude that there is a group of countries, including Germany and the Netherlands and Sweden, which have the greatest dynamic efficiency because they have high levels of R & D and training, high investment, high levels of profit and high output per head. Looking at stability, they take indicators of annual change in those parameters. Again Great Britain comes at the bottom, and the group of

countries which are reasonably highly regulated come towards the top. The same is true of social equity which is to do with low income housing and so on. They conclude that a level of regulation is a good thing because it promotes investment and training and R&D, which are some of the points that we made in the Atkins report. The sting in the tail of DG XII's report is that on every measure Austria comes out as being the worst. It has exceedingly high levels of regulation and government to the extent that the authors conclude that it stifles all levels of competition. Austria has the most highly protected construction industry in Europe, the worst provision of infrastructure in housing, the most expensive construction and so on.

Question 5 Ian Pace, European Investment Bank, Lisbon Office
Rosamund Blomfield-Smith made a number of constructive comments about the European Investment Bank (EIB), including suggestions on how the EIB could improve the effectiveness of its conditions for the financing of projects, at the same time as limiting risk. The limitation of risk helps the EIB to finance itself as a prime triple A at low interest rates and those low interest rates feed through to the interest rates it charges to its borrowers because it is a non-profit-making institution. The interest rates are the cost of its funds plus a small administrative margin to cover administrative expenses. The limitation of risk also allows the bank to finance itself long term and thus to offer the long maturities that were mentioned. The share of the financing taken by the EIB depends very much on the financing requirements of each project and on the size of the other financing sources. There is not a common ceiling of 35% as Rosamund quoted. In this context it is also worth stressing the concept of subsidiarity used in the European institutions in order not to crowd out the commercial banks from the financing of such projects. Sponsors of BOT projects should certainly consider EIB financing and the EIB will consider tailoring the terms and conditions to the profile of each project, particularly as regards security, with a possibility of taking partial project risk if the conditions allow.

Rosamund Blomfield-Smith, J Henry Schroder Wagg & Co
I didn't mean to suggest that EIB's inability within its current statutes to do certain things was in any way capricious. On the contrary when I am looking to structure a financial package in support of a project I look first to the EIB to maximise the contribution that it can make. It plays a crucial role, and one of the reasons is that it can fund itself at a very low rate of interest in the international markets because of its perceived low risk nature as a borrower. I didn't mention interest rates earlier because, for the financing of infrastructure projects, what usually bites is not interest rates but maturity. If it were possible to structure these loans such that one could get a longer maturity even if it necessarily cost a little more, that could often make the difference between a project going ahead or not. This does not apply all projects; each one is individual. But as the EIB looks to the future, it might like to bear this in mind as a possibility.

Question 6 Fikry Garas, Taylor Woodrow Construction
I am worried about the side effects of competition. The cut throat type of competition of recent years has affected investment in training, education and research. We have seen less money invested in these areas and this can be very worrying, especially if we are trying to compete in the world market. To overcome this problem I would like to suggest a model which has been adopted in Singapore. The government of Singapore passed a law that during the tendering stage organisations have to declare, as part of the bid, how much investment goes into research, training and education, which gives them credit or brownie points. Although I support competition, I am concerned that it can have the side effects of investment being cut in very important areas.

Ronald LeBright, ABB Lummus Crest

A number of sensitive issues have been raised during the discussions. Karlheinz Zachmann mentioned that there needs to be a platform of what is acceptable and what is not as people ply their businesses throughout the world. The use of children or disadvantaged peoples is not an acceptable way of executing your business to a civilised society. The European Union has a fine line to walk in what it wants to see accomplished within the European Community and how it applies the rules and regulations for those accomplishments relative perhaps to different standards that we in the construction industry may have to abide by if we go to other parts of the world.

Your concern for greater investment in training and research led to your observation on Singapore. Other areas of the world have similar programmes, and this is something that the EU could or should deal with. My own underlying concern is that the world is very competitive today. Most companies who buy the services that we as a group of construction companies offer give very few points for investment and training. Our industry has a history of riding a cycle. The cycle goes from a demand for quality to a demand for best price, but today we are being asked for both. The challenge is how to do that: how to be competitive, do all the maintenance, put in the investment to develop the best IT programmes and to come up with the best technology. The suggestions that have been made during the course of the conference so far for the European Construction Institute to relate closely to the legislature and the legislation and all these developments are excellent. It is frightening that a new set of rules and regulations will be put in place, strongly influencing how each of us does our business with many of us either not being involved enough to express our interests or even understanding the direction in which we are going. We must actively participate. Listening to the comments today from those who are involved in the Union, I believe that they want that type of participation. If there is one thing that I will come away with today, it is the need, as ever, to involve ourselves in these things that will influence us most.

The essence of this debate is that everybody here knows what we need to do to compete. We need to see that Europe, which is very strong in the international contracting community, continues to remain strong. Whatever regulations, guidelines or rules that are put into place, we need to enhance our objective. I would find it hard to believe that there is really a difference in the objectives of the regulations and the needs of industry. The two need to co-exist.. It is up to us to see that it happens.

IMPROVED BUSINESS RESULTS THROUGH BENCHMARKING

Prepared by E W Merrow, Independent Project Analysis, Inc.

William H Croker

Leader, Project Consulting Team
Chevron Research and Technology Company

BILL CROKER
Leader, Project Consulting Team
Chevron Research and Technology Company

BIOGRAPHICAL DETAILS

Bill joined Chevron in 1965 as a plant engineer at the El Segundo Refinery. Beginning in 1967, he began a three-year assignment in India as part of the team which constructed, started, and operated the Coromandel Fertilizer Project. Following that assignment, he returned to El Segundo, California and held a number of positions in refinery operations and major project management. In 1976 Bill was assigned to the Irving Oil Company (a Chevron affiliate at the time) in St John, New Brunswick Canada as Utilities Division Superintendent. He was appointed Senior Project Manager for Aramco in 1980 and led the development of two large grass roots refinery projects and one major refinery upgrade for Saudi Arabia. He completed his assignment with Aramco as Manager of the Ras Tanura and Tanajib Projects Department. From 1986 to 1993, Bill was Manager of Capital Projects for Chevron's Port Arthur Refinery in Texas. In 1993, he assumed his present position as Leader, Project Consulting, with Chevron Research and Technology Company. Since 1991, Bill have been involved in Chevron's Project Management Benchmarking and Process Improvement efforts. The resulting improvements have significantly improved Chevron's competitive position in the industry.

IMPROVED BUSINESS RESULTS THROUGH BENCHMARKING

William H Croker
Leader, Project Consulting Team
Chevron Research and Technology Company

INTRODUCTION:

I am pleased to have this opportunity to talk to you about Improved Business Results Through Benchmarking. Chevron has successfully used benchmarking to improve the performance of our project management system.

For many years, we at Chevron believed that we were managing our capital projects very well and that our performance was probably significantly above average for our industry. This perception was based solely on our internal comparison of projects. We routinely compared each project with the previous one we had done and, if we met the cost, schedule and startup requirements, we thought we had performed our responsibilities with excellence. Even if we did not meet all the requirements, we attributed the deviations to special causes that were unique to the project circumstances and were not caused by our project management system. But when we analysed these assumptions carefully, we realised that completing a project within the budget and the schedule was not very significant unless we compared our results with our best competitors. Internal comparisons are based solely on how well our system performed compared to targets determined by the same system. A comparison was needed to tell us how our system was performing in relation to the best competitors in the industry.

This revelation, coupled with our desire to contribute to our corporate goal of becoming "Better than the Best", inspired us to benchmark the performance of our project management system against the best in the industry. In mid-1990 we conducted our first benchmarking studies.

Before I discuss Chevron's experience with benchmarking, let's back up and understand whether there is room for improvement in our industry and exactly what is benchmarking. I will then cover the results of the Chevron benchmarking, the changes to our project management system, our progress to date, and the requirements to achieve a step change in system performance.

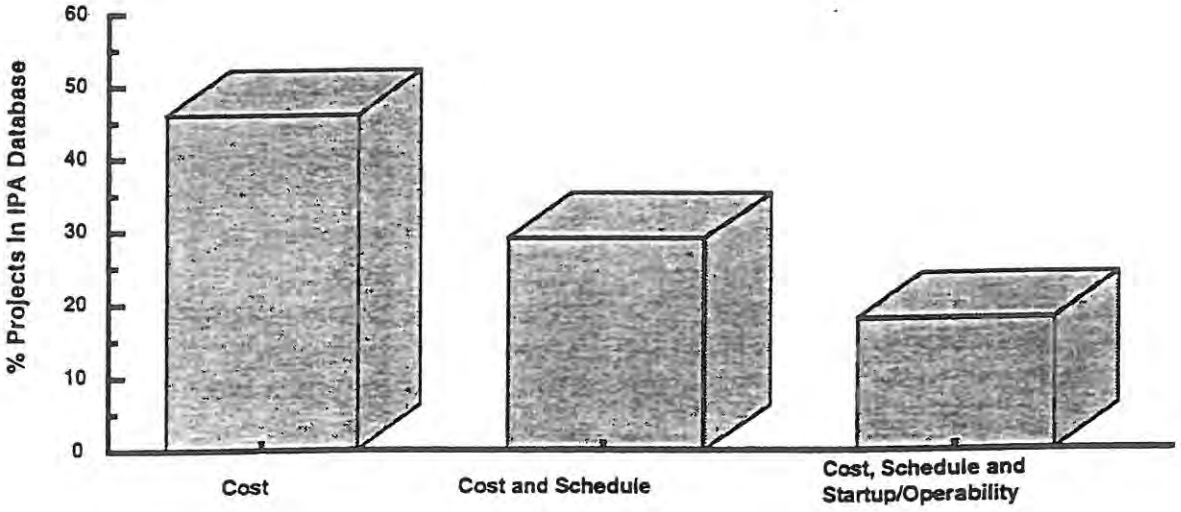
Is There Much Room for Improvement?

According to the Commerce Department, the United States process industries spent just over $100 billion on capital projects in the United States in 1993. Based on an analysis of data from top process industry companies, Independent Project Analysis, Inc. (I.P.A.) - a major project management benchmarking company in the United States and here in Europe - concluded that at least $20 billion of that was wasted on rework, changes of direction, inefficiencies, and failure to follow best engineering and construction practices. And this does NOT include the cases where either the wrong project was built or the project should not have been built at all! In addition to the cost savings, I.P.A. found that at least a 20% improvement in cycle time is available and, as measured by operability, an even larger improvement in plant quality can be obtained.

The data indicate that, of the major projects performed by the process industries, less than one in five meet their primary business objective in cost (less than 10% overrun), schedule (less than three months' slip), and operability (greater than 85% of nameplate in the second six months). (See *Figure 1.*)

Benchmarking is not the sole solution but it can be an important part of an overall solution to this grim record.

Figure 1
Only One-Fifth of Industry Projects Achieve All Business Objectives



What is Benchmarking?

Other than being another tiresome "new management" buzzword, what is "benchmarking" and why should it interest you? The term "benchmarking" can include a number of different activities built around a single simple powerful idea: "I can improve by the careful study of how others do business". At its best, benchmarking is a continuing discovery process that opens the organisation to new and even radical ideas. Benchmarking can play a pivotal role in improving effectiveness.

Benchmarking is NOT a one-shot bullet that will improve performance; it is NOT industrial espionage; and it should NOT be what it so often becomes, industrial tourism.

A number of activities fall into the general category of benchmarking; there is internal and external benchmarking; with competitors and non-competitors; one-on-one or data-based; domestic or global; qualitative or quantitative.

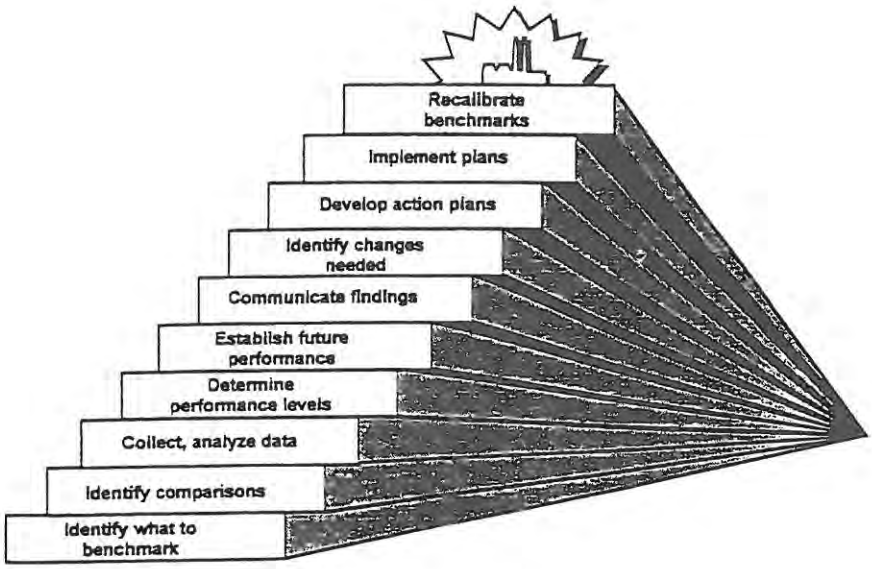
The benchmarking that I will be describing is Quantitative Competitive Benchmarking, that is, the benchmarking of one's performance against competitors using quantitatively developed and derived measures of project excellence and effectiveness. Quantitative Competitive Benchmarking is a logical first step in benchmarking that is often followed by other benchmarking activities as key performance gaps are identified.

Quantitative Competitive Benchmarking uses quantitative databases drawn from a large number of firms in the same or allied industries. The goal is to obtain a rigorous numerical comparison of business results on an "apples and apples" basis. Quantitative Competitive Benchmarking answers that most basic of questions: "How good are we in the things that are important to our business?" Quantitative Competitive Benchmarking has been developed in many areas of interest to the owner

and contractor communities such as capital project system effectiveness, operating costs, maintenance effectiveness, plant quality and reliability, and construction management.

Quantitative Competitive Benchmarking needs to be understood in the context of an overall quality improvement effort. In the "Ten Steps to Quality" first articulated by Xerox (*Figure 2*), the first four steps are covered by an initial benchmarking study. The most important and difficult step is the very first: what exactly should be benchmarked? Let's look at this for benchmarking capital project effectiveness.

Figure 2
The Ten Steps to Quality

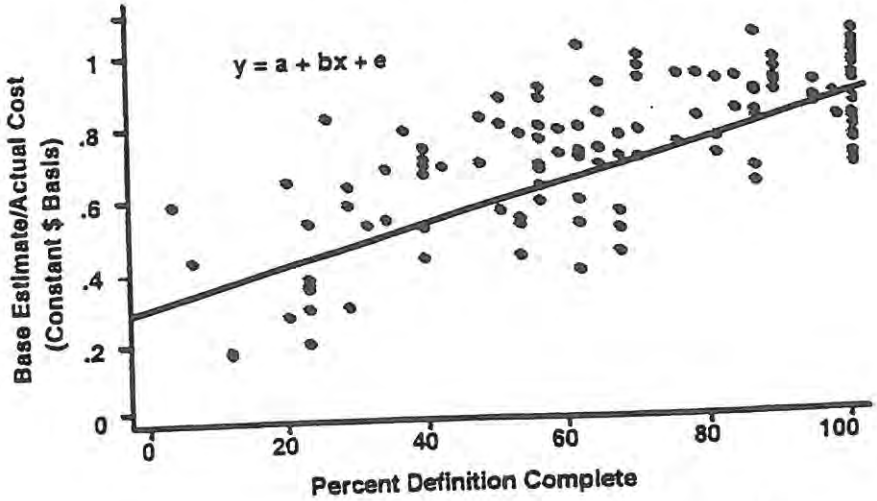


What Should Be Benchmarked?

In Quantitative Competitive Benchmarking, the determinants of what should be benchmarked are derived from analysis of historical data. The databases must serve to link project system performance back to work practices. I will illustrate how this process works.

Let's start with a result everyone cares about: what determines our level of cost predictability in capital projects? Empirical analyses (and common sense) suggest that the most important thing to examine is the relationship between estimating accuracy (as measured by the ratio of the base estimate to the actual cost on a constant dollar, constant scope basis) and the level of definition achieved when the estimate was made. As they say in real estate, "Location, location, location". In projects, it is "Scope, scope, scope". *Figure 3* shows the relationship. Despite its scatter, it is statistically strong but is not strong enough for forecasting purposes.

Figure 3
Project Definition as a Predictor of Cost Deviation



So let's look at a second relationship: estimating accuracy versus the use of new technology. Most project professionals know that new technology adds to estimating difficulties because new technology often causes late unpleasant surprises. The numbers support that view as shown in *Figure 4* but, again, it's a relationship that only a statistician could love. But now comes the power of analysis: when we combine just those two factors as shown in *Figure 5*, things begin to behave; when we combine the other factors that drive cost predictability, we get the relationship shown in *Figure 6* - which provides quite a reliable relationship.

