Implementation of the ISM Code in a Government Fleet

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Abstract

The Canadian Coast Guard is not required to comply with the International Safety Management (ISM) Code, but nonetheless has decided to do so, and, in addition, has decided to seek registration to the ISO Quality Standard ISO-9002. This paper explains why they have decided to do so, what were the governing factors in determining their approach to compliance and what lessons they have learned as they moved through the initial steps to compliance. It offers some suggestions on methodology, pitfalls and critical success factors in achieving ISM Code and ISO-9002 registration.

Introduction

Until April 1, 1995 there were two major civilian organizations responsible for the provision of marine transportation services to the Canadian Government. The first of these, the Canadian Coast Guard, under the auspices of the Department of Transport (DOT) which was responsible for the provision of marine transportation services, supported four major client groups - Marine Navigation Services, Icebreaking, Marine Search and Rescue and Environmental Response. The second, the Vessel Management Directorate of the Department of Fisheries and Oceans (DFO), provided service and support to two major clients that were responsible for managing the ocean's resources. These were DFO's Fisheries Conservation and Protection Service and the Marine Sciences Program, which also included Hydrography. As one might expect, the organizations had differing views on how to manage their fleets; the Coast Guard focused on asset management while the DFO Fleet focused on client service.

Effective April 1, 1995 the fleets were amalgamated as a result of a decision to reassign the responsibilities of most of the Canadian Coast Guard to DFO, At the same time that this was happening, both organizations were independently examining the ISM Code to determine how best to respond to this new IMO initiative. An immediate impact of the amalgamation was that the review activities

were now combined into a single effort, which included not only the two major groups within the combined fleet, but also stakeholders from organizations external to the fleet. Among these were the Coast Guard's Maintenance Policy Branch and the marine safety regulators, who remained with DOT. The purpose of the review was to determine whether the Coast Guard Fleet should comply with the ISM Code, and if so, how best to achieve that goal. Ultimately, the review led to the conclusion that compliance was not required for government fleets; however, compliance was a sensible thing to do. There were several reasons for this position, and the purpose of this paper is to convey how that decision was reached, to outline the strategy for achieving compliance and to provide some insight into the plans for implementation.

Getting Organized

The single largest part of the process to reach a decision on the Code was providing the participants in the decision with a sense of what the Code entailed. The Coast Guard has a rich maritime tradition and a reputation for "getting it done," frequently without benefit of a lot of paperwork. We rapidly realized that the practice of only providing broad guidelines to the Commanding Officers (CO's) about the plans for a given deployment was not appropriate to the ISM Code. The concept of moving to a management structure that required detailed working practices to be spelled out for all the things previously entrusted to the Commanding Officers and Chief Engineers to manage was difficult to swallow.

The issue of the differing cultures between the Coast Guard and the old Vessel Management Directorate of DFO also had to be resolved. The harmonization of the disparate management styles into a cohesive set of "best of breed" business practices was urgently required. In addition, this work had a very short timeline, since amalgamation of the separate fleets into a single fleet occurred overnight, with only one year to tie up all the loose ends. Starting with fundamental cultural differences and having

to rationalize all the business practices placed enormous pressure on the fleet, to the extent that the ISM Code could easily be seen as yet another distraction.

Simultaneously, DFO had to absorb a major budget cut, which required the fleet to eliminate many functions, reduce crew sizes, reduce operating schedules and make major changes in everything from cabin service to watch schedules. Many of these reductions were attached to cultural touchstones for the employees, and in particular, to the officers. The ISM Code initiative was viewed by many of them as just another exercise in cutting away at their authority and their resources. Already defensive, their resistance was expected to rise.

Despite all of the above, early efforts to amalgamate the business activities led to the identification of a significant number of "best practices" that the organization undertook to institute throughout the combined fleet. These included a common configuration management system, introduction of an activity-based costing process, development of detailed environmental management plans, improved methodologies for functional reviews and fleet mix determination, introduction of a condition-based maintenance policy and improved maintenance management. The ISM Code and ISO-9000, while seen as potential "best practices," were nonetheless seen as yet another initiative that a headquarters staff, reduced from 178 to 66 over the past few years, would have to absorb and manage without additional staff.

