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MASSOP

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2 Executive summary

MASSOP considers the ideas of decentralisation – of moving away from the traditional "command and control" system. Having said this, it must be said at the outset that progress in this direction for an organisation requires strong leadership; leadership that can both free up and clamp down.

MASSOP is specifically concerned with management structures. Considering these structures at this time however, is perhaps like considering them at the time of the transition of the industry from sail to steam. The transition that is taking place, and will take place, over the next few years is certainly just as significant.

E-commerce will soon have a revolutionary effect upon the way businesses are managed. Studies have shown that business-to-business commerce (B2B) will reach $1.3 trillion by the 2003. Industry-specific vertical web sites will be used by all companies. These will assist not only marketing and purchasing, but also knowledge management and staff development. Specific software application development will become a key factor for success in most industries – and the maritime industry will certainly not be an exception.

The effects of this will be not only to change management structures, but also to change attitudes and, to a certain extent, the key competencies that the organisation will need.

MASSOP in general therefore, and workpackage 7 in particular, considers these aspects specifically and looks at key elements and developments that will reshape the future management structures of the industry.

Many, or most, shipping companies are now developing a web site. These web sites however will quickly change. Companies now want their customer management, supply-chain management and other facets of their business accessible to everyone within the organisation. They need this to be easily maintained and updated, and secure. To a certain extent this has already happened with the bigger companies within the industry – those with in-house computer departments and large resources. This has been difficult however for the smaller companies that make up the bulk of the industry. Smaller companies however will increasingly need these developments; ASPs (Application Service Providers) make this possible. These companies enable outsourcing of the resources and software necessary for a small organisation to become fully involved in e-commerce and B2B interfaces.

No doubt many shipping companies may well not believe that all of this is an early requirement of course. Certainly, however, businesses without a functional e-commerce component in the next few years will be the equivalent of businesses decades ago that failed to install a phone system when that technology came along.

And just as sure as that technology changed not only the way communication occurred – both externally and internally – so e-commerce and B2B will inexorably change not only the way the business works with its customers and suppliers, but also

the way the organisation functions internally. This will, therefore, change management and operational structures throughout the organisation and the industry.

Workpackage 7 of MASSOP looks at these aspects and makes suggestions and recommendations for the future.

The work of this section also considers the MASSOP newsletters that were sent to several hundred companies and individuals during 1999. It should be said that the MASSOP programme and the MASSOP newsletter were particularly popular with the industry and therefore had a snowball effect. This, in part, explains the delay in this report; the research and involvement with the industry has been significantly more than originally envisaged.

The correspondence of the MASSOP newsletter is intended to be an ongoing and developing feature of the industry. At the end of 1999 it provides guidance, advice and discussion for more than 1500 companies and individuals within the industry. Projections are that this newsletter will be read by many more by the end of the year 2000. It is also suggested that the original concept –analysing the maritime world and providing development advice – will grow to the benefit of not only European Union organisations, but also the global industry. Additional support for companies and government organisations is being provided by World Maritime Organizational Development and this appears to be greatly welcomed by sections of the industry.

There is a real need for the industry in general to change. In section 7.10 of this workpackage the author describes the phenomenon of the "collapse of the middle". In this, the very many small traditional shipping companies can be seen as being 'squeezed' by the bigger companies. The major liner trade operators are becoming bigger and are centred on differentiation. The larger bulk trade operators cut costs.

Types of ownership vary widely of course, but many organisations are small family-owned companies with a small number of ships. The MASSOP survey sent to BIMCO members showed some 30% of the world's shipowners operate on average around 3 ships. (The actual figure is certainly higher than 30%.) Many of these are the family-owned companies.

In this sort of company, very often the family members have a significant influence on managerial and entrepreneurial aspects. This sets the standards and values of the organisation and the founder sets the culture and is the main reference point for decisions. Typically, this is characterised by a very centralised management style and a determination to retain financial control. To an extent this limits growth since it limits capital input and the input of outside ideas. There is often a reluctance to delegate responsibility and authority and this has a marked effect upon the management style and structural development of the firm.

This centralisation usually extends to the way the ships are managed. The owner/founder is often seen in a paternalistic role and this often breeds a loyalty and continuity that is seen as a major strength. But there is often a reluctance to look further than the companies' established processes, and innovation is often stifled.

Training is task oriented and strategic planning is usually minimal at all levels of the organisation.

All of the above is indicative of the development of a no profit pattern – particularly in the bulk market. The companies are largely undifferentiated and the companies are run with a strategic viewpoint based upon "years of experience". The business is often characterised by high fixed costs and chronic over-capacity.

Perhaps this is what has happened, and is happening, to shipping. The liner trades are differentiating – providing a high level of customer service etc., and generally geared to hub-and-spoke networks and door-to-door logistics. The bulk trades are emphasised around cost leadership. The traditional shipping company – i.e. the company that tries to compete without a cost leadership or differentiation generic strategy - is "stuck in the middle" (to quote Michael Porter), and can't compete.

"Collapse of the middle" industries are also characterised as being mature industries with knowledgeable customers; this is also true of shipping. There is a power shift from supplier to customer; this is also true of shipping.

The result of all of this is declining profitability. At the low cost strategy end – i.e. the bulk trades in the shipping industry – cost cutting is essential for survival for many organisations. At the differentiation end of the business, cost cutting is also necessary, although very often this is rationalised as being just normal and good management.

Whichever way one looks at it, the emerging pattern requires a new approach to management.

The work of this section is also based upon seminars given by the author during 1998 and 1999, involving many worldwide industry staff. The views of these staff are incorporated into many of the findings and suggestion.

The work basically recommends that companies should:

- Improve the processes by which the ships are run and the businesses managed – suggestions are given for this
- Improve IT systems – the area of business-to-business (B2B) processes is particularly highlighted
- Improve communication – both internally and externally
- Improve teamwork throughout the organisation
- Improve training systems
- Improve staff recruitment – both within the industry and the individual company

3 Objectives of the project

The MASSOP project had as an aim to create workable new organisational structures for the shipping industry. The project was based upon the idea that the traditional rigid "command and control" hierarchy, both at sea and ashore, may not be the best solution for today's shipping world.

Many projects have been and are considering aspects of the development of the shipping industry; MASSOP is intended to take an overview. MASSOP was intended to look at organisational structures and development, taking into account the experiences of other industries. An important aspect for consideration has been manpower recruitment, particularly in European and OECD countries, and MASSOP aimed to particularly address this issue.

There has been an overall emphasis on the reduction of operating costs in the shipping industry in recent years. Globalisation and the search for least-cost locations, as well as maintenance reduction and the trend to prolonging the life of the vessels, has led to operational difficulties for many companies. The industry is trying to improve its image and to improve safety by developing quality via the ISM Code and the revised STCW convention.

The reduction of European flagged tonnage has reduced job and career opportunities in the industry and, consequently recruitment has been difficult and insufficient to sustain even the present level of the maritime industry. An objective of MASSOP has been to investigate how the trend of the reduction in quality, and quantity (especially in some global areas), of suitable manpower for the maritime industry can be reversed.

MASSOP, as outlined above, also aimed to evaluate the global state-of-the-art of present management structures in the shipping industry. The rapidly changing political, economic, social and technical aspects will be studied and MASSOP aimed to provide cost-effective management concepts, in conjunction with studies of other industries and case studies, to further improve the performance of shipowners and operators both at sea and ashore.

MASSOP also aimed to realistically analyse the likely obstacles to growth for the European maritime industry and highlight the strengths and weaknesses. This was intended to be seen through the framework of deregulation that is occurring but balanced with the increased quality standards that are being introduced.

The project was also intended to provide the syllabus for a course in the management of change in the shipping industry. This course is envisaged to be specifically for the senior management of shipping companies.

The project relied heavily upon input from shipping companies globally, largely via the BIMCO membership, but also from the world-wide network of WMU graduates. Consideration of the management structures of other industries and analysis of financial approaches to capital investment has also been studied.

4 Means used to achieve the objectives

An initial survey was sent out to 958 owner-members of BIMCO. This survey covered a wide range of subjects, and as well as asking about fleet composition and company staff structures it considered views about centralisation/decentralisation and future manpower requirements, both at sea and ashore. It also considered IT systems and included a wide range of questions asking opinions about the present and future effects of the ISM Code. More than one third of the companies surveyed responded. The survey was therefore considered to be the view of a large proportion of BIMCO members and perhaps, a very significant proportion of world shipping companies. The information from this survey was widely analysed throughout many of the different sections of MASSOP

This survey also included an extensive personnel section dealing with staff origins, the influential factors for recruiting European staff, and recruitment and training in general. The information from this section was widely analysed and commented upon in workpackage 5.

Further collaboration was also sought by means of a MASSOP website and newsletter. The newsletter in particular covered a wide range of the aims and objectives of MASSOP and led to wide discussions and involvement of the industry. This work is mainly incorporated into workpackage 7.

5 Scientific and technical description of the project

5.1 Introduction

This chapter of the MASSOP Final Report provides an overview of the individual workpackages and includes some of the conclusions and recommendations from each of these.

Workpackage 1 was concerned with providing an inventory of relevant studies and the preparation of a questionnaire. This workpackage is not discussed here, but the results of the questionnaire are disseminated widely in the other workpackages.

Workpackage 2 analyses the external environment influence in ship operation. Internal structures of the modern shipping management organisation are considered in workpackage 3. Workpackage 4 considers the ISM Code and its influence and workpackage 5 deals with the human resource requirements.

Four case studies are presented in workpackage 6 and modern management concepts are discussed in workpackage 7. Workpackage 8 is intended to provide a policy impact assessment.

5.2 Workpackage 2

Workpackage 2 of MASSOP looked at the external influence in ship operation. The executive summary of this included the following points (as written by the workpackage co-ordinator:

The qualitative management which is expressed and conveyed by the ISM Code is very likely not to yield the expected results, if the external factors which affect seafaring do not fulfil their own roles. Such external factors are social, political, economic, technical and legal. Based on the questionnaire action (WP 1) and literature investigations the external environment influencing the ship operation and shipping management will be examined. External environmental influences in ship operation are effects that are outside the direct influence of the master, shipowner or ship operator. There is a large number of administrations, organisations and companies influencing the ship operations.

Social aspects contain in this context environmental protection and pollution prevention, human elements, safety and efficiency, the public opinion and the social aspects within the ISM Code.

The pollution of the marine environment comes from a number of different sources. Most important are industrial and urban discharges and vessel operations. Pollution of the marine environment has economic impact on coastal activities. Environmental costs are another important part of environmental aspects. For example, the average costs per tons of oil spilled is about US-$ 3,830 but it can rise from US-$ 71 to US-$ 21,000 per tons spilled. The extent of marine environmental damage following accidents depends on a range of factors, in particular the cargo of the vessel and where the accident occurs.

The implementation and introduction of the ISM Code will lead to a team-work between the personnel on ships and people in the office. This new shipmanagement system will deliver benefits to companies that take it seriously and it will lead to safer, more efficient shipping organisations. A well-run safety management system will render fewer inspections because the higher level of reporting and inspection by a company staff should cut down the need for third party intervention. The Code will support the concept of a safety culture on board. The establishment of shipboard safety committees and a designated person for all safety matters from the crew should be considered by developing new organisational structures.

A new safety case approach is based on the use of risk assessment techniques within an overall methodology of formal safety assessment. The chance of an accident occurring and the danger of environmental damage resulting from it has to be considered by risk assessments. Main risk assessment factors in particular areas are the risk of accident, of pollution and of environmental damage. A comprehensive assessment of all relevant risk factors should enable alternative strategies for reducing risks. It is important to identify in advance whether a new localised measure (service) will reduce or increase risks in the area concerned.

Regulated interventions for safety and environmental measures are necessary, but if international regulations are not enforced uniformly they will result in distortions to the market and the competition. The IMO has started to address the effective enforcement of regulations and information disclosure by the ISM Code and the STCW 95 for seafarers and shipping companies.

In addition to the shipowners' obligations the entire shipping industry must improve their own safety standards and establish quality assurance systems. The introduction of quality assurance systems for all companies, organisations, administrations and authorities dealing with maritime affairs seems to be necessary to cover the complete waterborne transport chain. The shipping industry has the opportunity to bring together market forces through technology that will support the economics of shipping and the safety of ships and the environment. The internal safety policy of a shipping company must include the employee and has to be known and accepted by the society as the external customer of the shipping company. The total safety management could lead to a reduction of incidents and accidents and therefore to commercial benefits.

The shipping industry mainly has a negative image in the public opinion. The industry must be aware of a public perception of the industry as polluters of the environment and accepting a low standard in safety of vessels. If an accident or incident occurs the masters, shipowners and ship operators must know that they cannot confidently face the media without preparation and proper management of the situation. A co-ordinated response between the master and the company representatives is necessary and leads to a successful co-operation with the media and a positive impression for the society, which includes the customers and business partners. A media-trained company representative could be away to reliably deal with the media.

The accidents in the shipping industry of the recent years, the numbers of lost lives and the value of lost ships and cargoes lead to the introduction of the ISM Code, the revision of the STCW convention by the politicians and administrations and the work on the introduction of former safety assessment systems by the IMO. These safety and quality measures will help to improve public opinion of the shipping industry.

The objective of the ISM Code is to ensure safety at sea, prevention of human injury or loss of life and avoidance of damage to the environment. Holding ISM certification demonstrates to clients, customers and governments the quality of the operation of ships and shows that the shipping company has set out to fulfil its legal responsibility. The safety management system will also give some confidence to legal courts if a company has to defend its actions. The mandatory ISM Code has the consequence that the new safety culture increases the costs of the shipping companies on the one hand but on the other hand increases also the benefits for the shipowners, the environment and the whole society.

Ship management has been grown recently in patterns and complexity to the extent that it is difficult to be defined since it includes all contracted and professional supply of all on-board services, together with their shore supervision, which would normally enhance a vessel from a bareboat into a time charter

description. A management company is usually separate from the vessel's ownership.

Because of the present situation of over regulation the cost not only in term of actual technical support and maintenance is increased to levels but supersede any previous comparison but such situation has reached the stage which the freight market does not in the day to day practice absorb such high costs. Quality in service is always a good proposition but the question is who is prepared and to what extent to pay this quality service.

The existing regulatory regime in shipping impose on the ships the cost of the quality management which is decided and on the other hand the market rejects such cost since it always prefers the lowest freight offering. This is by it self the reason of a non-compliance mechanism which in some cases becomes the rule of economic survival for many shipping companies.

We must look in the future not for new regulation but for the implementation of a new policy which will change fundamentally the uneconomic and unproductive situation of today which imposes too many surveys, high expenses, highly complex management mechanism with uneconomic results, good reasons for non compliance with the regulations and shrinking of the European merchant fleet.

External economic aspects influence the ship operation. The assessment consists of a description of the present situation and concepts taken into consideration for the overall improvement of ship operations and shipping management. This could be an incentive for transferring cargoes from rail and road onto vessels in order to avoid the feared "traffic infarction" in Middle Europe as well as environmental pollution.

The description of the present situation in shipping business can be summarised as follows:

International conventions published by the IMO since 1960 initiated a new trend of giving emphasis on safety management, which means the development of „software" for organisational structures and operational procedures on behalf of the personnel who is in charge for ship safety, either ashore or on board vessel. Especially the ISM Code enables ships to trade world-wide under a single set of safety regulations and generates maritime „quality management". The term „quality management" comprises the improvement of the product ship, its environmental safety and the compliance of standards with regard to organisational procedures within the entire shipping company – onboard as well as ashore.

The Code creates a „safety culture" and avoids a patchwork of regional or national regulations.

The trend of structural changes in liner shipping is going on. The constant increase of ship's capacities in the container trade results in low freight rates and forces the shipping industry to more concentration, more effective organisation with respect to collective pricing, and more customer orientation.

Increase of costs must be compensated by an effective cost management. The traditional cost factors are on a historical low level and cannot be influenced anymore, e.g. the possibility of reducing personnel cost by outflagging the ships is exhausted for many shipping companies, and costs for insurance have reached the lowest point and do not leave room for any exertion of influence.

For shipping companies, where an informal management style has prevailed, the implementation of the ISM Code has come as a shock. For many other companies with sound procedures in accordance with ISO-based quality assurance standards and a commitment to standards of safety, the implementation was nothing else than a formalisation of existing practice, not demanding any basis change in the overall organisation. The main objective of the Code is to establish both a mentality and a standard of operation in the shipping industry, which leaves no opportunity for the substandard shipping companies to continue to trade.

The major part of the shipping companies believes that the implementation of the ISM Code will have a positive influence on their relationship with the external organisations. After 20 % of the questionnaires have been evaluated, it can be stated that on an average 77 % of the shipping companies are expecting an improvement in their daily business with banks, insurance companies, port authorities, customers, etc. It may be of interest that larger shipping companies have a more positive attitude than medium size companies

There is the demand that the entire port industry must comply with the ISM Code in order to improve the overall image of the shipping industry.

During the last decade a fundamental change of the environment in shipping business took place. As a consequence, major shipping companies getting more involved in logistics and complete services from door to door. The ship itself became only a link within the whole transport chain and is depending more and more on external influences.

As far as the creation of workable organisational structures and procedures are concerned the following concepts have been introduced:

In order to meet the future requirements in the environment of growing competition some shipping companies have to widen their services. During the last decade more or less all container companies have been converted from a solely ocean carrier to a modern transport and logistic enterprise. The shipping companies are offering their clients a complete haulage from door-to-door as carriers arrangement. That means the liner shipping companies are directly involved in inland transportation, inland depot operations and container equipment management. To improve the profitability, most of the container companies collaborated in shipping consortiums with other liner companies serving the same relations.

The future demand of the shipping companies – not limited to container lines - is the foundation of joint ventures not only with port operating companies but also with forwarding agents, private railway companies, inland waterways

operators and truckers. However, prerequisite for the effectiveness of such collaborations is the establishment of a modern organisational management structure together with proper operational and administrative procedures. These procedures should be supported by an integrated EDP-system which guarantees an optimal information flow between the appropriate shipping company and its business partners.

Many of the existing rules and regulations published by the International Maritime Organization are not clearly structured and often mix requirements that apply to shipowners, seafarers, administrations and others.

In December 1997, the IMO launched a tender for the preparation of such a manual which will be financed by the International Transport Workers Federation (ITF). Undoubtedly, the proposed manual will assist the ship's crew in the conversion of the ISM-Code into practice. However, it is advisable to create such a manual also for the administrative staff of the shipping companies.

The European Parliament has taken initiative to assess the options of a „European Environmental Coast Guard". A limited study on this matter was carried out in 1994 investigating existing international and regional regimes in Denmark, Germany and Spain. The study resulted in the opinion that existing international regulations, notably those published by the International Maritime Organization, are technically sound, but lack implementation and enforcement at global and European levels.

The study recommends that a careful but distinctive step by step approach should be chosen to establish an effective control, supervision and response system in order to minimise the environmental threat of European waters through shipping and other maritime and off-shore activities. A possible approach could be a centralised system by means of a spider web concept: a strategic and co-ordinating central body with regional implementation and enforcement centres, supported by a central task force.

The proposed European Coast Guard shall not limit its responsibilities to environmental protection but should be vested with the same legality and scope of work than the US Coast Guard. Additionally, the European Coast Guard should take over the responsibilities of the Port State Control.

The development of such a concept on European level should start immediately in order to keep pace with other developments already under way within individual Member States.

In 1997 the European Commission published a Green Paper focussing on financing of maritime infrastructure in seaports. Until now the Commission has not considered public funding of port infrastructure. However, the Commission is the opinion that port infrastructure should be priced in such a way that users should bear the real costs of the port services and facilities they consume.

The proposed approach to port charges will contribute to improving the application of a cost recovery principle by ensuring that investments will be

financed by port undertakings on a commercial basis and accordingly their cost passed on to users.

The transfer of costs from the government to the private sector is the only way to reduce the payment of subsidies. Prerequisite for this is the creation of a uniform structure of port tariffs with relevant principles of pricing. This will also contribute to guarantee fair competition between the ports of the Member States.

In 1994, the Maritime Directorate of the Netherlands together with the Rotterdam Municipality and Port Authority initiated the "Green Award". The objective was to develop and introduce a scheme to facilitate the possibility to reward higher standards of ships operation and management, applicable in the international maritime sea transport.

Green Award incorporates and accepts existing quality management and certification schemes, such as ISO 9002, ISM, etc. Ships with Green Award Certification shall benefit from international commitments by giving preference to those vessels and differentiation in tariffs/fees and procedures.

Besides that, the IMO recommended favourable conditions for double-hull tankers in the framework of port dues levied in European ports. It can be stated that meanwhile some European ports followed the recommendations of the IMO and granted the requested rebates. But there is still the need for a world-wide consolidation. Economic incentives are considered as the main tool for stimulating the demand for modern and safety ships.

The ship operation management will be influenced by new technologies and techniques, standards and systems and especially by communication and informatic applications (technical aspects). The reduction of staff on board and the increasing use of new technologies leads to technical aspects that has to be considered in the shipping industry. Technical ship defects can be defined as components of ship and its equipment that did not comply with investigation rules and/or international convention regulations. Responsible to avoid technical ship defects will be the ships' owner/operator, ships' officers and crew, the flag administration, the classification societies and the Port State Control.

The co-operation of the owner/operator and the surveyors for maintaining the ship and holding the equipment in good conditions during the intervals between the surveys is very important. When ships become bigger and more complex and many more complex regulations have to be implemented this co-operation because of commercial pressures and reduced manning levels has generally diminished. It must be clarified that delegating flag administrations still retain the responsibilities and obligations under the conventions that they have ratified. Consequent improvement in maintenance in the intervals between surveys can be the result of the Code. In the long run the additional workload through the use of the ISM Code will have the effect of reducing the ship and equipment survey workload.

There are three different quality and safety standards widespread in the shipping industry. The International Ship Managers Association (ISMA) Code covers far more than is necessary and lacks official remission from the majority of

governments and flags. The ISO 9002, that covers a smaller range of items and concentrates mainly on technical aspects and the ISM Code that will be mandatory for all ships, ship owners and ship operators to obtain. Human shortcomings are addressed by the ISM Code and the STCW 95. They will be reduced when this combined legislation is implemented into the shipping industry.

The implementation of the ISM Code needs a total commitment from the top of the organisation so that ship and shore personnel can work as a team. It defines the allocation of responsibilities between the office and the ship's master/crew. The ISO 9000 series set out how an organisation can establish, document and maintain an effective system, that demonstrates how the organisation can satisfy the customers' needs. The ISO system can be applied to departments of functions in isolation to the rest of the company. The introduction of the ISM Code changed the whole management of ships. On one hand the extended regulations and compliance codes lead to engage experts for implementation. On the other hand the higher risks and associated costs lead the owners to attempt to gain greater control over the ships and not to seek out experts for the expertise.