Figure 4
Percent New as a Predictor of Cost Deviation

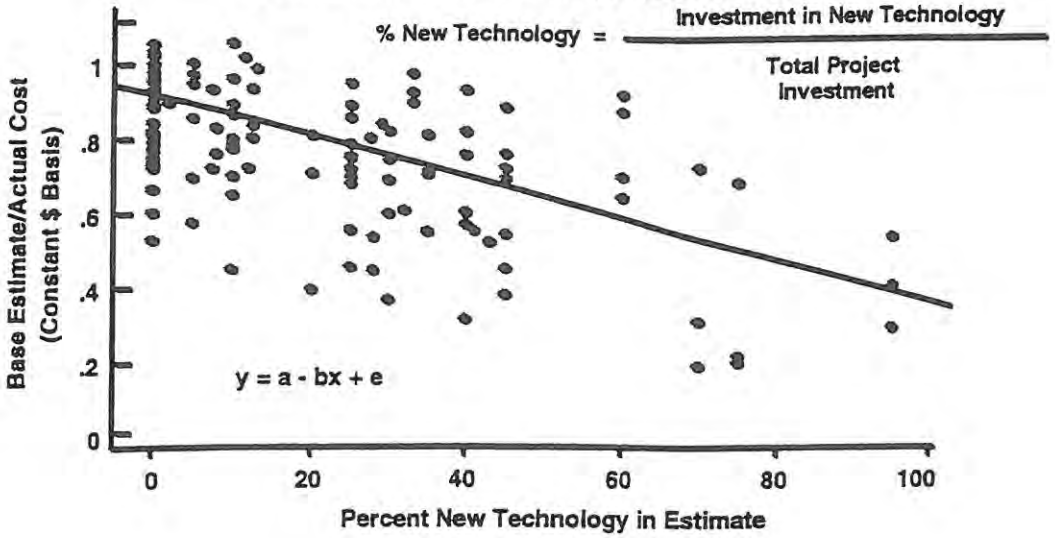


Figure 5
Project Definition and New Technology as a Predictor of Contingency Needed

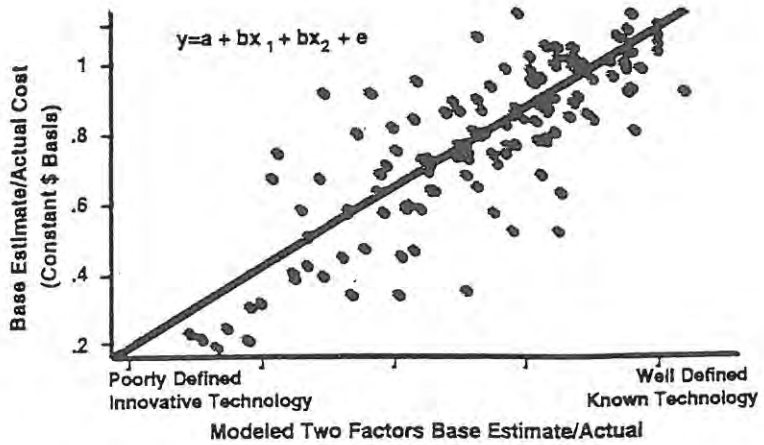
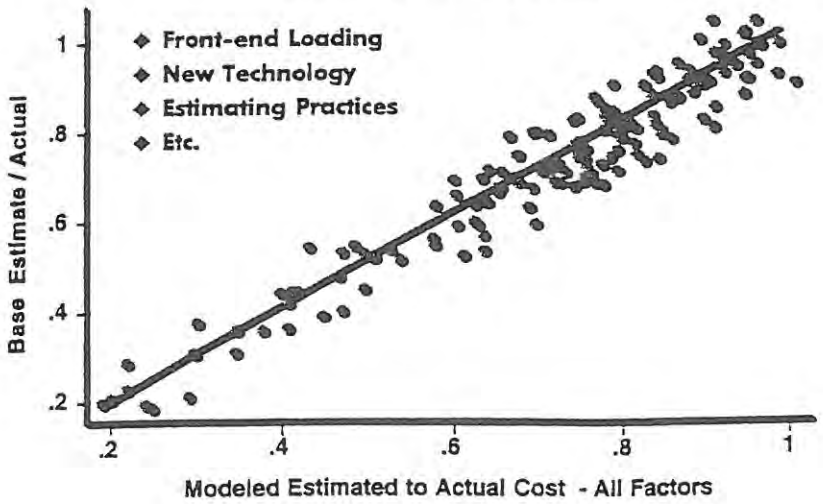


Figure 6
Benchmark Causal Factors



So why is analysis important? Because it provides us with the drivers of key project results in terms of work practices (such as front-end loading) and project characteristics (such as new technology). Those drivers are what need to be benchmarked. Analysis links outcomes to inputs such as definition, technology, project management practices, and the use of value-adding practices by the owner and contractor. It also enables one to focus on the critical work processes. If the work processes do not change, nothing happens. This is one area in which benchmarking differs from other types of studies: reorganisation is not viewed as a particularly useful response to performance shortfalls. Only after work processes have been improved does it make sense to enquire about whether the form of organisation tends to support or undermine the good work processes. In case after case, capital project systems have reorganised only to have nothing change.

What Happens After A Benchmarking Study?

The products of a good benchmarking study will be:

- A set of numerical performance metrics that can be adopted and monitored;
- An analysis of company strengths and weaknesses;
- A comparison against demonstrated best practices; and
- A solid foundation for continuous improvement.

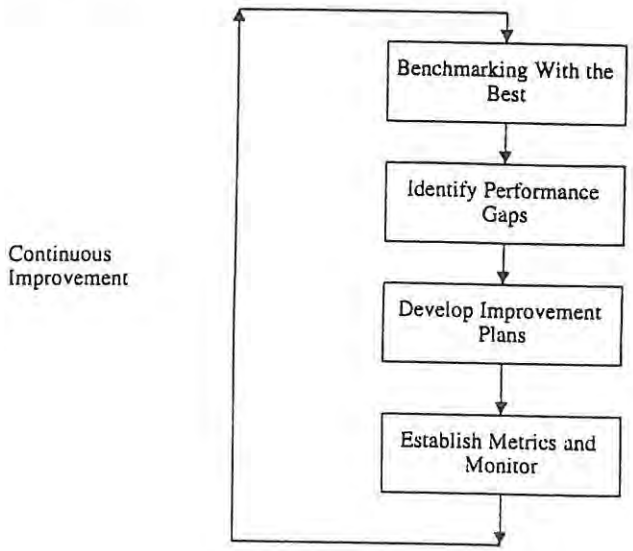
Results of the Chevron Benchmarking

Now let's look at how the benchmarking process has been used at Chevron.

As the result of the situation I discussed at the opening, we decided in mid-1990 to conduct a couple of benchmarking studies to assess the performance of our project management system and compare it to the best. Our process (shown in *Figure 7*) uses benchmarking results to identify performance gaps which would then enable us to develop plans to close the gaps and become competitive in the marketplace. The final step in our process is to establish metrics for continuous improvement using the original benchmarking data as the baseline.

Figure 7

CHEVRON PROJECT MANAGEMENT PROCESS IMPROVEMENT



When we started the benchmarking studies, we were very optimistic about the results. To our surprise, the results were sobering. Our first study conducted by A. T. Kearney was a qualitative assessment of our system performance. This study identified several areas where we had significant opportunities for improvement. Our initial reaction to the Kearney Report was that of denial. We, as engineers, always demand data. One of the Chevron managers had a sign on his desk that read, "In God we trust. Everyone else bring data". Since Kearney's study was qualitative, we looked for another consultant who could help us quantify our performance. We selected Independent Project Analysis, Inc. (I.P.A.)

At that time, I.P.A. had over 200 oil and chemical industry projects in their database and had the capability of quantitatively comparing our projects with most major oil and chemical projects in North America. We asked them to analyse 26 of our completed refinery and chemical projects and compare them to the industry. The results provide us with a loud wake up call. The analysis convinced us that our projects were poorly defined at the time we funded them. As the projects moved through engineering, we made numerous changes which resulted in major cost overruns and delays. Our project costs were significantly higher than those of our average competitors. We took longer than the best in the industry, both in start up and total cycle time. And, finally, new technology was almost nonexistent in our projects. The "Not Invented Here" syndrome was not only alive but was thriving at Chevron. In summary, every project was executed in accordance with the skills, wisdom, and desires of the project management teams. Even though every team did its best, the results were totally unpredictable and, on average, well below our competition.

With this kind of shock treatment you could hardly sweep the findings under the rug. We shared the results widely within Chevron and with our contractor partners. It took a while to convince ourselves that the poor performance of our projects was not due to a lack of competence on the part of our project professionals. It was primarily due to the fact that we lacked a consistent process and discipline in execution and did not provide state-of-the-art tools to our project professionals. This helped us get over the denial and move on to accepting the challenge of becoming "Better than the Best".

Changes to the Chevron Project Management System

We shared the results of our top corporate and operating companies' management and sought their guidance in developing improvement plans. A Steering Committee sponsored by our Vice Chairman with representatives from senior management of our major operating companies was chartered. Under the guidance of this steering committee we funded four quality improvement teams which had representation at senior levels from all of our major operating companies that had significant capital programmes (see *Figure 8*). These quality improvement teams worked intensively over a period of three months and with the help of our consultants, both internal and external, developed some remarkable recommendations, most of which were approved by the Steering Committee. Let me share a few of these with you.

Figure 8

CHEVRON PROJECT MANAGEMENT PROCESS IMPROVEMENT

QUALITY IMPROVEMENT ORGANIZATION

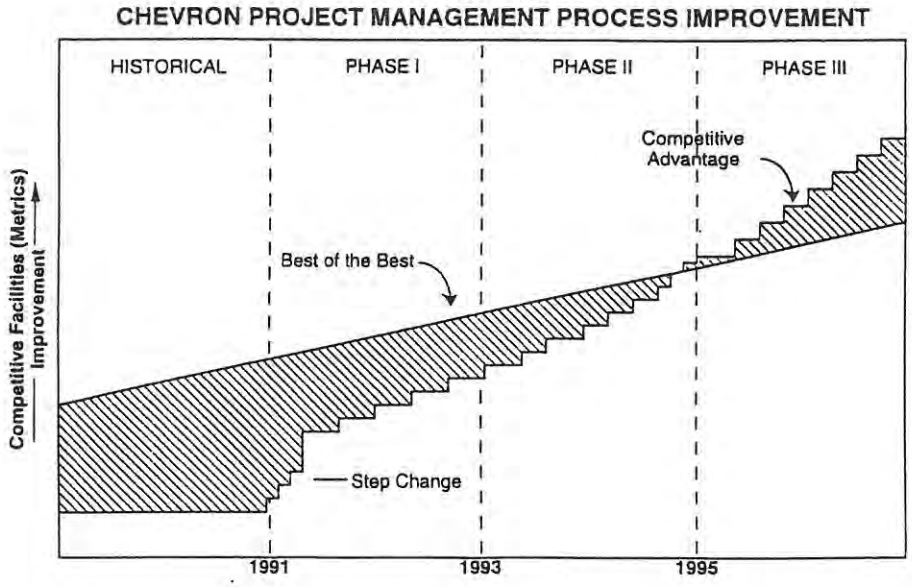
The teams recommended that a consistent project management process be implemented throughout the Corporation to provide a system with predictable performance. The supporting technology companies were charged with the task of strengthening their ties with the operating companies and developing a centre of excellence in project management. Corporate policies were revised to eliminate barriers and facilitate good investment decisions. Roles and responsibilities were revised to enhance accountability and, finally, metrics were established to benchmark the process on an ongoing basis. In other words, our project management process was totally re-engineered.

With these and other recommendations in hand, we created a vision to systematically improve our work processes, measure progress, and achieve system performance that exceeds the performance of the best. The target date was the end of 1995, only four short years away at that time. This goal was widely communicated throughout Chevron with strong endorsement from top management. This process is not a quick fix. Major efforts are required over an extended period of time to achieve excellence. The vision was supported by a new detailed project management process and training. During this period we have also developed many tools that have not only helped us improve the front end loading of our projects but have added significant value to the projects. We identified champions throughout the organisation who formed a network to drive the system towards excellence.

Progress to Date

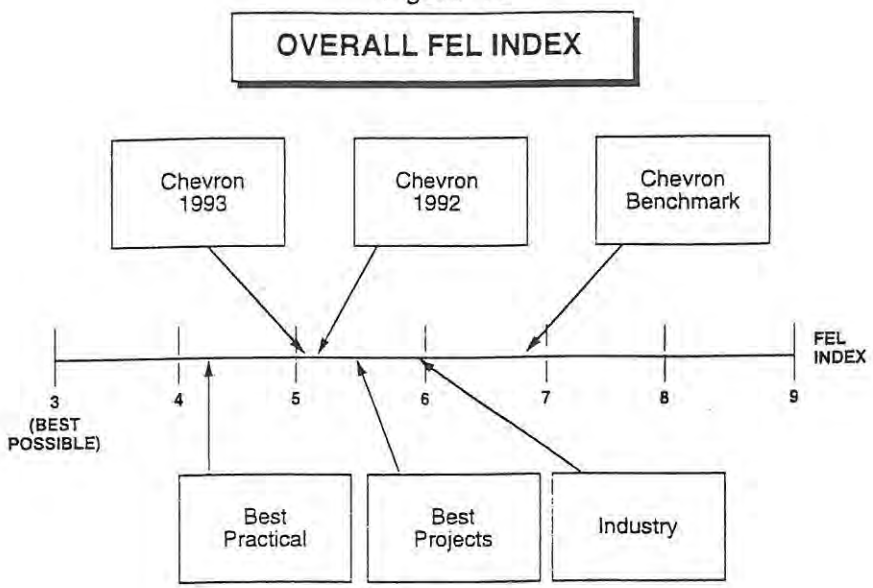
You might wonder where we stand in implementation and what the results look like. *Figure 9* is an overview of our progress. It is important to note that the best are also continuously improving which means benchmarking must also continue over time to determine relative performance.

Figure 9



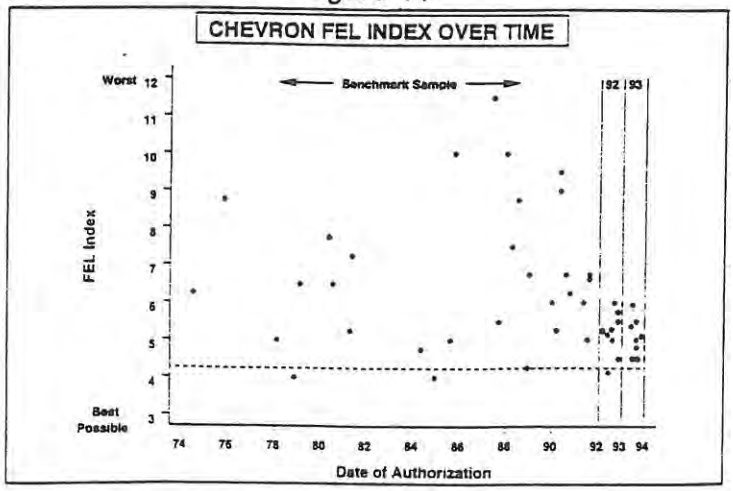
I am pleased to report that we have made significant progress in the last two and one-half years. As you can see in *Figure 10*, our front-end loading index, a measure of project definition at the time of funding - which used to be worse than the industry average - has now improved to "Better than the Best" projects in I.P.A.'s database. We still have significant opportunity to drive this to the best practical level. Benchmarking has indicated to us that our remaining gap in front-end loading is Execution Planning.

Figure 10



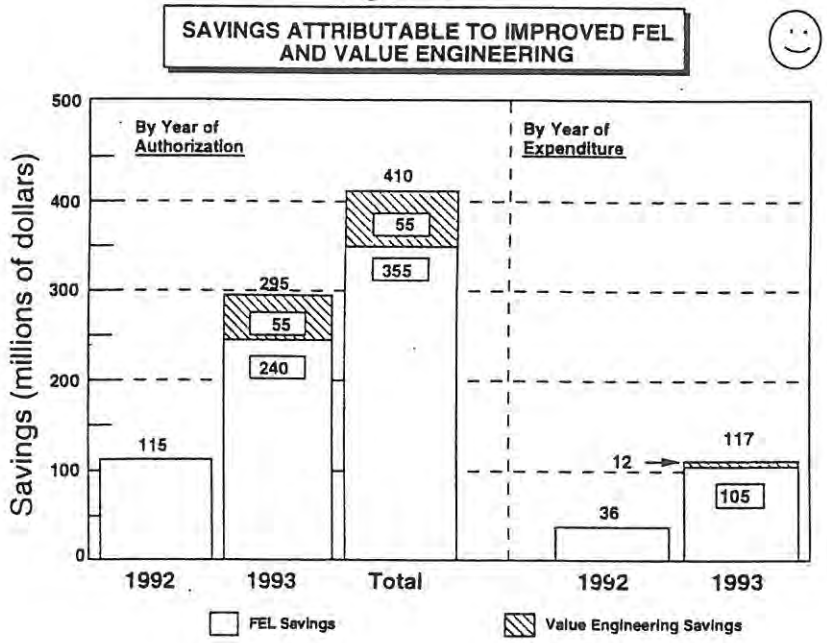
Consistent application of the process and tools has driven a totally unpredictable system to a highly predictable state. The front-end loading index of our projects in 1992 and 1993 are clustered into a very narrow band. The previous projects had unpredictable results (*Figure 11*). The predictability of the system provides a basis for continuous improvement and the addition of value-improving practices to further improve our projects.

Figure 11



What has all this meant to the bottom line? I.P.A. estimates that the savings during 1992 were approximately $115 million from a group of projects totaling approximately $700 million in appropriated funds. The savings in 1993, with projects totaling $1.2 billion, are nearly $295 million. $55 million of this is directly attributable to savings from performing value engineering studies. Also shown in *Figure 12* are actual savings by the year of expenditure. As you can see, these estimates show that we have saved a total of $153 million to date with the balance to be saved over the remaining life of the projects. That is a heck of a lot of money. Even if the savings are only half of those estimated, we believe that we are on the right track. Let me emphasise that I think we have not even achieved half of what we are capable of achieving. We are continuing to develop new value improving practices, fine tune our process, and apply it to all projects in Chevron. We believe that our goal of becoming "Better than the Best" by year end 1995, though difficult, is definitely attainable. We are determined to continue to move towards our vision.