However, it also became evident on further exploration that the ISM Code included a number of large benefits to our organization. The first of these was that the nature of the industry was such that implementing the Code would provide us with 90% of the requirement for ISO-9002[1] compliance. The only significant disparity was in the area of contract review as a means of confirming client satisfaction, a reasonable practice in any case, and one worthy of consideration on its own merits. Compliance with the ISO-9002 Standard, while also not compulsory for the CCG Fleet, or for any organization, is rapidly becoming the accepted standard for quality assurance in all industries world-wide. The Canadian Coast Guard is beginning to insist that contractors comply with it and recognizes that any attempt to expand the client base will, necessarily, require compliance as well.

A second benefit was that the Code would provide a means to validate that the practices and procedures in place were as safe as they could be under the circumstances. The reality is that the work undertaken by the CCG Fleet presents, even for the professional mariner, a safety risk. Proceeding up to a floating buoy to lift it out of the water, boarding fishing trawlers from small boats 200 miles out at sea in poor visibility and force 4 seas, and performing dramatic rescues in declining weather on a lee shore are not for the fainthearted. However, it is frequently possible to detect and eliminate potentially unsafe practice in advance of an incident, rather than reacting to an accident later. For example, selection of the right equipment for the task, combined with proper fitment in an engineered way made a significant difference in the safety and weather window available for the conduct of offshore boardings. The ISM Code would focus the organization on these efforts.

A third benefit of ISM Code and ISO-9002 compliance is that the Coast Guard would continue to show leadership within the Canadian maritime community. Unlike the U.S. Coast Guard, the Canadian Coast Guard is a fully civilian service. Most officers carry commercial certificates and they are represented by the same union that represents most of the private sector officers in Canada. The Fleet is maintained and safety inspected to the same requirements as commercial vessels. Finally, the Canadian Coast Guard is Canada's largest civilian shipowner, with a fleet replacement value nearing $3 billion, employing more than 3,000 people and operating in all three oceans upon which we border. Although compliance with the Canadian marine safety regulations is not compulsory for Federal Government vessels, the Canadian Coast Guard has always sought compliance and in many instances has taken on the additional role of acting in leadership as new initiatives in the industry have appeared, from periodically unattended machinery spaces to compliance with traffic management practices. It is fully recognized that industry will find compliance with the Code to be an onerous provision. However, the CCG Fleet can show them that it can be done, and done well, which should provide them with solid evidence that will overcome some of the resistance.

Other Factors

While the above benefits are easily identified, and compliance with both the ISM Code and ISO-9002 are sensible things to do, there are other factors involved. The first of these is a requirement for all Canadian government agencies to clearly define their client base, identify their needs and establish the means to confirm that the services pro-

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1   The ISO-9000 series of standards provide for the establishment of models for quality systems. The ISO-9002 standard specifically establishes the model for quality assurance in production, installation and servicing, and is typically considered useful for service-based organizations, such as transportation.

vided meet the needs first expressed by the client. This requirement in fact bridges the gap between ISM and ISO-9002, but does so in a very explicit way. It institutes a complete series of detailed instructions on everything from training of client services staff (ship's crews) to client feedback. Compliance with this series is required for all agencies effective April 1, 1996, and while it is possible to comply without a formal quality system, doing so made little sense in view of the close correlation between the ISM Code and ISO-9002.

There is also concern over the perception within our client base and the maritime community generally that we are not the "lean and mean" organization we claim to be. Instituting a quality system through ISO-9002 that is clearly focused on fiscal responsibility in addition to safe operations should provide fleet clients with the assurances they need in discussing levels of service with the maritime interests they support, who will be paying for the service as cost recovery proceeds in the industry.

Finally, instituting a quality system should give the CCG Fleet the capability to eliminate some of the irritants in current processes, such as writing lengthy reports that rarely get read, requiring senior management approval for routine activities and having complex ways of doing simple things.