The prospects for the market in the future could be to find another comparative advantage against other shipping companies and to meet the further requirements of the society. The environmental Code ISO 14000 series could become the next comparative benchmark in the shipping industry. ISO 14000 series are covering an environmental management system that includes the continual improvement of all environmental performances of a company. This contains the company's environmental policy, planning procedures and environmental management programmes, implementation and operation structures and checking and corrective actions. The shipping industry as a worldwide business must taken into account the changing environmental policies and should include an environmental management system in the management concept.

A quality assurance system is a framework of diagnostics, procedural discipline and measurement that supports the logically steer of processes. It is just one tool that enables the structure for planning, implementation and control. The great commercial risks in the shipping industry will be reasons to install safe operations that also support the reduction of environmental risks. The transformation of the shipping industry into a well regulated, disciplined and professional body within short time is an objective of quality assurance, but in fact there are no quick and easy solutions. The development of new and improved communication and informatic systems has paralleled the introduction of quality assurance. These systems led to on-line communication between ship and shore management and have changed the organisation of the shipping industry. Computers are used for administration, operation, navigation and technical support on safety management applications. The information technology will effect ship management systems significantly. Quality assurance systems influence the quality character on board and in the office. The ISM Code is a part of a quality assurance system in shipping companies that has to be adapted worldwide. Up to now it is not clear how the various cultures and nationalities will adapt it and how the control bodies will interpret and implement it.

Currently there are multitude inspections on ships carried out by class, charterers, flag, Port State Control, P&I-Clubs, shareholders, representatives, insurers, banks, and others. An effective quality assurance system that contains ISO, ISMA and the ISM Code as shipping operation standards accepted by all participants could lead to a reduction of inspections and therefore to a reduction of costs and time losses. An extension of this system to other companies, organisations, administrations and authorities dealing with maritime affairs seems to be necessary.

Port State Control inspections are carried out to ensure the ship's authority, do not pose the pollution risk, provide a healthy and safe working environment and comply with relevant conventions. Referring to an Australian Maritime Safety Authority (AMSA) report about their port state controls there is still an alarming amount of deficiencies on safety appliances onboard the ships. 50% - 60% of all deficiencies were exposed in this field. It shows the need for improved quality systems and safety controls. In carrying out Port State Control inspections it is important where a technical defect or substandard item is identified and who is responsible for that item. Responsible for a deficiency can be the classification society, poor maintenance by the crew, a damage, the flag administration or/and the ship owner/ship operator.

Organisations responsible for and connected with the shipping industry should also use safety management systems. The intention of the IMO to establish a „WHITE-LIST" of such administrations which are not having complied with STCW 95 could be a first step to introduce also safety management systems in such organisations.

The objective of coastal management is to protect the marine coastal environment and to manage the coastal resources. The political and economic geographic jurisdiction of coastal countries has extended from 12 nautical miles to 200 nautical miles in recent years. In response to inadequacy of shipping safety several coastal countries are developing localised measures and coastal management structures. There are national and international efforts to develop, implement and enforce coastal management policies that could impact the shipping industry. However, 75 % of the pollution entering the sea are from land based sources. This statement should be used for the shipping industry to promote the positive image in environmental related fields.

Very important for the shipping industry is the result of the public discussion about the disposal of oily waste from vessels, the availability of reception facilities and the payment principle/model for this service in different ports. To cover the whole problem this model should be extended to all types of ship's waste. The four main payment principles discussed in Europe are termed as free-of-charge, uniform-fee, low-special-fee and polluters-pay. The organisation and financing of the reception of waste in shipping impacts the shipowners and operators because their ships are responsible for ''waste production". A new model for the disposal of waste should give incentives to shipowners for investments in techniques to reduce the waste. An efficient reception system in ports for all types of waste is necessary. One payment model/principle must be established in all ports to avoid distortions of competition between shipping companies. Shipowners

and shipmanagement companies should rethink their strategy of waste disposal. They are responsible for the organisation of the disposal of waste and it seems to be useful that a person on board and a person in the office is responsible for a system to reduce the environmental impact of garbage and oily waste and to reduce costs which amount for this part of the ships operation.

When the code first became known, a number of commercial aspects was raised that created an awareness to the shipping industry. But the idea that the code would attack fundamental branches of the shipping law was not widely recognised. It is true that after the adoption of the code there was a period of inactivity because very few owners realised what would mean implementation of its requirements. Actually the code is of greater challenge to the substandard operators but it will also have an impact on small shipping companies. Suffice to say, many shipowners support the view that the effect of increased expenditure resulting from compliance with regulations at the international level will not be coupled with higher earnings. Consequently, those owners who run their ships in the cheapest way will have the comparative advantage, whenever the market rates harden.

The fact that the code came here to stay means that, from the legal point of view, it contains pitfalls for the unwary that might expose owners to liabilities which in the past might have been unpunished. In other words, the bottom line for the shipowners is that it will be harder to defend liability issues and harder to maintain the protection of the insurance cover. Moreover, we believe that the way things are going, the ones who will definitely benefit from the code's implications are the lawyers' firms.

5.3 Workpackage 3

Workpackage 3 looked at the internal structures of modern shipping management organisations. The following summarises the work:

The shipping industry has changed significantly over the last few decades. This has been caused by internal and external factors to the industry and its shipping companies; both of these are covered in some detail in MASSOP deliverable 3.

There is evidence to suggest that in most industries – and certainly shipping is one of these – people simply do not learn from past strategic mistakes. This is often emphasised as generations pass within the management structure. Knowing the background is often important to deciding the future. This deliverable therefore, looks at the background to today's shipping industry and commented upon it widely throughout the deliverable.

An area of particular concern in all industries is decentralisation. One area where this is particularly relevant in shipping is the increasing use of ship management companies by shipowners. This is discussed throughout the deliverable, but specifically when the background to ship management as a separate function is examined.

Another change in shipping is that National shipping companies of developing countries, which were a new factor in the 1960's and 1970's, have mostly disappeared, or are struggling, after the UNCTAD Code of Conduct for Liner Conferences and its 40-40-20 cargo sharing principle was ended by the Cartagena Commitment in 1992. There are exceptions to the rule – COSCO of the People's Republic of China is large enough to have a real impact in world shipping and is still in an expansive phase.

The deliverable also looks at a fundamental dilemma for the shipping industry: high freight rates are often seen as necessary to justify newbuilding decisions. But in the cyclic market, basing decisions on high freight rates can only produce high risks. Conversely the low risk situation must be when freight rates are low, but this might be difficult to justify to a board of directors whose knowledge of the marketplace might be limited. There is a need therefore for shipping to be more long term and for the management and the financial tools to work more in this direction.

Globalisation is of course one of the main driving forces of the change. Industrial decentralisation and relocation to least cost areas by shippers has been matched to a large extent by a globalisation and relocation of the shipping industry - or at least of many of its sectors. The shift in production centres has led to an expansion of transport requirements and a growing complexity in logistic needs; shipping has had to adapt to this. The effect has been increasing specialisation and significant structural change. A key strategic requirement for shipping companies, as with companies in all industries, is to gain competitive advantage. Whilst many companies have failed, many others have survived and thrived, differentiating themselves perhaps, or striving for cost leadership and economies of scale. Along the way, a new breed of shipowner has entered the market and, as with most other industries, things are not only changing but also changing at an increasing rate.

Political, economic and technological change has led to social change; the industry will never be the same. Why should it?

It is not only globalisation that is driving development: the industry is becoming truly international. These aspects are also examined in this deliverable.

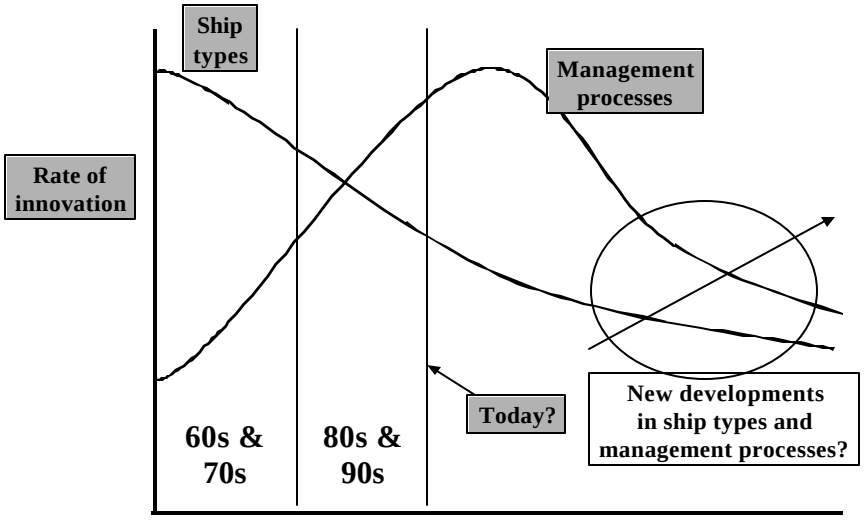
Technical changes to the industry are discussed. There is a continuing need for new tonnage, and shipping finance and its changing effects are considered as well as capital raising difficulties for shipping compared to other industries.

The deliverable also examines types of management structures and suggests that the shipping industry certainly lags behind many other industries in cross-functional process improvement. Ship management structures and the need for a process-based approach are investigated and examples from other industries quoted.

The traditional role of the manager was to plan and control, often in a clearly hierarchical organisational structure. This has been true in ship management as well, both on board and ashore. The reduction in crewing levels were compensated by additional control from ashore until staffing levels in the head offices were reduced as well, and the level of detailed control was no longer possible. There were not enough people to write all reports, neither were there people to read them. Although ships' officers were expected to contribute in more areas – they were essentially "knowledge workers" that could not be controlled in the traditional way – they were still expected to perform routine tasks, which were monitored. As communication technology had developed, authority in ship management had gradually become increasingly centralised, especially compared to the 19th century, when the master was managing practically all aspects of the ship when away from the homeport. The introduction of the ISM Code will certainly require formalisation of ship management routines but at the same time, flexibility will be necessary to be able to react to and deal with change. The MASSOP survey indicates that a majority of the surveyed shipowners saw their management systems as being centralised and that the effect of the ISM Code would be increasing centralisation, which would not suggest greater flexibility. Findings from other industries, however, have shown a negative correlation between formalisation and centralisation. In other words, the ISM Code should lead to increased decentralisation.

The area of co-operation within shipping is analysed and a comment is made that the shipping industry, like any other industry, is a co-operative endeavour. Information Technology (IT) is discussed and the need for a culture of free flow of information between the company and its clients considered.

It is concluded that developments in the "products" - i.e. the ship types - closely follow many other industries. Product innovation is usually followed by management process innovation; perhaps this is precisely what is happening to the shipping industry today. The following illustration tries to show this:-



It is commented in this WP that further significant innovation in both ship types and management processes will take place of course, but that the present is largely dominated by management process development following the introduction of quality standards via ISM and the STCW revision.

Workpackage 3 tries to show that not only are the types of ownership in the shipping industry changing, but also the assets of the industry - the ships themselves, the finance, the people and even the processes for using the assets. The result is undoubtedly an industry that is very different from the industry of yesterday. The industry of tomorrow will no doubt be equally different. The workpackage concludes that the key to success in all of this, for any type of shipowner, is management in general and management structures in particular. These points are further developed in workpackage 7.

Management structure should primarily depend upon strategy and that management strategy is usually thought of as long term. A problem within many sectors of the shipping industry however, is that the grand strategy requirements often change from expansion to retrenchment as the market and freight rates swing. This makes a flexible structure also desirable. The workpackage suggests that the emphasis needs to be on organisational development by means of process and people development. Once again, these points are highlighted for further discussion in workpackage 7.

The development of ship management over the past three decades into a business sector in its own right has, in different periods, been driven by various factors. Such factors as world economic crises, transferring ship registration to open registries, unfavourable market conditions, awareness of safety and quality requirements and changes in legal environment were studied in this section. These factors have been quite different in nature it concludes, but each one has turned out to be potent growth drivers for the ship management business. It suggests that although the growth in the ship management industry may slow down in the future, there is no basis for assuming that the trend will be reversed. The consolidation of the shipping industry, specialisation, increasing complexity of legal requirements and rapid development of information technology have been identified as areas of opportunity

for further development of ship management. Finally, there are still areas of the shipping industry – namely container shipping and cruising – which have not yet become major clients of ship management companies. These sectors must be seen as areas where the potential for substantial growth still exists.

In examining co-operation throughout the industry, it is concluded that a pre-requisite for co-operation is that the persons involved have the required knowledge in their fields of operations to fully appreciate the procedures and the point of view of the other involved parties. It is suggested that it is necessary that the persons are systematically trained in the relevant aspects of company's own policies and procedures; shipboard organisation and operations; financial, commercial and technical aspects of shipping management; insurance; information technology adopted by the company; customer relationship and dealing with other organisations. As the size of shipping company grows, as envisaged through the survey, the co-ordination with personnel department and the individuals, identification of training needs and arranging the appropriate training at various levels in the organisation the management structure will need a training department or a cell in the personnel department.

The role of the peripheral companies involved in the shipping industry was described. Such companies are:

Company's Representatives and Agents,
Company's Clients,
Suppliers of Provisions, Stores and Spares,
Classification Societies,
Ship yards and repair yards,
H&M underwriters and P&I Clubs, and
Port Organisations.

Although the analysis reflects the involvement of these industries in shipping, the core of this analysis are the relations between the shipping companies and the shipping related ones, having under consideration the ISM Code. Also, the identification of any safety and quality measures applied in the shipping related companies, and the similarities between them and the ISM Code are important.

Our point of view is that the shipping industry is a most institutionally controlled industry, with serious economic impacts. We believe that the transportation cost always burdens the shipping companies more than any other shipping related company (such as charterers, cargo owners, States, etc). Some statistics in the above topics would be very useful also for the forecasting of future shipping trends (freights, values, management, etc).

Deliverable 3 of MASSOP links closely with deliverable 4. The impact of the ISM Code and the revised STCW convention will, of course, have a considerable effect upon forming the management structures of the future. The impact of the ISM Code on management structures as well as management responsibilities and authority under the ISM Code, which are analysed in workpackage 4, are particularly related. Deliverable 7 specifically builds upon these ideas and evolves arguments for the future management structures of shipowners and operators.

5.4 Workpackage 4

Workpackage 4 specifically looks at the ISM Code in general and quality in shipping. In a European context, intermodal transport is becoming increasingly important. Organisational and management concepts in shipping are compared with other transport industries.

Workpackage 4 particularly looks at the impact of the ISM Code on management structures. It put forward several "points for consideration" which were later discussed at seminars and in the MASSOP newsletter. These points were then reconsidered in workpackage 7.

It looked specifically at management structures particularly in the light of the size of typical organisations and the following quotes part of this analysis:

The management structure within a shipping company evolves and the structure shapes the company. The people in the company then respond to that shape and interact and evolve a pattern of behaviour that is really a part of the culture of the organisation.

Structures vary, of course, depending upon evolution but also upon the type of company, the location of the head office and the type of ships operated. The following analysis shows average values that have emerged from the MASSOP questionnaire however, and which are important as a basis for further consideration of the industry in general and organisational development in particular.

In the tables below, the figures are analysed for small (5 or less ships), medium (6 to 20 ships) and large (21+ ships) companies.

Note	Company Size	Small <5 ships	Medium 6-20	Large 21+	Average company
1	**No. of companies**	**72**	**114**	**51**	**237**
	Percentage	**30%**	**48%**	**22%**	**100%**
	% in terms of no of ships	**6%**	**33%**	**62%**	**100%**
2	**Av. no. of ships**	**3.04**	**11.25**	**47.08**	**16.47**

1. 237 companies have been analysed for the purposes of this report. 30% of the companies were "small", i.e. operated 5 or less ships.

2. By the standards of most industries the average BIMCO shipping company member is a small organisation. Whilst the average number of ships operated is around 16.5, the very large number of small shipping companies is highlighted by the fact that the median is only 9. Even large companies, however, are relatively small as shown by the following:-

Note	Company Size	Small <5 ships	Medium 6-20	Large 21+	Average company
	Office staff				
	Ops/com	**3.76**	**7.46**	**26.39**	**10.41**
	Technical	**2.09**	**6.33**	**22.65**	**8.55**
3	**Services**	**4.22**	**10.71**	**41.29**	**15.32**
	Total	**10.07**	**24.50**	**90.33**	**34.28**
4	**Office staff/ship**	**3.31**	**2.18**	**1.92**	**2.47**
	Ops/com	**37%**	**30%**	**29%**	**32%**
	Technical	**21%**	**26%**	**25%**	**24%**
	Services	**42%**	**44%**	**46%**	**44%**

3. The average company employs around just 34 people in its head office with even the larger companies employing, on average, just 90 people. This situation, particularly in the "small" companies puts severe limitations on the possibilities for flexibility within the management structures compared to other industries. It is interesting that in terms of percentages, the breakdown between operations/commercial staff, technical staff and services staff is very similar in medium and large companies. Technical staff head office numbers can be seen as very low in the average "small" company both in terms of actual numbers and as a percentage of staff. With only around 2 head office technical staff there is a possible problem with regards to coverage: If, for example, that we assume a shipping company's head office should have a technical staff member in presence at all times and that ships need visits from technical shore staff, it should not be practicable to operate a company with only 2 or less technical head office staff. (It is fully appreciated that there is no specific legal requirement for this and that by definition from the above, many companies operate in this manner.)

4. The benefits of scale are clearly seen: "small" companies need, on average, around 3.3 shore staff for each ship, whereas "large" companies need only 1.9. This affects not only costs but, once again, flexibility within the shore organisation.

Note	Company Size	Small <5 ships	Medium 6-20	Large 21+	Average company
5	**IT ship-shore**	**25%**	**53%**	**70%**	**48%**
6	**IT significant**	**44%**	**48%**	**71%**	**52%**
	To a certain extent	**46%**	**45%**	**27%**	**41%**
	Not much effect	**10%**	**7%**	**2%**	**7%**

5. This question was intended to look at how developed the companies were in terms of information technology. The survey asked if the companies ships had computers and how these were used. It then asked if the computers on board were linked to those ashore. Whereas only 25% of the smaller companies had linked the IT systems between ship and shore, 70% of the larger companies had progressed to this.

6. This question asked whether the company believed information technology development would influence ship management "significantly" over the next 5

years, would it only affect it "to a certain extent" or would it have "not much effect". The larger companies clearly see IT as having a more significant impact. (The impact of IT will be extensively discussed later in MASSOP.)

Note	Company Size	Small <5 ships	Medium 6-20	Large 21+	Average company
7	Less small cos.	78%	70%	84%	75%
8	Subcontract	66%	67%	72%	68%

7. This question asked: "Do you believe that the costs of compliance with the ISM Code will reduce the number of single ship owners or small size shipping companies?
   Overall, 75% replied "yes" to this question. It is interesting to note that the percentage of small shipowners who believed this was higher than the overall average (78 versus 75 per cent).

8. The question asked: "Do you believe small 'self managed' ship-owning companies will be forced to subcontract their technical safety management operations to the larger international ship management companies?" Overall, 68% replied "yes" to this question.

Note	Company Size	Small <5 ships	Medium 6-20	Large 21+	Average company
9	HO Seastaff	28%	31%	28%	29%
	Increase	69%	49%	54%	56%
	Decrease	12%	33%	35%	27%
	Same	18%	18%	11%	16%

9. The question asked how many of the company's shore staff had formerly been seastaff - 29% on average. The question further asked if the company believed this number would increase in the future - 56% on average believed it would. This point has of course significant impact upon the development of future management structures and is considered in depth later.

Significantly then, the industry believes that there will be less small sized shipping companies in the future and that the large ship management companies will play an increasing role. Whilst there is every reason to believe that there will always be a place for the entrepreneur to enter and succeed within the industry, there is other evidence to suggest that shipping companies will evolve to be of a larger average size than at present.

In the liner trades for example, in 1981 the top 20 container shipping companies carried 32% of the total traffic, in 1997 this had increased to 62%! Certainly in the container trades the big companies are getting bigger. Will this extend to other trades - specifically the tramp bulk trades?

The effect of economies of scale (for considerations other than the office manning quantified above) is one aspect; financing aspects are another. Financing changes were specifically looked at in workpackage 3.

The objectives of the ISM Code are considered in workpackage 4 and the following makes what is perhaps an important point regarding this aspect:

The definition of lines of authority and communication should also perhaps be considered by the industry as a major step forward. An original concept of quality systems in other industries was that management should be able to delegate more because people know what is expected of them, and they subsequently expect to be allowed to do it. They then should determine better ways of carrying out these processes and procedures.

The system therefore, should be dynamic. The possibility that it is merely a process to be complied with is a major problem at present. There is a danger that the auditing function may assume an over-importance that may be detrimental to the system. This example, from another industry, has been given by Bob Beadell, Manager ISM Certification, British Columbia Ferry Corporation:-

> "On 9th May 1992 a spark form a mining machine underground at the Westray coalmine in Sellarton, Novia Scotia, ignited a mixture of methane gas and coal dust. The resulting explosion tore apart the mine and killed 26 miners. A recently released report focuses on the failure of the safety system. It highlights a difference between the system on paper and the system in reality. The system on paper won an award as Canada's safest mine just one month before the accident. The system in reality failed from top to bottom. The report describes the system as 'irrelevant and unresponsive'."

A lesson from the mining industry example that we in the shipping industry can use is that the system *needs* to be dynamic. The possibility that ISM is merely a process to be complied with, however, is a common perception in the maritime industry at present. There is a danger that the auditing function assumes the most important aspect within an organisation and the thing of which everyone is frightened. The objective becomes to pass the audit; not necessarily to improve the system or even be realistic about the systems problems.

But improving systems and processes is particularly useful for management; it creates a proactive safety culture. As previously commented, the shipping industry has always been considered a reactive industry - quality brings a real opportunity to overcome this

On the other hand, the shipping industry does need auditing to ensure compliance. The following is quoted from PJ Williams Principal Marine Surveyor and Quality Manager of the UK Marine Safety Agency:-

> "It is our view that responsibility for compliance with the requirements of international conventions and rules lies, in the first instance, with

> the owner. This includes decisions on the vessel's design, construction, maintenance, manning and operation. It is also clear that shipowners can, and do, obtain competitive trading advantage by ignoring regulations - endangering lives and the marine environment in the process. Figures from the Organisation for Economic Cooperation and Development suggest that owners may cut 15% from costs by operating at the minimum level of safety needed to keep the vessel operational, rather than at the minimum legal level. The saving rises to 25% when compared with the average expenditure of conscientious shipowners.
>
> One of the more obvious means of cutting costs is by neglect or postponement of necessary maintenance, often until enforced by the port state. It is a matter of common observation among port state inspectors that poor maintenance by owners accounts for the majority of deficiencies found in the course of inspection. In other cases the shipowner believes that he has complied with the rules simply by providing the ship with the specified equipment, but as a result of ignoring the 'human element' - the need for training and the ability of personnel to communicate - the crew is unable to operate the equipment correctly. This lack of management support for the master and the crew, combined with lack of resources for repairs, can lead to low morale. This in turn can lead to a culture of neglect of the ship. Regrettably, the acceptance of poor standard by owners and crew may be further encouraged by inadequate control by the flag state and less than thorough surveys by classification societies acting on their behalf."

