BA (Hons) Professional Practice

Module WBS 3841

Project Module

Project Title:

A Guide to Voyage Planning

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Key Words:
Marine Navigation
Voyage Planning
Practical Guide
ECDIS
Summary

Background There is currently a global shortage of some 34000 merchant navy officers. This has caused a critical dilution of knowledge of the voyage planning process within the first officer/navigator rank group. This is to become even worse as officer shortages are expected to double within the next five years.

Aims To determine the most effective and efficient method of voyage planning with Electronic Chart Display and Information System (ECDIS) and then document it for future use by inexperienced navigating officers.

Methods Action research approach initiated with a covering letter and questionnaire sent out to 3 experienced navigators. Follow-up e-mail interview/Q&A sessions which fed back into an active voyage planning process.

Results All 3 questionnaires fully completed. Average response time was 3.5 weeks and questionnaires took 3 hours and 10 minutes to complete. Written follow-up sessions were conducted by e-mail over a period of 3 weeks. All respondents agreed that current industry guidance, although useful, was not a substitute for experience. Respondents all correctly identified the relevant legislative guidance. All agreed on the standard presentation of the voyage plan, that being a combination of a Voyage Plan Notebook and the ECDIS. Respondents identified their methods of planning and the requirements for a Voyage Plan. Data analysis was mostly qualitative with some quantitative analysis. 3 checklists created, all aspects of which were tested in a working environment.

Conclusions A well-written practical guide on voyage planning is a most welcome addition to the present literature on voyage planning and certainly fills a much-needed gap. It is hoped that it will assist in slowing the erosion of skills in this safety-critical shipboard function. A standard format for the presentation of the voyage plan will also assist in maintaining a basic standard across the board. Training in Voyage Planning with ECDIS is needed. A facility to digitally sign tracks on the ECDIS is required.

Key Words Marine Navigation; Voyage Planning; Practical Guide; ECDIS
Chapter 1: Introduction

More than 90% of global trade is carried by the international shipping industry. Shipping is the most economically viable method of bulk transportation around the world. It is also the most clean and efficient mode of transport. To put it simply, without shipping the modern world and its global economy could not function.

At present there are nearly 100000 merchant ships trading the world’s oceans. The world fleet is registered in over 150 countries and crewed by 1.25 million seafarers of every conceivable nationality. 1000 of those ships are passenger ships. “The United Nations Conference on Trade and Development (UNCTAD) estimates that the operation of merchant ships contributes about US$380 billion in freight rates within the global economy, equivalent to about 5% of total world trade” in Marisec (2008).

Unfortunately as an industry we are facing a global shortage of over 34000 officers. This is expected to double in the next 5 years. Even despite the recent economic downturn and its devastating influence on shipping trade, growth levels are increasing exponentially and shortages will be as predicted. Current average age levels in the workforce are high and this will further impact on the problem of skilled labour in the future.

As a serving navigator/first officer in one of the largest cruise ship companies in the world, I was becoming increasingly concerned about the dilution of knowledge and of critical skills within my rank group. This has come about as a direct result of inexperience due to the global officer shortage.

The navigator is generally the officer responsible for voyage planning i.e. the safe and efficient prosecution of the voyage from berth-to-berth. I have had 3 years experience in my rank covering world-wide itineraries using ECDIS. I am also fortunate in that I have worked within 2 of my company’s major brands. I am specifically concerned with the degradation of the skills of voyage planning and in the general presentation and layout of voyage plans.

This very important skill is acquired through passing down knowledge and experience and then developing and fine tuning those skills as one actively plans, learns and ultimately gains experience. While I have very little influence on world officer shortages, I do feel that I can achieve some measure of success in the slowing of this critical erosion.

My primary aim, therefore, was to produce a guidance document that will assist navigators in the actual practicalities involved in the creation of a voyage plan using ECDIS. This will supplement our current industry guidelines in that it will cover practical aspects of the process based on actual experience of senior navigators. It will also supplement handover notes used between navigators, which are normally a good source of reference.

Secondly, I incorporated suggestions for standardising the layout of the voyage plan. This complemented my primary aim, in that I introduced a standard format that can be related to, time and time again and hence will be familiar to navigators around the fleet.

Furthermore, I hope that my guidance will be utilised within the seafaring industry in future applications. The possibility that these issues are being experienced elsewhere within the seafaring community of practice is real.
Chapter 2: Terms of Reference/ Objectives and Literature Review

I felt that a sound starting point was to define my aim:

**Aim**
- To determine the most effective and efficient method of voyage planning and then document it for future use by inexperienced navigating officers.