Figure 12



Steps Necessary to Achieve A Step Change in System Performance

Let me now summarise for you what it takes to make a step change in the performance of a system:

- Benchmark and understand the results.
- Share the results widely by communicating, communicating, communicating. Get over the "denial phase" as quickly as possible.
- Seek the endorsement and commitment of top management.
- Develop and communicate a clear vision of where you want to go and make sure that all stakeholders not only understand it but commit to doing their part in achieving it.
- Support the vision with well defined plans, tools, and processes which are championed by key managers and professionals in the system.
- And, finally, ensure consistent implementation, measurement, and continuous improvement.

I believe a step change in performance in a short period of time is attainable if you follow a quality process.

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MANAGERIAL AND TECHNOLOGICAL ROUTES TO COMPETITIVENESS

Session Chair: Peter Morris

Director
Bovis Ltd

PETER MORRIS
Director
Bovis Ltd

BIOGRAPHICAL DETAILS

Dr Morris is a Director of Bovis Ltd with responsibility for Special Projects. He reports directly to the Chairman of the Bovis Construction Group.

Bovis specialises exclusively in the management of construction projects and is one of the largest construction companies in the world. A wholly owned subsidiary of P&O, the Peninsular & Oriental Steam Navigation Company, Bovis is currently managing projects of over $10bn value world-wide, approximately half being in the US, 35% in Europe and the rest in Asia-Pacific and elsewhere.

At Bovis, Dr Morris is responsible for consulting and feasibility studies undertaken by Bovis companies and for Group strategic planning and company and management development. He also handles special assignments and projects undertaken by or for Bovis Group companies. His work has concentrated recently particularly on large project opportunities in Central and Eastern Europe.

Between 1984 and 1989 he was on the Faculty of Oxford University where he conducted research on projects and lectured in engineering and management. He continues as an Associate Fellow of Templeton College and as a faculty member of Oxford University. While at Oxford, Dr Morris consulted extensively to major corporations in Europe and the USA on major projects and management. He is currently Chairman of the Association of Project Managers.

Prior to his work at Oxford, Dr Morris was responsible for the international programme management activities of Arthur D Little, an international consulting company based in Cambridge, Massachusetts, USA. In this capacity he was responsible for several large consulting assignments world-wide. Prior to joining Arthur D Little, Dr Morris was with Booz, Allen and Hamilton, New York, where he conducted many project assignments covering the whole spectrum of project management activities - overall strategy, planning, procurement, information systems, logistics, construction, support systems - for numerous clients in North and South America, Europe and the Middle East. With A D Little and Booz Allen & Hamilton Dr Morris worked on a wide range of projects - petroleum and petrochemical, power, transportation, telecoms, urban development, steel, information systems, etc. He was resident in several instances on major projects in the Middle East and Latin America.

Dr Morris has provided counsel and expert testimony on project and construction matters in a number of legal hearings.

From 1968-69 and 1972-75 Dr Morris held a variety of engineering responsibilities with the civil engineering firm of Sir Robert McAlpine and Sons Ltd, London, including the construction and planning of city centre projects, oil platforms and power stations. Beginning as a field engineer, Dr Morris ended as a personal assistant to the Chief Engineer.

MANAGERIAL AND TECHNOLOGICAL ROUTES TO COMPETITIVENESS

Peter Morris
Director
Bovis Ltd

I was reading the Harris poll of European executives on European competitiveness, published in the *Financial Times*, which was really very pessimistic about the medium to long term outlook for Europe, essentially saying that the Asian countries are seen as undoubtedly offering much more attractive opportunities than Europe. It is important to recognise however that in reality many European countries operate outside Europe.

Companies are conceiving and executing strategies which allow them to operate across national and regional boundaries and it is a mistake to get too depressed by focusing only on the conditions actually within Europe. It is important also to remember that this is as true of owners as it is of contractors and suppliers - National Power, Electricité de France, Frankfurt Airport. Many major owner organisations and not least of course the oil and gas majors are now operating outside Europe in a global environment. The point is that to work competitively in today's world one needs a vision which sees business as global. One needs a mind set which takes into account the dynamics of international business. One must have an education a vision which enables one to see the technological, economic, managerial, financial, human dimensions of business which allow one truly to shape one's destiny in the world market place.

The earlier sessions were intended to examine the dimensions of competitiveness, in this more global environment. Today we live in a world of management which is substantially different from five to ten years ago. It is more exciting, it is more challenging, it allows us more freedom, the rate of change is greater. This is an era where the customer is king; where clients, suppliers, resources are traded and used internationally; where the emphasis is on total quality, on value, on continuous improvement.; where finance, particularly from the private sector, is used to influence commercial success and to increase commercial power. - all this to an extent which is radically greater than was the case five to ten years ago. In American jargon, it is a new ball game. Construction and project management is being reorganised, re-engineered.

Now we have already heard much of these new factors in this conference. Eberhard Meller talked about the dimensions of competitiveness, labour, education and training, innovation. Fred Moavenzadeh talked about the new demise of the traditional public sector and the new emphasis on public sector clients using private sector finance. Fred talked about new markets in Asia, Latin America, the Former Soviet Union, new competitors, new organisational forms, new hardware and software. Neville Simms reflected very strongly the philosophies of Total Quality and Continuous Improvement and Bill Croker talked about benchmarking, an essential dimension of business process re-engineering or of knowing where we are, knowing what the competition is.

European firms, be they suppliers or owners, face a very substantial challenge in operating competitively in the world market. We have two or three major dimensions that we can mobilise to enhance our competitiveness. Probably one of the most important is finance, a vital competitive ingredient both for winning projects and for managing corporations effectively. Increasingly finance is the dominant differentiating dimension for American and European contracts, at least where technology for example and patents, is not dominant. Apart from finance how

effective is our management know-how and our technology? What indeed are the principal trends? What is changing? Is the rate of change significant? Is it sustainable and for how long? This is the subject of this session.

INNOVATION AND THE CONSTRUCTION PROCESS

Joseph Chriqui

Managing Director
GEC Alsthom Combined Cycles Group

JOSEPH CHRIQUI
Managing Director
GEC Alsthom Combined Cycles Group

BIOGRAPHICAL DETAILS

Mr Chriqui commenced his career by commissioning a 150 MW thermal power plant in Greece and this was followed very soon afterwards by managing the construction of 6 large power plants in Greece, 5 thermal and one hydro.

He then moved to the USA to build the largest low head hydro power plant in the world before taking over the management of the hydroelectric business of the company.

In 1983, he went to the USA where for 7 years he was President of all the American subsidiaries of GEC Alsthom. He came back to Europe in 1990 as Managing Director of the Combined Cycles Group.

Since then we have secured and had to manage approximately 7500 MW of Combined Cycles Power Plants.

He has a triple education : in Science, Business and Law.

INNOVATION AND THE CONSTRUCTION PROCESS

Joseph Chriqui
Managing Director
GEC Alsthom, Combined Cycles Group

My speech will be focused on Turnkey Power Plants.

As you know, it has recently become a buyer's market and if you would like to make a small fortune in this business, my advice would be that ... you start with a big one.

The majority of projects today are promoted on a turnkey basis for various reasons including bankability of the projects, single responsibility up to client takeover, no interface discrepancies, etc.

Whilst clearly each project will have its own constraints and peculiarities including many unforeseen at the onset of the project, I have tried in my presentation to outline the actions we had to take to deal with the changes occurring in this industry. The title of my presentation could have been "What's new in this industry".

Here is the plan of my presentation.

- **First Part**
  What changes have occurred in this industry?
- **Second Part**
  What are we doing to adapt to these changes?
- **Conclusion**
  Where to go next?

1. What changes have occurred in this industry?

- **New Breed of Customers**

Let me start by talking about the most important person in our life: **The Customer.**

I believe we now deal with a new breed of customers because, as everyone knows, the trend towards privatisation of major suppliers and increased global competition have brought to our customers the necessity to

on the one hand

- **Become as efficient as possible, moving from the public to the private sector.** Some of them think that efficient means lean and mean but they are not always lean. Many of our clients represented here today see this as one of their strategic objectives.

and on the other hand

- **They have shareholders to satisfy.**

Our customers whether partly or completely privatised want the best deal they can get because they themselves live now in the competitive world.

So they fight to sell the power at the highest price, they fight to buy the gas at the lowest price, usually in "take or pay" contracts, "take or pay" being a

misleading expression; it may lead you to believe you have a choice between paying and taking. Wrong, it means "pay whether you take or not".

And our customers fight also to get the cheapest Capital Cost and O & M expenditures as well as the shortest delivery schedules to make sure that cash starts flowing in at the earliest possible moment, often to satisfy bankers requirements.

- **Higher Health and Safety Awareness**

Higher safety standards are naturally pursued by the Construction Industry but they are also promoted by the introduction of new European Union Legislation.

Some of our customers, who are present here today are understandably expecting that you will deliver the zero accident rate no matter how elusive this may appear.

- **High Environmental Standards**

These expectations are concurrent with more environmental regulations, which will also increasingly be subject to European Union Legislation.

- **Higher Efficiency/Productivity Needed**

Finally there is a need for higher efficiency/productivity. Achieving this is the only way to fulfil clients expectations with the minimum financial impact.

As a conclusion of this first part, we can say that we have moved away from the times when customers wanted power plants with full frills to fulfil a public mission to times when they want a reliable, safe, cheap money making machine which will be operating the soonest possible, as efficient as technically feasible with less emission than legislation or, as they say in UK, HMIP requires.

One good thing about all this, for the people building Combined Cycles Power Plants, is that if gas is available, economic and environmental considerations should lead to building new CCGTs and eventually closing down inefficient and polluting coal fired plants.

This is a very challenging time both for the customers and the contractors.

- **GET ALL PARTICIPANTS TO BECOME TEAM PLAYERS**

2. What are we doing to adapt to these changes?

These are a few innovations that we have tackled to achieve our success so far.

- **It's a team game**

The number one condition for success in building a power plant is to get all participants to become team players from Day 1 of the contract. On fast track projects, the players are of course your customer, all participants in your company, all of your subcontractors and everyone who may influence the outcome of the project (local authorities, National Grid, gas supplier, HMIP, etc).

The most difficult to take on board are your subcontractors who must adhere to these principles both contractually and philosophically. They must accept that to win the game, there must be a coach and that as prime contractor you

hold the right to manage the site as a whole. They must co-operate on health and safety matters and generally speaking obey site rules.

Frequent meetings should be held with all participants to develop the necessary communication channels. These meetings should be attended by those responsible for getting the work done. This atmosphere is vital if unforeseen issues are to be progressed expeditiously and as we shall see in the next paragraph this is more important today than it has ever been in the past.

- **Forward Planning, Recruitment and Training**

Forward planning and training have become critical as, in order to respond to the customers' demand for shorter construction project times, we have moved away from construction programmes comprising of site work activities carried out in a sequential and therefore time consuming manner to today's programmes carrying overlapping activities.

We have to plan and co-ordinate site works to avoid congestion of labour or materials and reduce to a minimum the interference of civil works with the mechanical and electrical works.

For this, you need the right tools for project planning control reporting and Quality Assurance. Many software packages exist today which deal effectively with this matter.

Project Management is not an exact science so the strength, calibre and leadership of the Project Manager, his ability to be effective, determined, enthusiastic and decisive is vital to the success of the project.

He should have authority to make decisions and bear full accountability for the project.

The recruitment and training of staff and labour with the best available skills is a must to meet these new challenges.

- **Early Investment, Early Development - Programme Management**

To meet these new shorter schedules, early financial commitments in terms of design, advanced manufacturing and site work contracting must be undertaken, even though this increases bidding costs, carrying out soil investigations before contract signature may allow the start of civil works shortly after contract award.

Thanks to the prevailing low rates of inflation, it is today less costly to buy early than to deal with late deliveries.

When interest rates were at 15%, the cost of buying 6 months early was 7.5%. Today it is less than 1% in most cases and this enables us to complete the designs earlier and to better organise site work.

- **Programme Management**

As soon as you enter into the details of the necessary fully integrated programme which takes into account all aspects of civil design, plant specifications, purchasing, manufacturing construction and commissioning, you realise the importance of involving the construction manager at the earliest stage to make sure constructability is taken into account by engineering.

For similar reasons the Commissioning Manager should also be assigned to the project during the construction period.

Time becomes the most important value and the programme at least at a certain stage becomes construction driven before becoming commissioning driven.

Similarly, cheapest price is no longer the most important criteria for purchasing; delivery time reliability and quality are as important, possibly more so.

A degree of urgency and some float should nevertheless be built into the projects to deal with the unforeseen. My technique has been to target commissioning, say 2 months earlier than the contract requires and leave some float in the commissioning period to deal with the unforeseen.

This has been very effective as I have commissioned every single power plant that I have built ahead of the contractual schedule.

- **Setting New Goals for Engineering and Design**

Simplification/Modularisation/Standardisation

As we have said, the plant should be designed not only to achieve the most efficient performance but to allow construction to be carried out in the most productive and safe manner, thus achieving the targets established for reduced site labour hours and programme duration.

It is obvious that we must today move toward simplified designs, as standard as possible, with minimum changes to accommodate site and customer requirements.

Modularisation also brings a major contribution to reducing the volume of work to be carried out at site, it reduces the need to work at heights thus reducing safety hazards, costly work and allowing better control over quality.

This has been achieved with the gas turbine and its modules, with HRSG modules, condensers, etc.

Every effort should be made to complete engineering design and purchasing early. It will cost between 2 and 10 times more to recover lost time during construction than at the office based stage. It also affects the morale of the workforce and creates problems with the customer and subcontractors.

Changes

There is no room for continual improvement of the design as sometimes engineering is tempted to do so. It is vital that engineering is led by an engineer who understands that and imposes vigorous discipline accordingly.

There is also no room for late deliveries, wrong material, design errors or defective construction. The design needs to be right the first time which means tight control of vendors and no short cuts in QC and QA. An overall inspection schedule will help a lot in this matter.

We should spend as much energy as is feasible in preventing problems even though of course some will happen anyway.

Discussions between all parties involved at the outset of the project should include a review of the plant layout, the main access routes for plant and personnel, the material lay down areas and the labour support facilities.

- **Site Management Infrastructure**

A typical 1500 MW CCGT power station will employ at least 1000 construction workers at peak, the organisation of the logistics will have a major impact on their performance and their productivity.

Attention should be given to security, car parking, electrical supplies, toilets, washrooms, canteens, etc.

Of course, in addition to this, you need to meet these new overlapping schedules, by developing a core site organisation staffed with specialists fully conversant and equipped to handle the whole range of construction, commissioning operational and maintenance management functions including authorised personnel able to enforce safety requirements and chemists for environmental and process control.

You must ensure that the service provided off-site must also be capable of rapid response commensurate with the fast track nature of these projects.

- **Health and Safety and Environmental Plans**

Society now expects the highest standards of health and safety and environmental preservation.

This covers ground conditions, contaminated soil, proximity of power lines or railway tracks, sometimes the risk of unexploded bombs and, very importantly, cleanliness and correct scaffolding at site during construction and of course rules and codes of practice must be followed during energisation and commissioning.

All of this should be carried out in the most formal way, in auditable and regularly audited plans which should be signed off by all participants of the project at responsible levels.

I would recommend a thorough check of any subcontractor's track record in these domains before he is awarded the contract to perform a portion of the work.

Today it is very easy to prepare video presentations on the subject and any existing or new employee should not be formally introduced to the site before he has watched the video.

As far as the environment is concerned, there are at least 5 principles that must be addressed to manage this matter:

- Compliance with the laws relating to the environment
- Waste and pollution minimisation
- Sound environmental working practices
- Education and training to increase the awareness of our employees
- Establish systems for monitoring and assessing performance.

As a conclusion to this second part of my presentation, I would say that we have on the one hand taken a giant step into making early investments in the project in terms of time, money and planning effort, and on the other hand, in addition to research on how to improve productivity, to establishing structures and acquiring means and personnel whose qualities and abilities will have a tremendous impact on the outcome of these projects, the average of which being in the 500 MUSD range.

Even though the quality of the whole staff is important, there are three positions that should be filled with the greatest care:

- Project Manager
- Engineering Manager
- Site Manager

3. Where to Go Next?

The hill that we are climbing is getting ever steeper, therefore we must consider where to go next.

- **More Standardisation**

We should aim for offering "off the shelf power plants" whenever this is possible as, if it is coupled with a very attractive price and delivery schedule, it may tempt some customer who will try to get the good price, the good schedule and what they will call small adaptations generally coupled with difficult contractual terms. But that's human nature and will still allow the early manufacture of major power plant components which have traditionally necessitated lengthy lead times.

- **Better Early Preparation/Adaptation to Local Conditions**

We have to adapt to the fullest extent to all aspects of the projects: custom clearing, transportation, working methods, working practices, regulations, contractor to employee relations, in search of productivity improvement in this labour intensive industry.

This may lead to partly re-engineering the product. Sometimes we have to involve the community positively in the development of the project.

- **Improving the Site Working Conditions to Improve Productivity**

Attention to a few points have a great impact on productivity:

- Reduction of walking time from the site support facilities to the workplace will actually increase the actual hours worked.

- Correct level of supervision will ensure that materials, drawings, plant and equipment are available to support the direct labour.

- Team building sessions with the customers and with the subcontractors.

I hope that this paper has given you an insight into the challenges that we are facing in the construction of our combined cycles and hints on the innovations that we are currently working on in our relentless quest to improve performance.

CONTINUOUS PROCESS IMPROVEMENT IN CONSTRUCTION

Paul Le Blond

General Manager Development
BAA plc

PAUL LE BLOND
General Manager, Development
BAA plc

BIOGRAPHICAL DETAILS

Paul Le Blond studied Geography at the University of Reading and took an MSc in Transportation Engineering at the University of Leeds. He joined BAA in 1970 and has undertaken a variety of roles since then.