Achieving Consensus

Upon completion of the analysis, the conclusion was reached that the implementation of the ISM Code as an integral part of a larger quality approach was a good thing to do and, in fact, that the quality approach would provide us with a common frame of reference, or backbone, to coordinate the implementation of all the other initiatives underway. The decision to proceed was based on a number of factors:

- In order to continue to maintain the image as a leader in marine transportation management, the CCG Fleet had to retain the DFO focus of client service, while ensuring our assets were well cared for;

- Maintaining a visible link to the Coast Guard motto: *"SALUTI PRIMUM AUXILIO SEMPER" or "SAFETY FIRST SERVICE ALWAYS"* meant that demonstrable proof of our commitment to safety was required;

- The CCG Fleet had to ensure that operations were conducted as efficiently as possible by eliminating duplication of effort, ceasing effort undertaken without reasonable benefits obtained, streamlining management to place more decision-making power at the scene and stand-

ardizing work processes centered around the simplest way of getting the job done; and

- The response to a client's requirement had to demonstrate that it was the minimum necessary to ensure that the need was addressed effectively, by addressing such matters as occurrences of perceived gold-plated vessel construction standards, the use of large vessels to do small vessel jobs and the retention and assignment of older inefficient vessels in lieu of modern or modernized ones.

When the Commissioner was briefed on the results of the review, his commitment to the initiative was immediate and wholehearted. While recognizing that resistance was inevitable and must be acknowledged and addressed, his confirmation that the approach was both appropriate and important to achieving success for the Fleet of the Future ensured solid support from management as we moved towards implementation.

To provide the focus for the initiative, a simple, brief, quality policy statement or vision statement, was prepared. It was intended to express our values and principles, and it reads as follows:

> The Canadian Coast Guard (CCG) Fleet is a service-focused organization committed to providing safe quality sea and air support to our clients.

> We do this in a way that ensures quality support at reasonable cost.

> We ensure that all operations are conducted in such a way that:

> - our seaborne, airborne and shore based personnel are active participants in the development, improvement and use of safe, efficient and effective delivery mechanisms,

> - risks are identified and measures are taken to mitigate them,

> - our employees, clients and assets are protected from unsafe acts, and

> - the environment is safeguarded from harm.

These three pillars of a focus on quality service at reasonable cost in a safe and environmentally sensitive way are illustrated in our logo, which is shown in Figure 1.

Plan Development
The implementation plan began with the development of a set of principles intended to guide us throughout the process. Prime importance was placed n having a very

good understanding of who the clients are, what their expectations are and how they could best be met. The motto of "Delight the Client" was adopted to express a positive approach to this issue. Part of this effort involved agreeing on who the clients really were. Clients are typically thought of as the end users of services (the navigators, for navigation services, for example). However, the CCG Fleet could not meet their individual and diverse needs directly. Furthermore, Federal programs already existed to deal with the public; these internal programs that determined how best to meet the public's requirements were our real clients. The CCG Fleet merely provided the platform, the personnel, and the expertise in delivering the services they proscribed.

Secondly, it was crucial to know and document how our services were delivered and what processes were involved in doing so. While recognition of the Fleet mindset and culture were important, and a large part of the culture included providing the Commanding Officers with considerable autonomy, the processes used in service delivery had to meet the four values of being client-based, safe, efficient and effective. The CCG Fleet cannot continue effectively achieving these values and maintain an informal approach to vital processes in an increasingly complex arena.

At the same time, many of the "re-engineering" efforts reviewed during the analysis phase were fundamentally flawed in failing to recognize the importance of this issue and ignoring the actual performers of the work as tasks were redesigned. Therefore the motto of "We do most things right" was adopted for this issue and the nature of the implementation plan ensured that the personnel at sea and in the air would be heavily involved in the description of our work processes.

Thirdly, the initiative was pinioned on knowing and empowering the Fleet personnel. The days when management could order and the workers would blindly obey are gone forever. Leaders now must lead, inspire, facilitate and encourage so that everyone may follow - a concept markedly different from what many are used to as managers. Managers were used to using a lens to look down on the workers, ensuring that they did what they were told. The workers looked up at management through the lens and saw their managers watching. Today, managers are required to literally turn 180° and must now look outwards, charting the course to further growth and security. The employees, rather than seeing us watching them, will see us leading the way towards a common vision that they helped develop. They must be empowered to act with self-assurance, which requires clearly established lines of authority and accountability. We must help them develop clear descriptions of the work processes and procedures they use to do their job so that the work can proceed as we

intend, then provide management trust and confidence in them, allowing them to get on with the job.