Much of the problem now lies with the belief that it is conformance that matters most. There is every reason to expect however that, as in other industries, a process improvement culture will develop.

Risk management is also dealt with in depth. The following highlights part of the discussion:

Risk is perceived by most people in shipping as something to be eliminated. Risk management within the context of a shipping company structure is perceived as the insurance and claims department. But risk management perhaps needs to be seen as something more than this by the whole organisation - ashore and at sea. The concept of risk and how it fits into organisational policy, how it affects the company, the ships and the individuals needs to be better understood at all levels.

A starting point may be to comment that there are two kinds of risks usually defined that particularly apply to shipping: dynamic and static. Both of these are relevant to the need for risk assessment and management techniques to be used as part of an organisation's safety management system. The concepts involved not only affect the safety management system; they may equally affect the company's approach to its entire organisational structure.

The first of these two kinds of risks, dynamic risks, are those which relate to profit and loss. They are those which arise from speculation, or from the effects of the business cycle. It is necessary for commercial organisations to find investors who will assume a dynamic risk and provide capital for the organisation. In order to attract investors it may be necessary to demonstrate that the risks, both those of this dynamic kind and those of the second kind, i.e. static risks, are being adequately identified and economically controlled. It should be noted - particularly in the light of the current reaction to the ISM Code where the emphasis could be construed to be one of safety at any price - that a key word here is that the risks need to be *economically* controlled.

There is a need for a management - and indeed the whole organisational structure - to appreciate that risk is necessary. Education may be necessary throughout the structure to ensure all staff understand the nature of risk. All concerned need to realise that if a business were to try to adopt a policy of eliminating risk altogether, it would be not only be unacceptably expensive but would also stifle innovation. Lack of innovation in an organisation reduces competitiveness. This in turn leads to decline, reduced staff morale, reduced incentive for innovation, and so on. This in turn leads to sloppiness, increased human error and increased static risk. To put it another way: too much risk control would in itself cause risk.

Static risks are those which lead to not profit or loss, but losses only, and relate more to loss of, or damage to, physical assets. They can of course, as we have all been made increasingly aware in shipping in recent years, also be incurred due to mismanagement in general and human error in particular.

The industry is currently deliberating extensively the "human error" factor. Lord Donaldson's "Safer Ships, Cleaner Seas" report of his inquiry into the prevention of pollution from merchant shipping has acted as an excellent additional stimulus to these discussions. The report included as part of it's conclusions (23.29):-

> "Most maritime casualties are caused, or aggravated, by human error. Human error can never be eliminated, but reducing it must be a major priority. The position has been made worse by changes in relationships between owners, managers and Masters over the last few decades: we believe that bad owners and managers are behind most substandard ships. Encouraging a safety culture is vital, but this is virtually impossible for regulators.....The responsibility of the Master and the competence of the crew are particularly important."

These conclusions astutely summarise many of the industry's management problems. As an observation however, the industry has now gone one stage further than the Lord Donaldson scenario. The industry has assumed that as human error is responsible for 80% of all casualties, this is the nature of the risk and the reason for the casualties. Despite the Lord Donaldson comment above that it is "virtually impossible for legislators", the industry has decided (probably rightly, but for a different reason: all industries need quality assurance) that we need to control this human element with legislation, manuals and detailed procedures.

But is the human element the bottom line? It is always useful to draw parallels with other industries. In the aviation world for example, human error in

general and pilot error in particular, was long ago concluded as being the major cause of accidents. The United States Air Force Strategic Air Command however, dictated many years ago that this was too easy and that this could not be used as an acceptable end of story. It suggested that in every case the human element factor might well be self-evident and that a more fundamental reason needed to be given. Of course the human element played a part somewhere but this is not necessarily constructive. For example, was the human error due to technical constraints or poor design, or was it due to for example poor staff selection or training. This shift in paradigm is particularly needed in the maritime industry and may well lead on to a better appreciation of the nature of risk itself and a more constructive search for solutions. A starting point for most shipping organisations may be to consider risk in it's wider sense and to look at the options.

The shipping industry is becoming used to dealing with change; the 1980s and 90s have been about searching for least cost locations and reducing costs. The ISM Code focuses the industry, for the first time perhaps, on the management of people and processes rather than just things. The future needs to be more about dealing with surprise, being better able to deal with any situation that may arise, and proactively reducing the risks involved. Risk assessment is a part of this; equally so there is a need to analyse and adapt the management structures of the industry to the changing regulatory, economic, social and technical environments.

In the Preamble to the ISM Code, it comments that the purpose of the code recognises "the need for appropriate organization of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection".

Ship management should be perhaps primarily seen as risk management. Ship managers add value not only by operating ships profitably but also by reducing the frequency and severity, as well as the costs, of accidents of whatever form – i.e. by managing the risks effectively. Risk is inherent in any occupation of course; the ship manager's business is to manage risk not to eliminate it. This point is implicit in the ISM Code throughout. Explicitly the Code calls for the ship manager to "establish safeguards against all identified risks".

Workpackage 4 then specifically considers procedural, active and inherent risk control and makes recommendations:

The ISM Code is of course calling for PROCEDURAL risk control, i.e. where the staff involved are required to control the risks according to the procedures set up. Implicitly the Code is looking to create an atmosphere of safety awareness and proactive participation by the staff, i.e. ACTIVE risk control in habitually looking for hazards and ways of improving the risk management procedures.

There is another implicit requirement within the constant review philosophy: the design process needs to be changed within the industry. INHERENT risk control needs to be more and more addressed, i.e. the design of ships needs to be continuously improved to reduce potential risks.

The workpackage then gives specific examples of shipping companies and their risk management developments. It goes on to make recommendations for developing a proactive safety culture and the following quotes part of this:

Perhaps the three main requirements for all shipping companies to improve organisational culture in general and safety culture in particular are staff loyalty, continuity and training. This was highlighted in the Mobil example above where the emphasis was on "long-term employment policies".

Loyalty is a quality that everyone instantly recognises and the idea of entrusting major assets into the hands of people who have no loyalty to the organisation, or even to each other, would seem strange in most industries. This is what has happened in many companies over the last decade or so in shipping; seastaff of long standing have been made redundant and cheaper foreign agency crews brought in. Another problem now perhaps, is that the better staff are looking for higher pay and that loyalty is a quality that many companies are finding hard to create.

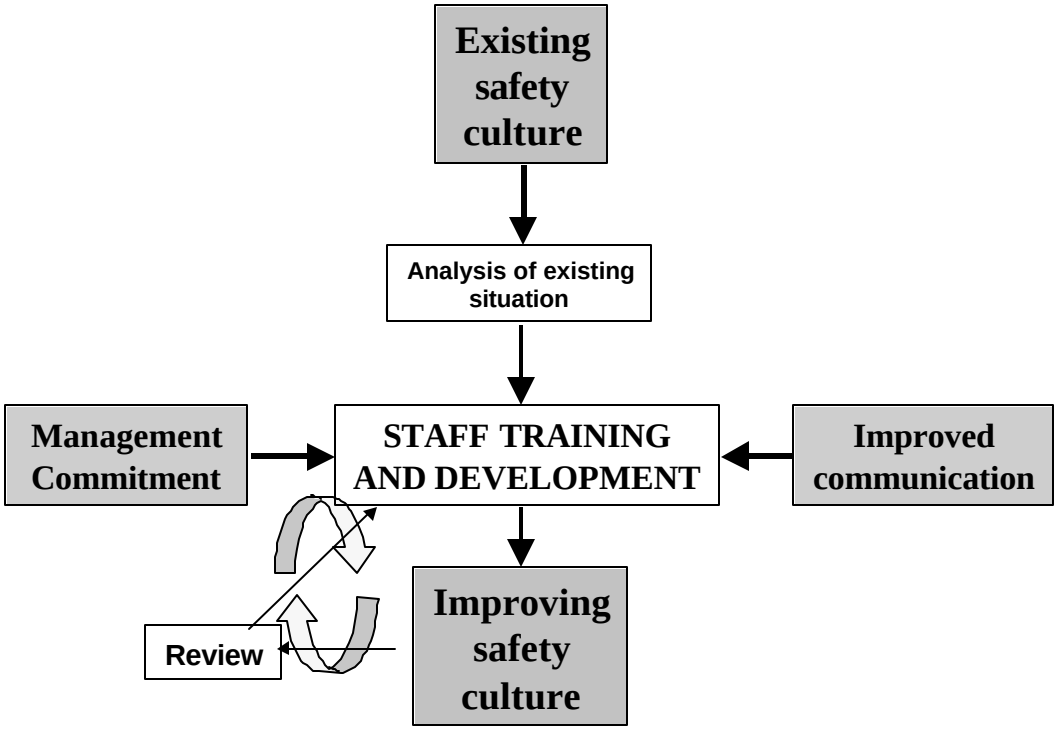
The risks involved need to be fully appreciated by the industry. Increased maintenance requirements with older ships, combined with a significant reduction in on-board staff and, commonly, a reduction in crew loyalty and continuity, have on many ships led to a reduction in standards and decreased reliability. Whilst most ships are no doubt managed and operated properly and well, there is undoubtedly, a large number of ships where the minimum amount of maintenance, by the minimum number of crew, who have been trained to the minimum standards, is seen as the policy to follow, despite the risks involved.

Operating a ship has a learning curve. Mistakes are made and people learn from these. Continuity is necessary to ensure resources are not wasted overcoming the same problems repeatedly. This seems obvious, but many sectors of the industry have chosen to forget this basic.

For companies with seafarers hired through manning agencies, the benefits of quality assurance may not be easily achieved. Without company loyalty, and the continuity of staff on board the ships, consistently following set quality procedures, may present difficulties.

Improving the safety culture requires perhaps a new management commitment. In this sense these 3 items - loyalty, continuity and training - should be seen as fundamental to any shipping organisation's strategy.

Training should really be looked at as an integral part of improving the safety culture, as suggested in the following system (Mottram, MASSOP paper given in London, 6.98):-



The workpackage then suggests that without doubt, the training budget in most maritime organisations in general and shipping companies in particular, needs to be increased if the risks involved in the industry are to be reduced.

In most industries training at all levels has become a basic fact of organisational life. It is considered a strategic item and the reasons for investing in training no longer need to be made explicit. Generally speaking this is not the case to the same extent with the shipping industry. It is becoming increasingly necessary for shipping companies to consider the question of the career structure of the sea staff if they are to gain the loyalty and continuity that they need.

For the organisation, training helps people do their job better. Training itself should also be designed to be an enjoyable experience and this helps improve morale and builds on the loyalty and continuity requirements.

The system suggested above requires an analysis of the existing system. This can perhaps be best done in conjunction with the ISM Code requirement for "*safeguards to be established against all identified risks*" (para 1.2.2.2) and that the company can "*respond at any time to hazards, accidents and emergency situations involving ships*" (para 1.4.5). This then should lead to a staff training and development programme that has full management commitment. Ideally as wide an involvement as possible with all staff should be developed and communication significantly increased. A common complaint often reported in organisations is that people feel that they "don't know what is going on".

The MASSOP project survey sent out to BIMCO members requested suggestions for training and educational processes. These are just a few of the ideas received:-

- ?? More training, more investment in training
- ?? Office staff to spend time on ships
- ?? Joint seminars - office/seastaff - examining problems
- ?? More interaction between office and seastaff
- ?? Focus on specific problems involved in running ships
- ?? Enhanced in-house training
- ?? Identify specific weaknesses and target accordingly
- ?? An emphasis on permanent training

The workpackage then considers the manning scale typically used for different types of ships. It considers different approaches and gives examples of companies that have chosen to have significantly higher or lower manpower numbers onboard and considers their reasoning.

It considers the need for shorestaff and quotes a MASSOP survey:

The MASSOP survey included the following questions:

?? What proportion of your office staff were former seagoing staff

The average answer to this was 29%

?? Over the next 5 years do you expect the proportion of former seagoing staff to:

Increase	56% expected this
Decrease	27% expected this
	16% indicated they expect to stay the same.

There is obviously a requirement for a large, and increasing, number of former seastaff to fill shore positions.

Centralisation/decentralisation trends and their implications are then considered:

In many other industries significant benefits have been obtained from decentralisation. Is this possible in the maritime industry? The MASSOP questionnaire asked whether the ISM Code would lead to increased centralisation or decentralisation. The majority of companies - small, medium and large - believed increased centralisation would result.

Certainly it is not feasible to imagine that increased decentralisation is possible unless crew standards of education, training and motivation are high. It will

also be necessary to put in place a system for improving the safety culture of the organisation similar to the one suggested above.

Increasing decentralisation is no doubt a system worth working toward as many other industries have found. And for shipping companies with high levels of loyalty, continuity and training there are considerable benefits to be obtained. One such company - Stena Line - has commented "Decentralisation and safety go hand-in-hand".

The main point is to decentralise authority. This can only be possible if inherent, active and procedural risk control is adequate as discussed above.

Once authority has been delegated - and this needs to be based upon high levels of training and support - motivation increases as has been shown in numerous surveys in other industries and staff take additional responsibility.

Many organisations in many industries have developed a team approach to organisation and management. There are areas within every organisation where the traditional centralised management structure will still be necessary but in many areas the reasoning behind the structure no longer applies to the same extent. The teams are organised more on a basis of process requirements rather than on departmental lines.

The following are some of the differences between these two approaches with comments about how these differences may well apply to the maritime industry:

Hierarchical management is vertically structured of course, whereas the team system tends to be flat and more participative. Reporting systems in a traditional system, as per the maritime industry, tend to be detailed, as mentioned above; flatter structures tend to report more by exception. This is a situation that many shipping companies need to be careful with just now as the introduction of the ISM Code is being seen (wrongly probably) by many organisations as providing a significant need for more paperwork.

When problems arise, hierarchical management traditionally puts emphasis on assigning blame; team managed organisations tend to emphasise fixing the problem and learning from it. We are finding this lesson difficult to learn in the shipping industry. As an industry, we realise that we learn from mistakes and suggest that we should have procedures for reporting and investigating near-miss accidents, but these procedures are often seen by seastaff as less than constructive, and very often they are not given the confidence necessary to open these situations to judgement.

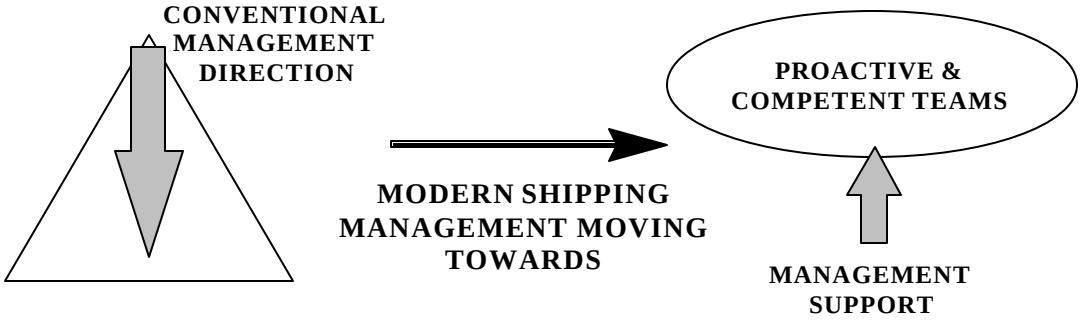
Employee turnover in traditionally managed organisations and industries tends to be high and with a high level of employee dissatisfaction; this is very much the case in the maritime industry, although there are other reasons for this of course. Flatter structures tend to have less employee turnover and a higher employee satisfaction level. A great deal of this depends upon trust of course; the top management must have confidence in the employees and this confidence must come from the adequate training and experience of the staff. This is perhaps a problem in much of the maritime industry to be realistic.

Information availability in vertical systems is invariably on a need-to-know basis and perhaps only to selected staff. Team systems emphasise transparency of information. Decision-making is of course accelerated in flat systems and employee input is continuously sought whereas the hierarchical organisation this area is very often widely neglected. This very aspect, i.e. lack of involvement in decision making often has a strong de-motivating effect upon staff in a traditional structure. This is the case in much of the ship management sector of the industry now as ISM Code manuals, developed by shore staff, with little or no seastaff input, are dumped onto ships with management instructions for compliance. There is a strong insistence in current conventional wisdom for commitment from the top; there is an even stronger need for common-sense induced commitment from the bottom in my opinion. I do know from discussions with many companies however that this point is being appreciated by many quality system managers who are wisely putting the concerns of the seastaff as a high priority item. This is not always, or indeed generally the case however and therein lies another difference: traditional management systems focus upon authority, modern flatter systems focus the requirements for senior people more on their responsibility than their authority.

Many industries have already gone through similar developments to the changes that are occurring in shipping. In general, an objective of management over the last hundred years or so in all industries has been to control the behaviour of its employees. In many industries however, this requirement has changed significantly in recent years. In general, the skills of the head are becoming more important than those of the hands; brain is replacing brawn. The term "knowledge workers" is used to describe this. Many books have been written on this subject – the general consensus of opinion seems to be that knowledge workers are different, and the books seek to explain the different management approach that is necessary. There is of course a science – human performance technology – which is being widely studied which particularly addresses this area.

There is an important difference between the knowledge worker and the manual worker: the knowledge worker is usually considered to be able to decide how he or she will respond to a situation. In this sense therefore, the knowledge worker can not, and -perhaps by definition – should not, be controlled in the traditional management sense. It follows from this, that it is not compliance that is required of the knowledge worker but a contribution in many senses.

In the shipping industry, we are expecting the ship's staff to make an increasing contribution in many areas, but are now increasing the compliance requirements also with the new procedural requirements. In other words, the emphasis is still, or even increasingly, very much on compliance with the incentives for contribution very underdeveloped in most cases. Will seastaff become knowledge workers? How far can empowerment be given to the ship's staff? Can the management structures ever change - as has happened in many other industries - to permit this? As sure as ships went from sail to steam, inevitably and eventually, the maritime industry must change its management style; perhaps it is not a question of if, more a question of when. The illustration below shows how the industry will and must change if the lessons of other industries are to be learned:



The economic impacts were studied and the following conclusions were reached:

For the present, the implementation of QA systems and procedures has shown that it is not only essential (in terms of human life and the environment) but can make a positive difference to the bottom line as well as in terms of:

?? Saving lives;

?? Reducing injuries;

?? Increase in safety awareness;

?? Increase of staff motivation;

?? Reduction of insurance premiums;

?? Reduction in operating losses.

A professional QA system does not increase the newbuilding or operating expenses of a ship significantly. There were and are significant overheads, but the end result has been more than worthwhile as it has allowed us to grow, because the senior management has had more time to focus on policies and planning, as opposed to continuous 'fire-fighting'.

Quality is not only free but has significant tangible (financial) and non-tangible benefits that can only improve the efficiency and perception of the shipping industry to the public at large, ultimately benefiting everyone involved in making a living out of shipping.

Experience has shown that safety is improved when personnel are given adequate training, prompt information, and the right degree of management responsibility. This plays a big part in improving and sustaining morale and motivation. On a ship the most important positions are those of Master and Chief Engineer. It is therefore essential that they have a large measure of responsibility for implementing their company's safety management policy.

In order to carry out these responsibilities they must have appropriate qualifications and the right type of experience; and they must be guided by company superintendents who have similar backgrounds. The interface of these management responsibilities with those of others connected with the operation should be made

clear. The benefits of this clarity hardly need stating and the cost of ensuring it is really quite minimal.

All companies want to be sure that costs are justified by the benefits which they bring. In the context of ISM Code the benefits are clear although some of them may have to be expressed in a negative fashion. In positive terms the Code must bring improved safety, less pollution, more effective organisation and a resulting better public perception of the industry. In a negative sense, if companies do not follow the Code, they may eventually find themselves out of the shipping business.

We are quite sure that the benefits derived from Quality Management will outweigh the implementation and running costs of the ISM in the longer term.[i]

The shipping industry was compared with other transport industries. The conclusion pointed out concepts, strategies and ideas, which could be adapted to future management structures in the shipping industry.

Road traffic companies are mainly forwarders and hauliers which offer more and more logistic services which could be within a complete or partial logistic chain and/or logistic treatments of goods were provided. In co-operations they try to offer other services to cover additional market areas. The organisational structure of forwarding enterprises refer to functions (i.e. disposition, storage, fleet management), products (dangerous cargo, furniture) or areas (Northern Germany, international).

The assessment of the railway companies shows that in Europe and world-wide the privatisation of the state-owned railways are in progress. However, up to now there is - with exception of the privatised United States Railways - no successful organisational concept that could be used for our objectives in the project. Interesting in this respect is very common establishment of staff-units (directly subordinated to the management) which are responsible for quality and business development.

Very common for liner shipping activities is the inter- and multimodal management concept. A multimodal transport operator (MTO) can be a vessel-operating multimodal transport operator (VO-MTO) or a non-vessel operating multimodal transport operator (NVO-MTO). The MTO acts as a principal, may or may not provide cargo consolidation services, issues a transport document which evidences a door-to-door transport contract and makes its own contraction arrangements with the sub-contractors of individual modal services.

An MTO needs a specific organisational structure. Instead of several departments a customer service team must be achieved. This team is able to react very quickly if an order comes from a client. A close co-operation within the team is necessary and a more sophisticated EDP support must be available.

Shipping companies' options in intermodal and multimodal transport lie between being full service door-to-door operators or being providers of the seaborne part of the transport chain in domestic or international traffic. A mixture of these strategies could be a reasonable way. The reasons for companies to re-organise their structures are to pay more attention to customer services, maintain constant and control service quality within a realistic price range, a shift in spatial production

patterns by networking and alliances and the increase in competition in the whole traffic market. The organisational structure of a transport enterprise must carefully consider the process that should be offered to shippers/clients.

New management and organisational concepts for the whole industry including production and services can be divided into Lean Production Concepts and Customer Value Concepts. Lean production management contains the Just-in-time concept, Kaizen, Lean Engineering and the Continuous Improvement Process. These concepts were used mainly in the production industry. However, a few points can also be used for organisations of shipping companies. Lean production means that all costs associated with non-value added functions should be eliminated. The technique is, e.g. the use of multi-functional workers, general purpose machines, group-based problem solving and the design of production (using fewer parts, less complicated design and standardisation). Continuous improvement process will lead to an improvement of the quality and productivity of the work and the production. Continuous establishment of teams and a continuous teamwork will motivate the personnel, and with this motivation a better and more efficient work in the process can be obtained.