His early career included master planning and facilities planning of major airport developments, as well as the line management of passenger and cargo facilities at Heathrow Airport. From the mid 1970s to the mid 1980s, he was involved in the development of a new terminal at Stansted Airport, and in particular with the public inquiry. From 1985 to 1989 he was General Manager of Heathrow's Terminal 2. In 1989 he became project manager for the Heathrow Express rail link, helping to obtain permission through a Parliamentary Bill. Following Royal Assent to this Bill he became Head of Planning Communications, which involved publicising the proposed fifth terminal at Heathrow.

Since 1992, he has been General Manager, Development in the Group Technical Services division of BAA plc. This role includes the responsibility for implementing improved project process in the group's 500 million ECUs annual capital expenditure programme. He is currently involved with around 40 separate projects ranging in scope and value from small property improvements to large airfield and terminal redevelopment.

He is based at the BAA Group Technical Services office at Gatwick Airport and is a Member of the Chartered Institute of Transport.

CONTINUOUS PROCESS IMPROVEMENT IN CONSTRUCTION

Paul Le Blond
General Manager
BAA plc

In the presentation, I would like to tell you about BAA's progress towards improving the way in which projects are undertaken. I will describe the BAA and its projects, explain why improvements are needed and what I mean by continuous improvement and then describe how BAA sees the project process. I will then discuss some of the tools and techniques we use, and conclude with a challenge to the European construction industry.

BAA plc is a private company whose shares are owned by over 500,000 shareholders. Our market capitalisation is around 6 billion ECUs making us the thirty-fifth largest company in the UK (larger than British Airways or Marks & Spencer) and the 74th largest company in Europe.

BAA owns and operates seven UK airports including Heathrow, Europe's largest. BAA airports handled 80 million passengers, 1,070,000 tonnes of air cargo and 860,000 air transport movements in 1993. Passenger numbers are currently growing at six percent per year and are forecast to continue growing at four or five percent for the next ten to fifteen years. In addition to its UK airports, BAA has interests in UK commercial property and in partnerships with other airports around the world.

Until 1987, BAA was owned by the UK Government, but was privatised along with many other transport undertakings and utilities. BAA has been profitable for many years and had reinvested its profits into developments at its airports. Amongst the main developments in more recent years were the 250 million ECU Terminal 4 at Heathrow, opened in 1986, the 300 million ECU North Terminal at Gatwick, opened in 1988 and a new terminal at Stansted, costing 500 million ECU, which opened in 1991.

Currently we are spending 500 million ECU each year in a 4.5 billion ECU programme which includes the expansion of Glasgow Airport, the construction of the Heathrow Express rail link and BAA's largest ever project, a fifth terminal at Heathrow.

But in fact, BAA is not just involved in large projects. Three quarters of our current workload is on smaller projects of less than 12.5 million ECUs. Most BAA projects are buildings, but we have significant investments in roads and pavements and also in infrastructure.

Lastly in this description of BAA, it's worth noting that the facilities that we build are owned and operated by BAA, although of course our business partners - airlines, retailers, control authorities - also operate in them. This retention of ownership and operation means that we retain an interest in our developments throughout their life, unlike some developers who build in order to sell.

Why then, with BAA's successful record of development so far, is change needed?

Bluntly, if we build what we need, for the prices forecast over the next few years, then we'll find ourselves on the spiral of decline with reduced profits, lower investment and decline. We could cut costs by simply cutting the amount of work, but then we'll not meet demand and we'll lose our number one position.

Currently, our buildings cost too much. In the next few years construction costs could rise faster than inflation. Also, we want our partners to make profits. The target is to reduce the base cost of our projects so that we can still achieve profits for all. It could mean a fifty percent reduction in basic costs.

How are we going to do it?

Let's look at how efficient the construction industry is in Europe compared with the US and also compared with other industries. Clearly there is scope to learn from elsewhere, and particularly to learn from industries which have thought about the process.

Thinking of construction as a process is a key step in improving construction productivity.

We think of the project process as having six stages, from pre concept where the idea is only just forming, through concept, feasibility and detailed design, then construction and fit out, with operations and maintenance being part of the project.

Across these stages, there are a number of subprocesses which take place. Each of these can be improved, and by improving the process, the end product will come out better. I will describe some of the process improvement we have begun shortly.

Continuous improvement is now well established in BAA as a way of attacking problems or exploiting opportunities. CI involves giving power to people to decide, being clear about your objectives, using data and dealing with the issues rationally, in a structured way. We have used it to increase throughput, reduce costs, increase sales and improve passenger service.

Let me now describe some of the tools and techniques we are using to improve the project process.

We try to structure our briefs to ensure that at each stage of the process a brief is written to describe what is required at the next stage. And we ask those involved to sign the brief, which makes them clearly own the project. This simple step is designed to avoid the situation where a client, on handover, says to the designer "This isn't what I wanted".

The project board is a group of interested people who are given the responsibility to see the project through from concept to operations. It is usually chaired by the main client representatives - the terminal general manager, the property director, or the head of operations. Other board members are from Finance, Planning, Retail and Maintenance.

The project board should have full responsibility for all major issues - appointments, design, procurement route, etc.

The project manager is responsible to the project board for the implementation of the project and all of the project team - the designers, consultants and contractors.

The important thing about this structure is that it provides clear lines of communication, with the project manager as focal point, and power given to the project board to make decisions to implement the project.

We have a process which helps to choose the most appropriate route, and we choose that route before we choose our contractor. The process quantifies each aspect of the project and suggests the best route. Design and build might be suitable for a straight-forward office building on a fenced site. A traditional route where an architect

completes all the drawings before any construction work begins might be used where time is not important. But in BAA we are increasingly using the construction management route which allows construction to begin before much of the design is complete, And also enables complex operations to be organised around the construction.

The requirements of the European Union are that we advertise our contracts in the Official Journal and select on the basis of objective criteria. And this we do in order to enable the widest range of appropriate companies to tender so that consultants and contractors have to be highly competitive.

Whilst on the subject of procurement, I should mention our moves towards partnering. Whilst the benefits of competitive tendering are well known, there are also positive aspects of longer term relationships. We have now established framework agreements with a number of key suppliers for lifts, escalators, loading bridges, carpets, seating and other items.

When it comes to the more detailed stages of design, we are increasingly looking for standardisation of components. We do not want to stifle innovation, but whilst the appearance can be highly unusual, it must be made from standard units. We'll try not to specify a 32 passenger lift when the manufacturer's standard unit is 36 passengers. Standardisation is particularly important when it comes to the operations stage, when we are looking to maintain and replace parts in small quantities.

We undertake value management sessions at the end of the concept and feasibility stages, and value engineering during detailed design. In value management, we get interested parties plus some independents to confirm the objectives and test options, using a range of continuous improvement techniques including brainstorming and matrix analysis. We believe value management saved us over 35 million ECUs last year, finding better ways of achieving our objectives. Value engineering is a structured method of meeting a specification at lowest cost applied during the detailed design stage. Post project reviews enable us to learn lessons from previous projects and apply them to new ones.

These are just a few of the process improvements we have established. We are working on many more and we hope over the next few years to achieve our target of a 50% reduction in the basic costs of our facilities.

I'd like to mention one more tool that we are developing to help us plan and design buildings - three dimensional visualisation or 3DV.

This tool allows us to understand more about a building at the concept stage, to test alternatives, to avoid clashes and, if we feed the computer with data about previous buildings, together with rules and specifications, the building can be designed for us.

This presentation shows a new pier we are building at Heathrow to serve European flights. It shows how the building is built up from the basic structure, how the finishes look from many angles, whether small details work and if there are any clashes of structure and services.

As a major client, it is obvious that we are looking for reduced building costs. Our programme amounts to over 4 billion ECUs over the next ten years, and we want that money to go much further than it would at present.

So we want partners who are prepared to join us in learning from our experiences, help in the necessary research, and enter into mutually beneficial arrangements.

If we can jointly reduce our building costs, then we can build more and all of our partners can make profits.

THE ROLE OF IT IN IMPROVING THE COMPETITIVENESS OF THE CONSTRUCTION INDUSTRY

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BIOGRAPHICAL DETAILS

Fikry Garas obtained his Doctorate Degree from the University of Sheffield in the field of structural behaviour of concrete structures. He has been employed by Taylor Woodrow since 1965, occupying a number of posts including the Headship of the Research Laboratories and presently he is responsible for the management and co-ordination of Advanced Technology Projects.

He has more than 30 years experience in research and development and specialist advisory work in a number of areas in particular structural engineering associated with the nuclear and offshore industries, stability and safety of structures, renewable sources of energy and automation of the construction process. His experience included project management and co-ordination of large national and international R&D programmes involving consultation with a wide range of disciplines.

He was the Programme Manager of the UK Advanced Robotics Initiative in Construction and Civil Engineering (1985-1991). In 1988 he led a UK Study Mission to Japan, to report on the state of automation and robotisation of the construction industry. He is at present the Programme Manager of the Eureka CIMsteel (UK) and the ESPRIT ATLAS Projects. The CIMsteel project is concerned with the development of Computer Integrated Manufacturing for Constructional Steelwork and the ATLAS project is addressing the application of Information Technology to the integration of large scale engineering and construction projects.

In the eighties he was responsible for developing a renewable energy strategy for Taylor Woodrow and was commissioned by the Department of Energy to undertake a study on the commercialism of geothermal energy from hot dry rock. He also undertook a number of 'special studies' related to civil and structural engineering concerned with demolition and decommissioning of 'special' and complex structures and design of underground shelters.

He is a Visiting Professor at the City University, London, a Fellow of the Institution of Structural Engineers and a member of a number of professional institutions. He is also Chairman and member of a number of technical committees for national and international organisations. He is a founder member and chairman of the Institution of Structural Engineers Study Group on "Model Analysis as a Design Tool". He is also a member of the Science and Engineering Research Council Panel in IT applications in the field of built environment.

In 1987, he was awarded the 'Lewis Kent Award', the highest award for personal services, by the Institution of Structural Engineers.

He has published more than 80 papers and reports and edited seven seminar proceedings.

THE ROLE OF IT IN IMPROVING THE COMPETITIVENESS OF THE CONSTRUCTION INDUSTRY

Fikry Garas
Senior Consultant, Special Projects and Advanced Technology
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Introduction

It is a pleasure to be invited to speak on a very important subject - the role of IT in improving the competitiveness of the construction industry. For the purpose of my presentation, I define IT as the exploitation and application of the available computer hardware and software technology in our business operations.

Since the invention of the telegraph, IT has revolutionised the way we communicate, the way we do business and the way we live. IT has collapsed time and distance, becoming indispensable in today's world economy. Yet although businesses and organisations have spent tremendous amounts of money on computer hardware and software, these investments in IT have not raised productivity or profitability of most organisations in a significant way.

How can the construction industry make better use of the available technology? To put what I am going to say in perspective, it is worth reminding ourselves of the role of the construction industry and its importance to the European economy. The construction industry accounts for 12% of European Gross Domestic Products and 20% of EC civilian employment, including the associated services, government and distribution. It also accounts for 60% of gross fixed capital formation in the Community and, in doing so, provides the infrastructure for living, working and movement of people and goods. It also accounts for 50% of all energy used.

The need for IT computer integration of the construction process in Europe has been recognised during the past 10 years and it has been actively pursued since the late 80's. The European construction industry is facing demands for higher productivity and improved quality in order to meet external competition.

What do we mean by competitiveness? The elements of competitiveness are generally agreed to be: Price, which is dictated by efficiency and the level of competition; Time or delivery, which is often determined by availability of information and of resources and the quality of management; Quality, determined by regulation, specification and management; Economic use of resources, dictated by the supply of skilled workers and conservation issues of natural raw materials and energy.

Construction Industry Characteristics and Needs

To appreciate the problems we are facing, we need to examine some of the characteristics of the industry. Our operations involve multiple-disciplines and skills. Industry is fragmented usually involving decentralised workplaces, many project stages, concurrent activities, and suffering from co-ordination clashes and having to choose from multi-vendor applications. The industry suffers from lack of exchange of standards and non-AEC semantic tools. What the industry needs to overcome some of these problems is improved integration techniques, similar to those used in manufacturing, and also to address and use the life cycle type analysis, treating construction as a manufacturing process. The industry needs an open system for the exchange of information electronically and new user friendly software capable of integration and interchangeability.

To meet the challenge of competition, the industry needs to reduce costs and to increase productivity, to shorten construction project times, to improve the skill of the workforce and satisfy the full life cycle performance needs of the client and the customer. It needs to provide value for money, to improve the culture of the industry, and to unlock potential for growth in world markets.

Any engineering project requires a number of disciplines and involves many operations. One of the major, and probably the primary problem in our fragmented and de-centralised industry, is compartmentalisation; that is a person believing that he has a responsibility only for a very closely defined, very limited type of activity in a project which he has trained for and which he has specialised in. In dealing with projects, the design and construction team are always dealing with information and they have to manage information for profit. We have to treat information as an important asset for our business. Companies need to handle information with care in the same way they handle money and finance.

The Design and Construction Process

Traditionally, the flow of information between various disciplines and various organisations has been exclusively on paper with little use of electronically transmitted computer based information. However the general introduction of stand-alone software packages dealing with specific operations of the construction process, for example drafting, detailing, estimating, planning, has made a significant impact on the culture and on the environment of our industry. For our industry to improve and to be competitive, it must aim at integrating the design and construction process. In fact, if the industry does not change its practice and adopt IT in its operations, it will be left behind and perhaps some companies will be out of business.

However introducing IT and integration of the construction process has not been that easy and it has its own problems because of the traditional parties to the construction process, traditional methods of procurement and also the problem of IT techniques and user interface. Recent reports have suggested that for the construction industry to compete in world markets it should aim at 30% real cost reduction by the year 2000. European countries are lagging behind the United States and Japan, and we need to develop a strategy for modifying the culture of the industry based on partnership and teamwork with clients and customers at the heart of it. We need to develop an IT strategy based on international standards for the exchange of information, utilising open system integration. Look at the electronics industry. If you want to buy a hi-fi system you can go to an electrical shop and buy a complete set supplied by one manufacturer, or if you don't want to stick with that particular manufacturer you can mix and match the various components of the hi-fi system. All that you have to do is buy the necessary little cables which connect these parts and you can hear your CD or your record. What we want to achieve in our construction industry is a similar approach by which we are able to mix and match a number of software applications to do the jobs we want.

In recent years companies in the manufacturing industry have achieved significant increases in productivity coupled with improved product development times through concurrent engineering and by adopting a strategy for business integration utilising information technology. Can construction do the same? Well, introducing integrated information technology will lead to improved productivity, saving time by not regenerating information, because all disciplines in the process can make use of the same information from the same detailed base, from the same source. It can improve quality of information because it eliminates errors caused by data re-entry. It gives flexibility and improves collaboration with partners, customers and suppliers and improves price performance and will enable quick response to changes and will improve business opportunities.

One of the key elements of improving competitiveness is compressing time. Various techniques have been successfully achieved in manufacturing, for example the car industry. Time is a valuable resource that can be used for competitive advantage and IT can help our industry in compressing time. Focusing on time compression eliminates waste leading to cost saving and improved productivity and quality. Time competitive businesses are more flexible in the way they serve the market and customers. Time compression motivates an organisation towards working in a constantly changing environment.

Levels of Business Transformation

It is now generally accepted that different levels of application of IT can support or induce different levels of business transformation to enhance the competitive capability of an organisation. Five different levels of exploitation of IT have been suggested together with the corresponding degrees of business transformation. The first one is called localised exploitation and most construction organisations have achieved this. In this phase the general aim is to automate a particular process or task, for example the accounts system or word processing, design, drafting, and estimating. For these types of programme, there will be an upper limit to any further increase in efficiency obtainable once the task has been automated. The second phase is internal integration, and this involves the linking or integration of previous stand-alone applications. This level of application of IT assumes and requires the digital transfer of information between separate computer programs probably used by individuals responsible for different tasks within the organisation. Examples of this include CAD data, to detailing or design, CAD data to quantities or schedules and design data to detailing. Most companies in the construction sector have not advanced beyond this level.

The third phase is the business re-definition which requires the re-thinking of the way in which a business operates. The implementation of this phase needs the re-aligning of IT strategy with business strategy. One of the best success stories of business re-definition is direct line telephone insurance pioneered in the past 3 or 4 years by a number of organisations. By making use of the telephone and computerised proposal handling they have replaced the qualified insurance professionals such as brokers and salesmen by well trained sales operators. Similar operations have also successfully been adopted in share dealings, for example on the stock market and these businesses are now very successful and profitable. The fourth stage is the re-design of external links and this involves the establishment of relationships between the participating organisation in a business enterprise. All of us are familiar with the EDI techniques and the enabling technology used which allows the strategic linking of the business and technical processes of organisations. The fifth and the most ambitious phase will involve the re-thinking of the way the whole industry operates. A shake up of the whole industry would be needed. An integrated approach would be required and benefit would be gained from identifying the key changes that other industries have made in exploiting an integrated approach in the use of information technology.

These five levels are being pursued by the manufacturing industry at the moment, for example the car and aircraft industry, and we may be able to do the same in the construction industry but it will take time and effort. Unfortunately our industry does not invest enough in information technology and the UK construction industry is a typical example. In a recent survey consultants were found to invest 1 to 1.5% of their fee income in IT, while contractors, for example, invest 0.25% of their turnover.

Generally, investment in the construction sector is highly constrained because it operates in an environment that is intensely competitive and liable to significant fluctuations in workload. Senior executives in that industry are often faced with crucial decisions on the strategic development of IT within their own organisation, for

example what budget, what priorities and at what speed should the technology be introduced.