Finally, measurable results of the efforts were expected. It was imperative that measurable results of the initiative's impact be available, not only at the big ticket level of seatime, but for all the internal services provided, to each other and to the clients themselves. Every work process has a cost and a benefit. Unless the benefits and costs could be identified, no logical decision on whether a process was worth doing was possible.

These four principles are illustrated in Figure 2.

The Policy Manual
Systems developed to support the ISM Code and ISO-9002 generally have three levels, or tiers, with the highest tier being a brief policy manual that states the intent of the program in specified areas identified in the Code and/or Standard. The second tier consists of procedures, which define how the intent will be put into practice. The third tier contains work instructions, checklists, forms and similar documents used to elaborate on the procedures or report on their use. This document structure is shown in Figure 3.

As an example of how it works in practice, in our documentation, Chapter 3 discusses client consultation and Policy 3.1 describes when clients must be involved in our work. While the second tier documentation has not yet been completed, a section of it, perhaps 3.1.2, will refer to how we go about meeting the client's requirements without making major changes on the make-up of the Fleet, through alterations, adding new structures or providing for bolted on equipment packages, from winches to container labs. A third tier document will include ways to encourage participation from the client, forms that may be used, etc., all of which will be numbered 3.1.2.X, depending on where it fits hierarchically.

The first tier document is crucial to the success of the system development and its preparation must be undertaken by Senior Management themselves. It is not enough to merely state that quality, safety and environmental stewardship are priorities, they must show that they mean it. In our case, that meant that senior managers gathered in Toronto in the middle of July, 1996 and wrote the manual, from top to bottom, in five days. While this was an ambitious undertaking, it highlighted the importance that management attached to the program. With that done, we could then begin work on the next tier documents.

Empowerment
Employee involvement in the further development of the ISM Code/ISO-9002 implementation was considered the key to success. This was not a superficial attempt at employee buy-in but rather a concerted effort to ensure

that the employees had the opportunity for meaningful involvement in the design and development of a new and integrated CCG Fleet Quality, Safety and Environmental Stewardship Program. Involving the employees depended largely on three components of the implementation plan. The modeling methodology used in developing the system would have to be simple and effective for employees to learn and utilize. The technology would, likewise, be user friendly and accommodate the broadest range of employee capability to access, generate, and use the data, Finally, the implementation plan must include the front line employees, the actual service providers, in the work of designing and developing the system.

The Methodology

An appropriate methodology had to be found or developed that would permit all levels of employees to describe their tasks and processes in a manner that was both simple, efficient, and useful. Currently many methodologies exist, however most use complex graphical representation and require modelers with years of experience to create and decipher the process models. Clearly these were not suitable to the CCG Fleet approach of broad based employee involvement. A methodology and language that fully met the CCG Fleet requirements was identified - IDEFO[2] is a well known standard for diagramatically describing industrial functions and processes. Initially developed by the U.S. Air Force in the 1970's, the methodology was accepted in 1994 as a U.S. Federal Information Processing Standard. Its major strength is its simplicity, since its graphic elements consist of rectangular activity boxes and "ICOM" arrows.

The activity boxes are used to depict the activities, functions, tasks, and processes performed in producing products and services. Every box contains a verb or verb phrase describing the activity being represented. Each activity box can be decomposed into lower level (subordinate) activity boxes on a related subordinate diagram. In this manner process description from a high level descriptive generalization down through to detailed and specific lower level actions may be achieved. Generally it is rarely necessary to decompose an activity to more than the 5th or 6th level in order to obtain significant and useful process description and typically most processes are comprehensively described through decomposition to the 4th level descriptions.

The people, things or data required in completing any activity are represented as Inputs, Controls, Outputs and Mechanisms, or ICOMS. Inputs are those objects or data that are consumed or changed by the process in producing output. Controls are things or data that control how the inputs are correctly converted to the outputs. Outputs are the result of the process, and mechanisms are the people, things or data that provide the means to perform the activity. The positional relationship of arrows to activity boxes differentiates the role category of an ICOM, and an attached arrow label with a noun or noun phrase describes what the arrow represents. Just as activity boxes are decomposed to lower level subordinate activity boxes, providing more detailed process description, the ICOMs are also decomposed on the subordinate diagrams by branching, adding and joining arrows to represent increasingly detailed information of ICOM description and interrelationships to the activity being modeled. Decomposition of activities and ICOMs is a simple, easily understood, and effective means of describing complex tasks and processes. The application of this methodology is shown in Figure 4.