How do we quantify “efficient and effective” though? The navigation of a large cruise ship is a safety-critical function. For the purpose of this project I would like to amend the definition of safety critical from 14 US CFR 401.5, “Safety-critical means essential to safe performance or operation. A safety-critical function is one whose proper recognition, control, performance, or tolerance is essential to system operation such that it does not jeopardize public safety.”

If we get from A to B safely by following our plan, we have planned and navigated effectively. Obviously this does not take into account any near-misses, the reporting and control of which are beyond the scope of this report. If we then quantify efficiently, we have continuous delivery of planning for the execution of the voyage free from mistakes that could result in a catastrophic occurrence that affects public safety.

I have thus defined my objectives that support my aim.

**Objectives**
- Revisit, synthesize and summarize my literature review, to provide further reflection and possibly unearth new or more up-to-date literature.
- Define my research statement and research questions.
- Obtain feedback from my data collection instrument and then review and analyze that data.
- Continually consult with my research subjects in a cyclic process whereby I test their responses within the practical voyage planning process.
- Reason ethically at all stages of my research process, considering the safety of life, safety of shipping and the protection of the marine environment.
- Produce a practical guide and then analyse it by eliciting research subject response.
- Finalise my guide and publish it though a professional body such as the Nautical Institute.

I conducted a full Literature Search and Review as part of WBS 3828, as a precursor to my final project. The full text of the review is included in Appendix 7. As an initial step in the activity phase I revisited the literature to determine if any updated material had been produced. I did this throughout the data analysis stage.

I also conducted specific secondary literature searches throughout the analysis stage in order ensure that I was continually threading the literature stream with my experiential and empirical streams. A good example of this is when we consider the analysis to question 7 (p.15). A secondary literature search found the material to back-up my finding on our approach to the weather in our voyage planning. I unearthed Nash (2009) and his “Optimum quick bridge manoeuvring guide” in a professional maritime journal which gave good advice. I was able to use some of his suggestions in an active process to test and validate my findings.
Having now re-consulted and synthesised the various sources of available literature at the three tiers present in international shipping, I have defined my research statement and research questions.

Research statement

- The provision of a guidance document to assist inexperienced navigators with the method and layout of a voyage plan would be hugely beneficial in the current manning and experience shortfall facing cruise companies.

Research questions

- How do experienced navigators plan voyages practically and efficiently to ensure a successful passage?
- What industry publications are available to assist with voyage planning?
- What are the essential elements necessary for a voyage plan to be effective?
- What is the best method to present a standardised Voyage Plan Notebook?

Chapter 3: Methodology

In order to facilitate the compilation of this chapter, I felt that it would be more effective to divide it into specific sections. I felt that this systematic approach, coupled with critical reflection during the construction of each sub-section, would ensure a wider depth and breadth of attained knowledge and understanding. My various components will therefore include:

- Role as a work-based (insider) researcher
- Research approach
- Data collection techniques
- Ethical considerations
- Triangulation of data

Role as a work-based (insider) researcher

Seafaring is an occupation which requires seafarers to spend their working and leisure hours in the confined environment of the ship and in the company of the same individuals. Appropriate self-discipline and behaviour therefore assume a particular importance when working at sea. Seafaring is unique in that the workforce must deal with a combination of stressors including fatigue, criminalisation, absence from family, high workloads, poor pay/conditions, lack of shore leave and piracy. These are not generally experienced at such levels and combinations in any other industry.

I would therefore say that seafarers have two distinct phases in terms of their roles as worker researchers. They are either at sea or are on leave. This is a critical distinction which I shall elaborate on. At sea, the seafarer is faced with the intense social problems not normally experienced ashore and he naturally becomes a participant observer. I feel that we are not always able to distance ourselves enough from the problem due to the closeness of the environment and the necessity to continually interact with work colleagues. This, I believe, leads to increased subjectivity and bias with resulting fuzzy distinctions between the duality of the roles.

Seafarers are constantly advised and urged to avoid conflict at sea. This is particularly important on passenger ships with their associated large multi-national crews. There is,
in fact, a zero tolerance policy to all forms of workplace conflict. This can impact negatively on our research as we may not follow through on a contentious issue due to the fear of “making waves”. We are all familiar with the problems peculiar to our profession and therefore may also be unduly influenced by others. This could be as a result of our subjects becoming aware of our research and they then seek to influence the results or outcome to improve their conditions or lot. It may also simply be an unknowing conformity on our part towards what we naturally do.