There are already a number of ongoing developments and projects which should be able to contribute to the process of introducing integrated IT in our industry. Examples of these are the ATLAS project and the CIMsteel projects which we have been involved in now for the past two years. ATLAS is a collaborative research project supported by the European Commission under the ESPRIT programme. In this project we have six participating organisations. The objective is to improve the efficiency and competitiveness of executing large scale engineering through the integration of project life cycle and establishing the related standards. Two application sectors are being pursued in the project - building and process plant.

IT Initiatives in Projects

Again, in the ATLAS project, we are trying to achieve integration through an open system utilising international standards for the exchange of information. That is, support business co-operation for the adoption by software developers and end users. Since its commencement in 1992 the project has made considerable progress in the development of product and project models and software tools facilitating integration. The ATLAS demonstration being planned for the next six months will include the integration of a number of software applications used in the building and process plant sectors. We are pursuing two avenues for integration; one utilising the STEP link and the other utilising EDIFACT link via a Project Model.

The other project is CIMsteel. CIMsteel operates within the EUREKA framework and it is about developing computer integrated manufacturing systems tailored for the constructional steelwork industry along the lines of those successfully used within the aerospace, automobile and general manufacturing industries. The project was conceived with a vision to place the European construction steelwork industry in a leading position to compete in the world market. If you compare the market in Europe for this sector with that in the United States or Japan, it becomes obvious that the market has not reached its potential in Europe. In Japan for example they produce something like four or five times what the European market produces.

CIMsteel is a collaborative European venture with 45 organisations from eight countries representing a wide cross section of the industry (Austria, Denmark, Finland, France, Italy, Sweden, Holland, United Kingdom). The funding is essentially made up of grants from national governments and organisations' own funds. The total effort is estimated to be about 400 man years. One of the core activities of the project is in the area of developing the technology to achieve integration of the whole life cycle from a perceived need to design and analysis, detailing, fabrication, erection and even demolition. Integration is being achieved here by developing the CIMsteel integration standards to enable the transfer of data directly between various stages in the life cycle, and similar to the hi-fi example, this will give the end users the flexibility of mixing and matching software packages from different vendors which will greatly enhance the efficiency of the industry.

In October 1994, in London, a live demonstration of the integration and inter-working of ten leading European structural engineering software applications was successfully achieved utilising the CIMsteel Integration Standards, witnessed by about 200 people.

The CIMsteel project will lead to dramatic improvement in the quality and efficiency of the entire construction process and will transform the industry into a world class one to compete in world markets. The potential impact of ATLAS, CIMsteel and other projects on the industry is expected to contribute significantly to the performance and cost saving demanded by the client.

Need for Automation

Another area where IT plays an important part is in the field of automation and robotics required by the construction industry. The need for automation and robotic application in construction has been recognised by a number of countries in the Western world. The industry is experiencing increasing shortages of skilled labour and an ageing workforce. For reasons of competitiveness, the construction industry needs to pay special attention to site automation. Automation should also offer increased efficiency, better control and quality, speed of construction and can raise standards of health and safety by performing hazardous and unpleasant tasks. Japan, for example, has set itself up to automate the construction process by applying the principles of modern manufacturing to construction and they are making efforts to standardise their procedures and processes. They are on the way towards simplifying them by detailed and fundamental analysis for computer and robots to play a substantial role. The Japanese construction companies have developed a range of prototype robots for their own use.

The Japanese vision of the future is combining robotics with IT automation and this in fact has been realised in a number of projects successfully achieved in the past two to three years.

In the future a fully integrated site may be organised to incorporate various integrated systems from tender stage to completion using largely current technology, but the real barriers to implementation will involve issues of management, organisation and attitude.

To work towards "Site 2000" I believe there is a need for a firmer multi-discipline test bed site to be used as a proving ground for the introduction and integration of new technology. The role of IT in computer integrated construction is to unite design, construction, occupation and even demolition.

I am pleased to report that the ECI are taking the subject of IT and the integration of the construction process seriously by agreeing to the setting up of a Task Force to address some of the issues raised in this presentation. The scope of the new Task Force is to identify the needs and common problems, to agree on future requirements, to evaluate the results of ongoing IT projects, to define a work plan and to set up a members network. The new Task Force will work towards improving the efficiency and competitiveness of executing large scale engineering through the integration of the project life cycle and establishing of related standards. Large scale engineering encompasses building, civil engineering, process plant, offshore, shipbuilding, power plants, infrastructure and similar industrial sectors where products are physically large or high capital cost, basically what is described so often these days as one of a kind.

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COMPETITIVE ADVANTAGE THROUGH ALLIANCING

Bob Scott

Project Manager
BP Exploration Technology Directorate

BOB SCOTT

BP Exploration Technology Directorate

BIOGRAPHICAL DETAILS

A civil engineer by profession, Bob Scott graduated in 1967 and spent the early part of his career with major civil consulting engineers and contractors before joining BP in 1973. during his 20 years with BP he has gained wide and extensive experience in the design and construction of upstream oil and gas facilities in a variety of geographical locations.

Over the past ten years he has had managerial responsibility for pre-project development studies for offshore developments, firstly in BP's Offshore Division in London and latterly in BP Exploration Europe Major Programmes group in Glasgow and Aberdeen. Developments to which he has contributed include Ula, South East Forties, Bruce and Harding.

Most recently he led BP Exploration Europe's team of facilities, subsurface and commercial specialist which transformed the highly marginal Andrew Field into an attractive investment opportunity whose development was sanctioned earlier this year. He led the negotiations with seven major contractors which resulted in the establishment of the innovative Andrew Alliance Agreement for the project implementation.

He has recently joined BP's newly formed Technology Directorate where one of his specific accountabilities will be facilitate the continuing development and sharing of best practice across BP Exploration's world-wide assets in support of achieving their business goals.

COMPETITIVE ADVANTAGE THROUGH ALLIANCING

Bob Scott
BP Exploration Technology Directorate

INTRODUCTION

Since 1990, BP Exploration Europe has been developing a significant track record in substantially reducing the costs of new oil and gas development projects. This is allowing fields which were once highly marginal to be transformed into attractive investment opportunities and has opened up the prospect of a future in the North Sea stretching well into the next century. At the same time safety and quality standards are being maintained or enhanced and the design and construction contractors, as well as suppliers of materials and equipment, are sharing in the success by attaining enhanced levels of profitability.

A fundamental shift in the nature of the relationships between client and contractors lies at the heart of this transformation - a shift which has seen all parties put aside their previous adversarial approach to each other and instead, pool their skills, expertise and resources to find creative solutions which allow their individual business goals to be achieved.

Underpinning this are so called 'Alliancing' contractual arrangements. These are specifically designed to align the business objectives of client and contractors, to promote efficiency in all activities and at all interfaces, to ensure that risks are shared in a balanced, equitable way and to link rewards firmly and clearly to the outcome of a project as a whole.

Alliancing is also affording those companies which participate, the incentive and opportunity to improve their own individual competitiveness to levels which enhance their ability to access the global market. The principles involved can be adapted and applied to any industrial sector to give access to radically improved performance and competitiveness.

BACKGROUND

By the latter half of the 1980's, BP Exploration Europe (BP XEU) along with many other operators, had recognised that reducing costs both of existing operating fields and of new developments was a prerequisite to the continued economic exploitation of the North Sea's oil and gas reserves and indeed, to the survival of the North Sea Oil and Gas Industry. The high cost environment was such that the prospect of oil companies investing significant sums in new developments beyond those already committed was regarded by many as unlikely, particularly given the competition for investment funds from oil provinces elsewhere in the world.

Faced with this situation, the operators initial response was to put a great deal of effort into articulating the need to reduce costs with particular emphasis being placed on imparting this message to the contracting and supply industry in the expectation that this would lead to costs being driven down. Coupled with this was a drive to find technological solutions and the introduction of contractual arrangements such as EPC and EPIC all of which were regarded as offering routes to reduced costs to the operators.

The results achieved were less than had been hoped for and, with the benefit of hindsight, that was perhaps predictable. It was equally clear that, whilst technological

advances could help, they alone were unlikely to produce the step change in costs that were urgently required and contractual approaches such as EPC and EPIC were being seen as offering, at best, a means to contain costs rather than reduce them.

By the beginning of the 1990's, therefore, some operators had recognised that a different approach was required if their goal of reducing costs was to be achieved and started examining how the culture and attitudes of their own organisations and personnel might be an inhibiting factor. In the case of BP XEU, this revealed that for the most part, contractors and suppliers were generally held in low esteem. The overwhelming attitude was the BP knew best and not only had to define its requirements of contractors and suppliers in fine detail, but also had to employ large teams to monitor and check them at every stage.

Of course there were many (valid) reasons why these attitudes and practices had developed over the years but it seemed clear that they were at the root of high costs. This view was confirmed from the responses given by a wide cross section of contractors and suppliers to an open invitation to describe what it was like to do business with BP XEU. A number of common features of BP XEU's relationships with contractors and suppliers seen as contributing to high costs were identified including:

- lack of recognition and ineffective utilisation of contractor/supplier skills
- risks placed on those unable to influence or manage them
- conflicting business goals
- over prescriptive and onerous client requirements
- lack of clarity of accountabilities
- short term and adversarial

These were all considered to characterise a 'master/servant' type relationship and to be a major source of unproductive costs through the inefficiencies they were seen to engender within individual organisations, at the interfaces between companies and through the duplication of effort across companies. In addition, the nature of the relationships was such that ideas for innovative approaches and improvement to reduce costs coming from contractors and suppliers were being stifled.

The clear message received by BP XEU was, that if it was serious in its intent to achieve lower costs, then it would have to be willing to develop and implement new forms of relationships with its contractors and suppliers which addressed the shortcomings that had been identified.

The then existing forms of relationships between North Sea Operators and their contractors and suppliers had evolved over a considerable period. Whilst both sides considered them to be unsatisfactory, they had established patterns of behaviour on both sides which were deeply entrenched and presented real barriers to setting up new relationships. So whilst it was self evident that new relationships would ultimately have to find expression in contractual terms, it seemed clear that the key to success initially lay in finding ways to break down these barriers and encourage and foster appropriate new behavioural patterns. BP XEU, as the client, also saw that it would have to provide a lead but that it was important that this was done in a way which clearly demonstrated BP XEU's integrity, was non prescriptive and allowed contractors to participate and contribute as equals in the process so that all parties would develop full ownership of the end results.

These basic principles have subsequently been applied in developing relationships across a range of activities both for existing operating fields and for new 'green field' projects. This has led, through a process of evolutionary learning, to what have become know as 'Alliance' relationships which are discussed further below with particular reference to 'Alliances' formed to undertake new projects.

ALLIANCE PRINCIPLES

The dictionary defines an alliance as "a union or association formed for mutual benefit". In the context of undertaking a new development, the aim is to construct an alliance whose members will typically be the client and the key contractors who can most directly influence the outcome of the project and who will then work together to deliver the project and share in the benefits of doing so in a more efficient way.

From what has been learned to date, BP XEU sees that the main principles that should be included in any 'Alliance' arrangement are:

- a primary emphasis on the business outcome for all parties
- a commercial basis which offers the opportunity to achieve rewards commensurate with exceptional overall performance measured against clear pre-defined targets and in which risks and rewards for the parties are equitably balanced
- individual and collective responsibilities and accountabilities clearly understood and defined
- access to and contribution by the expertise and skills of all parties
- openness and co-operation between the parties
- encouragement to develop and apply innovative approaches and achieve continuous improvement

Business Outcome

The importance of the business outcome for all parties needs to be fully acknowledged and the 'Alliance' focused on achieving a 'win' for everybody. A 'win' for the client will certainly include a lower cost for the project but may also include other factors pertinent to the specific project. For the contracts a 'win' will usually be measured by enhanced profitability but again other factors may also apply. The important thing is that jointly determining the factors is vital in setting a context for achieving alignment of goals.

Commercial Basis

The primary incentive for parties to enter into an 'Alliance' is the possibility of gaining enhanced rewards. A key factor in the alliancing arrangement is that, where possible, rewards are geared to the outcome of the project as a whole and are not dependent solely on the performance of the individual contractor. It is therefore extremely important that the parties to the alliance jointly develop and agree the targets around which the risk and reward structure is to be based. This requires an unusual degree of openness between the parties. For example, each of the parties has to be willing to share with the others the detail underlying his portion of the costs.

Of course achieving enhanced rewards cannot be a guaranteed outcome and there will always be a risk that the reverse will apply. It is also worth noting that any enhanced rewards that are on offer should not derive from the operator transferring inappropriate additional risks to the contractors. Only those risks which are related to the scope of the specific project should be taken into account.

There are two specific principles relating to risk which are paramount in achieving an equitable arrangement. Firstly, none of the contractors who are party to the alliance should be expected to expose themselves to a commercial outcome that would endanger the future of their company. Secondly, the risks inherent in any project undertaking should be jointly identified, properly understood and fully articulated. It will then be possible to agree which party or parties should have prime responsibility

and accountability for managing particular risks and develop a structure which balances the rewards with the risks.

Responsibilities and Accountabilities

It has always been the case that contracts have defined responsibilities and accountabilities or at least attempted to do so. However, there is an additional dimension to this in respect of 'Alliances' in the sense that each party will now have obligations to each other. Having each party understand this and have a proper regard to discharging these obligations is an essential part of achieving a successful outcome.

Skills and Expertise

In developing an alliance relationship an essential first step is for the client unreservedly to recognise and acknowledge the skills and expertise base available within contractors. Mobilising these skills and resources to create additional value to the benefit of all the parties is a key issue in constructing an alliance arrangement. The desired end result is to put together a structure for implementing the project which is truly integrated and in which there is no duplication of functions, responsibilities and accountabilities. For most clients this represents a fundamental shift from their previous modus operandi which was based on keeping contractors at arms length whilst at the same time monitoring and to some extent controlling the contractors activities and outputs. It is a shift, however which is essential if the potential benefits of alliancing are to be gained in practice.

Openness and Co-operation

This is one of the so called softer aspects but nonetheless, it lies at the heart of alliancing and the importance of engendering truly open and co-operative behaviour by all cannot be over emphasised. It is an essential prerequisite, without which, the chances of achieving a successful outcome will be more dependent on luck rather than design. It is an area in which the client has a significant part to play in creating an atmosphere in which the contractors do have the freedom of expression which will allow them to make meaningful contributions to the goals of the alliance.

Innovation and Continuous Improvement

The essence of 'Alliancing' is to reduce costs and increase profitability for all without sacrificing safety or quality. Achieving this is dependent on all of the parties finding ways to make the whole implementation process more effective. In turn, this requires that all of the parties continuously examine not only their own activities but those which involve interfaces with others with a view to eliminating unnecessary activities and finding ways to execute those which remain more efficiently. The alliance commercial basis referred to above should also be constructed in such a way that it promotes such processes even to the extent of encouraging one party to transfer activities to another if that offers an improvement.

SOME PRACTICAL CONSIDERATIONS

In this section some practical aspects of establishing an 'Alliance' incorporating the principles described in the previous section are addressed. These include the contractual framework including the management and the selection of contractors.

Contractual Framework

Careful thought needs to be given to the contractual and agreement framework to be adopted for 'Alliancing' relationships and it is as well to appreciate that there is probably no single correct model. The important principle is that the contract structure and terms should be designed to support the desired outcome and relationships rather than the reverse. It should also be recognised that, ultimately, the key to success is more likely to be found in the way the parties work together than in the way the contracts between them have been drawn.

One particular issue which has to be addressed is the choice between incorporating the alliancing commercial basis within the individual contracts with contractors for the provision of their services or in a separate alliance agreement to which the client and contractors are all party or indeed by some other means.

Irrespective of the choice made, the question of how the contractors are to be directly paid for the services they are providing has to be addressed. Given the nature of alliancing and its intentions, it is clear that some form of reimbursable approach is required and it could be argued that a totally 'open book' approach would be the ideal. However, it is important to recognise that this will not always be possible and flexibility will be required.

Sharing of Risks and Rewards

There are several possible approaches as to how gains and overruns are to be shared between the parties to the agreement of which perhaps three are most favoured. These are that each party's equity stake is proportional to one of the following criteria:

- ability to influence outcome
- value of services being provided
- total money put at risk

Each approach has its merits and so it is not surprising that this topic can generate much time consuming debate among the parties. However, given its importance, this is time well spent as reaching full alignment on this matter is crucial.

Management Structure

The management structure for implementing the project is of particular interest to the contractors who, with arguably more to gain and lose, wish to take a more direct role in managing the project as a whole than they have done under more conventional contracting arrangements. Equally, the client (including co-ventures where applicable) is concerned to ensure that the alliancing approach does not erode their ability to influence and control matters that have a critical bearing on the outcome of their investment. The perceived wisdom is that somehow these interests are in conflict. However, a few moments thought soon reveals that the key fact, and one that is often overlooked, ignored or even totally discounted, is that all of the parties stand to gain from a low cost, well executed project. Having all the parties recognise and acknowledge this, is an important first step in building effective management structures and controls.

Two specific management structures have been set up for BP XEU Alliances - an integrated Project Management Team (PMT) and secondly, a so called Alliance Board (AB). The PMT, comprising the project managers of all the contractors is led by the BP Project Manager and is directly responsible to for the implementation of the project, and the management and administration of all of the Works Contracts. The AB, comprised of a senior management representative from each of the alliance members, is responsible for administering the Alliance Agreement itself and more

importantly, for providing guidance and advice to BP as the client and to the PMT in the implementation of the project.