The Technology

Maximizing employee involvement and maintaining efficiency required the use of computer software to implement the methodology of IDEFO in a simple, effective and easily learned manner. The intent of the modeling process was to have employees focus on the processes, generate descriptive data, develop the process models and then use the model data to develop and maintain a safety and quality system. The risk of modeling becoming an end in itself was evident, as the task of modeling is sufficiently onerous that "ownership" may negatively focus individuals solely on the model rather than being positively focused on the processes being modeled. Focusing on the model rather than the processes could lead to entrenchment and an unwillingness to incorporate changes to the model. To minimize this risk the tool for implementing the IDEFO methodology must be user friendly and greatly facilitate the modeling.

The appropriate tool for CCG Fleet's purposes would effectively and efficiently facilitate the drawing of process model diagrams. Front line employees, and not specially trained draftspersons, would be responsible for data collection and the development of the IDEFO diagrams ultimately comprising the entire CCG Fleet model. The tool would be capable of easily developing descriptive text linkages for quick access to supporting work instructions checklists and illustrations. The software would provide graphical presentation of detail as well as a convenient index (referred to in IDEFO as the node tree). Model data maintenance and control during the development phase

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2   The IDEF series, standing for Integrated DEFinition language, describe business elements, IDEFO is used for modeling business activities and IDEF1X is used for modeling business entities and their relationships.

would be a concern and the appropriate software would have suitable means of exerting configuration control over the model. Finally, the appropriate tool for CCG Fleet would permit its use in deploying the results of the model - the safety and quality procedures - to the ships, aircraft and bases in a manner that would facilitate and encourage use by Fleet personnel.

A corresponding list of requirements was prepared in the analysis phase of the project, and software claiming to support IDEFO were reviewed. Several vendors whose products had previously been reviewed by a consultancy were considered to offer reasonable products with IDEFO implementation capabilities that met the requirements. The vendors were requested to submit evaluation copies of their software and, based on the results of that evaluation, a final selection was made[3]. The selected software tool not only met the initial requirements for model development but, upon further evaluation and discussion with the developers, supported the strategic application of an easily accessible, comprehensive, up-to-date and useful safety and quality procedures database. It also supports activity-based costing and process improvement simulation and is designed to interface automatically with workflow automation tools.

The Front Line People

The successful implementation of the ISM Code was always considered to be primarily dependent on the active and broad based involvement of front line personnel in the design and development of the safety and quality system. The implementation plan established specific roles and input opportunities to involve the broadest range of employees possible in the program. Management's role was to lead the way and to encourage and to facilitate - not to control the work and restrict the outcome. Positions of process modelers would be filled by regional employees familiar with the realities of service provision to the client. The source of the data describing Fleet activities and processes would come from the organization's most valuable resource, the process experts who are the front line personnel doing the day to day tasks that result in the provision of safe, efficient and economical services to the client.

Accordingly, fleet officers will be recruited to document detailed procedures and work instructions. A similar blend of management nomination and peer review will be used to identify and select the individuals. Each region will nominate several candidates from which two or three modelers will be chosen (representing their respective deck, engineering and logistics disciplines). During train-

ing, these individuals will assist in modeling Headquarters functions. Following training they will return to their respective regions and model assigned elements of the processes that comprise the regional involvement in delivery of services to the client. The role of Headquarters in regional modeling will be solely one of co-ordination, coaching and mediation, ensuring that the individual models developed in the regions ultimately form a coherent whole.

The Road Ahead

A fundamental component of a quality system is the staff and structure to support it. However, a large staff of specialists is not necessary. The bulk of the effort requires specialists in the processes, not in modeling them, and this can be done by front-line personnel equipped with the right tools, such as Design/IDEF. As such, the CCG Fleet staff consists of one manager, a process engineer, a quality auditor, a process librarian and a division clerk.

The process engineer will be directly responsible for the development of descriptions of all the processes, fleet wide, which will be used in documenting the procedures required by the ISM Code and ISO-9002. Other duties include advising departmental employees and officials about the methodology, progress and results of the process modeling effort and quality engineering generally, reviewing and negotiating agreement on and formal acceptance of new procedures and changes to accepted procedures and maintaining the validity of the database supporting the procedures, associated manuals and policy statements through controlled incorporation of all changes to process models that arise prior to and following registration.