A seafarer on leave is removed from the stresses and strains of working onboard. This allows for far more objective reflection away from the influences of other seafarers. It can, however, also result in un-realistic assumptions, as seafarers quickly forget what it is like at sea. Personally, I feel that the best approach should be a combination of participant observation when at sea followed by a period of detailed contextual analysis when on leave. This must be reinforced with intense critical reflection of all research approaches at sea when one is on leave. With a seafarer’s natural tendency towards self-discipline, we have a resultant extremely sound method of study. This can only improve our understanding of our profession and this will eventually lead to improving conditions and working practices.

Research approach

My overall approach is qualitative. I have collected and analysed mostly non-numeric data. I did consider a quantitative approach originally, but discounted this when I applied it to the unique requirements of my proposal. I received feedback from individuals meeting certain criteria and followed a cyclic process of knowledge sharing and theory generation. I drew on the depth of understanding and experience of my fellow navigators, rather than eliciting responses from a large number of seafarers of various ranks.

I am aware though, that there were elements of quantitative data that entered my research. There is, I believe, always the opportunity to quantify data at a later stage but not so easy to qualify numeric data after the fact. This allowed me more flexibility in the research process. This is important for me as a seafarer when you consider the hazardous and varied environment that I am exposed to.

The main purpose of my research was to record and standardise the voyage planning procedure that I hope will eventually improve workplace practice. I therefore followed the action research approach. “Action research is a term which refers to a practical way of looking at you own work to check that it is as you would like it to be” in McNiff (2002:1). Bell (2005: 8) states that action research “is applied research, carried out by practitioners who have themselves identified a need for change or improvement....”

I combined a survey approach with my action research in order to achieve my objectives. “Surveys involve systematic observation or interviewing” in Blaxter, Hughes and Tight (2006: 76). I combined my analysis of published literature with an improved practice, which developed through my research while continually comparing and evaluating the new knowledge. I achieved:

- **Education:** My guide will educate less experienced navigators on how to effectively plan a voyage.
- **Collaboration:** I worked with my peers in this process of education.
- **Problem solving:** That of the dilution of knowledge due to the global shortage of experienced navigating officers.
• Future planning: My guide can be utilised initially with other cruise ship companies, and then eventually world-wide.
• Change: I amended and simplified industry guidelines, coupled with the introduction of raw experience and produced a new method of practice.
• Improvement: By standardising and utilising experience I am confident that improvement will be the final result.
• Involvement: Other senior navigators in a consultative cyclic process.
• Cyclic creation: From the questionnaire I promoted dialogue that fed back into the creative research process.
• Teamwork: With other senior navigators in a process with which they were familiar with and assisted all involved to not only create, but learn as well.

Blaxter, Hughes and Tight (2006: 69)

Data collection techniques

The most effective method of getting responses and feedback whilst at sea was to combine a survey approach into the action research process. I sent out a covering letter with a questionnaire to three senior navigators. The criteria that I used to choose them were:

a. I knew them personally, their work ethic and knowledge base.
b. They had at least 3 years experience as navigator.
c. Their experience has been varied across brands and cruising patterns.
d. They are highly regarded by their seniors.
e. This was something that they are interested in.
f. They have had experience with ECDIS and limited folios as navigators.

As a seafarer I was really restricted to using e-mail as a tool. This led me to believe that my approach would fundamentally be deskwork. When reflecting on the published literature on this subject more closely, I realised that the distinction was not as clear cut as I had first anticipated. My survey began with a letter set in such a way as to be a questionnaire that enables my respondents to feedback further in an on-line type of interview. Blaxter, Hughes and Tight (2006: 78). I was able to use this generated knowledge in an active voyage planning environment to test its effectiveness.

I conducted my research primarily sitting at a computer conducting internet searches and e-mail surveys interviews. I did, however, also venture into the electronic field as such. My research therefore included a combination of fieldwork and deskwork, but not in the traditional sense. An example of my survey tool can be found in Appendix 3.

Ethical considerations

Seafaring is an occupation where ethical-decision making takes on a particularly significant role. Indeed, we are trained extensively in navigation, seamanship, management, stability and emergency response. Ingrained into this training though is the teaching of the importance to reason ethically.

Ask seafarers what their primary responsibilities are, and they will tell you:
• The preservation of the safety of life at sea.
• The preservation of the safety of the ship.
• The protection of the marine environment from pollution.

My company, like many others, provides a “Code of Business Conduct and Ethics”, which provides guidance on how to act ethically when conducting business. This is particularly important in the highly competitive global world of sea transportation. At the end of the day, good business is ethical business.