BP XEU see the concept of an AB as being at least equal in importance as a truly integrated PMT, and potentially much more influential than a description of its responsibilities might imply. This importance lies firstly in the fact that, whereas previously, the client had to rely principally on its own resources in managing projects, a much wider, and arguably more pertinent, pool of knowledge is now accessible. Secondly, it affords the contractors a forum in which their senior management can put forward their ideas for improvement with the guarantee that they will not be brushed aside as has so often happened in the past. What is more important, is that it offers them an opportunity with the client to raise their level of thinking and contribution to project management, to a higher strategic level and open up a real possibility of radical performance improvement in all aspects of projects with consequential benefits for all the participants.

Selection of Contractors

There are three aspects of selecting contractors which need to be given consideration, firstly which contractors, secondly, the timing of their selection and thirdly, the method by which they will be selected.

Which contractors should be invited to form an alliance will depend on the specific project but the principle criteria should be their ability to influence the final outcome. For the most part this will be related to their ability to influence the final cost but for some projects other criteria may carry equal weight.

Traditionally, contractors have been selected at a relatively advanced stage of design of the project and almost invariably after the project has been financially sanctioned by the client. For the alliancing approach there is a strong case for involvement of the contractors at a much earlier stage both to allow them to make a contribution to developing the case for sanction and to allow the detailed alliancing arrangements to be put in place as part of the sanction case.

With regard to selection, it has also been the traditional approach to select on the basis of competitively tendered bids with price being by far the most important and in many cases, the sole criterion. However, it has been BP's and others experience, that bid price is not a particularly reliable indicator of final costs and that there are many other factors which have a bearing on the final outcome. In the case of 'alliances' it can be argued that some of these, principally the so called 'soft technology' or 'behavioural', factors are likely to be even more important and that the selection process and the selection criteria should be designed to take these fully into account. In BO XEU's view these factors are so important that frequently they are now given equal or greater weighting in selecting contractors for an alliance through processes that fully comply with EU Directives.

PERFORMANCE

BP XEU'S start on developing new approaches to working with contractors on new developments can be traced back to the Unity development completed in 1992. Whilst this was not set up as an alliance, it nevertheless saw the introduction of several important changes from BP's traditional approach to development projects and some important steps in the process of promoting changes in working practises at the interfaces between the various parties involved.

Prior to Unity being sanctioned the cost of the development had been estimated at £150 million pounds this being based on a 'business as usual' approach to project execution. The project was actually sanctioned at £125 million to take account of the

estimated impact of some of the changes it was intended to implement. The final cost turned out to be £94 million, a result which reinforced the view that new approaches could pay handsome dividends.

Unity was followed by the Hyde development in which the concept of alliancing was first formally introduced. Hyde, a small gas field in the southern sector of the UK North Sea, was regarded as a highly marginal investment opportunity which clearly required development costs to be reduced significantly if it were ever to go ahead. In many ways, however, Hyde presented an ideal opportunity further to develop what had been learned on the Unity project. It was a relatively small project and perhaps most importantly, the facilities required for Hyde were more or less identical to those which had been constructed for BP's Amethyst field. This latter point led to the idea that by using the same main contractors, it might be possible effectively to utilise the combined experience of client and contractors to produce better results.

After some months of negotiation these contractors and BP developed a target cost for the development and a risk/reward structure based on the final outcome which gave a sufficient basis for the project to be sanctioned. At the same time, BP together with the contractors had also entered into a formal agreement to undertake the implementation of the project as an alliance. In the event, the project was completed some 25% below the agreed target cost. This result was not only highly satisfactory from BP's point of view but with the contractors taking a large share of the savings, their levels of profit were substantially above those they would normally expect.

Andrew being a much larger development than Hyde with potentially more main contractors as well as being an entirely new development, presented new and different challenges when it came to constructing an alliance. Like Hyde, however, it too required significant reductions in cost if it were to be sanctioned. This led to a major departure from BP's normal approach in that it was decided that it would be appropriate to select all of the main contractors prior to sanction and to have them work together with BP jointly to develop the sanction case. In effect a pre sanction alliance was formed which had as its common goal the sanction of the development. The prize for the contractors in achieving this was their involvement in the execution of the development and for BP an opportunity to make a profitable investment for its future. This goal was successfully attained with the sanction cost being some 25% lower in real terms than would otherwise have been achieved. An exceptionally narrow range of uncertainty on this estimate was also achieved as the result of having base costs to which all the parties were committed and a jointly developed understanding of the risks to these costs. All of this is underpinned by the formal alliance agreement between BP and the six main contractors involved which ties the overall reward to the parties to the final cost and the final completion date of the project. The arrangement is such that the contractors between them will receive over 50% of any savings actually achieved against the agreed target cost.

The implementation phase of Andrew only started in February of this year with completion targeted for the end of 1996. Already however there is tangible evidence that the alliancing approach is encouraging new levels of co-operation between all the parties leading to cost and time savings. For example the alliance has been able to find around £10 million of savings and to bring forward the projected completion date by 2 months.

The Cleeton Compression project has also just been sanctioned and again alliancing has been a major factor in achieving sanction and will be a major feature of the project execution arrangements. In this case the alliance will include a major supplier for the first time and the risk/reward structure will not just be geared to the cost outcome of the execution phase of the project, but will also encompass various targets for the first two years of the fields.

CONCLUSION

BP has taken important steps in transforming the relationships between itself and its contractors in undertaking new development projects. The results being achieved, give a strong indication that this provides major leverage in reducing the costs of developments whilst at the same time enhancing both the profitability and competitive position of the contractors who are involved. Similar results being obtained through alliances for various activities on producing field reinforce this view.

Whatever progress has been made, it would be a mistake to believe that there is nothing more to learn and that a detailed recipe has been developed which, if rigorously applied, will guarantee success. The process is continuously evolving to design the right alliance for each project. What has become clear however, is that it is in the behaviour of and relationships between individuals and companies where the keys to achieving 'competitive edge' can be found and that support from the highest level of management is needed to get alliances started and to keep them working.

SKILLS, TRAINING AND MOBILITY OF THE EUROPEAN CONSTRUCTION LABOUR FORCE

Jan Cremers

General Secretary
European Federation of Building and Woodworkers

JAN CREMERS
General Secretary
European Federation of Building and Woodworkers

BIOGRAPHICAL DETAILS

Born: 3 May 1952 in Limbricht, The Netherlands

Nationality: Dutch

Status: Unmarried

1976 Graduated in Social Science as an Organisational Sociologist

Place of Residence: 53 Stevinstraat, Brussels
Since 1989

Career History
Until 1979, researcher in the sphere of youth policy, employment and industrial relations. Subsequently held position of General Secretary of the KWJ, the trade union youth organisation of the NKV.

During the period 1982-85 worked as lecturer in Industrial Relations and Research Officer at the Ministry of Social Affairs and Employment in The Hague (NL).

From the beginning of 1985, head of the Human Resources Department of the Bouw- en Houtbond FNV (Building and Woodworkers' Federation) in Woerden (NL).

In November 1988 elected General Secretary of the EFBWW. In 1991 elected for a second term.

SKILLS, TRAINING AND MOBILITY OF THE EUROPEAN CONSTRUCTION LABOUR FORCE

Jan Cremers
General Secretary
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In my capacity as General Secretary of the European Federation of Building and Woodworkers it is with great pleasure that I have accepted your invitation to speak to you here.

'Skills, Training and Mobility' are the themes presented to me by the ECI. But first of all I would like briefly to consider the socio-economic and political context which are of key importance to any further discussion of these questions.

In so doing I am of course drawing in the first place on our experiences over the years in the European trade union movement.

1. The single market as a labour market

When the concept of a single market was first mooted in the early eighties the debate on mobility in the European market took on a new dimension. For one of the 5 freedoms lying at the basis of the single market is the concept of the free movement of people.

For the construction industry, a labour-intensive sector in which furthermore the product is produced on site, the free movement of workers is more important than the free movement of goods and services.

But facilitating, improving and further liberalising the movement of workers calls for a whole host of measures:

- measures to promote the recognition of occupational qualifications and vocational training courses followed,
- measures leading to a certain degree of harmonisation of workers' qualifications,
- measures to guarantee social security for workers and concerning their living and housing situation,
- and finally, measures to restrict adequately the pursuit of competition at the expense of conditions of employment and work.

This list is certainly not complete and unfortunately I cannot go into the last of these - the risk of social dumping - on this occasion. So I will confine myself to the view we represent that if the free movement of workers is seen solely as a means of achieving cheap results in the short term in the form of downward pressure on pay and employment conditions, this is not only objectionable politically seen, but also would as well in the long run do more harm than good to the construction sector.

The above list does however set out the areas which we have had to cover in the European policy debate in recent years. They belong to the so-called social dimension of an integrated Europe.

If we now take stock of the merits of the political debates initiated in the mid-eighties on the European internal market then we find a sharp contrast between the far-reaching liberalisation on the financial and economic markets and the lack of serious results in social matters.

The recognition of professional expertise and vocational training has still not been settled adequately in spite of the numerous meetings on this question over the past decade.

The harmonisation objective has faded into a convergence objective only subsequently to completely vanish into simple descriptions of existing differences.

Investment in human resources has so far never been an objective of a European programme which could be compared to the R&D programmes developed.

And in the field of social security, legal status and employment conditions it is social insecurity which predominates. This still means unfortunately that, in particular for the low-skilled workers, mobility is first and foremost an economic necessity. From this perspective the free movement of workers is far from a free choice.

In conclusion it can be said that the development of a genuine European labour market is still in its infancy. And on reading the European Commission's White Paper on social policy more closely, it looks as if we should not set our hopes too high with regard to new initiatives in this area.

We have commented on the passivity that reigns in Europe in this respect on other occasions.

2. Mobility, fact or fiction

There is a great deal of speculation about the mobility of workers. The free movement of workers is said to be growing and, in tandem with the other 4 freedoms, is leading to greater competition, efficiency and so on. But the question is whether this mobility across national borders really will increase so much.

If we consider the labour market first of all as a market in which the laws of supply and demand operate then all the conditions are present to talk about mobility. In all European countries there is talk of a large pool of unemployed, skilled and unskilled. Where the construction industry has to recruit from the market the sector is handicapped by a poor image and a widespread tendency to over-value office jobs.

The above-mentioned economic mobility is often in the hands of none too reliable subjects and as long as this mobility comes from outside EU borders, the more stringent laws on immigration and the hardening political climate in Europe mean that the circumstances are not more attractive to make people cross borders.

How has this been happening in the recent past?

In the past talking about the mobility of the workforce was talking about migration. We all remember that, during the period of the economic boom, workers from the Mediterranean regions and later on from Turkey and Morocco were press-ganged to work as low skilled workers in the industries in the North West of Europe, industries that had serious problems in recruiting workers on their own national labour market. By supplying the lowest levels in the labour force migration even made possible a social mobility which affected the whole labour market.

To a certain extent this development is still going on. Since the late 1980s at least 2 million immigrants per year enter the EU countries. According to some recent figures 50% of these migrants were labour migrants, their dependents or spouses of previous immigrants entering for family re-unification (see Dr R Coleman, *Migration: facts and figures*). Compared to the fifties and sixties, all EU countries have now turned into 'receiving' countries.

There are nevertheless some important reasons why migration as the instrument of the mobility of the workforce has diminished. As, after the oil crises, the period of economic welfare ended and unemployment grew, recruitment from abroad ended. The tensions on the labour market disappeared. This by the way created new tensions in the so-called supplying countries, in some cases unemployment was now exported from Europe. Companies had to improve their productivity and the growing competition and the process of rationalisation lowered the mass demand for low skilled workers. Next to this the shift from industry and agriculture to services accelerated; this asked for a more qualified manpower.

Even in industries with a labour intense character, like construction, investment in persons with adequate professional qualifications was one of the only solutions to keep the business going. The low skilled jobs were given away through a chain of subcontracting and the unemployment in every country guaranteed a certain "reservoir" of workers. During more than 10 years this was the dominant situation.

The last period of growth (middle of the 80s) has brought a new phenomenon.

Next to the growing mobility at managerial and staff level, most of the time temporary and often inside the same large firm, we have seen the introduction of a new army of cheap labour, notably people coming from the former East European countries and from the Magreb-area. But the conditions for a warm welcome have changed and with unemployment still very high, this has led to real substitution. Workers from Turkey or Morocco, living for years in the EU countries, are replaced on the labour market. Here, the social consequences of this mobility of workers are the worst for the low paid and low skilled on the market.

There are no reliable data about mobility in Europe and where we have data they are incomplete and often not comparable. And yet I have often spoken out on other occasions about these figures (see J Cremers - *The Posting Debate).*

What we do know today is that the mobility of workers from an EU country creates significantly less problems and it can be expected that these problems will increasingly disappear in the future, partly owing to trade union transnational actions. Big problems crop up once we enter the twilight of grey areas in construction or as soon as we talk about the engagement of workers from outside the EU border.

To leave no doubts about it, we as a European Trade Union movement in construction have always welcomed the fact that workers from all parts of the world work together on site and so far we are pleased with the fact that xenophobia never has had a chance on site.

We think that an equal treatment of workers (conditions of work, health and safety etc) is, to say it in French, a "condition prealable" also for the future.

3. The crucial role of skills and training

In recent years the EFBWW has conducted intensive discussions with the European Commission and with our partner in the European social dialogue, FIEC, on the political and policy issues flowing from an integrated Europe.

The field of vocational training formed one of our key themes. In the wake of these discussions and in the light of an exchange of experiences with the approach to vocational training in the different European countries our involvement has grown considerably. Employers and workers have an interest in greater mutual co-ordination of vocational training in the construction sector. In this sense there is a need to adapt existing curricula in accordance with a European perspective.

When we review the different training systems in Europe finding a common approach is by no means self-evident.

In some countries training is closely defined and organised in line with the market mechanisms. This means that in times of recession it is the first to be cut back.

In other countries the State's role is determining or partly determining or else the origins of the vocational training goes back to the guilds of the Middle Ages.

In a hard core of European countries it is the social partners in the construction industry, the employers and unions who consider vocational training to be their joint responsibility and which have developed joint structures to this end.

This last approach has proved its worth, not least because a certain anti-cyclical effect flows from it. In times of recession there is less haste to break up the vocational training structures built up and the jointly developed funds provide some kind of financial basis even in bad times.

On the basis of a recent comparative study on collective agreements in the building industry, conducted by the EFBWW in 17 European countries, I am able to report two interesting findings on employee training provisions.

Only agreements established collectively are concerned here.

a) *The entry of young people into the building trade*
In many countries young people enter building industry employment via a two-tiered form of occupational training, i.e. training with both theory and practical components. The form developed for this purpose is, as already said, different between one country and another.

The German dual system is sufficiently well-known. The Benelux countries, France, Italy and for some time now Spain, have jointly managed apprenticeship systems (i.e. by both employers' and workers' organisations) which share many common features, and also the Scandinavian countries, Switzerland and Austria to some degree fit into this tradition. In most cases here the training lasts from 3 to 4 years.

The picture is different in the UK and Portugal, where the training, often arranged through individual training centres and individual plants, is to a far greater extent dependent on fluctuations in the economy.

In the UK there is the additional factor that the enormous increase in the proportion of so-called self-employed workers (now making up 45-50% of the working population in the building industry) has led to a worsening of conditions for training. As a rule, self-employed workers do not undergo training.

b) *Facilities for further and re-training*
In only a few countries is the right of workers to participate in further training courses laid down by social partners. But even in those countries at the moment the following of continuing training courses is viewed by employers as a private matter concerning the individual worker. In this area the collective instruments which we have are still insufficiently committed when it comes to the necessary investment in human capital.

4. Concluding remarks

In my introduction I touched on a number of themes which currently call for attention. Of necessity I have confined myself to drawing a general picture. I could also have put before you a number of propositions or set out some of the things the EFBWW wants to see in the areas mentioned. However, that seems to me much more appropriate for the discussion afterwards. But I cannot let this go by entirely without mention.

Almost 3 years ago the Directorate-General for industry at the European Commission (DG III) commissioned a study on the outlook in the European construction industry. The consultants W S Atkins conducted various national studies and comparative reports on this subject.

Originally, when discussing the competitiveness of the national construction companies the main emphasis was placed on the wage costs question. On the basis of a number of important research findings this discussion was entirely shifted in the final report to the importance of good vocational training and education.

Partly on the basis of information which we had submitted it was apparent that the building industry in countries with a high investment in human resources (substantial attention for vocational training, safety, good employment conditions and pay, etc.) ultimately performed better and at a lower overall cost to the building industry.

More investment in human resources leads to higher productivity and higher quality, greater competitiveness and innovation and not least to better paid and motivated workers.

If we want to keep the construction industry competitive then we must create an attractive mix of good vocational training and attractive employment conditions within the labour market.

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THE REALITY OF IMPLEMENTING CHANGE

André Safir

Chairman
Stratorg

ANDRE SAFIR
Chairman
Stratorg

BIOGRAPHICAL DETAILS

Management consultant and President of Statorg, a European Consulting firm, he is a specialist in the construction industry. As such, he currently advises 15 out of the 40 most prominent European civil and general contractors. During the last ten years, he has conducted or managed more than 150 missions for engineering firms, real estate developers, building and civil contractors, covering a wide spectrum of subjects:

- Strategy on modes of competitive differentiation (BOT, facility management, dams, tunnels...) or geographical expansion (regional, European, East European, world-wide...);

- Organisation, on topics such as decentralisation, headquarters/operations relations, overheads, cash and time management.

In addition, he has conducted missions to redefine strategies and new organisational structures in the metallurgical, mechanical, robotics and services industries.

He has worked for several European governments on the strategy and organisation of the construction industry, for French Public Agencies on the reorganisation of several public departments, for the Spanish government regarding industrial orientations, and on the reorganisation of the Moroccan Ministry of Finance.

At both regional and European levels, he has conducted industrial, economic and social audits.