The Customer Value Concepts are more useful for service companies than lean production concepts. The Total Quality Management Concept, the Value Chain Concept, the Business Process Re-engineering Concept and the Virtual Company Concept could be completely or partly adapted to service companies. Total quality management has the objective to meet the needs and expectations of customers. Quality becomes the responsibility of all parts, departments and sections in the organisation. The customer's experience of a delivered product is totally vital for the companies' success. The close co-operation between different departments and other companies/organisations involved in the process are necessary to avoid sub-optimisation.

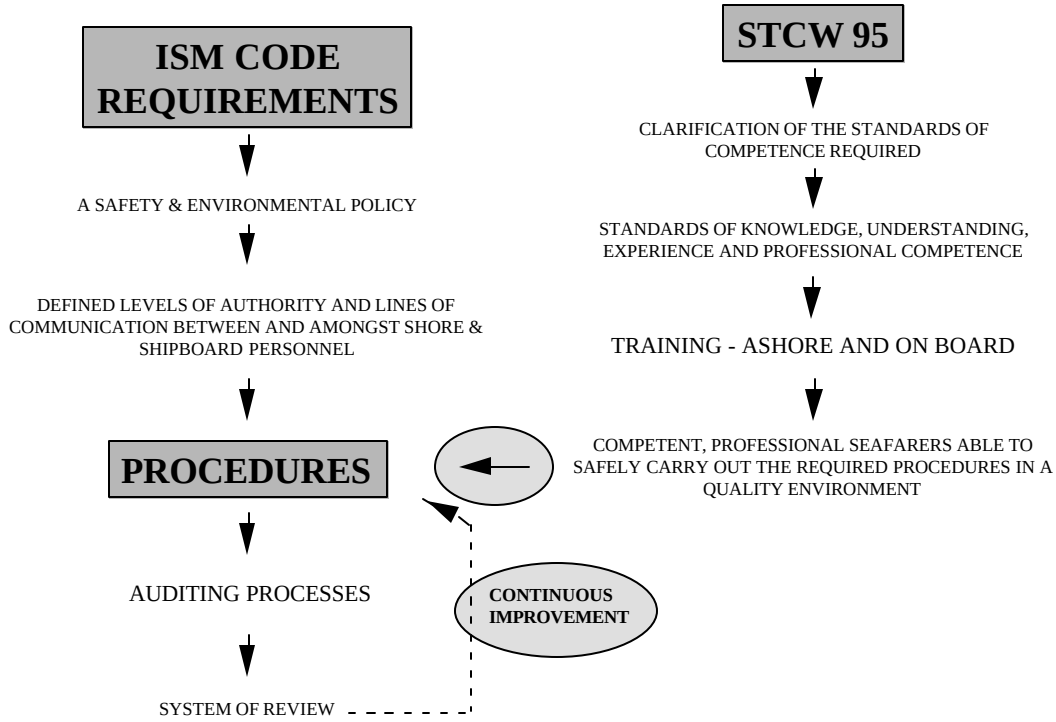
The value chain concept is an instrument to analyse business activities from the customer's point of view. The documentation of the chain of value adding and non-value adding activities will be the foundation for decisions to assist the consequences caused by changes within the business. Most important are the activities, which are directly contributed in creating customer value.

Business Process Re-engineering is the fundamental re-thinking and radical re-design of business processes to achieve dramatic improvements and critical, contemporary measures of performance such as costs, quality, service and speed. The goal of the re-engineering process is to replace the existing process with a totally new one.

A Virtual Company consists of a network of independent organisations that co-operate to achieve what none of them could possibly achieve alone. These companies will concentrate around core competencies. The virtual company needs an information system that has to operate with an integrated network. Most important in this system is the efficient access to information and good relationships.

Workpackage 4 also looked at consistencies between the ISM Code and the STCW Convention. It gave the following analysis:

The following puts the two together and adds one further ingredient - the need to constantly improve the system:-



It went on to discuss on-board training requirements and suggested that the re was a need for the industry to realise that individual jobs should provide:

- ?? Variety
- ?? A meaningful task
- ?? Optimum work cycle
- ?? Control over work standards and feedback of results
- ?? Preparation and auxiliary tasks
- ?? Use of valued skill and knowledge
- ?? Contribution to end product

It concluded that some of these points are clearly missing from jobs on board ship. Variety is often difficult to introduce and the seafarer does not see his contribution as meaningful in many organisations. The work cycle is often not optimal either for the individual or the task. Watchkeeping routines seven days a week can be difficult and long sea service periods do not fit in with modern lifestyles for most people.

The workpackage then suggested that it is perhaps in the last 4 of the above points that the ISM Code perhaps worsens the situation in many or most companies.

Seafarers in general no longer can believe they have control over work standards and there was no involvement in the preparation of the procedures - the ISM Code manuals and documentation have been "dumped" on most ships with no consultation. There is usually no feedback except in the negative sense – i.e. when non-conformities occur.

Taking the second point: how do we use ISM/STCW to improve standards. Quality assurance in any form - ISM and STCW included - should really have as an objective quality improvement, i.e. it must be a dynamic process rather than a static process. The dynamic possibilities provide real benefits to a shipping company and can provide the means for the company "to raise the standards of competence and professionalism".

The static view of a quality system is that it is "conformance to the requirement", the dynamic view is that it is a process of continuous improvement. This process of improvement however must be aimed at not only the ship's staff – i.e. the team responsible for carrying out the shipboard procedures - but also at the organisation in general and all of the individuals - both ship and shore. As a starting point, however, the concept of the team needs to be expanded to include at least the shore staff involved in ship operation.

The workpackage then went on to consider motivation for staff, communication and management support. It also considered flexibility and quoted from the STCW foreword:

This line -"..to allow greater flexibility in the assignment of functions on board ship.." - in the STCW foreword is being taken to the very opposite in many peoples minds of what the procedures in ISM are all about. The belief is that there should be exact conformance to the procedure and that within that there is no flexibility whatsoever.

Taking this to the extreme, this industrial phenomena has been studied by many researchers. One researcher (Robert Young, American Society for Quality) commented that it can lead to a general lack of initiative by doing *exactly* what the procedure says:

> "In industry this is called 'working to rule' and is considered to border on industrial sabotage. Doing *exactly* what one is told is a characteristic of the roles of prisoners, people in the military and children under the yoke of particularly authoritarian parents. Of course, to follow orders to the letter, without using one's discretion and common sense, very frequently leads to disaster, which is why so much slapstick comedy illustrates this form of revenge against silly rules and rulers. The outstretched hands, accompanied with a shrug and a look of pseudo-innocence, completes the moment of Oedipal triumph, just before the chase by the would-be punisher begins. Having been addressed like an idiot and told to do 'exactly as I say', one then behaves like a fool, thereby protecting the vulnerable, sensible self from further humiliation."

Each shipping company then, needs to be aware of the dangers of "silly rules and rulers" and to ensure that flexibility is not taken away from seastaff.

Inherently there is greater flexibility in shipping than in many areas of the aviation industry, for example. The pilot operates the aircraft only. At the end of the flight the pilot hands over the plane to the ground maintenance team. In shipping at the end of the passage the ship's staff are usually involved in maintenance and cargo operations, among many other things.

Another difference is perhaps that while aviation staff are becoming more specialised, seafarers need more generalisation - a wider knowledge with less depth. This point is analysed in METHAR (Harmonisation of Maritime Education and Training in Europe). The Dutch MAROFF concept is an example of the flexibility and generalisation aspects. MAROFF is intended to create a multi-purpose officer, i.e. an officer capable of operating the ship from the bridge and also capable of managing the technical systems of the ship. Setting training arrangements in shipping is perhaps not as easy as in aviation bearing in mind the wide range of ships and possible work requirements. From the safety viewpoint there are also obvious differences. Once again the scope is wider in shipping. The safety culture in aviation however is more fundamental, established and accepted.

The specific problems with recruiting staff are being increasingly recognised in shipping. There is also a realisation that flexibility is necessary to make the life attractive to new recruits. This point is made by Hakan Gezelius of the Swedish Shipowners Association:

> "We now have a positive problem - a shortage of officers. This has been caused by many of the officers reaching retirement age and, as the fleet increases, there is a greater demand for them both onboard and later as a source of qualified personnel ashore. ... It is necessary to inform the young people of the opportunities available to them in the shipping industry. ...A new careers advisory board will be set up. This should provide potential recruits with a helicopter view of the industry. They may want to go to sea and then come ashore, which gives them job rotation. The should be informed that the industry is flexible."

Mr. Gezelius said he would like to see more integrated training developed, with such subjects as maritime law, shipbroking and marine insurance in the syllabus. "It should be possible to offer more flexible training where personnel could, for example, serve at sea for seven to nine years, and then work on shore after that," he said.

The costs involved in adopting ISM/STCW were also considered in this workpackage. But it was considered that investment in crew recruitment and training would perhaps be increasingly important in the near future. Shipowners and managers are well aware of this fact. Lloyds Ship Management carried out a survey on ship management costs in late 1997 and concluded that managers expect crew costs to rise sharply. They suggested a figure of "as much as 5% per annum, due to the inevitable demand on a more limited supply of officers".

The following key points concerning future management concepts were put forward:

First the attitude of IACS attitude to the new management concepts issued by the implementation of ISM Code was analysed.

Analytically, IACS' attitude towards the procedures of appliance of the Code, is focused on the following points:

During the time before the appliance of the Code, every shipping company – on voluntary basis – will be able to apply safety management system which will automatically lead to the acquisition of the original Certificate right after the date of appliance.

IACS and its members intend to be authorised by flag Administrations so as to act on their behalf after the appliance of the Code.

IACS encourages flag Administrations towards the appliance of IMO Resolution concerning both the appliance of the Code and the assumption of more general activities on the part of Classification Societies representing Flag State Authorities. We refer to decisions A739(18) "Guidelines for the Authorization of Recognized Organizations Acting on Behalf of the Administrations" and Resolution A788 (19) "Guidelines on Implementation of the ISM Code by Administrations".

IACS recommends the appliance of the Code to all the Organisations involved in the certification, since it is considered to be of great importance. The importance of this consistence lies in the fact that compliance should be more effective, especially in the case of companies which manage ships under different flags.

As it is well known, IACS' role regards the procedures of inspections and control. So, IACS' members are closer to the control and certification procedure according to ISM Code than any other Organisation. Nevertheless, there should be a clear distinction between these two functions of the Classifications Societies. That's why IACS considers that the traditional class or statutory surveys concentrate on the fitness for the purpose of the ship and its hardware (e.g. hull, machinery and equipment) and verify that compliance with specific requirements of safety and pollution prevention as specified in mandatory Rules, Regulations or other applicable Codes, Guidelines and Standards. On the other hand, a Safety Management System focuses on the safe and environmentally responsible operation and maintenance of the ship and its hardware by ship's crew to mandatory Rules and Regulations. So, the scope of ISM Code audits is therefore to verify that the company is operating under a system that effectively implements all measures to ensure compliance with mandatory Rules and Regulations.

In the preceding report there should be a clear distinction between the personnel which carries out the procedures of auditing and consultancy and the personnel, which carries out the final control and issue of relative certificates.

The question of certification and issue of certificates according to the ISM Code should be exclusively checked by a classification society – IACS' member or by

IACS Member Branch Company, in order to ensure the quality of control and certification.

IACS considers that although every shipowner is free to choose the approved Organisation for his certification according to the Code, that could produce additional administrative expenses given that two different Organisations will be involved in the procedures of control of the ship (in spite of the distinction by IACS)

Finally, IACS enters in the issue of the qualifications that an organisation should have so as to deal with the issue of the certification according to the ISM Code of a classification society and a ship. IACS believes that such an organisation should also have knowledge about statutory certification subjects in order to be able to offer apart from the auditing and consulting services, a continuously responsibility for all aspects of a particular ship.

It is therefore obvious that an important differentiation in the activities of the Classification Societies has befallen after the adoption of ISM Code. So, while the main duty of the Classification Societies was to take care of the ship from the technical point of view, the activities of IACS' members are extended to the subject of consulting of shipping companies, in matters of appliance of safety quality systems and certification according to the ISM Code.

The introduction of ISM Code in the Institutional framework that governs the shipping industry, issued considerable organisational and structural changes in the organisation and control procedures of merchant vessels. It is true, though that it is the every day practice that is expected to confirm or not the correctness of changes in the management of the merchant vessels.

These changes were accompanied by the modification of the traditional activities of Classification Societies. Therefore, IACS and its members consider that they have the first move in the development of safety management systems of shipping companies and of ships.

Their basic argument is that they have the right experience given that the Classification Societies have a direct bearing on the technical supervision of ships from the moment of their construction, till their demolition.

Still, it is commonly accepted that the question of safe marine transport, concerns mostly the human factor, that is why we are led to believe that every safety issue is complex and that is how we should cope with it. The issue of the stuff training of the ship (both officers and crew) as much as of the office (employees and especially the personnel of operations department) is now of the uppermost importance.

If we approach this topic from the economic point of view, we should define the cost to which the shipping company is subjected, in order to satisfy the legal requirements of the Code, and of course its direct relation to the usefulness of these measures. For that reason, we reach the suggestion of appliance of the cost-benefit analysis according to which any propositions concerning a financial framework should be suggested and finally adopted. Otherwise, problems in the efficiency and

liquidity – of small companies in particular – are created, having as a consequence the unexpected impact on commerce, on the competitiveness and the formation of prices of consumer goods.

The conclusion drawn from the research on this topic is that no Organisation or other individual sector is in a position, acting on its own, to succeed in improving the safety conditions during marine transportation. Combined action towards this course of action is needed, which is though, likely to lead to an increase of cost. This increase could refer to the running cost (marginal increase in the number of the crew members so as to deal with the bureaucracy load required by the Code).

It is known that we face nowadays a keen competition in the tramp shipping, which doesn't even allow thinking about an increase of the running cost.

We have to underline, though, that the number of the crew is in many cases inadequate, in situations of constant multiple loading and discharging operations. For that reason, safety issues onboard are dealt with mechanistic perception – due to lack of time or great exhaust – making every innovation or appliance of any safety management system, seem inoperative in practice.

To sum up the relation between IACS and its members and ISM Code, we could say that Classification Societies have definitely a raising role and responsibility towards the safe transportation of goods by sea but, under no circumstances could they succeed in their goal acting on their own.

It is essential to make a concerted effort on a technical, administrative and economic level, based on the human factor and having as a keystone of the project the cost – benefit relation by the appliance of any measure. Otherwise, the bureaucratic procedures will be increased, burdening even more the so far encumbered time schedule of the crew, as well as the encumbered financial situation of many (especially small companies) with uncertain results.

Finally, we should acknowledge that the general safety framework as it is expressed through the ISM Code, couldn't be judged at this early stage, only some months after its compulsory appliance.

Except the relations between the IACS members and ISM Code, we have analysed the impact of ISM Code in small size shipping companies.

According to a procedure of brief interviews with ship owning and management companies which operate 1-5 ships we found out that some of them tried in a very short period of time to apply and function the new quality system in order to catch up the deadline. From a first glance we observed the following: some of them do not fully understand what was really involved. Also, they underestimated the required work or they assumed that extensions would be granted by the flag states. We do think that a substantial number of smaller owners in the one to five vessel categories transferred (officially or unofficially) or will transfer their ships to third party managers.

On the contrary, some of them which have implemented the Code, obtained benefits such as:

- ?? improved control and planning,
- ?? improved efficiency and productivity,
- ?? improved customer service (e.g. satisfied charterers, insurers, passengers etc).

Also, they hope to earn direct and indirect profits, which will be derived from the main ideas supported by the ISM Code which are:

Quality - Safety - Transparency - Liability

Additionally, in economic terms, the companies which have already implemented the procedures of the code in the recent past, they managed world wide trading without detentions, better insurance policy premiums, reduction in P&I premiums and eliminating or improving awareness of problems.

Generally, the impact of ISM on small size companies is not so different if we compare it with the impact of ISM on every shipping company except from some essential points in the internal management and operating structure of the first ones. (For example, the limited financial assets and the economies of scale). But some of the small size companies all over the world don't believe in short term positive results.

For many "small" ship-owners (if we compare them with shore industries, they are not small at all), the real price of shipping is too cheap, the real rate of return is too low and too risky to encourage long term productive investment. Also today, some descent small shipping companies face the continual threat of being undercut by cheap and substandard operators and no one, not even from the poorest countries, can go to sea with the slightest confidence that they will be able to build a worthwhile career. But to tackle the cancer of substandard shipping requires attacking the cause not the symptoms. One way is the ISM Code.

The International Safety Management Code as everybody understood should not be another exercise in paper. The much-publicised ISM Code is a systematic and mandatory approach to managing the safe operation of ships, which contains both a threat and a promise. The promise is that it will deliver benefits to companies that take it seriously. They will have safer, more efficient management structures, which operate as a team and they will have take a small but significant step on the long road to "self-certification". The threat is to those companies, which do not take the code seriously. They will either be unable to comply and so unable to trade or they will spend a lot of money putting another burden on their unwilling staff. The shipping industry has to observe very closely not only the statistics, but also every small or huge marine case (the accidents in the shipping industry, the numbers of lost lives, the value of lost ships and cargoes), in order to improve, to update and to assure the quality procedures. Otherwise, there will still remain a negative image in the public opinion.

In view of the current implementation of these global industry standards, the future of maritime administrations will much depend on whether or not, they will be in position to meet the requirements of these new regulations. It is also not anymore a

question of the colour of the flag that the ship will fly, but whether a particular flag state administration can meet the needs of the shipping industry in a professional and cost effective way.

As we believe, the best way to cope with the ISM Code is to avoid accidents and in order to avoid accidents the finest way is to have highly qualified crews, which means experienced and satisfied crews.

It must be understood that shipping must not be pressed always by new regulations. If we suppose that the main three-axes idea is the avoidance of flagging out from the European traditional shipping countries, the avoidance of establishment of a small number of ship-management companies, which can control a big tonnage, and the avoidance of marine accidents, the implementation of a new management policy must be based in an economic and productive philosophy, which means fewer individual surveys, less unproductive expenses and delays, more high communication technology and finally, more human centralised management.

The implementation of the ISM Code is just one step that enables shipping industry to be controlled. This fundamental change must use the development of new and improved technology (communication systems, information systems, simulation and automation systems etc). These steps will lead to a new management philosophy taking seriously into account the cost reduction, the predictive maintenance, the enhancing of ship efficiency and safety levels and finally, the improving of environment protection

The future structure (supply and demand of the shipping services) either of tramp or liner shipping we suppose that will be the full direct co-operation of ship managers not only with port administrations and companies but also with all the other parts of the transportation chain.

The procedures of this co-operation should be supported by the development of an innovative and integrated common user friendly interface (open architecture) using for example: Electronic Data Interchange, Electronic Data Processing Systems, Electronic Chart Display, Vessel Traffic Systems, Shore Based Pilotage, Shore based Search and Rescue activities, Shore based Medical Care, Voyage data recording systems, Decision Support Systems on board and ashore, Safety Management data exchange.

These new quality and socio–technology services will compose the new management structure basis for safer and more efficient sea transport use : by avoiding delays and congestion, by reducing accidents and their effects, by increasing productivity, by providing additional capacity from existing infrastructures, by encouraging integrated transport, by reducing the use of energy recourses and finally, by reducing environmental pollution.

Further, workpackage 4 looks at the effects of the ISM Code (and to a certain extent the STCW convention) upon management responsibilities and authority.

It is first commented that this analysis is not written by a lawyer but by someone with considerable experience of shipmanagement. The intention is not to state legal facts but to formulate points for discussion that can be analysed and used later in the MASSOP development. It is considered a fundamentally important part in that it considers the obstacles to decentralisation and changing management structures as they may be seen by shipmanagers. This then is intended to link with the realities of personnel development, both at sea and ashore, in an attempt to consider how recruitment and training should be influenced within the industry to improve management and career structures.

In other workpackages the problems with recruitment are being addressed. An important point to bear in mind here is that the single most pressing question for many organisations may not be "How can we do it better?" or, worse perhaps, "How can we do it cheaper?" Remembering the pessimistic BIMCO/ISF manpower forecasts, for some companies the question may be "How can we do it at all?". The analysis is intended to be optimistic (indeed the writer - David Mottram - *IS* optimistic). It then comments that the solution perhaps lies in a more interesting career structure for young people and that management structures will be a key factor in this.

The MASSOP questionnaire circulated to BIMCO members asked the question "Do you believe the effects of the ISM Code will be increased or decreased centralisation as a result of the ISM Code". The overwhelming view in the return received was that it would lead to increased centralisation. This section of this workpackage argues that this need not be necessarily so and that it may be much to the advantage of the industry in general and the individual company in particular to try to gradually move in the direction of decentralisation.

The ship's staff needs to be seen as a team carrying out processes. In most industries the trend is to teams of people performing process-oriented work. These teams are invariably self-directing. Within the limitations set for them - productivity goals, quality standards, etc. - they make the decisions. It isn't necessary for them to constantly refer back to a supervisor. This situation should be possible equally in the maritime situation; there is no need to consider the ISM Code as a barrier in this direction and in fact, it helps in the sense that it sets a quality environment. Providing the shore managers have acted with due diligence in selecting the crew, ensuring they are properly trained and are working in a quality environment, this should enable shore managers to delegate responsibility and, more importantly perhaps, authority to the ships. There is no reason to believe that this in any way weakens the position of the company with regards to liability as discussed earlier in this workpackage.

Centralisation / decentralisation is a key consideration for organisational development. One large European company believes that this is the single most important item - they comment that "decentralisation and safety go together". MASSOP dissemination seminars have shown that there is general agreement that this can be a key point. There is general agreement that it does require staff continuity

however, and it should require a considerable investment in training. There is general agreement however that the benefits are potentially very real.

Decentralisation is possible however as the following case shows. This provides an example of the approach that one European shipowner took to formulating procedures and at the same time, taking the opportunity to decentralise operations. The following shows the procedure for drydocking a vessel prior to decentralisation:

DRYDOCKING ROUTINE BEFORE DECENTRALISATION	SHIP	SHORE	MD
Planning	C	R	
Drydock specification	I	R	
Tender		R	
Evaluation		R	I
Decision	I	R	I
Execution	C	R	
Follow-up		R	

R = Responsible **I = To be informed**
A = Approval from **C = Co-ordinate with**

The superintendents were clearly responsible for all aspects of the drydocking. The ship's staff were merely informed about the specification and the decision on which drydock the vessel would use. They were consulted about the planning and the execution of the work but generally all responsibility lay with the superintendents.