The quality auditor will develop and implement periodic internal safety and quality audits that may be required or deemed necessary to maintain compliance with the standards and codes, as well as initiating and monitoring periodic mandatory external audit by a certified registrar.

The process librarian will ensure that all associated quality engineering and audit data and documentation, all resulting procedures, control documentation and records are catalogued, disseminated, retrieved, filed and archived in a manner compliant to the requirements of ISM and ISO-9002.

During the implementation phase, each of these staff officers will maintain a watching brief on the work of the process development teams to ensure that their efforts can be quickly and easily assimilated by the Fleet, yet retain an assurance of good quality service to the clients. Sub-

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3   The tool selected was Design/IDEF, by Meta Software of Cambridge, MA.

sequently, they will be able to call on the developers, who will have returned to the Fleet, to assist them in the effort of maintaining the system.

The organization reports through the Chief, Quality Services to the Director, Fleet Services. However, the non-conformities raised will be provided to the Director General, Technical and Operational Services, who in maritime law terms is the "Managing Owner" of the Fleet.

The implementation plan has been set up to accommodate a significant amount of development time, with a full year to develop the baseline process models and a further 6 months before the registration process begins. As such completion of the development work is forecast for November, 1997 and registration is expected to start in April, 1998. While this time may appear generous, the fact that the work requires entirely revisiting all of the current policies, plans and work instructions and developing an entirely new set of manuals indicated generous lead time was required.

The efforts of the process developers during the first year will not only be focused on documenting what we do and why, but ensuring that the staff in the field, at regional offices, bases and at sea, feel part of the team. They will be acting more as coaches, motivators and facilitators than as process modelers. Again, the simplicity of the tool being used for documenting the processes will allow the flexibility of doing this. If the translation of the process gathering effort into usable models required major effort, the flexibility to allow the development team to act in this role would not have been available. In all likelihood, the use of peers in the modeling at all would have been problematic. This necessitates further training, however; the skills required for these added roles do not come naturally to many mariners, who are more used to leading than encouraging. Again, a package of training materials has been put together for this purpose, with the assistance of Contrex and Ernst and Young. It includes not only the psychology of acting in these roles, but tricks of the trade that they will be able to use to encourage teamwork, communication and participation.

They will also be trained in auditing to a quality standard, as internal auditors. This training will serve two purposes. Firstly, it will provide them with the knowledge base that auditors need, so that the policies and processes will be auditable when introduced. Secondly, it will provide the organization with a trained staff for subsequent internal audits.

With the policy and procedures documented, the next step will be to arrange for an initial review and pilot registration in one of our regional offices. Selection of the registrar will be undertaken by competitive bid. Both ISM accreditation and ISO-9002 registration will be sought in a single

effort, which will require the agency used to be recognized in Canada for these purposes and have a harmonized audit process able to provide both inspections in a single pass against a single set of manuals.

Selection of the region will be undertaken once the process modeling is well advanced and will be based on the ability of the region to achieve compliance. This will in turn depend on a number of factors, such as the degree to which the region has in place the required policies and procedures, the degree of effort required to move from the current status to full compliance, the level of participation shown by the region during the development phase and the willingness of the regional management team to take on the role.

Within the selected region, a representative sample of ships will be involved. The sample will account for the full range of our clients as well as a mix of vessel sizes, so that the results can be quickly applied to the rest of the Fleet. We will then amend the policies and procedures to account for non-conformities and observations raised during the initial assessment, translate all materials into Canada's two official languages and proceed with national accreditation/registration.

We anticipate completion by March of 1999.

To summarize the major lessons learned:

- Commitment from senior management must be present, This requires much more than lip service. They must actively lead and make sure that all staff are fully behind the effort. Of particular importance are the lower level executives and managers, who must commit to the process wholeheartedly and show their staffs that this is a good thing to be doing.

- The employees at the front-end must be consulted, involved and encouraged. It is not enough to use focus groups and other tired techniques of marketing. The employees see them as what they normally are - another way to make the tough medicine go down. The project team must involve peers, they must be selected with peer input and they must be constantly talking with the front-end people throughout.