During his career, he also held the following positions:

- Ministry of National Education (France), special assistant to the Minister Mr Edgar Faure;
- Presidency of Senegal, UNDP expert;
- French Housing Authority (LSF), Vice-president in charge of management services.

He is a Master of Economic Sciences and Management from Sorbonne, Harvard University and the Piekhanof Institute of Moscow.

He is a trustee for the French economists association (ANDESE) and for the Association Europe et Entreprises.

THE REALITY OF IMPLEMENTING CHANGE

André Safir
Chairman
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Following common knowledge, the construction industry would not have undergone such radical changes as manufacturing. Many authors regularly compare the drastic cost reduction of the electronic industry to those of the construction sector and suggest that insufficient efforts have been made. This, of course, is not fair! If objective calculation on productivity had been possible, they would probably show a very different picture. But how to compare the level of service offered by the most traditional city buildings to most recent high tech offices and therefore find sound ground for real comparison? How to compare accordingly the economics of the Chunnel to the Suez canal?

What is true, though, is that changes in this industry are more difficult to implement than elsewhere in part because of the number of actors involved, the complexity of their relationship and the level of risk. This is not to say that others are not facing the same types of difficulty but there are here increased by heavier time constraints and the nature of the job exclusively devoted to the production of prototypes.

If for no other reasons, change would be necessarily tough for this industry because, like in other activities, it is within the realm of change that most creative and aggressive competitors will find the opportunity, especially in the present challenging times, to build an offer of the unique selling proposition type: the only solid ground for profitability.

How to reconcile the needs for change and the difficulties of its implementation? This is what this paper is aiming at.

Contractors must find their competitiveness by differentiating on a small part of their activity

First let us remember an evidence for those involved. The construction industry (in opposition to manufacturing) presents a cost structure with a heavy local content. And this is true, even in some complex industrial or process projects, where the amount of equipment is heavy, and also where the incorporation of precast components in building and civil engineering projects is important. Whatever the various attempts, construction is made on site! This cost structure drives a very strong price competition as overheads need to be taken care of locally and therefore prevent any attempt to differentiate by specialisation of any sort. In addition the mastery of present industry technics concerning products, production and selling are, at this precise moment, relatively well mastered by most significant competitors which reinforces the small degree of differentiation between competitors and therefore competition on prices.

Meanwhile, critical mass requirements are growing for engineering teams to design and tender for more and more complex projects, for financial experts to set up project finance or BOT schemes, for R&D engineers to enhance their techniques and for IT departments to develop or maintain technical and managerial software.

As a result 80% of the turnover, whatever the contractor, is only there to cover the fixed costs and necessary overheads, not to speak about projects undertaken at loss for whatever good reason. At the end of the day, a maximum of 20% of the turnover can bring extra profit, if awarded and completed outside pure, hard price competitive bid, that is when there is some room for differentiation.

Unfortunately, there seems to be few ways to differentiate and the even nature of the construction industry implies structural difficulties in implementing them. Nevertheless, provided that the whole of the industry and its environment are involved in the necessary changes, and that each of the competitors tries to make the best of collective progress, there is still room for profitability in the construction industry.

I. FOUR WAYS TO COMPETITIVENESS: THE CONSTRUCTION INDUSTRY AS IT SHOULD BE

Whether it is based on a special technical expertise on specific types of construction, a different marketing approach, some specific clients, an original production technique or a new type of service offer, our experience and previous lectures in this conference suggest that there are only two main routes to achieve real differentiation.

The first one requires to keep ahead of competition, to make a "breakthrough", if this is not too strong a word. The other one requires a better command than competition of most of the factors of competitiveness, to achieve better efficiency and make the best of contracts.

A. Developing a differentiating competitive edge

Since there are no new "products" as in manufacturing, building a real differentiating competitive edge can take only two ways: either developing a new process (not only technical, constructive process but any "Unique Selling Proposition" to meet client needs, as marketing men would call it), or anticipating new markets, before the bunch of competitors (which I will refer to as the "Local Route").

The "Local Route" managing a geographical portfolio, anticipating maturity of markets and the competition

The logic of differentiation under the "Local Route" is to anticipate emerging markets and invest ahead of competition. In this strategy, the "centre" anticipates the markets, decides to settle local contracting companies when the right time comes and allocate resources to them, both financial and managerial.

The Head Office role is also to develop its top level managers for the local companies, set their goals (but not the way to achieve them), measure their performance against these goals, and reward them accordingly, positively or negatively. However crucial this role may be, it remains a holding role, and the Head Office should not interfere with marketing and operations of these companies.

This slim head office needs only low overheads, whereas the local companies act as autonomous profit centres, with a full range of competences and adequate means. The local managers develop entrepreneurial spirit and attitudes and play according to the local rules of their markets.

The "USP Route": bringing extra profit through distinctive skills

The logic of differentiation under the "USP Route" (Unique Selling Proposition) is to identify new ways to meet customer expectations better or at a lesser cost, to create the ways and means to achieve it and nurture this competitive edge.

The Head Office plays a central role and is in charge of the development and maintenance of the differentiator, which they distribute through local "outlets". It keeps a strong control on the compulsory use of the USP and all plant, processes, techniques, etc. related to its marketing and implementation.

As said before, since there have been no new "products" in construction, as in manufacturing, breakthrough are more about new "process", new ways to meet client need and complete construction projects. One can quote not only technical constructive process as you all know of better than I do, trenchless technology, RCC dams, diaphragm walling, etc. but also, if not mainly, around the core activity of construction: financing (BOT) or managing the projects.

B. Developing a Better Command of Critical Success Factors

The other logic of competitiveness requires a better command than competition of most of the critical success factors in the industry in order to achieve better efficiency and make the best of projects and contracts. Specialisation is one way to improve efficiency, by focusing the company. Increasing the learning capability of the company is the other, among possible methods to achieve it. Quality Management approaches are often quoted.

Specialisation improving efficiency by focusing the company

It has to be understood that concentrating is a way to ensure if not a truly **unique** selling proposition, at least a favourable position through a coherent mix of commercial, estimating, operating, expertise. Focusing on a smaller part of the market allows its needs to be better undestood, to encompass a wider range of them and provide a more global offer which helps clients to solve their problems. The focused company can allocate dedicated resources, which become more efficient through a learning process and eventually give more regard to specific clients and specific problems.

The "Progress Route" : improving efficiency of the organisation

Improving company efficiency can be achieved either by punctual organisational operations or by overall ongoing progress.

Some significant progress can be achieved by redesigning some of the processes inside the company for better efficiency, like cash management or tendering procedure. This can lead to the complete re-engineering of the company.

"Total Quality Management" means incremental, ongoing progress through improved communication, to share and accumulate experience across the company. This "Learning Company" has no strong structure, but builds on procedures (e.g. Quality manual). Managerial roles and attitudes are to facilitate communication to flow freely throughout the company, and to encourage a non-adversarial attitude with clients, subcontractors, and inside the company with a lesser direct pressure on profit.

II. IMPLEMENTING CHANGE IN THE CONSTRUCTION INDUSTRY FACES STRUCTURAL CONTRADICTIONS

There are, of course, many obstacles along each of the routes described towards competitiveness. Contradictions may come from inside contractors and the industry, or with their environment.

Risk of fading away along the "Local Route"

Along the "Local Route", the anticipative competitor is faced with uncertainty on the state of the market and the reaction from competition, and with risks from within the company.

On the market side, we all know how difficult it is to anticipate the emergence of new markets and balance cost of entry and potential return against risk: there are not so many regions/countries still with potential for growth and

profit to allow for newcomers: and there will be fewer and fewer. Once settled, the logic of the evolution of the market drive margins down: on the long range markets mature, new competitors pile in, competition comes on prices, and the margins fall. We all have experienced this evolution.

Perhaps not so well understood is the difficulty to maintain corporate identity when there are very few opportunities to exchange between managers keeping their focus on their specific domestic markets.

These two forces may eventually drive the anticipative, proactive corporation on the local route to become a loose network of mediocre, low profit local contractors.

Difficulty in maintaining a USP
We all know that it is not an easy thing to find a distinctive competitive edge. What is even worse, once developed it has to be protected against attrition from competitors and from within the company.

Processes (way to do things) are often not directly protected by patent or indirectly by some plant necessary to achieve them, but only by the expertise of a few people inside the company that has developed them.

So they can be easily copied by followers as soon as it becomes clear that they give an advantage. Some innovators succeed in keeping ahead of competition, by creating and maintaining systems to accumulate experience. But differentiation on a process usually does not last long: project management once was one, it is now mastered by all the industry, and available through "on-the-shelf" softwares. BOT is already diffusing in the industry and, even if it is still a decisive argument for Public Authorities facing shortage of financial resources, it will shortly need to be packaged in a competitive offer if not to be presented only to prospects near to bankruptcy.

Not being "hard" factors of competition they may not even be always identified from inside the company. Through higher margin they "subsidise" the whole of the activity and give access to a larger share of the global market to fulfill the drive for growth. It is the worst danger of losing the competitive edge, only achieved by concentrating on the core competency. by so scattering their resources they stop keeping ahead of the competition at a time when their differentiator becomes available on the market place.

Limits to specialisation
Limits to specialisation arise from the market situation, the constraints of the contractor and the reactions of its competitors.

Few sectors allow for a specialisation on which it is possible to build a differentiation. Focusing may bring forth niche positions, too small to allow for enhanced profit for major contractors. Due to the cyclicality of markets, it may become necessary to cover fixed costs outside the scope of specialisation if specialist projects do not bring enough turnover.

Being present on a local market often requires taking part in non-specialised projects: it may be necessary to show interest and compete to maintain credibility and connections with the market.

Specialist position is often not protectable. Competitors, not understanding the advantage of the specialised contractor will tend to tender nevertheless. They will both make a loss if awarded a project and jeopardise the margin of the specialist by competing on price.

Structural contradictions of Total Quality
We see structural contradictions in Total Quality approaches, both inside contractors and along the industry value chain, which account for its limited success up to now.

Inside contractors, servicing locally requires autonomy and entrepreneurial attitude of local companies, risk control requires economic sanction of the profit centres. Introducing a concept of collective interest leads to release the pressure on short term issues to make place for more sharing and exchanging. This may jeopardise both entrepreneurial attitude and risk control, thus endangering the company's profitability.

Along the industry value chain, from client to contractor and subcontractors, through engineers, consultants, project or construction managers contradictions may arise at each link. Long term relationships are hindered by competitive tendering, and, whatever statements on "tendering for quality" one can read, lowest price bidding is still the winning concept, especially in depressed markets, highly competitive. The role of project managers and general contractors is viewed by clients as to select subcontractors on competitive pricing, not to optimise global performance by learning to work together. And general contractors themselves still see their relationship with subcontractors are cut throat, screwing "rapports de force", not partnerships for global efficiency.

So, although a lot of contractors talk about quality and Quality Management, we must reckon that there are yet few real quality programmes implemented apart from certifications and the writing down of some procedures manuals, which are but new names for old games in the industry. This is obviously due to the difficulty of agreeing on what quality is about in construction: products, process or the facilities, standards or performance, meeting client expectations or specifications and price. And implementing quality programmes is also made difficult by the nature itself of the construction industry dealing with projects, not products and dispersed on sites, not concentrated in factories.

III THE REALITY OF IMPLEMENTING CHANGE: LEVERAGING NATIONAL STRENGTHS

A. A need for collective change strengthening the industry

Implementing any of the necessary changes described, requires that the context should be favourable, which implies not only a single contractor, but all of the industry, their clients, consultants and subcontractors and even national Governments to make room for change. It is true for sharing cost in search of a USP, risk and cost of entry in new markets and for progress involving the whole industry and its environment. It calls for collective action including R&D and lobbying.

Cost of USPs requires sharing with the industry and public authorities
The cost of developing USPs, be it financial or the involvement of top managers in fighting their way through corporate inertia to make room for new ways of doing, always weigh on scarce resources. As we know, contractors overheads have to be low: this leaves small discretionary resources to spare. This obviously calls for partnerships, including with Government authorities for funding R&D programmes.

Risk and cost of entry in new markets call for partnerships along the Local Route
The risk of putting "all eggs in the same basket" leads to spread investments but the cost of entry calls for partnerships except for a few huge corporations which can face spreading the risk on their own. It obviously can benefit from the support of Government eco-diplomatic actions.

Progress involves the whole industry and its environment
Global performance of the value chain can only be optimised by learning to work together with clients and subcontractors.

For example, the sequential approach developed in building, with the help of French Government, requires a reshuffling of all traditional tasks in a few sequences of work which involve cooperation of general contractors with M&E and other subcontractors. Clients have to agree on these new ways, understand the interest of working together on a repeat basis for quicker learning and get their profit from the change. All this requires changes in attitudes and also in some regulations, standards, insurance etc.

"TQM" approaches also require changes in national regulation and attitudes to make place for non-adversarial relationships between clients and contractors.

B. Room for individual success through common conditions
We can understand from analysing success and failures of many an international contractor, that the conditions for success are deep-rooted in the national context of their domestic market. But it is their responsibility to make best use of these national features, adapt their approach to market conditions and be creative to build their capability and export it to other markets when evolution makes it appropriate, making a chance of the opportunities offered by the challenge of European construction.

A comparison of French and British construction environment
(obviously oversimplified in the time available for this presentation)
Heavily centralised, as well as in market location (22% around Paris, 11% Lyon, the same around Lille and 7% around Marseille), as in the decision making of the public sector which is a major part of the demand, **the French market** led to a more integrated "filière" looking for global efficiency through integration.

The general contractors (entreprises générales) have acquired a major role along this filière:
- coming from concrete which represents approximately 50% of the cost of a building project;
- with strong, charismatic, leadership of contractors executives, more interested in satisfying their desire for power and the consideration of their peers, than in maximising shareholders value;
- through ententes/cartels and by buying local market shares with the profit coming from exports in the good old days of the French colonies;
- by their proximity with powerful concession companies and public decision makers.

The consultancy companies are comparatively weak, infrastructure engineering being done primarily by public agencies, architects being technically weak by culture (architecture is an art) and the law preventing the merger of architects and engineers).

The UK market features favoured a more dispersed construction industry with no dominant players, by job or size:

- more competitive/free entreprise with less cartel organisation and a lesser role of the public sector;
- importance of the South-East region not so dominant as the Ile-de-France;
- strong architects and building and infrastructure engineering consultants;
- no stronger player in the filière due to lesser role of concrete vs steel frame;
- shareholders value concern, pressure of the City to short-term profit in a cyclical industry, construction companies handed over to finance oriented managers.

All led to more flexibility, smaller size, less integration and the search for optimisation through slicing projects down, competitive tendering for each slice and control by powerful project or construction managers.

Make best use of national conditions
Through the times some contractors have always taken more advantage of the characteristics of their domestic market than the rest of the competition, and use them as a leverage to expand in other markets. In the USP process, Bovis has become the leader in construction management by using UK market features which favour optimisation through coordination and Bouygues is the "Entreprise Générale" typical success of France centralisation and concentration which favours optimisation through integration. On the specialisation route, Strabag is making best use of Lander dispersion in the road sector for its eastern expansion and HBG of the Netherlands' position on the coast of Europe and capabilities in dredging and marine and coastal civil engineering. Along the progress route SHIMIZU could be an example of Japanese advance in non-adversarial relation.

Adapt: the BOT example
In the water business the French Concession giants have set up what is often called the French model. Its building and success has been very much dependent on the features of the French industry context: centralisation, relations between industry and public authorities, integration of the value chain.

If this model - i.e. joint development of competencies by specialised contractors, consulting engineers and operators - is to be used in other countries, for other sectors, it should be based on the features and the specific competence of the domestic market. Better than trying to compete in water, the UK construction industry could use the opportunity of the privatisation of British Rail to build the equivalent offer in the railways sector, to expand over Asia and Eastern Europe. The recognised competencies of British Port authorities, sea transport companies, specialised contractors and engineers in marine civil engineering and ports development could bring the same kind of advantage.

Be creative: all routes are still open
Entrepreneurial aggressiveness can make for fading USPs, if all the company is pushing hard on the market place. Creative strategic thinking and more factual analysis improve success ratio and the chances to take a good risk when choosing a new market. Pragmatic learning approaches such as process re-engineering, time management, setting new, more confident relationships between operations and the Head Office, give alternatives to too unrealistic TQM vision.

Use opportunities of the environment: Europe is a challenge and a chance
In search of ways to differentiate, either on process, new markets, specialisation or capability to progress, each of our countries construction

industry has a lot to learn from the other, just because conditions were different inside national borders, leading them to different solutions for increased efficiency.

Should we use the fact that these borders are, at least partly, disappearing, to unite our attitudes and behaviours? Increasing variety, as we learn from cybernetics and biology, is increasing the chance of success or survival. I would suggest that if you cross borders you should not look at doing what you already know, but to learn new ways that will help you bounce from Europe to the outside world: learn construction management from the British, "entreprise générale" from the French, cooperative management from the Germans.

C. TWO CONDITIONS FOR IMPLEMENTING CHANGE SUCCESSFULLY

Coherence and consistency in direction by a cohesive top management team are the two essential conditions for implementing any of these recommendations.

Coherence and consistency in direction

Choose one direction and stick to it, give it some time and maintain strategic intent. "Stratorgonise" the company: by building strategic coherence into the organisational know-how through the structure of the company, its procedures and the corporate culture.

A cohesive top management team

Building the credential of the "Centre" by implementing changes, not "justifying" spending overheads; achieve small, quick wins to help technique oriented, management conservative, but pragmatical construction staff to believe in new directions.

Build top management teams: 15 to 20% of top management must dedicate themselves to the new philosophy and ways of doing things. Dispose of reluctant managers but retain others with a clear statement of their role and permanence in the changes. Build on the new generation of managers or resource externally if necessary.

