



Managing ISM Compliance

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*Winner of the Seatrade 2000 and
CITIS 2000 awards for Innovation*

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Complexity turned into simplicity – a threat turned into an opportunity

A few years ago I attended meetings at IMO when the International Safety Management Code and its Guidelines were being drafted. That experience gave me an early warning about the future expectations from the industry. Whereas prior to ISM we already had to contend with controlled manuals and procedures (as for example with the "Vessel Response Plan" of the OPA90, and the "SOPEP" of MARPOL), these earlier experiences addressed much narrower areas of operations. The ISM Code, on the other hand, required that all activities on board and ashore which in any way relate to safety and prevention of pollution be documented and followed by auditable procedures, and also that all relevant communications and records be documented and traceable. This is a very broad requirement, with the practical implication that the Code could lead to cumbersome manuals, large volumes of paperwork and to impossible filing systems. In other words, to an exhaustive paper chase.

At that time, when we discussed in our company the prospect of compliance with the Code, we concluded that it would be necessary to make use of a computerised system so as to ease traceability and to contain the paperwork. Having resisted office computerisation in preceding years, we realised that the now much-cheaper computer memory, plus the power of computers to file and retrieve large volumes of information, was the way forward for an ISM support system.

The basic requirements we envisaged were: (i) to make it easy and fast for a user to locate all relevant entries in the company manuals for any given task; (ii) to create a system which would administer the expected large volume of documentation (and its traceability) required by the Code; (iii) to establish a platform for the dissemination of other relevant information (applicable codes, guidelines, recommendations, IMO Resolutions, company instructions, etc); (iv) to take advantage of today's technology for speedy and economic communications. We searched the market for a suitable system, but as such a system did not exist, we decided to design and commission the development of one, which we suitably named "Integrated Shipping Management Solutions" (or ISM-Solutions, or ISMS).

THE NEED FOR PEOPLE WITH LITERATE COMPUTERS

The overriding and guiding thinking throughout this development has been dictated by our simple realisation that the introduction of computerisation on ships would be unsuccessful if we did not take fully into account the shipboard culture.

Unlike shore-based personnel, ships' officers rarely consider that record keeping for the benefit of reporting to the office is an essential part of their job. In reality, the tidy reporting of information is more of a benefit to the shore-based operation and to future relieving officers than to those entering data in the ship. A good chief engineer, for example, prides himself in minimising a ship's idle time, a job that is dependent on his labour management, technical experience, knowledge and focus. Therefore, any software

intended for on board use, where turnover is high, and where there is little direct benefit to the data entering user, must face a great challenge: it must show immediate benefit to the user with proportionally low familiarisation effort. To put it another way, the user must find it better and easier than any alternative.

In today's shortage of well-trained and motivated officers, a piece of cumbersome software will be ignored, as will awkward record keeping and ISM systems. Therefore, as ship operators, we felt that we could elect to computerise only when the software in question could convince new users that it is easy to use and is highly beneficial. In conclusion, we agreed that if computers were to be used in more widespread areas of shipping, the software had to be "people literate", rather than forcing people to be "computer literate".

This simple realisation required a fundamental change in programming philosophy, which was achieved from an already established collaboration with a University in the development of educational packages. Part of the development of the ISMS system therefore involved experts from the world's largest centre for cognitive sciences, the Institute of Learning Sciences at Northwestern University in Illinois, in the areas of task analysis and the design of human-computer interface.

A software company was contracted ("Ulysses Marine Electronic Market Ltd") to develop the system, and a number of its programmers/developers were relocated within our company in order to work alongside the "shipping" people.

Additionally, we were successful in obtaining the support and partial funding for this work by two development projects of the European Commission: TREVI Esprit EP23311, and IDES Telematics Applications Programme Task TR5.10.

ISM SOLUTIONS

Early in the summer of 1998 the basic development work was completed. The ISM Code audits for DOC and SMC were successfully and relatively painlessly passed with LRS just before the July deadline using the fully computerised system. In fact, we believe that this was the first time a shipping company passed its ISM audits using a fully computerised system.