- The use of simple tools that the workers can use to develop the work instructions is of paramount importance. While it is possible to develop the documentation without automated tools, be prepared for a large maintenance task if they aren't.

- Be proactive with the employees. Don't wait for them to suggest better ways of doing things, since few will avail themselves of the opportunity. Encouragement, coaching and motivation skills must be provided to management.

- Remember that quality is personal and must be the mantra of every employee.

The bottom line is that the new CCG Fleet will only be successful with everyone involved in making the fleet of the Future a reality. We represent this in the graphic shown in Figure 5.

Figure 1
Defining the Fleet Focus

Figure 2
Principles of Implementation

Figure 3
Building an ISM/ISO Organization

Figure 4
Process Description Through Decomposition

Figure 5
Building a CCG Fleet for the Future - Unified Through ISM/ISO 9002

Discussion
by Al Attermeyer
Military Sealift Command

I've included several questions you might address to clarify your comments. These relate to your last two paragraphs:

1. I don't see the definitions of BPR, DOC, or SMC in your paper. What do they stand for? Recommend you write-out the meanings.

2. You address "the size of our Fleet (C $3 billion in asset value)". I have no reference to gage the size of the fleet by its monetary value. Ours is about 40 active ships, with about half as many in ready reserve, etc. but I have no idea of the "asset value". (Since we receive many of our stores ships from the Combatant/uniformed navy, at a high average age per ship, their value is more intrinsic than monetary, and with downsizing the total numbers of Navy ships, there is hardly a replacement value.) Could you define your term "asset value" or perhaps identify other criteria (# of ships, total personnel, active/inactive ships, etc.) ?

Reply to Attermeyer discussion

On the first point:

BPR is Business Process Re-engineering

DOC is the Document of Compliance. It is issued to a company for a shore installation that has been audited and found to be in compliance.

SMC is the Safety Management Certificate. It is issued to a ship that has been audited and found to be in compliance.

I used the value of the Fleet because our fleet is so variable in size that the use of size or number has no practical meaning. The ships to be audited for the ISM Code is about 60, but they range from 500 GT coastal hydrographic ships and buoy tenders up to the 12000 GT Louis S St.Laurent. Since our ships are constructed to commercial standards, the costs tend be understood by that community. All the ships are active, since we dispose of ships that are not in service (except for small patrol vessels, where we might keep a hot reserve for a fleet class available). We employ about 3000 people, but again, the number has to be related to the manning scales, since we man our vessels to commercial standards. As such, the best solution might be to delete the reference to a quantum entirely and just leave it at the size of our Fleet, ignoring the part in brackets.

by J. Barile
US Maritime Administration (MAR-611)

The article by Neill Conroy and James Davis presented the trials and tribulations of the Canadian Coast Guard's voluntary implementation of compliance with the ISM Code and ISO Quality Standard ISO-9002.

I have received feedback from several US companies seeking to do the same during 1996. To my knowledge most ship owners are not going through the elaborate "model" proposed by the Canadian Coast Guard (CCG.) Most are simply taking the major ISM requirements as their goal, and spreading out their current operating procedures, company wiring diagrams, etc., over a large table (or floor) and trying to plug up the shortfalls. However, the CCG paper does point out a couple of significant problems.

The first is **time.** The longer an owner/operator company waits to start the process, the less time they have to allow meaningful "staff contributions," which is the point of the process. It is a time-consuming event to propose a topic, figure out what the current company policy or procedures are, discuss it, gain consensus, draft procedures, comment on the procedures, test them out, and finalize them into company policy.

Second is **perception**. The companies I have spoken with really do have a problem "selling" ISM to mid-level management.

There appears to be a fear that it might actually work. The concept of moving to a management philosophy that requires a detailed working practice to be spelled out for all things previously entrusted to mid-level management is anxiety producing. What happens when an entry level employee (3rd AE) has as much of a chance to review a procedure, and make recommendations to a fairly senior official (the designated representative) who not only will listen to the 3rd's safety recommendation, but might even change procedures because of it? Suddenly this entry level employee has upper management's attention.

In fact, the CCG's observation that "employees must be empowered to act with self-assurance, which requires clearly established lines of authority and accountability" is frightening. Instead of being the most technically competent or senior in time, mid level management must now promote the "vision" of where the company wants to go.