The ship's staff were consulted and informed that decentralisation was intended. They were asked their views as to which of the items they felt they could be responsible for. The results are somewhat surprising: -

DRYDOCKING ROUTINE AS PROPOSED BY SHIPS	SHIP	SHORE	MD
Planning	R	C	
Drydock specification	R	I	
Tender	R	C	
Evaluation	R	C	
Decision	R	C	A
Execution	R		
Follow-up	R	C	

R = Responsible **I = To be informed**
A = Approval from **C = Co-ordinate with**

The ship's staff felt confident that given the necessary support they could assume responsibility for all of the work segments within the procedure. The superintendents, in their view need only provide support. It must be said that the items earlier highlighted as fundamental – i.e. loyalty, continuity and training - were particularly well developed in this company.

The superintendents were then consulted and asked to consider how they believed decentralisation could best be effected and how they would propose responsibility could be assigned. This was their view: -

DRYDOCKING ROUTINE AS PROPOSED BY ONSHORE MANAGERS	SHIP	SHORE	MD
Planning	C	R	I
Drydock specification	R	A	
Tender	C	R	
Evaluation	C	R	
Decision	C	R	
Execution	R	C	
Follow-up		R	

R = Responsible **I = To be informed**
A = Approval from **C = Co-ordinate with**

This shows a marked difference from the ship's views. The superintendents believed that the ship could prepare the specification and carry out the drydocking but that they should retain responsibility for most areas.

Joint meetings were held and, with a determination to decentralise and good-will from all staff, the following agreement was reached: -

DRYDOCKING ROUTINE ECONOMY OF SCALE CONSIDERED	SHIP	SHORE	MD
Planning	C	R	I
Drydock specification	C	R	
Tender	C	R	
Evaluation	R	C	
Decision	R	C	A
Execution	R	C	
Follow-up	R	C	A

R = Responsible **I = To be informed**
A = Approval from **C = Co-ordinate with**

Once again, the result is somewhat surprising and perhaps would not be entirely suitable for every company. The point however is that authority and responsibility can be delegated providing the earlier discussed factors of loyalty, continuity and training are considered strategic issues in the organisation and that this should not in any way work to the company's detriment with regards to liability as outlined earlier in this workpackage. The result will be more interest and involvement for the ship's staff. In general it is providing a more interesting and attractive career structure. It can also be assumed that companies like this have less staff wastage.

Finally, the workpackage considered document and data control under the ISM Code. The writer concluded as follows:

Document and data control under the ISM Code needs support from specific EDP systems. To have a practical view and give useful information specific software was investigated and described. Comprehensive lists were prepared for specific ISM Code software and integrated software packages, which contains the name of the company/organisation and the offer. Furthermore, several databases were investigated on Internet, which could be helpful for the daily work with the ISM Code. The results of these investigations were presented and lists with website addresses, which include important databases, were prepared.

5.5 Workpackage 5

Workpackage 5 was developed by Precious Associates on behalf of BIMCO. Much of the considerable information in this workpackage is based upon section 3 of the questionnaire forwarded to BIMCO members worldwide and this is referenced and quoted throughout other deliverables of this study. Precious Associates comment that a return rate of some 30% has ensured that the data is meaningful. Individual country reports are included and a wide range of statistics is presented. These individual country reports have the intention to provide a simple summary of labour statistics. Related seafaring issues, primarily referencing training and promotional measures to attract young people to a marine career, are also recorded.

The executive summary of workpackage 5 comments as follows:

The European seafaring profession has been in severe decline over the past twenty years. Initially cost driven through competition from the Far East, this was followed by successive government policies of abandonment of the industry, which coincided with a period of poor press image through a number of shipping disasters. Not surprisingly, the choice of a career for young people, in the once highly regarded Merchant Navy, has all but disappeared from the majority of European countries.

MASSOP addresses many issues relating to shipping, with a particular focus on the European Community. This Deliverable 5 examines the human resource element and, simply, poses the question "as we approach the Millennium, is there a future for the European seafarer and, if so, will there be an available supply?"

The author firmly believes the answer is yes, provided a number of measures, some of which are already underway, are continued and encouraged by a policy of EU cohesiveness and planning and underwritten, as appropriate, by local and central EU government. Reasons to support this positive belief are:

- Many of the major international shipping groups are still European based, with finance, management and policies being decided in Western Europe.
- Leading industry bodies, whether regulatory, commercial, educational or human resource are still, primarily, European based.
- The focus of world trade embraces a European arm with many commercial sectors flowing in and out of the Northern Hemisphere.
- Finally, and from a people perspective, there will be a continuing and future demand for many thousands of European citizens to play a leading part in the shipping industry, both at sea and ashore.

None of the foregoing comments naively suggest that there will be a return to the mid 1950s, when European shipping and European seafarers dominated world trade. The Far East, as a major supply of personnel, is recognised, as is the pattern of cross trading that excludes Europe.

Nevertheless, all the data collected in this Deliverable includes sufficient opinion, and some evidence, to confirm there should continue to be a requirement for a West/East balance in maritime labour. Neither can exist without the other.

This is a human resource, ie a people, issue, with the key points for the future being:

- There must a European marine career, embracing a planned sea and shore training role.
- Measures must be taken to promote the attractiveness, to young people, of this marine career path.
- There must be clearly thought out incentives for young people to commence and, thereafter, stay within the industry, both through a challenging career and also through personnel recognition and identity.
- European government support, evidenced in many countries through tax and employment measures, must be co-ordinated and further developed.
- There must be a high focus on a people caring and professional image.

Considerations to address are:

- A major age imbalance over the past thirty years has resulted in the European industry today having a too high age profile, with a gap in the thirty to forty year group.
- In some European countries, recruitment to the industry has almost ceased; ways must, therefore, be found to fill the inevitable shortfall of seafarers, particularly over the next five to ten years.
- The image of shipping needs to be urgently and radically improved.

Labour costs, naturally higher than Far East competition, must not be allowed to extraordinarily increase and Europe must be seen as providing quality personnel for a sophisticated technical market.

The deliverable firstly considers recruitment and comments in its overview:

The European shipping industry has a great deal to offer young persons starting out in employment: early responsibility, comparatively rapid advancement and, in due course, a variety of career opportunities in senior positions. Then:

- Why do so few of the very best youngsters apply?
- How do schoolchildren form their view of the industry?
- What advice do they receive, and whom do they ask?

This Work Package will attempt to respond to just a few of the above questions and information is provided on a programme of recruitment measures currently being implemented in the United Kingdom, and, it is believed in other European countries, amongst them Denmark, Norway and Sweden.

Different methods of current recruitment, across Member States, were recorded in individual country reports.

The workpackage then considers marine careers and comments:

The closeness of sea and shore personnel, today, naturally leads to a broad-based combined career, with the attractiveness being promoted in pre-joining recruitment literature. There are similarities with certain parts of the armed forces, where different opportunities exist for both active/field work and office based, essential, administrative tasks. Advantages will accrue, not only to the individuals, who will develop many different skills but, on a personal level, and well documented elsewhere in this Deliverable, the drawbacks of enforced time away from families will also be lessened.

It then considers recruitment, entry programmes and suggests a possible European model of recruitment as follows:

Whilst it is recognised that much is already under way to recreate interest in a marine career, the activities undertaken by a group of committed shipping Companies and support parties (in the south east of the UK) may provide a form of model for those other EU countries who are considering their own recruitment / initiatives. The key features of this "Solent Group" are:

† † The establishment of an action plan to:

i. Increase awareness amongst school children and their advisors that there are attractive and rewarding careers, with high levels of training and qualification, to be had in the shipping industry;

ii. Promote shipping as a modern, highly professional, industry, with an attractive lifestyle;

iii. Make it as easy as possible to bridge the gap between initial interest and commitment to a Cadetship.

† † The implementation of this action plan by:

iv. Establishing a hotline and employer web database (whereby information can be quickly obtained);

v. Writing to the schools or colleges in allocated groups, introducing Company representatives who will then be invited to follow up this introduction with an energetic approach to the school or college, offering to make or arrange for a visit and presentation;

vi. Beginning this programme of visits to schools, complemented by a parallel campaign in the local/free press and local TV /radio;

vii. Instituting an annual mailing to schools not being visited, to communicate to careers teachers, the hotline number, industry website address, an indication of the number training berths available and an offer to visit if required;

viii. Producing a two-year action plan for promoting the shipping industry, in all levels of (Hampshire) schools.

Note: In order to ensure that all schools receive a broadly similar pitch, which promotes the whole industry, Company representatives will be equipped with a presentation pack and supporting literature. Both the presentation and the literature will be, primarily focused on selling the benefits of a seafaring lifestyle and a seagoing career. As well as pictures of ships, the pack will contain images of seafarers at work, undertaking their challenging, worthwhile and interesting duties. Additionally, a career for life in the industry will be featured, with subsequent shore based jobs explained.

It then concludes:

In the context of a growing shortage of skilled manpower, there is a need to act, and to act quickly. But it is a complex problem and simple solutions will not do. There is little merit in drumming up interest in jobs at sea if the result is simply an inflow of youngsters desperate for a job or those looking for short term adventure and travel. Neither is there any merit in creating interest in high calibre youngsters if they then find it difficult to take the next step of finding a Company to sponsor their training.

Two other considerations must apply:

1. The availability of training berths.

2. The opportunity to follow a marine career to its ultimate conclusion of senior positions, either at sea or ashore.

The workpackage looks in depth at training and concludes:

The industry has, through ISM and STCW, made great strides over the past twenty years to both regulate and streamline training related issues - primarily as regards safety, competence levels and procedures. It is probable that, at the outset of these initiatives, and looking at the practical issues, there were, initially, more disadvantages than advantages in trying to upgrade the industry and its practices. However, success was achieved and the industry, as a whole, must now feel more comfortable with the progress made.

A consolidation of training programmes would thus seem a logical progression and, taking into account that, generally, there is a worldwide preference for (at least) senior European Officers, the EU could, perhaps, lead the way. It will not be easy!

Finally, and within the UK, there is ongoing support for the quality initiative Investors in People, which is the national standard, setting a level of good practice for improving an organisation's performance, through its people. In many observers

view, it is the people/ human resource element which supports the main ISO/ISM management quality effort and it is believed that the Investors in People standard is now being "exported" beyond the UK. It is thus for consideration whether MASSOP, or any other review body, should focus further attention on Investors in People and its relevance and value to the EU shipping (people) scene.

Further, the workpackage examines career structures and gives as an overview:

The career structures across EU countries, leading to a seafaring qualification, are broadly similar, even though they may be addressed from different standpoints.

There is evidence that seafarers view a seagoing career, traditionally, and are reluctant to see major changes in the arrangements. There too is a possibility that a "job ashore" is viewed on the basis that the "grass is always greener on the other side of the fence". For those who have a more realistic view of "the other side", there are suggestions that an industry wide educational, training and certificate regime deserves active consideration.

This Work Package now advocates serious consideration to the development of a total marine career.

The deliverable then considers the seafarer questionnaire and comments:

Within the Seafarer Questionnaire, it is interesting to note that 62% of those replying believed that their career had met their expectations. When taken against the overall wastage to the industry, and especially the wastage during MET, this is a high figure. But, of course, this question was directed at those who had stayed at sea, so perhaps the reaction is not surprising. It is, therefore, also not surprising that these seafarers indicate a preference for the traditional career route.

However, the considerable changes in the industry are acknowledged and, in certain circumstances, a degree of naiveté amongst new recruits is recognised. In this context, the wider needs of the industry and its longer-term survival must be addressed, together with the need for multi point entry facilities and a challenging career structure for the future.

It is, perhaps, peculiar to the industry that the lead time to a (Deck discipline) Master's (Class 1) Certificate is relatively long compared to other industries and, across EU countries, this period varies somewhat. It has been suggested that, having evoked the interest of the prospective seafarer at, say, late school age, the need to maintain interest to the final certificate is over a protracted period.

Overwhelmingly, the view of the seafarers questioned was that the traditional manning and departmental structures on board are still entirely appropriate. However, there is acknowledgement of the greater integration of the departments over more recent years and the need for common support. Polyvalent, or dual purpose, career paths appear still in the majority of Member States to only have developed slowly.

Coming Ashore:

Whilst a fairly high proportion of seafarers surveyed (62%) responded positively to the question "If you come ashore in the future, would you like your career to continue in the marine industry?", there exist certain misconceptions as to what life is like ashore. Whilst there is a strong belief, amongst seafarers, that Officer qualifications will suit them well in shore based professions, this is not always a view shared by employers outside the industry. Certificates of Competency are not necessarily accepted to be relevant ashore and the skill and qualification base of professional seafarers is often undervalued. This latter assumption is certainly the belief of the sea staff themselves. Counter to this, seafarers are not always kept up to date with management and IT training, areas which may well equip them better for a working life ashore.

With the supply of quality seafarers continuing to fall, those with the necessary qualifications and experience should be able to achieve early promotion. This relates to higher salaries that are difficult to match when the individual seeks a posting ashore.

The seafarers questioned considered jobs ashore to be better in the areas of:

Attractive career prospects;
Training;
Job security;

and jobs at sea to be better in the areas of:

Travel;	Job satisfaction;
Independence;	Pay and conditions.

One of the perceived disadvantages of a career at sea is the disruption to family life. Long leave periods do not, necessarily, "compensate" for long periods at sea and the effect of separation on families should not be underestimated.

Within the close environment of a ship, there is the need for those working onboard to co-exist and co-operate with each other. Seafarers consider this to be an attribute and the majority of those questioned believe their training and experience at sea has prepared them for a career ashore in the marine industry.

Working Ashore:

Whilst, in the past, it has almost been a requirement for certain shore marine jobs to be filled by former mariners, there is now a move to employ, in some cases, totally shore trained personnel for these positions. This is of necessity, due to the increasing non-availability of ex seafarers, and a practical example of this is the role of Ship Planner. Traditionally, this position was always filled by a trained Deck Officer (Chief Officer rank), but it is not uncommon now for a graduate, computer trained, and with a flavouring of marine life, to adapt to this role.

It is appreciated that, in no way, can all marine specialist jobs ashore be filled in this way, but certainly some can, and will, and in increasing numbers.

One question remains, is there an appropriate marine qualification / career route available for this graduate, now Ship Planner?

A Total Marine Career:

More emphasis should now be placed on a marine career, with entrants for both sea and shore being encouraged to view their future as a lifetime within the marine industry. As training progresses, there should be opportunities to obtain a selection of marine qualifications, similar to the approach envisaged by the revised STCW, to equip the individual for a working life at sea or ashore, or both.

One of the problems today, is how to attract intelligent, capable and well educated young people into the industry when (particularly in the UK), they are under considerable pressure to go into higher education at University. There must, therefore, be a greater acceptance of younger marine professionals, ie post graduate entrants. Principles of Company loyalty, service, commitment and dedication should, once again, be high profile, and benefits will accrue for employers and seafarers alike.

An approach to a marine career that does not tie an individual to only sea or shore only (but links to both) is to be positively encouraged. There are those who are happy to remain at sea for all of their working life, but the majority are likely to want to come ashore at some stage, either for family reasons, needing a change or seeing a transfer to a shore based position as a significant career promotional move. Being able to offer a new recruit the possibility of a marine career, embracing both sea and shore service, for those that so wish, is sure to be advantageous. Indeed, this has been the concept operated by the navies of the armed forces of EU members over many years.

The workpackage then proposed that the re should be the possibility of a career within the industry, embracing both sea and shore and suggested the following should be some of the features of this:

- ?? Possible entry at present Cadetship level;
- ?? Possible entry at graduate or any other level;
- ?? Qualification to include seagoing (STCW) competencies;
- ?? Qualification to include shore competencies, perhaps of a vocational nature;
- ?? Cross over from sea to shore positions and vice versa to be possible and planned;
- ?? Opportunity, if so chosen, to eventually remain entirely within one field or the other;
- ?? Consideration of fringe industry career such as pilots, port operators, surveyors, etc.
- ?? Funding / resource levels;
- ?? As far as possible, a common EU educational and certification route.

It was suggested that the list was not exhaustive.

David Precious then concludes:

The MASSOP team believes that the proposal of a total marine career is worthy of separate detailed consideration, with input from seafarers, academics, shore management and governments. The industry within Europe is vibrant and exciting, with a wealth of talent at its disposal. A radical approach to the career structure will ensure its continued growth and prosperity.

The marine industry should embrace this total marine career concept, such that an individual is encouraged to join the industry as a whole and not just one part of it.

The deliverable then considers wastage and made the following important observations:

The Reasons

The causes of wastage, in any situation, can be varied, with the customary ones being:

? ? Career change, caused by frustration or attractiveness elsewhere;

? ? Family reasons;

? ? Medical reasons;

? ? Redundancy;

? ? Retirement;

? ? Dismissal;

? ? Death.

As will be expected, there is no one reason for wastage (or, indeed, for staying at sea) but, in looking at the above statistics, the following is for consideration:

✍✍ One area of attention, relative to wastage, is the age profile of any population group. This is especially pertinent to shipping and even more so in regard to European seafarers, who are the oldest of any seafaring region. Within OECD countries (which includes much of Europe), 58% of Officers are aged over 40. For the Far East and the Indian sub-continent, only 35% of Officers are aged over 40. This is thus an ageing European work force, which has a further detrimental effect upon any future supply and demand comparisons.

✍✍ Another caveat, with respect to an ageing work force, especially within the senior ranks, is that the industry may be lulled into a false sense of security, believing that, from the returns, more seafarers will stay in the industry as a whole than is the case. For example, if the seafarer is within sight of retirement, he/she is unlikely to move elsewhere now. Such figures could thus mask the actual true feelings of seafarers as to their perceived future in the industry.

✍✍ As has been mentioned elsewhere, European seafarers feel undervalued. Not only do they believe that their skill base is not appropriately recognised, but many

consider they are the victims of continual cost cutting as a result of owners comparing such manning costs against Third World supply costing. There is, thus, a demoralising effect upon the seafarers themselves, which can contribute further to the wastage statistics.

- All the above will be compounded by past economic pressures that resulted in the spasmodic instigation and curtailment of training programmes. The long term effects of this "stop/go" policy inevitably impinge upon the industry.

- At the opposite end of the spectrum, however, in an article by Captain Colin Stevenson of Warsash Maritime Centre, published in "Seaways" in February 1998, the main reasons for remaining at sea (ie contrary to wastage) are identified below:

    1. Pay;
    2. Leave;
    3. Having a responsible job;
    4. Making my own decisions;
    5. Having reliable fellow workers.

The report identifies other elements that are relative to the subject of wastage. In this context, "being out of touch with the family" is also mentioned as being high on the agenda although, interestingly, it is not believed that marriage has as much an influence to leave the sea as was the case in the past. Whilst most seafarers can more readily adapt to change than the majority of their counterparts ashore, there is dissatisfaction that the "importance of seafaring, to people in the respondent's own country, was generally considered to be low" - this adds weight to the belief that seafarers perceive themselves undervalued.

- The MASSOP seafarer questionnaire also identifies the three main attractions of a seagoing career. These were reported as:

    1. Job satisfaction;
    2. Pay and conditions;
    3. Attractive career prospects.

Interestingly, and in slight contradiction to the Warsash report, job satisfaction is rated higher than pay and conditions.

The area of family life is also covered in this questionnaire, with the seafarers themselves making suggestions as to what can be done to help alleviate the pressures.

In summary, therefore, there is no one reason for wastage, nor is there one main reason for remaining at sea – it is all down to what, in general, the seafarer perceives is best for him/her.

The Way Forward

In considering the way ahead, the options are:

- To do nothing;
- To make immediate changes that can be accomplished within the current framework;
- To undertake a radical rethink of the industry as to how manpower is provided, not only for the ships but also for the industry at large.

The first option is not believed to be sustainable. Unless it is the wish to see the death knell of the European shipping industry in our lifetime, it is surely a mix of the latter two options which must be addressed.

The various surveys that have been conducted in an attempt to analyse wastage have, as almost a by product, pointed the way to those areas where changes can be made that can, hopefully, reduce the wastage rate or, at worse, ensure there is no increase. Based principally on the MASSOP seafarer questionnaire, supported by the Warsash study and the views of the author, a range of measures, not all requiring major funding, are (in no order of priority):

- Continuation, and possible enhancement, of job interest.
- Improving job security.
- Introducing greater shared responsibility between those on board and those ashore within the organisation – e.g. one unit working towards one aim, without an "us" and "them" perception.
- Reduction, or curtailment of stress, with improved procedures, which may result from fewer (perceived unnecessary) ship inspections, less onboard paper work and less pressure from shore.
- Better shore liaison, especially with personnel departments, including improved appreciation for leave, either on or off pay.
- Better appreciation of family separation (in particular, enhanced communications to home for both family and friends).
- Maintenance (and, possibly, low cost improvement) of an attractive employment package.
- Enhanced and structured training, leading to career development for both at sea and ashore.
- Reliable, and skilled, fellow seafarers.

Additionally, the "stop/go" policies relating to training must cease. There must be consistency in the industry if it is to have, in the eyes of potential employees, a credible future. Elsewhere in this report, a suggestion of a common European Certificate Structure is proposed, as well as an ability to be employed across the European Union. Both these, it is suggested, will have a downward pressure on wastage, so that there will be many more who will wish to be attracted, and then to stay, at sea or ashore within the industry.

In conclusion this section comments:

The industry must address itself to the issue of wastage – ie the loss of skilled and highly competent seafarers from the industry as a whole. Statistically, the figures included in this report, whilst of some concern, need not be viewed as alarmist when compared to other industries. The facts are not in dispute, but the solutions to resolving these problems are feasible and, if addressed correctly, cost effective. Of necessity, however, is the realisation that solutions will best be addressed across all Member States.

It is evident that there is material already available that will assist with some of the issues, but it is also apparent that more work needs to be done. A co-ordinated European effort is considered the best way forward.

The workpackage also considers demand and supply. It comments:

One of the aims of MASSOP is stated as *"An important aspect is manpower recruitment, particularly in European and OECD countries, and MASSOP will particularly address this issue".*

Whilst accepting the requirement is to primarily address European and OECD countries, this needs to be set in the context of shipping being an international (labour) industry and it is, therefore, essential to consider global issues and how these may impact on Europe. Within this Work Package, a number of areas of attention are thus addressed, the main ones being:

?? International manning - primarily statistical;
?? The European (sea and shore) labour market;
?? Seafaring legislation;
?? Miscellaneous;
?? Labour costs;
?? Central/East Europe.

Individual areas are considered with the objective of setting these in the context of demand for and supply of (primarily) European seafarers.

It then gives statistics of labour supply and discusses seafaring legislation. It comments:

It would be irresponsible for MASSOP to ignore the present world economic climate, and the effect this may have on labour. The prime international factors affecting shipping today are:

?? The current Balkan situation;
?? The continuing, but slowly recovering, Asian economic crisis;
?? The global oil recession;
?? Multi national mergers and acquisitions;
?? Threatening economic crises in certain South American countries, such as Brazil;
?? Uncertainty in some EU countries as to threatened recession, eg the UK;

?? Seaborne trade fell, in 1998, by an estimated 0.7%, compared with the previous year;

?? The world fleet increased by 1.4% in 1998 to 732.4 mdwt.