DISCUSSION
MANAGERIAL AND TECHNOLOGICAL ROUTES TO COMPETITIVENESS

Chairman: Peter Morris, Bovis

Question 1 Geoffrey Trimble, European Construction Institute
The IT Alvey initiative, five or more years ago, provided some lessons about the involvement in IT projects of IT specialists only. One quite expensive experiment was carried out under the name of Planit in which all the participants were IT specialists. The end product of the experiment was a piece of software that no-one wanted to use in the real world. May we have some reassurance from Peter Morris that the initiatives he described will involve practising project managers so as to ensure that the end product will be useful in the real world?

Fikry Garas, Taylor Woodrow Construction
The problem was that the Alvey initiative was dominated by IT specialists. We have to make sure that in the future any initiative should involve the end user, the customer, and practising engineers and we have to encourage a number of demonstrations, to prove that the technology works. By demonstration, I mean not just a prototype demonstration; we have to apply the technology to real structures and real projects.

Question 2 Ronald LeBright, ABB Lummus Crest
Could you say what you mean by non-AEC standard tools and something about the status of STEP and EDIFACT?

Fikry Garas, Taylor Woodrow Construction
Very briefly we formed a new group addressing STEP related activities to construction, process plant, heating and ventilation. A few weeks ago, three application protocols were applied for through STEP: one related to structural steel, one to building and one to heating and ventilation. These are being debated at the moment and there are the signs that they will be approved within the next three months, forming an introduction to STEP Standards in the construction sector. The standardisation process takes some time and when we launch the CIMsteel standard, it will be aligned to ISO/STEP.

Ronald LeBright, ABB Lummus Crest
Although the last presentation largely concerned contractors, it was very useful for this conference because it made several points. We are talking about the European construction industry, and competitiveness, but we can't get away from our national backgrounds. We have tended to follow best practice in terms of quality and business process re-engineering, but there are a number of other approaches available to us to gain competitiveness.

Question 3 Peter Shaw, Freedmans
Can I go back to the presentation by Mr Le Blond and by Mr Scott. I would like to ask a three-part question, the first part directed to Mr Le Blond and the second and third parts to Mr Scott. First, how do BAA recoincile the desire to create long-term partnering arrangements with European Union regulations on open competitive tendering? Secondly, and perhaps picking up a point from the last speaker, Mr Safir, can alliancing arrangements be transferred to less sophisticated or high-tech construction projects? Finally could Mr Scott say a little more about the operation of the alliance board when it comes to dealing with the client veto and the recourse measures that the contractors can take advantage of.

Paul Le Blond, BAA
My understanding is that the requirements of the European Union in terms of advertising can be met with periodic indicative notices or framework agreements as we call them. You notify through the *Official Journal* that you want to enter into these sort of agreements. You get all your returns in and select from that list for a period of five years or so. That is what we have done with the agreements that we have set up so far. So clearly it is possible to do it within the regulations of the European Community.

Bob Scott, BP Exploration
Can alliancing be transferred? For me, underlying the whole business of alliancing is the need for complete changes of behaviour among clients and ultimately among contractors and suppliers. It has taken us a long time to get it going in BP. We started talking about it in 1990 and it has taken time and patience. In my view, it is capable of being transferred anywhere, and its principles can be applied to virtually any human endeavour, not just engineering. But the time it takes to encourage people to work that way will vary from country to country, area to area, industry to industry.

You also asked about the recourse that the alliance members have in the event of the company exercising the veto. I should explain that we have a veto because we are only one partner in the development. We have four other partners and all the companies have a share. We have a joint operating agreement with them that places clear obligations on us as to how we have to operate in respect of their interests. We see this as a fallback arrangement, which as a prudent company - and our contractors are equally prudent - we wanted to set up. In the event of our exercising a veto which will add to the cost or the schedule, i.e. to our basic targets against which we are going to pay out or not pay out, there is a mechanism whereby we can adjust those targets.

Question 4 A Delegate
I have another question for Mr Scott. I remember that impressive graph where you have the vertical line with the turning point of the scissors opening to the left and to the right. I would imagine that reaching this point is a painful process. How do you arrive there? Is it by offer and negotiation or is it through a more in depth and integrated discussion between the alliance partners?

Bob Scott, BP Exploration
As a client we would like that target to be as low as possible and the contractors would like it to be as high as possible. That is an inevitable tension when you are talking about money. I did have one of my view graphs showing the process that we went through and I was trying to stress that we shared all the information. In essence we were all singing from the same song sheet, and getting to an agreed target price turned out not to be very difficult in that case. When it came to negotiating the details of the alliance agreement, we effectively achieved all the main details in three meetings. That was a testament to the fact that we had been working with these contractors and doing the pre-sanction work for around six to nine months. If I may use a term that is in vogue, the process also allowed a degree of trust to be built up between ourselves and the individual contractors and indeed between the contractors themselves. The alliancing approach in the Andrew development turned out to be fairly straightforward, but the approach is totally reliant, in my view, on everybody having access to all the data and understanding all the risks that are associated with the project. There must also be a willingness only to put risks on contractors that they have some means of managing or controlling. We have specifically excluded in the arrangement risks that the contractors are not capable of controlling.

Question 5 Bob Tatum, Stanford University
Dr Garas's levels of information technology were a very interesting framework and the links you made to business transformation very convincing. Could you elaborate on that? What kinds of organisations seem to be making these transformations and taking advantage of the potential offered by information technology? What are the differences in those organisations?

Fikry Garas, Taylor Woodrow Construction
In the area of manufacturing, for example the car industry, they have been very successful. A year or 18 months ago, a major initiative called AIT started in Europe, led by the major car manufacturers in Germany and France, including the Rover

Group. They are aiming to achieve level 4 and perhaps approaching level 5 in the next two or three years. The electronics industry is also catching up. The process plant industry have made progress in the last two or three years, but the straightforward contracting organisations have to catch up.

Question 6 Denise Gilmour, British Gas
As a potential customer, I found Mr Chriqui's presentation encouraging. However, it reflected a basis of working which I would expect from all my suppliers. Which key factors do you think GEC give a competitive edge, putting aside technical matters?

Joseph Chriqui, GEC Alsthom
At the end of the day it is the quality of the people that you have that makes the difference. If you look at the people who are available in the market and rate them on a scale of zero to 20. it is almost impossible to employ solely people who are close to a score of 20. You then have to adapt the structure in order to make up for their perceived shortcomings. I insisted on having a project manager, engineering manager and site manager of the highest calibre. It is essential to have top quality people. We are talking about projects in the 500 million US dollar range, some of them two or three times that size. The people who are in charge of these projects are making decisions on a daily basis which can have tremendous financial consequences.

Our competitive edge is partly due to the enormous experience we have in building power plants, which we have been doing on a turnkey basis. We have secured approximately 25% of the world markets since we started building combined cycle power plants. I believe we have now a very strong team, with a large core of people who have trained with the company over the years. They start their training with commissioning, moving onto the design department and the construction site, supervising the construction of one or two projects before going on to project management. After 15 years of experience, they will be familiar with all the facets of the job and are able to deal effectively with them. The results are always down to people and their ability to deal with all the issues. The most difficult thing is to foresee the unforeseen. In all the plants I have built, unforeseen events have happened, never the same events. So we have to try to become effective in dealing with that.

Question 7 Bill Fairney, National Power
I understand that the fast rail link from London to Heathrow has been contracted under the new engineering contract. Paul Le Blond touched on the subject of partnering. Partnering is fine when projects are going well but how well has it stood the test of recent problems?
[This question was put in the wake of severe technical problems during the tunneling work for the Heathrow Express.]

Paul Le Blond, BAA
For the moment, the particular type of contract is not relevant. What is important is that we have a team of our own people and our various contractors, partners and consultants who have got on with the emergency work of recovering the situation and stabilising the tunnel. I don't think that anybody yet has opened up the contract to see what to do. This tallies with what Joseph Chriqui has just been saying about the need to get the right people. If you have the right team who understand one other, a contract is not the immediate need. You need a contract to sort out the mess later, and I don't think we have quite reached that stage with the Heathrow Express project. But our experience on projects elsewhere indicates that it stands a very good chance of helping us to resolve the difficulties without aggravation or losing our relationships. It is early days, but we have high hopes that the NEC will enable us to resolve problems.

Question 8 Chris Marchant, British Gas
The third session has been about how to improve and there is a desperate need for us to improve. Most client companies at this conference face the same challenges that Paul Le Blond outlined in his presentation. Would any members of the panel care to give their views on where the best opportunities for future improvement for the construction industry lie?

First Response
We have to be realistic about contractor culture and the attitudes prevailing. Neville Simms was asked in an earlier discussion if contractors are likely to make fewer claims than in the past. Will attitude change? It will obviously happen with a certain number of people like yourself who are chivvying the construction industry into improvement but with the legislation and the attitude of some governments, for example in France, Italy and Spain, significant improvement will be hard to achieve so long as clients will not change the type of relationship they have with contractors.

Second Response
The quality of people is an essential issue. In the British construction industry, even before competition starts, a more collective programme for vocational training is one of the conditions that should be fulfilled. We also have to look at training even in times of recession because otherwise I think that we will lose the competition both at a world market and a European level. Greater investment in this area is essential.

Question 9
In the IT field, we have a problem of communication. It may be the fault of IT vendors and software houses, or of the client and contracting organisation. What is needed is more meetings of this sort and various workshops, in order to communicate with one other and try to find a common language. The ECI is a good forum to enable all this to happen.

Question 10
I would like to come back to the comparison between the big job and the basket ball game. If everyone tries to score we may end up losing the game. We have to work as a team. If we are going to perform better collectively, we have to move away from a relationship of contractors to subcontractors and toward one of partnership and working together for the common success. Alliancing is one of the means that could help get us there. As soon as the contract is signed, or even before, we should sit down with the customer on the same side of the table and devise a way of winning together. That is an important step.

Paul Le Blond, BAA
I would like to make a brief comment in response to Chris Marchant's question about the opportunities for improvement. As the saying goes, 'necessity is the mother of invention', and it is my view that clients and consultants and contractors who do not improve will not survive. I am sure that in our necessity, we will find a way. If we don't, we won't be here.

A Delegate
The quality of people has been mentioned. I have no doubt that we do have the right people, but what is required is the leadership to allow the talents of those people to be exploited and make the contribution that they are capable of. That takes courage.

Discussion often seems to imply that we have to choose between one option and another. I can quote an example from my own industry. Where there is a general perception that if you want to have low operating costs you have to spend more capital. We need to examine seriously all those either/or situations. I see no reason why in most instances we can't have both options.

Question 11 Benito Manoli, Snamprogetti
My first question is about alliancing. I can see clear advantages in the reimbursable approach. I don't see the same advantage in lump sum contracts. Can Mr Bob Scott elaborate on this? My second question relates to the management structure for implementing a project. As a contractor I find that current levels of supervision turn into extra supervision, becoming something of a nuisance. But I must admit that four eyes are better than two, and this 'nuisance' is often necessary from the point of view of quality (e.g. certification and acceptance, especially for offshore projects). What are the implications for quality where you are reducing your own input into the construction management ? In addition to an alliance which is fine for a single project, it is a good idea to look at long-term partnerships where you can rely on your contractor.

Bob Scott, BP Exploration
The notion behind alliancing is that you can have improvement throughout the life of the project. If you start with a lump sum, it doesn't work in terms of offering extra profit. The question of not having any monitoring team on site, is very keen. Let me say that safety, quality and environmental issues are top of the agenda for BP, but in all our contracts responsibility for quality lies with the contractor. What we have done as clients in the past is to take that responsibility away from the contractor immediately by putting in teams who monitor, check and tick everything off. Many contractors have looked to the client to provide the quality assurance that they themselves should be providing. So we do look to contractors to have QA/QC programmes to maintain quality assurance. We do have spot audits, but we are saying that this is the contractor's accountability. It is what he has contracted to do and is expected to do. It is about giving the contractors the responsibility which they frequently complain has been taken away.

Question 12 Ernesto Lo Cascio, Northcroft International
I was interested to read in Mr Scott's presentation the savings achieved by BP in recent projects. Savings of about 33% of capital cost are most impressive. This has clearly exposed a high level of inefficiency, which has been attributed to behavioural problems in the past. New levels of target costs have now been set.

I wonder how comfortable clients and contractors will be in agreeing target costs at these new levels in the future. How will the share of risks be addressed ? Will the balance between risk and motivation need to be revisited? I wonder if Mr Scott would like to comment on it.

Bob Scott, BP Exploration
That will be one of the next big challenges as we set new standards. However I am coming more and more to the view that we don't know how efficient we can become. Witness other industries. The car industry is producing products of much higher quality and reliability than it was 10 years ago at significantly lower cost in real terms. The electronics industry is full of similar examples. Although the construction industry is not exactly analogous, there is a long way to go in making the industry more efficient.

Ronald LeBright, ABB Lummus Crest
I have been asked to summarise what I believe has been quite a sucessful conference. The conference has had a wide variety of themes. We should recognise that construction is a complex industry or set of industries, ranging from technology to base craft considerations. When we talk about a European construction industry, we are talking about an industry that is local and regional as well as international. It is important that all of us, particularly at senior levels, have a vision of where the industry is going. That vision is sometimes difficult to formulate because it changes all the time. The greater the rate of change the harder it is to sustain the vision.

Secondly, it has been encouraging to see the leadership demonstrated at this conference from owners. Construction projects are only going to improve when owners allow change to happen. Also, when they not only lead but also allow leadership from all project participants. We have seen the importance of allowing a win-win relationship to develop. When we consider project success, be it business success or functionality,we must emphasise a team working together to achieve overall project success. We have heard during the third session, as well as the earlier sessions, the importance of pre-engineering and pre-planning, in other words spending time up front. It is almost axiomatic that we need to work on pre-planning before the contract has been agreed. We have heard a great deal about technology and about the importance of marrying cost and technology through target costing and value management.

Information technology is radically changing the way that our business can be managed. It is difficult to give a vision of where information technology is going and over what time frame. Dr Garas gave us an excellent paper. Technologists must talk to business users and vice versa in a meaningful way. IT is being developed within the industry. When we talk about R&D, we are also seeing the developments of other industries directly affecting the way that we can re-engineer and improve performance. IT can provide the information hub for the management of the project as a whole.

We had an important presentation from Jan Cremers who reminded us
how local and national workforces are very much a part of the team. In listening to André Safir, I was reminded of the importance of R&D and of government as a primer to R&D. In our industry, government initiatives at the national and European level are to be welcomed in support of R&D.

I welcome the recognition and the importance of profit and also remembering Joseph Chriqui's enjoyable presentation, the importance of fun and job satisfaction. We have to attract into the industry people who are capable, educated, intelligent and have something to offer. They will come into the industry because it, it turn, offers excitement, fun and the opportunity to profit. We need to be able to pay our people and reinvest in R&D. We must attract good quality people at the entry level and educate them so that tomorrow's leaders are developing with today's best practices. Let's hope that the European Construction Industry will be getting the best in contribution and results.

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CONFERENCE CONCLUSIONS

Granville Camsey FEng

Chairman
European Construction Institute

Granville Camsey, ECI and National Power

This has been an extraordinarily good conference. What has encouraged me has been the breadth of contributions from throughout Europe. I have gained new insight into the whole business of retaining the competitive edge. That is good for my business in National Power, good for your business, and if nothing else good for our own individual survival as professionals. In this day and age, surviving as professionals in our business is increasingly difficult.

There has been a certain emphasis on motherhood, but I would just like to pick up on some of the new insights. We have had a spectacular example of seizing the competitive edge from Chris Marchant. I was encouraged hearing Paul Weissenberg's talk about transport, communication, labour flexibility and energy in Europe. His views on liberalising the market and the opportunities it will provide were heartening. It is the first time I have been enthused by anybody from the European Union. Perhaps we ought to now stop knocking liberalisation of the market. I was struck with Dr Garas's observations about communication, Professor Moavenzadeh's US perspective on international competitiveness also caught my ear. Changes in our business structure are clearly needed. For the niche player, being prepared to sell at the margin of your own core skills may be necessary, rather than using them as the means by which you gain a competitive edge. André Safir's contributions raised one or two challenges to that. A couple of points struck me among political contributions . Never mind about the tigers and the dragons, what about the animals prowling in Eastern Europe? They have the same opportunities and by virtue of being much closer are going to steal the technological and commercial bases and use their leverage of cost to provide new competition. Further afield, Japan can not only become more competitive but can create large numbers of real jobs. I am concerned at the European view which holds that to be competitive means losing jobs. And we have a serious problem in Europe of the educated young having no jobs. That is an issue of some substance for us. And let me say, as an Englishman among French, Belgians, Italians, Germans, Dutch, Swedes and Americans, that the state is taking too large a fraction of GDP. Shouldn't we get it reduced? I am arguing for privatisation, of course.

Comments about labour are valuable. I doubt that ideal of flexible labour throughout Europe is truly achievable. We are still separated by languages. The contributions from our businessmen have been exceptional at this year's conference. Bill Croker from Chevron, Joseph Chriqui from GEC Alsthom, Paul Le Blond from BAA and Bob Scott from BP Exploration all proposed a synergy of being prepared to look outside our own expertise. You can build power stations like you can make motor cars. In my company we know how to build power plants, but we don't know how to use what is best from Rover and BMW and the other great car manufacturers. I would just like to point out that we, at National Power, are now buying power stations a third cheaper than four years ago, and I have not seen any supplier go bust. On the contrary, I have seen them become more and more profitable and I believe we can take another third out.

I thought that the observation about construction backing into production was important, presenting as it does a new strategic opportunity. And what of the ECI? It is clear from the comments of politicians and others at the conference that the ECI has an increasing role to play. It has a wonderful opportunity to provide the forum which will aid all our members to become more competitive.

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