We are also guided in how to behave in our social dealings through a “Code of Conduct”. A code also exists for the British Merchant Navy as a whole, but certainly each company would have its own publication. I can find further guidance in the Nautical Institute’s (NI) “Code of Conduct and Ethics”, the professional body for Master Mariners, of which I am a member.

Guides are not sufficient on their own. I obtained direction for my final decisions through careful reflection of my main responsibilities as a seafarer. I considered this with the potential socio-economic and environmental implications of my actions. Additionally I further ensured sound ethical decision-making by adopting an ongoing risk assessment strategy at all stages of the research process.

I identified potential ethical considerations early on. I then identified hazards and their likelihood of occurring. I therefore aimed to avoid them, if the circumstances of the case allowed, but where I could not, I introduced suitable measures to control them. The Ethical Release Form provided me with a good reference for control. I did not rely upon the form as a stand-alone tool though; I also reinforced my ethical reasoning with constant critical reflection.

For example, I was quite concerned regarding my ethical responsibilities when uncovering poor practice while doing my research. Fortunately I did not uncover any. I could have consulted with my line manager initially. My industry has in place a Confidential Human Factors Incident Reporting Programme (CHIRP) had I not got a favourable management response. My professional body NI also has the Marine Accident Reporting Scheme (MARS). I therefore had available two acceptable control measures for that eventuality. My programme adviser was also available to me at all stages of my research process for any ethical considerations.

Triangulation of data

It was quite important for me amplify my results as I followed the action research approach. This can be quite difficult to judge by traditional criteria, as the generation of knowledge does not always follow a laid down systematic process. However, triangulation can be very effective, if it is introduced at all stages of the cyclic action research process.
“So, we must be wise and vigilant, critical of our interpretation of the data, regularly question our practice and wherever possible triangulate”, in Bell (2005: 167). I like the triangulation process, because it has its origins in surveying. The earliest surveyors were of course navigators. When we check the reliability and validity of our position on the surface of the earth, we always use three position lines. This position is then verified as being accurate by comparing it to other positions determined by other means.

By triangulating my data from my three streams, that being:

- Experiential – Personal experience and learning log
- Empirical Data – Survey questionnaires and follow-up interviews
- Literature review – Published literature;

I was able to generate my improved practice in the form of my “Guide to Voyage Planning.” This is appended to this report as Appendix 5.

This chapter has discussed and justified my choice of research approach and also the data collection techniques that I chose. The process and writing has increased my knowledge and understanding of this important phase of the research process. Ongoing critical reflection has also allowed me to consider my methodology within the actual activity of conducting the research.
Chapter 4: Project Activity

In chapter 4 I intend to describe and analyse what I did during the research process. I will focus on the design of my questionnaire, collecting my empirical data and reflect critically on what assisted or hampered the activity.

This is my Gantt Chart and I will use it to discuss how I actually conducted my research. Obviously the research process is one that cannot be planned and followed to the letter. This is especially true when one is conducting work-based research in an occupation as demanding and changeable as seafaring. The process can also be a lonely one at times and when deadlines are not looking achievable, it can lead to periods of soul-searching and self-criticism.

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Figure 2 – Gantt Chart

What is important is that one must always view the journey for what it is. That being the generation of improved practice which includes generation of knowledge for the researcher, research subjects, critical friends and fellow practitioners. This continual critical reflection, with a clear understanding of one’s aims and objectives, assists the insider researcher in getting through the more demanding periods. This kind of reflection is what helped me through.

I had already conducted a literature search as a separate module for my project. The stand-alone literature search was a fundamental part of this process. The allowed time-frame would not have allowed for the literature search to be conducted as comprehensively as it was. I feel that this method of module progression prepared me better than just conducting a search and review as part of the “Project Report” phase.

What I did do though, was revisit all of the literature during week 1 and conduct further searches in order to identify any new material and also allow time for further reflection and analysis. This second phase reflection on the literature was beneficial in the work based learning process, in that I engaged initially in a process, was able to conceptualise that process and then apply it to my actual research activity.

My foremost consideration after gaining written approval for my project proposal was designing a detailed and workable research instrument. I wanted to design a
questionnaire that was short enough to not be too overbearing. It had to be thorough enough to ensure that my research questions were answered as fully as possible. The design had to also promote additional dialogue and thinking and generate knowledge.

I used the pilot method on one of my subjects, and while initially sceptical about my design (I felt that it may have asked too much), I was surprised to find that I had indeed hit the mark on my first attempt. I also made use of the “Checklist for Piloting a Questionnaire”. This was a very valuable tool, the use of which I extracted from my module coursework. Its use is something that I would recommend to all researchers utilising a questionnaire. This assisted in identifying any potential ethical problems with the survey tool itself from the point of view of the respondent.