Following on from the foregoing, a quick snapshot of different trading sectors at end March 1999, shows:

?? The container / dry cargo market at an all time low;

?? Barely break even results being expressed by most tanker owners/operators;

?? A generally buoyant passenger/cruise sector;

?? The supply/support industry feeling the downturn of oil exploration;

?? Car carriers booming;

?? Reefer vessels in major difficulties, with a number in lay up.

The potential impact on seafaring labour is considered to be:

†† Some easing of the Far East labour market, with evidence of former seafarers returning afloat (from shore jobs).

†† Similar easing of manpower pressure, some country examples being India, Croatia and South Korea (influenced by decreased demand).

†† Likely reduced recruitment of Officer trainees.

†† From the foregoing, some potential for reduction in manpower costs, i.e. greater availability leading to falling wage rates.

†† Possibly curtailment of training budgets.

Other international features, which may have an influence on shipping, and particularly the labour market, are:

✍✍ The ITF and their flag of convenience campaign. This has been reviewed recently and, whilst some changes may follow, in principle this, it is believed, will continue. Other ITF aspects are:

- ?? Their determination to maintain the AB wage uplift, to $1400 at 1/1/2001, appears as strong as ever.
- ?? Their "open door" policy will presumably continue.
- ?? Their belief in the principle of "payment for the job", irrespective of nationality of seafarer, will also continue.
- ?? There is little evidence to suggest that the ITF influence/interference will diminish.

✍✍ Environmental pressures, especially in such areas as scrapping of vessels.

Labour costs are discussed extensively together with the subjects of manpower skills and availability. The chapter concludes:

In recognising the responsibility to the EU shipping community, MASSOP proposes that greater attention should be given, by Europe, to this potential source of marine labour. Areas that may need specific attention will include:

- Measurement of standards (i.e. STCW);
- Awareness of training institutes and educational standards;
- Appreciation of English language;
- Close liaisons with relevant EU shipping communities;
- Acceptance by European shipping of equivalent standards of competence;
- Awareness of cultural differences;
- Political stability is essential for a cohesive European seafarer supply;
- Cost / commercial awareness and appreciation.

In essence, the emerging availability of Central/East European seafarers should be further researched and sourced. This option, for the long-term future of the EU shipping community, is considered more attractive that the Far Eastern option.

In conclusion this section comments:

This Work Package has addressed a whole range of issues all, in some way or other, related to demand for and supply of labour. As regards the future "manpower recruitment" scene in Europe, the main areas are:

The outcome:

- Whilst there will be some easing in the demand for European seafarers, this will not diminish entirely and there will still be a requirement, for many years to come, for European seafarers.
- Insufficient EU recruitment is taking place.
- Demand from shore sectors will increase.
- There is limited availability of women workers.
- Legislation should be controlled (but how?).
- Commercially, the industry is in a difficult phase.
- International European manning costs, especially for Officers, exceed Far Eastern costs and, realistically, Europe can not compete in manning terms, in a totally cost driven labour market. However, recent seafarer wage increases (in Europe) have been lower and the gap between West and East, partly driven by ITF, will narrow.

Suggested measures to overcome:

Based on the outcomes above, there will still be a requirement for EU Officers, but there are insufficient numbers to meet this demand - proposals are:

- Increased recruitment of EU Officer Cadets, in greater numbers and greater consistency, with emphasis on an attractive marine career.

- Through controlled intake, make greater utilisation of Central and East European Officers.

- Maximum use should be made of EU legislation to permit EU seafarers to serve on EU vessels and, in time, to extend this to other Europeans.

- Agreement on a common European certificate structure.

Workpackage 5 also considers accident statistics and in particular states as an objective:

"To examine available accident statistics, in relation to seafarers and what effect the statistics may have upon the supply, demand and wastage of manpower specifically, but not exclusively, to the European shipping industry."

The work widely quotes statistics and concludes:

The 1970, ILO Convention 134 on Accident Prevention has Recommendation 142, which says that members should record and report accidents and that national statistics should be kept, however, the rules on reporting differ from country to country. As an example, the UK reports on accidents where the seafarer has been off work for three days or more whereas, in Norway, the figure is one day.

It is clear, then, that it would be more beneficial if reports are made and records kept on a common base worldwide.

From the information to hand, the following conclusions emerge:

- Is there a medical fitness problem amongst seafarer and are shipboard personnel adequately trained to meet the first aid / medical care demands placed upon them?
- Accidents are generally caused by human error and possibly attributable to complacency and "lack of active management interest" as such they can be avoided.
- Three out of five major accidents are directly related to an error on the part of one or more individuals engaged in a particular activity.
- Language problems have a part to play in contributing to error.
- Fatigue is a continuing and growing cause for concern, especially where manning is reduced without the introduction of labour saving devices to offset that reduction.
- There is no firm evidence to support the contention that a seafarer of any nationality will be more likely to have an accident on one flag ship than another.
- There is no firm evidence, which suggests that one nationality more than another will suffer an accident.
- It appears that the age of a vessel does have an effect on the likelihood of accidents.
- It also appears that the type of vessel has some effect on the level of claims.

It is clear that the sea and its immediate environment are areas that are dangerous. Whilst this has been recognised by the majority of clear thinking and responsible flag states, by the introduction of regulations and procedures to minimise accidents, implementation of these, by shipowners, ship operators and, most importantly, seafarers themselves, still has some way to go before the dangers of the sea, as it effects people, are minimised.

As an updated report to MASSOP, Precious Associates commented as follows:

The Past and Present

Seafaring is traditional and, by and large, vessels of today have an onboard complement not very different in composition (but not necessarily numbers) to that found some fifty years ago. The key structures broadly found on a ship are:

- The Deck Department - responsible for navigation and cargo operations;
- The Engine Department - responsible for technical and maintenance operations;
- The Catering Department - providing support services;

Each Department has a rigid and strongly demarcated structure of:

- Officers;
- Petty Officers;
- Ratings (or Crew).

Over the years, there have been "fringe" changes, primarily cost driven, but also through increased technology, the main features being a move to a more flexible crew structure with Ratings sharing collective tasks, for example, painting, storing and, to a lesser extent, some watchkeeping duties. In recent times, the permitted removal of the Radio Officer (through the implementation of GMDSS) has received statutory approval.

The foregoing, simplistic in approach, manning structure will be found on many seagoing vessels today and the "standard" manning complement of an ocean going tanker or bulk carrier is likely to broadly comprise:

Officers

Master	Chief Engineer	
Chief Officer	1st Assistant Engineer	
2nd Officer	2nd Assistant Engineer	
3rd Officer	3rd Assistant Engineer	
Extra Officer	Electro Technical Officer	Total Officers=10

Ratings

Chief Petty Officer	
Petty Officer	x 2
AB (GP)	x 3
OS	x 2
Motorman	
Wiper	
Chief Cook	
Second Cook	
Messman	
Total Ratings	= 13
Total Complement	= 23

Other manning features to record, and mainly European by nature, are:

?? Dual or polyvalent manning;
?? Functional approach;
?? IT developments.

Dual Manning

This has been a fairly long-standing style of manning in a number of European countries with France, in particular, taking the lead. The principle is based on a sharing of Deck and Engineering roles, thus leading to full integration of Officer tasks. At present though, within the UK, Dual Cadets, where they exist, are required, for onboard legal purposes, to obtain their statutory Certificates of Competency (or licences) in both Departments, this being a drawback of the scheme (i.e. extra time required for training and certification).

Functional Approach

The revision of the STCW Convention has created an opportunity for introducing a functional approach to the training and certification of seafarers, this being achieved through ongoing assessment of the skills necessary to operate the vessel safely, effectively and economically. This supports the European initiatives of shore vocational training and qualifications.

IT Developments

The development of IT, specifically in the last 2/3 years, is rapidly changing roles both onboard and ashore - speed of response, greater knowledge and awareness, simulators for training, etc are rapidly changing the tasks and functions in vessel (and shore) operations. This will move even faster in the future.

The Future

The MASSOP team believes it is no longer appropriate for ships to be manned in the time honoured way recorded above under the past and present. The key themes of greater IT, dual purpose manning and the functional approach will permit the introduction of more relevant and flexible onboard complements, briefly seen as follows:

An onboard team of multi skilled personnel to meet the prime tasks of Administration and Operations.

For a standard ocean going vessel, similar to that recorded above, the future complement is likely to comprise:

Administration staff	x	4
Operations Staff	x	5
Total		9

The senior person on board, with all the necessary legal and managerial skills and mandatory training, will be the Ship Manager, drawn from any background.

On a required basis (and not too dissimilar to the airline industry), back up teams of skilled mechanicians will be appointment to the vessel, either in port turnarounds or, when not possible, for planned sea voyages; such staff will undertake the required maintenance programmes.

To satisfy the ambitions of "new" people in the future, traditional shipping Company philosophy of centralisation must change – greater responsibility must move to the vessel.

The following notes support the above:

To meet the tasks required of either Administration or Operations, there will need to be a greater emphasis on training and familiarisation (the latter aspect to receive a far higher profile than at present through enhanced simulation training based on the particular vessel designated for onboard service).

Former divisions of Officer and Rating to be discontinued; in effect there will be a core key group of personnel, based upon a single stream entry of training and qualifications.

The saving of fourteen people to be an investment in training for the future.

The principles of Company identify / loyalty / trust to be reinforced through a partnership at all levels of the organisation, through success reward schemes.

A clear upward career path must be identified which will also include the required elements for those who choose the wider marine option, alternating between sea and shore.

Pointers to the manner is which this concept may be achieved will be found elsewhere in the MASSOP papers and in this Deliverable but, obviously, this whole area is for further in depth deliberation.

5.6 Workpackage 6

Deliverable 6 consists of four case studies. The main task of the deliverable is to identify an effective management system for four different types and categories of shipping companies.

This kind of management system must be based on the following aspects:

- Technical,
- Operational,
- Market,
- Commercial,
- Financial,
- Competition,
- Network,
- Political, and
- Research and Development

The four different shipping sectors analysed in each work package are:

WP 6.1: Case Study on Short Sea Shipping,
WP 6.2: Case Study on Ferry Services,
WP 6.3: Case Study on Industrial Carriers, and
WP 6.4: Case Study on Government Fleets

WP 6.1: Case Study on Short Sea Shipping

This case study specifically examines:

- The significance of the Mediterranean Local Market
- The role of the Mediterranean Greek - Owned Merchant fleet
- The main characteristics of Greek short sea shipping in the Mediterranean
- Financial, commercial, operational environment of the companies

The case study makes the following conclusions and suggestions:

In this case study, we examined the main characteristics of the cargo short sea shipping in the Mediterranean Market owned by Greek Shipowners. The Greek-owned Mediterranean fleet constitutes a particular category of the Greek- owned fleet, not only because of the different tonnage of ships, but also because of its specific characteristics. Despite the gradual decrease of its number of ships and their tonnage, it is of great significance. Its contribution to Greek economy and Greek- owned shipping is considered particularly important. But, in spite of its significance it has never been fully investigated. There is a suspending factor for every inquisitive attempt, and that is the substantial non-existence of official statistics. It becomes clear that it faces structural difficulties - as much in matters of the fleet itself as in matters of enterprising organisation, that is estimated to work in a suspensive way to its future promotion.

During the examined period 1990 - 1996, the development of the Mediterranean fleet was opposite to the correspondent development of the Greek - owned fleet as a whole. Whereas the Greek-owned fleet went through a rapid

development, the Mediterranean fleet has weakened, since the number as well as the tonnage of the vessels decreased. This reduction was followed by deterioration of the fleet's quality characteristics, as appointed by its average age, its specialisation and the flags it uses. Its average age, which was significantly higher than the average age of the Greek - owned ships, was increased up to 3 years, its specialisation though wasn't differentiated to approach contemporary and specialised ships (such as containers), while the percentage of the Greek flag that was lower than the equal one of the fleet as a whole, was further increased favouring Flags of Convenience. Furthermore the fleet under Greek flag, as far as age and specialisation criteria concern, was less dynamic than the fleets of Flags of Convenience. It seems that the high average age of the fleet, as well as low renewal and modernisation rate, are the most important problems that the Mediterranean fleet faces nowadays. Another important feature of the Mediterranean marine that is up to one point a suspending factor, associates with its double nature, meaning the fact that it includes that at the same time participate in two kinds of markets, as much in the "protected" as in the competitive ones. Meantime, for a basic section of the fleet sailing under the Greek flag, a different legislation is in force.

The second group of difficulties concerns directly the enterprising organisation of the local market, where enterprises of different size and organisation coexist. To be more specific; a small number of contemporarily organised companies and a great number of small, family companies having low organisation rate that struggle for their survival in the market. Although flexibility ensured by size and limited organisational development has positively functioned during that period, it is doubtful whether this will continue to happen in the future, when the environment and the companies' function will alter due to the application of the ISM Code.

The small size of a company in addition to personal involvement of the shipowner and its family members at its function is a competitiveness- adding factor. At the same time though, it has opposite results. The majority of companies administrate only one vessel or fleets of few. Besides the fact that they lack possibility of exploitation of economies of scale in ships' operating exploitation, because of low tonnage, moreover they are not capable of financial exploitation of mass transaction. Such companies cannot reduce their operating cost, which, due to the ships' old age, is high.

A factor adding competitiveness to the companies is their low fixed cost, as a result of ownership of over - aged vessels of low price, by self - financing or by credit opening from salesman. This strategy of investment though, which is definitely imposed up to a point by particularities of ship - owners newly - entered in the market or companies struggling for their survival, lead to the increase of the fleet's average age and through that to a further reduction of its competitiveness.

Finally, we believe that some very interesting proposals for improving policy through the introduction of new management measures will be:

?? The development and implementation of a data base system by mode of transport (passenger/goods) for commercial development and policy making.

?? A research for the production of new ships particularly suitable for the Greek short sea shipping market.
?? The improvement of industrial image through the acquisition of specialised training (e.g UNCTAD's European Trainmar), with the involvement of all related partners.
?? An improved intra-maritime communication and interaction for increasing morale through reversing the feeling of abandonment from institutions and inadequate participation in the market (for a, chambers etc)
?? Design for increased productivity while at berth through interventions on ships and ports (ships of reduced loading and unloading times, better communications for avoidance of delays, soft investment upgrading of port facilities, and optimisation of port shifts).
?? A new rational pricing system for sailing through the Corinth Canal
?? Establishment of a cargo stock exchange for bringing together all the parts of the demand supply relationship (shippers and forwarders, ports, brokers, industrialists, traders etc)
?? Change of the network configuration through reallocation incentives, which will lead to better network diffusion.
?? Financial support to small sized coaster companies for renewal of the fleet, marketing and organisation, through co-operative credit organisations.
?? The establishment of roundtable and discussion for analysing and solving the problems of coastal cargo shipping.

WP 6.2: Case Study on Ferry Services

This case study spe cifically examines:

- Demographic Elements
- Coastal Service Demand
- Estimated time table – Port Infrastructure
- Basic Principles of Vessels Supply
- Elements of Operation Cost
- Elements of Revenues
- Scenarios of Efficiency – first, second and break-even

The case study then makes the following conclusions and recommendations:-

The accomplishment of the transportation needs of Dodecanese, particularly as regards the islands with an unprofitable shipping line, is considered urgent and imperative. The decision for the routing of a modern high-speed vessel of specific regulations so that it will fully respond to the particularities of the area, gives the

solution to a long-continued problem not only locally but also regionally as well as nationally.

The reasons that support the accomplishment of such an investment are the following:

-Social reasons, since there will be new occupation posts, on one hand due to the crew of the new vessel, and on the other hand due to the increase of the tourist activity of the area.

It is also a good way to prevent the decay of the area, since it would restrain the migratory movement of the local population and mainly of the young people who turn themselves to other business markets.

-Financial reasons. With the ensuring of a regular daily route, there will be an increase of the tourist activity and consequently an increase of the revenues for the local population.

-Defensive reasons. In cases of emergency the vessel could be used by the Ministry of Defence due to her specific construction.

-National reasons. The existence of such a vessel solves the long-continued problem of hard approach and fortifies in a state of defence the East Aegean area.

The results of this case study should be under consideration with the present situation of the ferry fleet as it is provided in the relevant database.

WP 6.3: Case Study on Industrial Carriers

For this case study the writers worked together with a Greek Shipping company who are operating their fleet under their management with two offices one in Piraeus, Greece and the other in New York, USA. The fleet operated by them is 21 Bulk carriers out of which 17 are flying the Greek Flag, 3 are flying the Panamanian Flag and 1 the Flag of Malta.

This case study specifically examines:

- The Market in which Company's ships are trading
- Commercial Sector in which the Company's ships are trading
- Competition
- Operations
- Technical
- The Financial side of the Company
- The Future of the Bulkcarrier

The case study then gives a proposal for alternative shipboard management.

WP 6.4: Case Study on Government Fleets

This case study provides information on safety systems applied in several different government fleets. It was tried to cover different countries and types of fleets. However, the author comments that the efforts were unsuccessful for foreign fleets, probably because some aspects of safety management are seen as internal and even possibly security issues. Therefore only German fleets could be studied. The types covered are privately managed government research vessels, those managed by a Government administration, navy support ships used for non-military purposes, and the Waterways and Harbour Police's vessels. All in all different types and sizes of ships and different organisational structures could be covered.

This case study specifically examines:

- Introduction of the ISM Code in Government Fleets
- Other Safety Management Systems in Government Fleets

The conclusions and recommendations of the case study are:

RF:

1. Intensive dialogue between ship and shore for high motivation of the staff.
2. Language on board as an important feature.
3. Utilisation of one officer or captain acquainted with the onboard procedures as mediator between the shore and the ship based for fast implementation of ISM requirements.

Navy:

1. New technical environmental protection measures like biological sewage treatment, micro-filtration, solid wastes storage in separated waste room on board, separation of packaging.
2. Prevention of accidents through regular checks and immediate repairs.
3. Mandatory damage prevention training for all crew.
4. Use of physicians for independent control of work conditions on board.
5. Designation of persons for worker's safety at two levels, one directly under the department head one close to the crew level (confidant) to continuously control, report, improve and educate in their areas of duty
6. Set-up of a committee with all designated persons, the department head, and navy physicians on matters of worker's protection to analyse disease/accident reports and to prevent their recurrence.

BSH:

1. Immediate rectification of all defects.
2. Using a familiar crew speaking the same language, who know and care for their ship.
3. Waste separation facilities on own premises.

Waterways and Harbour Pdice:

1. Use of every opportunity for teaching the crew in general safety matters or the technical crew in the use, maintenance and care of the engine.

2. All safety equipment has to be adequately stored, easily approachable and usable, and the crew has to know the storage area and be familiar with its use. Limits of usability have to be considered and amounts necessary for the number of crew on board maintained.
3. Speed is governed by the aim of the mission, economic use of fuel and engine, legal requirements and precautions due to good seamanship.
4. All necessary and prescribed ship's documents and all relevant documents for operation and maintenance have to be on board in one folder.
5. All changes to regular procedures, necessary in cases of emergency, e.g., contacts with the ground and with unknown objects have to be reported to the superior on shore, even when no damage is evident, and have to be noted in the diary (time, location, reasons).
6. In case of accidents the safety of the boat is checked, proof is obtained and the superior on shore informed at once to give guidance for further measures.
7. Leadership is clearly formulated and consists of authority and responsibility. The director gets feed back from all levels of organisation during weekly meetings and through diaries.

Overall Recommendations:

1. It is of great benefit to work with the same crew.
2. Regular safety checks by designated safety officers or engineers as well as regular maintenance, repair, and control of all safety relevant equipment are necessary and help to prevent accidents.
3. A safety system works best if the crew is familiar with each other and with "their" ship(s).
4. Training is an integral part of an active safety system.

5.7 Workpackage 7

This workpackage looks at **future management concepts in the maritime industry**. It considers the ideas of decentralisation – of moving away from the traditional "command and control" system. Having said this, it must be said at the outset that progress in this direction for an organisation requires strong leadership; leadership that can both free up and clamp down.

MASSOP is specifically concerned with management structures. Considering these structures at this time however, is perhaps like considering them at the time of the transition of the industry from sail to steam. The transition that is taking place, and will take place, over the next few years is certainly just as significant.

E-commerce will soon have a revolutionary effect upon the way businesses are managed. Studies have shown that business-to-business commerce (B2B) will reach $1.3 trillion by the 2003. Industry-specific vertical web sites will be used by all companies to assist not only marketing and purchasing, but also knowledge management and staff development. Specific software application development will become a key factor for success in most industries – and the maritime industry will certainly not be an exception.

The effects of this will be not only to change management structures, but also to change attitudes and, to a certain extent, the key competencies that the organisation will need.

This workpackage therefore considers these aspects specifically and looks at key elements and developments that will reshape the future management structures of the industry.

Many, or most, shipping companies are now developing a web site. These web sites however will quickly change. Companies now want their customer management, supply-chain management and other facets of their business accessible to everyone within the organisation. They need this to be easily maintained and updated, and secure. To a certain extent this has already happened with the bigger companies within the industry – those with in-house computer departments and large resources. This has been difficult however for the smaller companies that make up the bulk of the industry. Smaller companies however will increasingly need these developments, and this is being made possible by ASPs (Application Service Providers). These companies make it possible to outsource the resources and software necessary for a small organisation to become fully involved in e-commerce and B2B interfaces.

No doubt many shipping companies may well not believe that all of this is an early requirement of course. Certainly, however, businesses without a functional e-commerce component in the next few years will be the equivalent of businesses decades ago that failed to install a phone system when that technology came along.

And just as sure as that technology changed not only the way communication occurred – both externally and internally – so e-commerce and B2B will inexorably change not only the way the business works with it's customers and suppliers, but

also the way the organisation functions internally. This will therefore change management and operational structures throughout the organisation and the industry.

This workpackage of MASSOP looks at these aspects and makes suggestions and recommendations for the future.

The work of this section also considers the MASSOP newsletters that were sent to several hundred companies and individuals during 1999. It should be said that the MASSOP programme and the MASSOP newsletter were particularly popular with the industry and therefore had a snowball effect. This, in part, explains the delay in this report; the research and involvement with the industry has been significantly more than originally envisaged.

The correspondence of the MASSOP newsletter is intended to be an ongoing and developing feature of the industry. At the end of 1999 it provides guidance, advice and discussion for more than 1500 companies and individuals within the industry. Projections are that this newsletter will be read by more than 5000 companies and individuals by the end of the year 2000. It is also suggested that the original concept – analysing the maritime world and providing development advice – will grow to the benefit of not only European Union organisations, but also the global industry. Additional support for companies and government organisations is being provided by World Maritime Organizational Development and this appears to be greatly welcomed by sections of the industry.