The system works by having the controlled manuals (e.g.: ISM, ISO 9002, etc), all relevant forms, checklists, Standing Instructions, Company Circulars, and all other communications between ship and office in electronic form. The mode of communication between office and ship is by e-mail. However, if a ship does not yet have e-mail, or if the items of communication are bulky or not urgent, the system allows the option of sending messages or data by floppy disk. Filing of all information (checklists and communications) is automated.

The real and necessary innovation of the system is that it is task and role based. That is, depending on the user's role (Master, Chief Officer, Superintendent, Operations Manager) and depending on the task he is about to embark upon, he is presented with all the relevant support information available to assist him in performing

that task. We have conveniently divided the support information into: (i) "*Manual References*"; (ii) "*Relevant Information*"; and (iii) "*Support Tools*". These are explained below:

Manual References

Manual References provide, for any given task, direct links to relevant sections of the company's ISM manual. However, the system is not restricted only to ISM procedures. If for a given task the company wishes to also disseminate information from other sources, then such information can be entered into the system centrally by the company's Quality Department, linked to appropriate task(s) and then distributed electronically over the office's and over the ships' networks. Incidentally, the same process is also followed for updating (remotely and electronically) the ISM and other manuals. Let us say for example that IMO has adopted a new Resolution, which is of particular use on board ships. This Resolution can be linked in ISMS to relevant tasks and then disseminated to the users' system. Intended users will then see this new Resolution when they select the task to which this information was linked. The great improvement over a paper filing system is that the ISMS user will be able to find information even if he did not know that it existed in the system in the first place. A further example of the versatility of this system is that a company who needs to have manuals (or parts of manuals) in two languages, for example, can have these shown in parallel.

Relevant Information

The user, having selected his task, and in addition to having a direct reference to manuals, also has access from within the task he is working to "Relevant Information", which includes: any previously filled forms, communications, reminders, standing instructions etc, whether originating from the office or from within the ship. Such information may be voyage-specific (in which case it is shown only when selecting the relevant voyage), or general (in which case the information is shown regardless of voyage number). Having this kind of "live" information has extended the ISMS system into being much more than an ISM Code compliance tool. The system is a day-to-day management tool, carrying and disseminating all kinds of operational, commercial and technical information, while at the same time ensuring compliance with the ISM Code as a by-product of the users' normal work.

Support Tools

From "Support Tools" the user also has immediate access to any blank forms and checklists he may have to fill in as part of the task he is undertaking. Once filled in, such documents can be sent to the office by e-mail from within the ISMS system, and/or can be filed in the ship's electronic directory. Also, from "Support Tools" the user has access to any software the company may have provided to assist in performing the task in question, such as for example spreadsheets, electronic distance tables, payroll programs etc.

In addition to the above functions of the Role-Task system, easy location and retrieval of historic information is made possible by a search facility which allows the user to filter records according to:

vessel, voyage, form name, dates of interest, etc. This is a most useful facility for internal or external audits.

Manuals, forms, checklists, roles (i.e. personnel), tasks, and flow of information are all totally customisable, i.e. the system allows any company to populate and operate the ISM-Solutions software with their existing company structure and systems. Furthermore, if a company's organisational structure changes at some time in the future (for example a new role is created in the office and a redistribution of tasks takes place) the ISMS system is simply modified in-house to model the new structure without loss of historical data. After the system has been used for a few months its value becomes more apparent because a company's recorded experience starts building up. Reminders, and records of past experiences effectively build into a "corporate memory".

CONCLUSION

I believe that UMEM have created a very practical tool which allows a company to record its experience and knowledge and to share it to relevant personnel on board and ashore. The user then has access to any available information, for what he needs, when he needs it, whether he is ship based or shore based. Giving such effective access to information, which may otherwise lie unread in forgotten volumes, is a real commitment and the key into the essence of the ISM Code.

Over the last two years several shipowners and shipmanagers have adopted ISMS, the latest being Kuwait Oil Tanker Company (KOTC),

V Ships, and Eurasia of Hong Kong (part of the Schulte Group). ISMS also recently received industry-wide recognition by winning two major awards: in May 2000, ISMS was the winner of the Seatrade Award 2000 for excellence in the category of innovation, while in March 2000 ISMS was the winner of the Lloyd's Ship Manager's "Communications & IT in Shipping 2000" award for "innovation in the application of IT in ship operations".

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