For senior management the issues are two-fold. First is whether they really **believe in safety or are just lip-synching it.** Lately the press has been full of examples of corporations lip-synching the "politically correct trend" of the moment.

The test for this comes when the "designated rep" proposes a change in procedures which requires funding. If senior management believes in what the change claims it does, the funding will be there; if it is lip service, funding will be hard to come by.

The second, and slightly more subtle issue, is again based upon discussions with several ship management companies, that is, senior management officials who are delighted to embrace ISM and ISO 9002 as long as it doesn't require their personal time, effort, and commitment. If someone else develops the "vision," they have no problem supporting it. Again, this is not the essence of ISM or ISO 9002, as the CCG pointed out in their lessons learned section "Commitment from senior management must be present."

The item owners are concerned with is **how much is ISM going to cost.** Even for a company who maintains that it has always been safety conscious (and most US companies are) there is the initial outlay of drafting up all of the items required (and it takes a good year or more for most companies to get into the position of being ready to implement), but also the question of on-going expenses for continual training of employees. The crew is already the most costly item in the equation and ISM appears to be adding more cost to it. It will be up to each company to decide whether having a more "safety conscious" crew makes a difference. To the pessimists, the best that can be hoped for is productivity remains the same or doesn't drop.

And the alternative to this, is if a company spends its time, effort, and money on people, **what happens to technology?** Up to now most marine safety has been achieved by minimizing the human element. Boiler safety valves provide more reliable pressure reduction than humans on watch. There are humans who are fearful that if ISM is implemented, funding for research and development will go down, because those funds normally channeled into research will go for personnel training. This is not necessarily the case. Evidence from other industries with a high emphasis on safety back the reverse. When humans started to drive, we had isenglass windows. Humans demanded better, safer cars... technology gave us glass...humans had accidents and wanted safer glass..technology gave us safety glass. Technology kept pace, and in some cases even pulled the humans along toward better safety. Hopefully with the implementation of ISM there will be more demand on technology to support safety, e.g., simulators for training, better equipment to avoid accidents, faster access to information, etc.

Author's reply to Braile discussion

The points made my Ms. Barile are important. With respect to the first point about the model, it is true that most shipowners are trying to fill holes in their current documentation to achieve compliance, rather than starting fresh. However, it is our view that the results will be compliance, without the culture change that will sustain the effort, and provide the real economic benefits.

On the issue of time, the delay to get started in unfortunate, and is based on the. premise heard frequently that they can buy a "package" that is equivalent to ISM In A Can. No such package exists that will provide a reasonable result, since all companies are different, with different cultures, personalities and ways of doing business.

As for the difficulty of selling it to middle management, we concur that this is the main stumbling block in most organizations. However, they must be made to realize that the only choice they have is to get out of the business. As was pointed out many times by other speakers, ignoring it, delaying it and slowing it down through bureaucratic interference are not options. We are sure that their legal advisors will rapidly point out that the ISM Code is the minimum standard of care in the industry. Failure to adopt it into the culture of the company will not sit well with the courts, or the insurers who have to carry the economic can.

As for the cost of getting there, we recognize that the costs of implementation are high. However, the payoff comes quickly if you face the reality of what it means, make the big changes early in the process and simplify how things are done to the maximum extent possible. In doing this it is worthwhile noting that many "simplification" exercises fail because the intent gets lost. We discussed the BPR scene in our paper, but the organization flattening movement is a better case in point on this specific issue. What has been lost is that the flattening is the result of simplification, and does not precipitate it. The idea was to move decisions out to the scene of the action, which results in no need for the middle layers since they have nothing to do. Yet we suspect that a large number, if not the majority of flattening exercises result in the decision point moving up the chart, not down. This does not shorten the chain, almost certainly lengthens the response time and in many cases makes for a worse, not better decision due to lack of understanding of the full issue, compounded by a lack of time to gain that understanding due to the large number of issues now handled at that level due to the flattening.

This does not mean to say that the comprehensive model we have used is needed in all Fleets. Bearing in mind the size of our Fleet (over C$3 billion in asset value), the multiple client types, the diversity and the cultural issues, the model is a good solution for us. But private sector shipowners may find that the compliance approach may get them their first DOC and SMCS, but will cause them no end of heartache and expense within the next few years as they try and maintain the result.