There is a real need for the industry in general to change. In this report the author describes the phenomenon of the "collapse of the middle". In this, the very many small traditional shipping companies can be seen as being 'squeezed' by the bigger companies. The major liner trade operators are becoming bigger and are centred on differentiation. The larger bulk trade operators cut costs.

Types of ownership vary widely of course, but many organisations are small family-owned companies with a small number of ships. The MASSOP survey sent to BIMCO members showed some 30% of the world's shipowners operate on average around 3 ships. (The actual figure is certainly higher than 30%.) Many of these are the family-owned companies.

In this sort of company, very often the family members have a significant influence on managerial and entrepreneurial aspects. This sets the standards and values of the organisation and the founder sets the culture and is the main reference point for decisions. Typically, this is characterised by a very centralised management style and a determination to retain financial control. To an extent this limits growth since it limits capital input and the input of outside ideas. There is often a reluctance to delegate responsibility and authority and this has a marked effect upon the management style and structural development of the firm.

This centralisation usually extends to the way the ships are managed. The owner/founder is often seen in a paternalistic role and this often breeds a loyalty and continuity that is seen as a major strength. But there is often a reluctance to look further than the companies established processes, and innovation is often stifled.

Training is task oriented and strategic planning is usually minimal at all levels of the organisation.

All of the above is indicative of the development of a no profit pattern – particularly in the bulk market. The companies are largely undifferentiated and the companies are run with a strategic viewpoint based upon "years of experience". The business is often characterised by high fixed costs and chronic overcapacity.

Perhaps this is what has happened, and is happening, to shipping. The liner trades are differentiating – providing a high level of customer service etc., and generally geared to hub-and-spoke networks and door-to-door logistics. The bulk trades are emphasised around cost leadership. The traditional shipping company – ie the company that tries to compete without a cost leadership or differentiation generic strategy - is "stuck in the middle" (to quote Michael Porter), and can't compete.

"Collapse of the middle" industries are also characterised as being mature industries with knowledgeable customers. This is also true of shipping. There is a power shift from supplier to customer. This is also true of shipping.

The result of all of this is declining profitability. At the low cost strategy end – i.e. the bulk trades in the shipping industry – cost cutting is essential for survival for many organisations. At the differentiation end of the business, cost cutting is also necessary, although very often this is rationalised as being just normal and good management.

Whichever way one looks at it, the emerging pattern requires a new approach to management.

The work of this section is also based upon seminars given by the author during 1998 and 1999, involving many worldwide industry staff. The views of these staff are incorporated into many of the findings and suggestion.

The work basically recommends that companies should:

- Improve the processes by which the ships are run and the businesses managed – suggestions are given for this
- Improve IT systems – the area of business-to-business (B2B) processes is particularly highlighted
- Improve communication – both internally and externally
- Improve teamwork throughout the organisation
- Improve training systems
- Improve staff recruitment – both within the industry and the individual company

In Workpackage 4, several "points for consideration" were raised. These points have now been researched and analysed via the MASSOP newsletter as well as during several seminars and workshops given by David Mottram. These points are considered fundamental to future management concepts within the industry and are therefore discussed in depth in the early part of workpackage 7.

The workpackage then looks at product versus management innovation and the changing role of information technology.

It considers the role of the modern Enterprise Resource Planning (ERP) system, and comments that the major advantages of the ERP system are:

- Resource allocation and usage can be optimised. This applies to all of the resources outlined earlier – things, people, money, processes and time
- Better control of expenditure
- Greater customer satisfaction

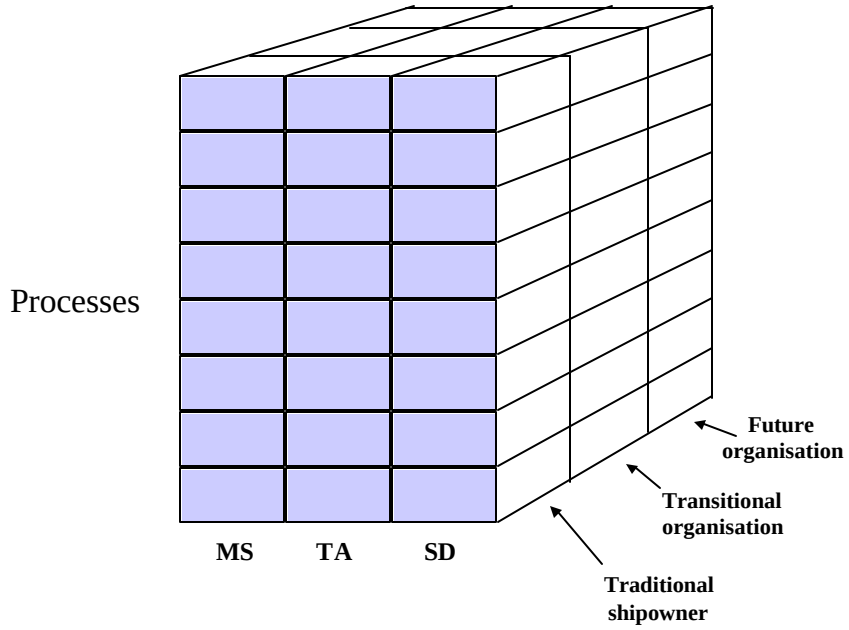
A single decision support system should then be the objective of modern maritime organisations. The advantages of consistent information include:

- All managers view the same information
- Discussions on whose information is right are eliminated
- Large resource savings can be made by eliminating multiple decision support systems
- All decision makers in a particular process view the same information

The workpackage then looks at process development and comments as follows:

The whole culture shift needed to continue evolving the organisational processes is of course a fundamental requirement of the leadership of any company and certainly to the management structure.

All of this is really three-dimensional. This is shown in the following sketch: -



The change from sail to steam changed the management structures (MS), the technical aspects (TA), and the staff development needs (SD) of the processes, and thereby changed the industry. In the same sense, the effects of technological change in general, and information technology in particular, are now changing the processes involved in ship management. The sketch above shows this as being 3 dimensional. Going from the "traditional" shipowner type organisation to the "future" organisation is basically related to changes in the processes involved. This then requires organisations to go through a transitional period.

The workpackage then looks at the effects of e-commerce and business-to-business upon the processes of the organisation and comments:

And just as sure as that technology changed not only the way communication occurred – both externally and internally – so e-commerce and B2B will inexorably change not only the way the business works with it's customers and suppliers, but also the way the organisation functions internally. This will therefore change management and operational structures throughout the organisation and the industry.

The main facets that will be developed by companies are:

?? Electronic commerce
?? Marketing
?? Knowledge management
?? Enterprise relationship management

The workpackage then discusses the stages for implementation of the changes that organisations will go through: -

1. A company needs to set up a business case for the development of the new processes of course. This business case should include a cost-benefit analysis, return on investment (ROI) estimates and measurable objectives. An ERP system may well form a key part in this.

2. Audits are then necessary. These need to specifically include: How marketing and customers are dealt with; The knowledge available within the organisation; An analysis of the existing technological infrastructure.

3. An analysis of the existing company website, where this already exists. Rating it and the web sites of the organisation's competitors for areas such as ease of navigation, design, use of appropriate technology etc.

4. It is then necessary to establish guidelines to ensure the use of correct, open technologies for best Internet development.

5. The extent of the process development work is then decided in conjunction with company staff to enable software choice decisions to be made. An internal workshop is probably the best and quickest means to facilitate this.

6. There then needs to be an implementation plan drawn up. This is intended to provide a prioritised, cost-justified framework for establishing the

requirements of the business, the users, and the various functional aspects of the system.

7. The software for the e-commerce, marketing and knowledge management processes is then designed and developed.

8. The systems are then implemented. It is necessary to integrate them with existing systems and databases of course.

This perhaps no more than summarises an area that is considered will be of particular importance to industry in general, and certainly the shipping industry in particular, over the next few years. It is an area that will considerably impact upon management structures and therefore deserves special consideration by every company.

Various management aspects are then discussed in the workpackage – scientific management, total quality management – and then discusses basic management points for organisational development.

The main ship management processes and benchmarking are then discussed in the workpackage and results of surveys carried out by the MASSOP newsletter are included.

The research clearly shows that shipping companies and ship management companies clearly see staff recruitment and development as a very important process – perhaps the most important.

MASSOP newsletter number 8, sent out to more than 1000 shipping companies and individuals suggested that the subject was of such importance that a short course should be developed specifically dealing with this aspect. This is suggested as a future work area.

The newsletter commented on the themes that had been developed in correspondence with several shipping companies. In particular it suggested that the performance of individuals, including the human error aspects is a function of the following and in the order of importance given: -

1. Hire firstly for attitude. Skills can be taught but attitude is fundamental
2. Ability. Qualifications are often essential, but the ability to use these qualifications (which includes experience) is more important in practice
3. Training. A company wide training scheme for all employees is important
4. Supervision/management
5. Company culture, including compensation (in its widest sense)
6. Job design - authority, lines of communication, procedures etc.
7. Work methods and job aids

It was suggested that of these, the first is the easiest and least costly to improve, i.e. via staff selection. The response to the newsletter was very positive with most respondents agreeing with the above points.

It is not proposed to deal with the question of staff recruitment in any depth in this workpackage; this has been dealt with in other MASSOP sections and indeed by other EC projects.

One aspect that has constantly been raised however, is the area of employee satisfaction within the industry. 24 companies were asked the following questions:

1. Other than interviews, do you measure employee satisfaction, i.e. by means of surveys sent to staff?

   2 answered 'yes', 22 answered 'no'.

2. Do you believe that in general companies should measure employee satisfaction?

   22 answered 'yes', 2 answered 'no'.

As with other surveys carried out with MASSOP newsletter companies, this appears to show a marked difference from other industries.

The Benchmark Exchange for example conducted a survey in 1999 together with Siemens Energy and Automation. Of 176 companies that responded, 125 said that they measured employee satisfaction. 51 said they did not.

When asked what tools were used to measure employee satisfaction, the results were as follows:

??	Focus groups	13
??	Interviews	10
??	Meetings	7
??	Opinions/suggestion box	19
??	Performance appraisals	7
??	Surveys	105

The area of employee satisfaction is clearly neglected by many companies within the industry. It is however fundamental of course to organisational development in general and the way the management structures are developed in particular.

Quality systems within companies are also of course clearly affected by employee satisfaction and the employees' perception of management attitudes to this. A classic case is that of Ford. When the quality system was being introduced staff acceptance was a problem. The quality director however commented: 'The real breakthrough occurred at a meeting when someone suggested that our values could be expressed with three *P*s to make them easy to remember: people, products and profits. The most important element was the sequence, with people first.' In a service industry like shipping, the product is of course ton-miles, but the same principle applies.

Hierarchical versus team management is then discussed and the difficulties with flexibility versus formality considered. Then concentration of authority versus structuring of activities aspect is also dealt with at this point in the workpackage.

The MASSOP newsletter correspondence and subsequent discussions with shipping companies led to analysis of **quality-oriented development programs** that are being implemented by shipping companies and ship management companies.

These programs are common in many industries but MASSOP research found little evidence that they are widely implemented in the shipping industry to date. Several companies reported that they had sent staff on external courses for Total Quality Management as a follow-up to ISM implementation. Only a few companies however reported that they had developed a strategy for on-going quality improvement.

The following questionnaire was sent to 24 shipping companies that agreed to participate: -

1. **Do you have a quality-oriented management development program to develop beyond ISM to full Total Quality Management?**

   1.1 Yes – we have a fully organised system with full senior management commitment.
   Only 2 of the 24 answered yes to this
   1.2 Yes – but only to a certain extent, staff members are regularly sent to external courses
   4 of the 24 answered yes to this
   1.3 We have sent people to courses but this is not a regular feature of our staff development program
   12 checked this answer
   1.4 No – we have no such program at present
   6 checked this answer.

2. **Do you believe that shipping companies and ship management companies would benefit by providing training to allow staff members to build their quality knowledge and skills?**

   22 of the 24 answered "yes" to this

3. **Do your staff members who have attended internal or external courses use the knowledge gained to improve the processes within the company?**

   20 of the 24 answered this question.
   6 answered "yes", 2 answered "no", and 12 answered "to a certain extent"

4. **Do you as a company have a benchmarking program to properly assess the quality programs of other companies?**

   All 24 companies answered "no" to this question

5. **Do you believe that benchmarking your quality processes would be useful for your company?**

20 answered "yes", 4 answered "no", 0 answered "don't know"

It is believed that there is a real need for a benchmarking service for maritime organisations. To meet this need World Maritime Organizational Development (WMODev) has now set up this service. (To subscribe email benchmarking@wmodev.com).

Open book management is then discussed and the workpackage gives suggestions for implementation.

The workpackage then looks at **Enterprise Resource Planning** in greater depth. This section is concluded with ERP implementation suggestions that came from brainstorming sessions during MASSOP discussions as part of David Mottram seminars:

- ?? ERP implementation need to be carefully planned
- ?? Process change needs to be carefully considered; if possible implementation should firstly consider today's requirements followed by a phase 2 that adds the new process requirements
- ?? The corporate culture existing needs to be assessed; project management procedures need to be implemented to deal with any negative cultural elements
- ?? A project team needs to be set up and the right people need to be selected for this team
- ?? The people should perhaps be selected for leadership abilities, people who learn quickly, a good mixture of the right technical backgrounds, and willingness to work hard
- ?? As with the ISM Code and quality implementation ideas, upper management support is seen as essential

Suggestions for management when setting up project teams:

- ?? There should be a focus on mission and objectives, and mission critical items in particular
- ?? Management should consider financial incentives for the project team – you will be expecting them to work particularly hard
- ?? Appoint a project manager
- ?? Functional titles should be left outside of the project
- ?? The team should not revisit resolved issues
- ?? Expectations – up, down and across the organisation – need to be focused upon

Teamwork and groups is then considered and the following comments made:

The improvement of management structures in the industry can then perhaps be seen to be essentially about improving teamwork and team interaction. This, together with improving information technology can be

During MASSOP seminars, groupwork and its importance to ship management was extensively discussed. Generally people strongly agreed on the following points:

?? Groups need clear objectives
?? Talking about effective groupwork does not make it happen
?? The members of groups should have open access to the information they need
?? People need to be equipped to work in groups and teams
?? Managers are often reluctant to give up real authority

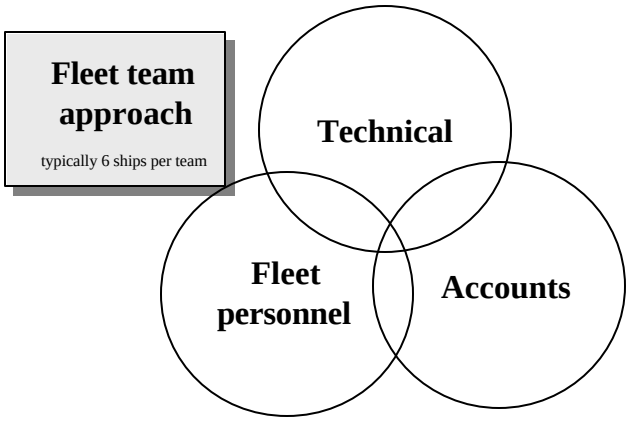
The participants in the survey felt the following were important even though they didn't strongly agree to the same extent as the 4 items highlighted above:

?? Different groups should share a common vision if they are all to move in the same direction
?? People should be rewarded for working in groups
?? Diversity should be encouraged within groups
?? People learn effectively in groups

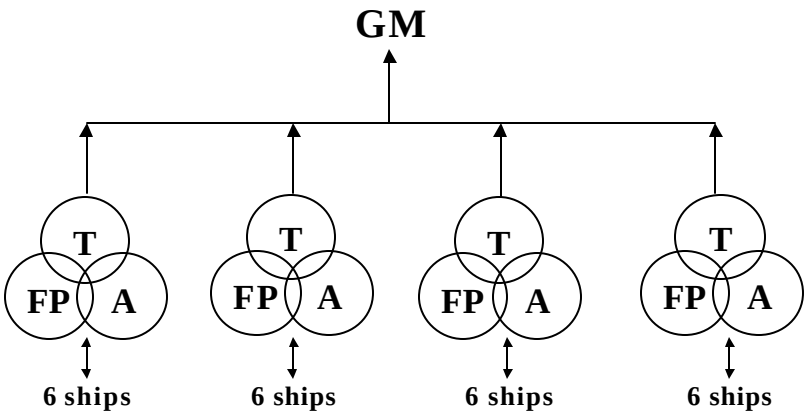
Generally people disagreed with the following points:

?? Responsibility is lost when tasks are given to a group
?? Groupwork slows things up
?? Information technology is a barrier to groupwork

The management structures that can best assist in teamwork and groups was then discussed. A variation on the matrix structure was considered, ie the "cellular" structure; the large shipmanagement companies often adopt this type of structure. Under this system teams work together to manage a group of ships, as is shown in the following sketch:

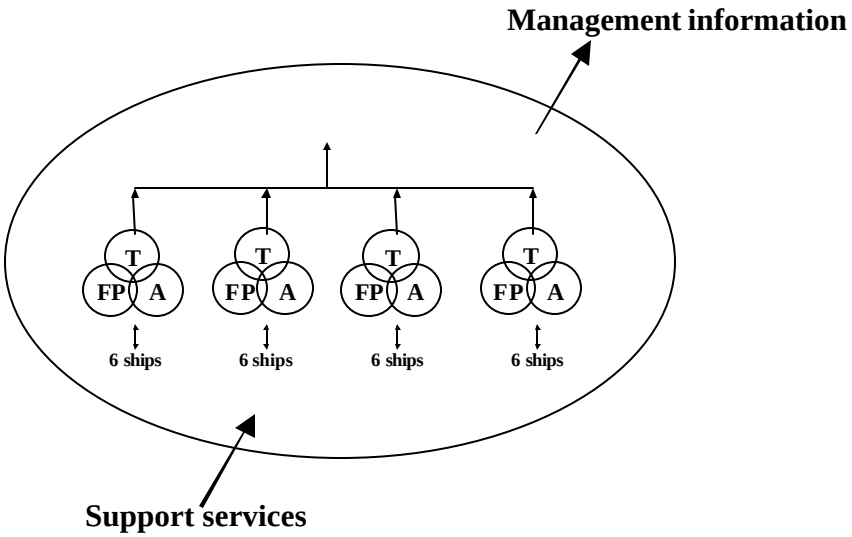


These teams link together as shown in the following:



The ship management teams report to a general manager. The arrangement however is very much working as a matrix arrangement since the technical, fleet personnel and accounts functions in each team are also regularly communicating with their counterparts in the other teams.

The structural arrangement shown above is supported as necessary by other departmental functions, such as IT and purchasing etc, and this is shown in the following:



This has considerable advantages with formalisation and centralisation as discussed above. The processes can be decentralised to the individual cells, with overall centralisation of support services etc.

Organisational development.

One of the main areas highlighted earlier is that in order to change processes and adopt new technology, training for personnel would need to be increased. This therefore is seen as a key area for organisational development.

The MASSOP project survey sent out to BIMCO members requested suggestions for training and educational processes. These summarise the main items received from the participants: -

- More training, more investment in training
- Office staff to spend time on ships
- Joint seminars - office/seastaff - examining problems
- More interaction between office and seastaff
- Focus on specific problems involved in running ships
- Enhanced in-house training
- Identify specific weaknesses and target accordingly
- An emphasis on permanent training

These points were additionally discussed at length in MASSOP seminars. It was felt generally that these were particularly important for organisational development. These points are therefore carried forward to the recommendations.

It was also felt that organisations in the maritime industry should focus upon quickly changing to adapt to the new technology and to develop processes as quickly as possible.

The following summarises the important aspect of how quickly change can or should take place within an organisation. It compares the major areas of incremental or fundamental change: -

Factor	**Incremental change**	**Fundamental change**
Senior management involvement	Symbolic	Essential and substantial
Visibility within organisation	Low or moderate	High
Timescale	Ongoing	Definite period
Activities	Continuous	Discontinuous
Objectives	Organisational development and improvement	Early and significant culture and business change
Effect upon business	Gradual and not usually disruptive	Disruptive
Responsibilities	Usual but increased involvement of staff in development	Special project team heading the developments
Focus	Individual processes/tasks	All processes
Communication	Within departments	Cross-functional
Importance of information technology	Limited – adapted to improving the processes	Fundamental – often new processes are built around new IT systems

Use of groupware	Isolated	Pervasive
Motivation requirements	Limited and tolerant	Fundamental
Risk	Low	High
Impact	Gradual and comparatively small	Relatively large

It is suggested that shipping in general and ship management in particular needs to adapt a mix of these points as follows: -

- ?? Senior management need to be involved, not just symbolically but in a substantial manner
- ?? The organisational development programme needs to be highly visible. This should be seen as an ongoing development from ISO or ISM by all staff and the benefits from the viewpoint of people, products and profits
- ?? The timescale needs to be seen as ongoing but with definite stages with specific dates to meet specific objectives
- ?? The overall objective should be organisational development for the benefit of the people, the products and the profits
- ?? The effect upon the business should obviously be seen as non disruptive
- ?? A special project team should be set up as discussed regarding ERP, but with the intention of ensuring the involvement of all staff
- ?? The focus should be on all processes but with priorities given to the most important processes
- ?? Communication should be increased to include all departments and to supply information in a cross-functional manner
- ?? Information technology needs to be widely but carefully expanded. In some areas new processes will be built around the IT and in others the IT will be used to improve the existing processes. Groupware should be widely used
- ?? Motivation considerations should be given high priority by management
- ?? The risks involved in introducing the new systems need to be carefully considered. The advice of consultants should be sought to ensure that problems encountered by other companies are avoided
- ?? It is expected that while the impact of the development programme will be gradual, it will have a fundamental and positive impact upon the culture of the company

The workpackage then sets out a system for developing a "learning organisation". WMODev (www.wmodev.com) who has discussed this with several shipowners, some of who are now implementing the system described, has called the process being described here "SML Organisational Development". SML stands for short, medium and long term.

THE SML ORGANISATIONAL DEVELOPMENT PROCESS

1. SHORT TERM

The initial consideration should perhaps be to carry out a SWOT analysis of the company - SWOT being strengths, weaknesses, opportunities and threats. This can be carried out internally but it is perhaps better to utilise an external consultant who has experience of working with shipping companies. A consultant can not only bring an external view, but can also share a wider experience of the changes that are taking place in management, technical aspects and staff development. Ideally, the external consultant should discuss with management the proposed analysis areas and then work with internal staff to produce an initial analysis and ongoing recommendations.

An analysis of the key processes should also be carried at the same time and in fact the SWOT analysis technique should also be applied to these processes. Once again, an external analysis is perhaps most useful as internal staff are often too involved with the processes to take an unbiased view of the SWOT aspects.

The consultant working with the company management then needs to highlight several key staff within the organisation. The object of this is to identify the strategy that will develop the company's processes and create a learning organisation.

A short in-house course (around one week) is then given for these key staff. The object of this course is to develop the key staff who will act as catalysts for change within the organisation.

The course syllabus includes:

Organisational philosophy. Understanding the basic business strategy of the company and how it can be developed to advantage based upon the SWOT analysis. Discussions of how the belief system and attitudes within the particular organisation work and how these can be enhanced to work more productively.

Organisational economics. Understanding the basic business systems of shipping and ship management. Understanding the business systems within the organisation and discussions on how these can be improved and developed.

Process analysis and development. Understanding the basic processes of the industry and discussions about the strengths and weaknesses of the processes within the organisation.

Staff development. Analysing the tasks within the processes and discussions on development and training necessary to perform and improve these tasks.

Problem solving and decision making. The various techniques for these essential skills are outlined. Discussions are then held on how to apply these techniques within the organisation.

Reflective and transformational learning. How to think about and question assumptions regarding the business. How to bring about the changes necessary in tasks, teams and individuals

Open-book management items. This includes providing a full understanding of:

?? Balance sheet
?? Income statement
?? Cash-flow statement
?? Sales and marketing plan
?? Capital plan
?? Inventory plan
?? Organisational chart
?? Compensation plan

As early as possible in the SML Development process it is suggested that a staff information meeting be arranged to inform all staff of the developments that are taking place within the company. The in-house communication systems and the Intranet within the organisation can also be used to speed up this process and to ensure the involvement of all staff. Suggestions from staff need to be welcomed and where useful, incorporated into the development plans.

2. MEDIUM TERM

In the same sense that an external consultant is perhaps useful to developing a framework that can help a company progress to being a learning organisation, it can be useful to hire staff specifically to speed development. These new staff members can be either to replace existing staff, or to cater for expansion, or as additional staff intended to specifically accelerate development.

The resistance to change that can be a part of the existing staff culture does not hamper new staff. The key question is perhaps, what characteristics should the new staff have? If a faster learning program is to be successful it will help if in this sense, the new staff are faster learners and possess skills in more than just their functional area.

Three key skills are necessary in all organisations. These are:

?? Technical skills. These relate specifically to functional expertise
?? Managerial skills. These relate specifically to team leadership and membership
?? Business skills. How to run a team as a business unit

Very often candidates for new positions are chosen only upon one or, at the most, two of these skills. It is important that new staff members chosen to accelerate development are chosen with reference to all 3 of these skills.

This concept then needs to be incorporated into the hiring and staff development practices of the organisation. Upon hiring, these new staff should be given the benefit of the course outlined above. At the same time, other staff can be given the course.

For these new staff, and for selected existing staff, additional in-house training in organisational strategy, project management and business economics would be useful at this stage.

3. LONG TERM

The foundation for building a long term learning organisation can be summarised as spreading the knowledge of managerial skills – which really includes business skills – to *all* staff. This can be summarised by giving a new meaning to the acronym MASSOP

MAnagement **S**kills **S**upplementing **OP**erations

The process then continues with benchmarking – as described elsewhere in this workpackage.

The whole learning organisation procedure then really requires 3 items in particular that need to be stressed:

?? Management commitment
?? Improved communications
?? Continuous review

Workpackage 7 includes the following in its conclusions:

Some general points from MASSOP research

In the Points for Consideration section of this report, the following points were noted as recommendations: -

1. The sheer volume of regulatory matters influences management structures. Wide concern was also expressed about the liability issues involved. The general feeling however was that these regulations exist and will continue to do so. The consensus was that they will probably continue to grow and that the industry has to live with this. The conclusion may be to suggest that ship management structures need an adequate source of advice for these matters. This may be difficult for smaller companies unless they are somehow linked. Management structures need to be assisted by better knowledge and an ongoing source of this knowledge, with regards to the regulations. The Internet and an external source of advice may be the best means of overcoming the management structure requirements, certainly as far as the smaller shipping companies are concerned. This is intended to form part of the section below on 'external factors'.

2. There a positive correlation between quality systems and financial performance as is shown by research from other industries. However, it is necessary to focus upon companies that have not just implemented these systems, but implemented them effectively. Benchmarking is widely used by most industries and shipping organisations should utilise this process more. Once again this forms part of the external factor considerations below.

3. There is a need for management systems to be responsive to the attitude of seastaff. Later it is concluded that this could be best achieved by means of

simplified and more direct reporting systems, together with in-house seminars for sea and shore staff. This is part of the culture that exists within the organisation and is dealt with below under 'internal factors'.

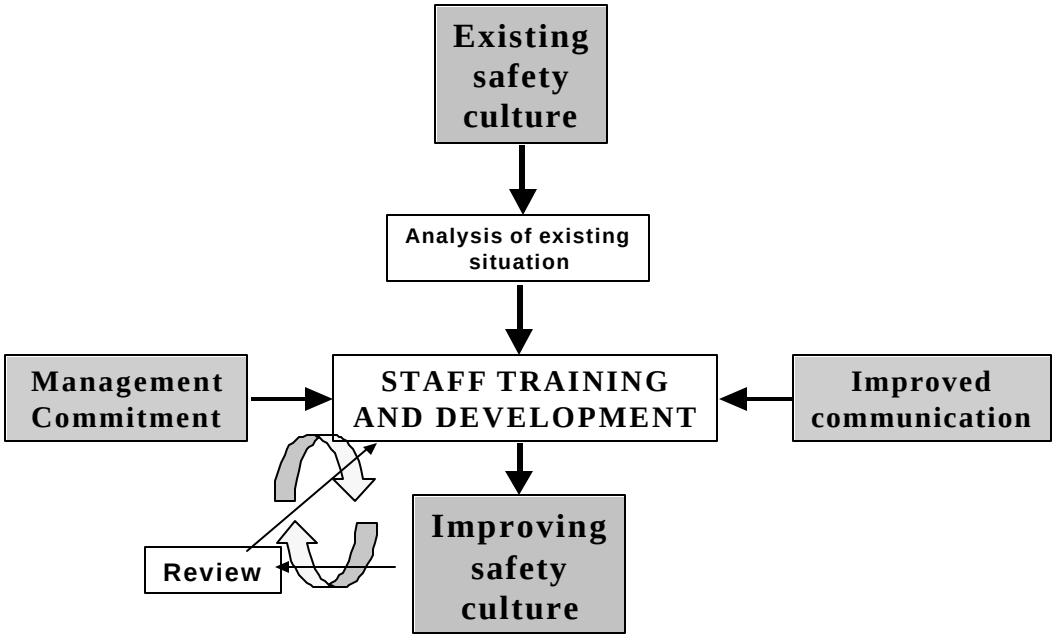
4. There is a need to encourage the reporting of near misses. It was suggested that the industry, and individual companies, focus on fixing problems rather than fixing blame. Once again, this is seen as a cultural situation and is dealt with under internal factors below.

5. There is a need for companies to recognise the significance of item 1.2.2.2 of the ISM Code, i.e. to *'establish safeguards against all identified risks'*. It was suggested that these should be looked upon in 3 categories – procedural risk control, active risk control, and inherent risk control. This is detailed in MASSOP workpackage 4.

6. There was a strong feeling that shipping companies should work towards trying to establish continuity of seastaff. The same consideration was given to shorestaff. Dr. Corres commented "One should not forget there is a great number of alternative occupational opportunities ashore with less complications and lower exposure to risk, which no doubt will not be disregarded". Retaining and developing staff throughout the organisation is therefore seen as a key factor for success.

7. Improving the safety culture requires perhaps a new management commitment. In this sense these 3 items - loyalty, continuity and training - should be seen as fundamental to any shipping organisation's strategy.

Training should really be looked at as an integral part of improving the safety culture, as suggested in the following diagram: -



8. These 3 items – loyalty, continuity and training are seen not only as fundamental to developing an improved safety culture, but also as fundamental to establishing more on-board decision-making. This is seen as essential to the development of a more efficient and effective ship-shore interaction.

9. Maximum use of developing technology should be made for on-board staff familiarisation.

10. Staff recruitment should be given particular concern by the industry and the individual shipping company.

11. The tasks involved in operating ships need to be reviewed by the industry and the individual shipping company. The principles of job design should provide for: -

- ?? Variety
- ?? A meaningful task
- ?? Optimum work cycle
- ?? Control over work standards and feedback of results
- ?? Preparation and auxiliary tasks
- ?? Use of valued skill and knowledge
- ?? Contribution to end product

It was felt that some of these points are clearly missing from jobs on board ship. Variety is often difficult to introduce and the seafarer does not see his contribution as meaningful in many organisations. The work cycle is often not optimal either for the individual or the task. Watchkeeping routines seven days a week can be difficult and long sea service periods do not fit in with modern lifestyles for most people.

But it is perhaps in the last four points that the ISM Code perhaps worsens the situation in many or most companies. Seafarers in general no longer can believe they have control over work standards and there was no involvement in the preparation of the procedures - the ISM Code manuals and documentation have been "dumped" on most ships with no consultation. There is usually no feedback except in the negative sense – i.e. when non-conformities occur. Once again it is considered that the only possible solution is to provide more direct involvement of the ships staff in decision making – i.e. onboard ship management teams and greater levels of decentralisation. It was also felt that seminars should be regularly given for office and shore staff where job design principles could be discussed. At these seminars all staff, in both sea and shore positions – and at all levels - could be made more aware of the advantages that could be obtained from better job.

12. The following points were also considered intrinsic factors for consideration during in-house seminars with regard to the work on board ship and the development of career structures:

- ?? Does the work provide achievement? - Perhaps, but probably not much
- ?? Does the work provide recognition? - Rarely
- ?? Is the work attractive? - Probably less so than at other times. Certainly this is true for European officers
- ?? Does the work provide responsibility? - Probably not in any real sense that could provide satisfaction
- ?? Does the work provide advancement? - Not any more than the normal promotional prospects for officers at sea

13. A reality is that it will no doubt be necessary for staff to work simultaneously in different organisational structures. For one task they may need to work as part of a team. For another task - perhaps even at the same time - they will need to work as an individual, perhaps as part of a "command and control" system. This dual functionality needs to be stressed during the training and development periods for staff.

14. Job performance, including avoiding errors, was seen to be a function of:

    a. employee ability and motivation
    b. employee training
    c. supervision/management
    d. company culture, including compensation
    e. job design (dividing all the work into jobs for individuals)
    f. work methods and job aids

    Of these, it was considered that the first is often the easiest and least costly to improve (through selection).

    In this sense then, it is considered to be very much in the shipowner's interest to not only select staff carefully but also provide a high level of training for staff. The general concern however of many companies was that many of their staff were with them for short periods, i.e. they paid for training for staff and these staff were subsequently lost to other companies or other industries.

While this point is accepted, it was generally considered during MASSOP discussions and seminars that a figure of 6% of payroll was a useful benchmark for companies to consider for training costs.

Workpackage 7 concluded with the following points:

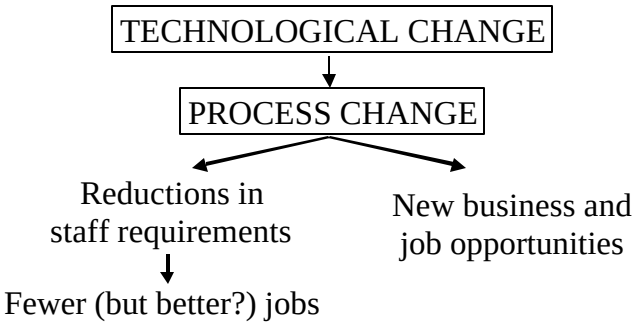
The change from sail to steam changed the management structures, the technical aspects, and the staff development needs of the processes, and thereby changed the industry. In the same sense, the effects of technological change in general, and information technology in particular, are now changing the processes involved in ship management. The change was shown to be three-dimensional. Going from the "traditional" shipowner type organisation to the "future" organisation is basically related to changes in the processes involved. This then requires organisations to go through a transitional period.

There are then two ways to proceed. This can be either by:

1. Process improvement – i.e. habitual incremental improvement, or
2. Process change – i.e. re-engineering

In MASSOP discussions it was considered that some processes might lend themselves to radical change – particularly where significant new technology developments were involved. Other processes might benefit from more gradual change. Whatever the case, all involved believed that a greater focus on process development is necessary for most companies. This not only has the benefit of improving the efficiency of the processes, but also in improving the effectiveness of the staff involved and providing a better more open organisational culture.

The effect of radical process design however can effect the situation with organisational structure. Some jobs that exist may be lost with process changes. Technology change usually brings fewer jobs, but hopefully these are better jobs. This is shown in the following sketch: -



The main object therefore should not only be to produce fewer but better jobs, but also to develop new business and job opportunities.

The effects of E-commerce and business-to business (B2B) developments were considered. It was suggested that shipping companies without a functional e-commerce component in the next few years will be the equivalent of businesses decades ago that failed to install a telephone system when that technology came along. It then suggested a system for implementation of the changes that will be necessary for a company to go through.

Various management aspects were also considered – decentralisation, total quality management, and generally making the organisation more centred on teamwork and openness.

Finally, organisational development was considered and this specifically focused upon the staff development area highlighted as part of process development above. The main key items received from participants during the research were:

?? More training, more investment in training

?? Office staff to spend time on ships

?? Joint seminars - office/seastaff - examining problems

?? More interaction between office and seastaff

?? Focus on specific problems involved in running ships

?? Enhanced in-house training

?? Identify specific weaknesses and target accordingly

?? An emphasis on permanent training

A suggestion for organisational development was then put forward. This suggested that a company should become a "learning organisation" and a process for this, together with a syllabus for an in-house development course was developed. This process looked at the development from short, medium and long-term needs.

To summarise, it could be said that the object of modern management should be to:

?? Improve the processes by which the ships are run and the businesses managed – suggestions are given for this in this workpackage
?? Improve IT systems – the area of business-to-business (B2B) processes is particularly highlighted
?? Improve communication – both internally and externally
?? Improve teamwork throughout the organisation
?? Improve training systems
?? Improve staff recruitment – both within the industry and the individual company

5.8 Workpackage 8

This workpackage provides a cost benefit analysis. The authors comment that it stems as the result of previous MASSOP work, as described in Work Packages 1 through 7, in the form of the synthesis of benefits and costs that are expected from the implementation of the ISM Code.

WP 8 comprises of two Chapters:

Chapter 1 consists of a summary of overall costs and benefits resulting from ISM Code implementation and of a description of the method that can be applied for the estimation of related net benefits by the actors involved or interested in this field.

Chapter 2 describes real cost elements and economic impacts related to the implementation of the ISM Code and a view of the economic impacts if new concepts for management structures for shipowners and ship operators can be implemented.

The workpackage provides a summary of the types of ISM Code related costs and benefits in the shipping industry together with general guidelines for applying the cost – benefit evaluation. It comments:

An issue is who will pay the costs for implementing the Code. This must be tackled at all levels:

- The level of individual company, in line with expected increase in profits. Smaller companies have higher operating costs per unit, due to lack of economies of scale. Also, smaller companies have more difficult access to bank financing and usually no access to the stock exchange. Finally, small companies usually perceive investment in ISM Code implementation as of higher risk, regarding its effects on improving market position and revenues.
- The level of collective organisations, in line with benefits expected for the industry as a whole. This may imply that some aspects of Code description, dissemination of information etc., as well as some market research projects (the output of which can be used by individual firms in their own assessment of costs and benefits) can or should be financed by the collective organisations (e.g. the various Shipowners Associations, IACS etc.), if benefits expected for the industry as a whole warrant it – although it is in fact possible that larger firms may be satisfied by reduction of competition from the smaller firms that are incapable of implementing the Code.
- Society as a whole (e.g. through the general budget, grants, tax exemptions etc. to companies of limited financial ability that implement the code), to the extent that related net benefits justify it – e.g. maintaining work positions provided by the smaller companies in problematic areas, avoiding oligopolies and promoting competition, insuring cleaner environment, reduction in social security payments, value of human life etc.

In fact, the above argument leads to the position that, in some cases, investments in ISM Code implementation by firms facing difficulties in financing related outlays can or should be subsidised.

Real cost elements are discussed and it comments:

Costing measures that are taken in the interest of safety or environmental protection - by setting up and maintaining a safety management system - is notoriously difficult. The experience of other industries in coping with the regulation has been drawn upon, and quality costs are estimated at between 4% and 25% of Company turnover; advantages stemming from the more systematic approach to safety management was also touched upon and this topic is returned to with regard to the shipping industry.

The cost of financing safety and environment protection measures applicable to ships, in the end, might be expected to fall almost entirely upon ship owners. In general, the implementation of the ISM Code increases burden on the ship owner. The coming years will show in how far the additional costs can be compensated by the benefits.

In the meantime many treatises have been published about costs and benefits regarding implementation and running costs of quality systems in shipping. In the following statements from shipping companies and shipping experts about actual and estimated costs are summarised.

A wide analysis of operating cost elements is carried out in the workpackage. It concludes with cost reduction possibilities and suggests:

"New shipment seaport management structures may result in reducing the personnel which will be used on board ships from the average number of 21 seamen today to 12 persons, corresponds a reduction of about 18 % of the ships' daily costs.

However, apart from the direct reduction of costs we have a number of other economic factors, which will be affected downwards.

The P & I insurance premiums could be negotiated on a reduction tendency. The use of information technology on board ships with a prerequisite for the new management structure will produce further savings.

We therefore believe that a revised new seaboard management may produce an overall saving of up to 25%."

6 Conclusions

The whole scientific and technical description of the project given in the sections above are, in essence, findings and conclusions of the project. All these conclusions were summarised and presented in workpackage 9 of the project.

MASSOP basically recommends that companies should:

- Improve the processes by which the ships are run and the businesses managed – suggestions are given for this
- Improve IT systems – the area of business-to-business (B2B) processes is particularly highlighted
- Improve communication – both internally and externally
- Improve teamwork throughout the organisation
- Improve training systems
- Improve staff recruitment – both within the industry and the individual company

Suggestions for these points have been given, particularly in workpackages 5 and 7. Many of these recommendations have been discussed with shipowners and their staff in seminars, which are outlined in the list of publications, conferences and presentations given below in section 7 of this report.

A major vehicle for dissemination however, is the MASSOP website and newsletter. The newsletter has already covered a wide range of the aims and objectives of MASSOP and led to wide discussions and involvement of the industry. The newsletter is intended to be ongoing and the conclusions will be issued to the many subscribers. The response to the newsletters' contents will also be fed back to the subscribers and hence the project itself will be ongoing in this sense.

The conclusions of MASSOP include a recommendation for an organisational development process called "SML Organisational Development" where SML stands for short, medium and long term. This process is outlined in section 5.7. above on pages 86-88.

7 List of publications, conferences and presentations from the project

The following outlines the dissemination that has taken place and outlines the ongoing intentions of the website (http://www.massop.com) and newsletter

1. BIMCO Weekly News article - February 1998
2. PRESS RELEASE
   "Assessment and development of new concepts for Management Structures of Shipowners and Ship Operators - MASSOP"
   Press release by Rogan Associates - Athens 16th February 1998
3. PRESS RELEASE
   "Neue Konzepte für Managementstrukturen für Schiffseigentümer und Schiffsmanagement Gesellschaften"
   Press release by PTC - Bremen February 1998
4. "RISK ASSESSMENT AND THE ISM CODE"
   Together with an introduction to the MASSOP research study
   David Mottram - "Safety Risk Assessment in Shipping" conference
   A paper - London 19th February 1998
5. "MANAGEMENT STRUCTURES FOR THE MARITIME INDUSTRY"
   Together with an introduction to the MASSOP research study
   An article - David Mottram - BIMCO Bulletin April 1998
6. "STCW - DIFFERING INTERPRETATIONS AND DIFFERING LEVELS OF COMPLIANCE"
   Together with an introduction to the MASSOP research study
   David Mottram - STCW conference
   A presentation - London 13th May 1998
7. "RELIABILITY EFFECTS WITH REGARD TO MODERN MANNING STANDARDS"
   Together with an introduction to the MASSOP research study
   David Mottram - 22nd CIMAC International Congress
   A paper - Copenhagen 18th May 1998

8. "MASSOP - THE PROJECT - INTRODUCTION AND DISCUSSION"
   A presentation to all students of the class of 99
   David Mottram - World Maritime University, 16th June 1998
9. "SHIPPING OGANISATIONAL STRUCTURES - THE PRESENT AND THE FUTURE"
   Together with early observations about the MASSOP research study
   David Mottram - "STCW 95 - Practical Considerations" workshop
   BIMCO Residential Course
   A presentation - Copenhagen 17th June 1998"
10. "PRACTICAL METHODS FOR DEVELOPING A PROACTIVE SAFETY CULTURE WITHIN THE ORGANISATION"
    Together with early observations about the MASSOP research study.
    David Mottram - "Beyond ISM" conference
    A paper - London 24th June 1998
11. Patrick Donner (WMU) participated in CAMET 7 in Lisbon on Wednesday 9th September and in the workshop on the human element in the maritime field on the following day. On these occasions he presented some details of MASSOP progress.
12. "MASSOP, RISK ASSESSMENT AND THE ISM CODE"
    David Mottram - "Safety Risk Assessment in Shipping" conference
    A paper - London 15th September 1998
13. "MASSOP", David Mottram – Maritime Seminar. A paper – Hogeschool Zeeland Maritime Faculty, Vlissingen, The Netherlands. 9th October 1998
    David Mottram also acted as chairman and MASSOP was widely discussed. The conference was attended by around 200 people from the maritime industry. MASSOP external assessor Michael Grey also attended.
14. RISK MANAGEMENT AND SHIPPING
    A one-day lecture by David Mottram at the Swedish International Development Association (SIDA) International Training Programme in Gothenburg on November 8th. The training programme was attended by some 25 senior maritime personnel from 20 countries. MASSOP was presented and the "Points for Consideration" referred to in workpackages 3 and 4 were discussed. The feedback from this will be incorporated into workpackage 7.

15. CDG ISM Seminar at WMU with some 25 delegates from around the world. David Mottram chaired the conference. MASSOP was presented and the "Points for Consideration" were discussed. The feedback from this will be incorporated into workpackage 7.
16. BIMCO REVIEW 1999

    Article by David Mottram – "The Management Structures of Shipping Companies"

    The article discusses MASSOP and some of the results of the survey of BIMCO members.
17. MASSOP website (http://www.massop.com) set up during December 1998
18. MASSOP newsletter introduced end January 1999

    This newsletter now goes out to several hundred shipping companies and individuals and it is intended that this should be on-going. As mentioned above, at the end of 1999 it provided guidance, advice and discussion for more than 1500 companies and individuals within the industry. It is expected that this number will considerably increase as future editions of the newsletter are published. It is also suggested that the original concept –analysing the maritime world and providing development advice – will grow to the benefit of not only European Union organisations, but also the global industry.