I felt that the use of a detailed covering letter certainly made the process a lot smoother. I had approached all subjects prior to engaging the process to ensure agreement in principle. The tactic of the covering letter assists in the resolution of certain ethical considerations such as anonymity and confidentiality and transparency. Examples of my covering letter and questionnaire may be found in Appendix 3.

I received all three questionnaires back fully completed. The average response time was 3.5 weeks. The fastest response was 2 weeks and the longest 5 weeks. The average completion time for the questionnaires was 3 hours and 10 minutes, with the shortest taking 1.5 hours and the longest 6 hours. With hindsight, I could have possibly elicited the responses of two more research subjects. I had highlighted 2 who were near enough to my selection criteria for them to be beneficial. Given the timeframes, I probably could have received and analysed their responses as well. In any event, they were always available as contingencies. Were I to conduct further detailed research, for example into the process towards obtaining a higher degree, I would be able to utilise them.

While I had allowed 3 weeks for the return and analysis of the survey, this was an absolute maximum for my time frame. As the average response time was over this, I was quite pressured for a period and felt that I may have cut things a little short. Fortunately I was able to work around this. This is definitely something that I had not planned for and is a huge consideration during the planning stage. I had not really allowed for the demanding nature of my respondents’ working regimes. I had factored in for myself and not for them and this is something that I would pay more attention to in future research.

One respondent had started on the survey and then informed that circumstances at work had changed quite dramatically. He was scheduled to operate in one geographical area and was moved, at very short notice, to another, some 6000 miles away. However, all 3 agreed that under normal situations and with proper application, 3 weeks was enough time.

I could have done with more time to conduct the follow-up questioning, but I suppose this is a statement made by most researchers. This was done by e-mail over a 3 week period. I was able to get clarification on certain points in the questionnaires and feedback ideas into an active voyage planning environment.

I had to close-out one area of my research, that being the use of back-up folios of paper charts when using ARCS in areas of no ENC coverage. During the period of my research a Flag-State ruling changed stating that ARCS were sufficient on their own as a suitable back-up. While simple enough to remove from the process, it was quite exasperating in that I had allocated resources to this area. This did teach me to be more flexible in what is a fluid process anyway. ‘Action research is not a ‘method’ or a
‘procedure’ for research but a series of commitments to observe and problematize through practice a series of principles for conducting social enquiry’. McTaggart (1996:248) [Cited in Smith (2007:Online)].

As a seafarer, I was not able to make full use of the OasisPlus VLE during this period. This is due to bandwidth constraints imposed by our satellite servers. My tutor support was thus mostly via telephone. I did make use of OasisPlus for draft submissions and found this and the telephone support very beneficial. I was also limited to obtaining research specific literature via the internet whilst at sea. While this was difficult at times, I felt that my literature search module prepared me adequately for this eventuality.

In chapter 5 I will discuss my project findings by describing my analysis in more depth. This will involve a detailed discussion of my data triangulation, with the result of identifying my dominant themes which leads towards my conclusion and my recommendations to identified stakeholders.

Chapter 5: Project Findings

In chapter 5 I will present my findings by working through my questionnaire in a systematic fashion. I have used some nominal scaling in my questionnaire although I am more interested in the qualitative responses of my subjects. I will demonstrate how I have triangulated my data by discussing the published literature, research subjects’ responses and my experiential evaluation. In order to determine my experience, I completed the questionnaire in the manner I expected of my subjects. My questionnaire is included in Appendix 3.

Background

All 3 research subjects were males between the ages of 27 and 32. All 3 had at least 3 years experience navigating large cruise ships on world-wide itineraries. In defining large I am referring to vessels of over 100,000 GT. World-wide itineraries refer to voyages of 14 days and over, encompassing at least 4 different countries with distances travelled of over 4000 nautical miles.

Subject A is still working in the cruise line industry as First Officer/Navigator. Subject B is now a Marine Pilot working in a British Port and has not practiced Voyage Planning for 18 months. Subject C is now working in the private yacht sector as a First/Chief Officer and although practices Voyage Planning to some degree, has not practiced cruise ship Voyage Planning for a year.

Whilst it may seem that 3 questionnaires is a small number, they are detailed and were designed to promote further dialogue and knowledge generation. It is also the qualitative aspect that I am more interested in.

Questionnaire Analysis

1. What publications do we have that give us guidance on voyage planning?

All 3 respondents correctly identified SOLAS Chapter V as the international/government standard to be consulted for voyage planning. Furthermore all went on to list company specific guidelines as the next most useful reference over current
industry guidelines. This was an interesting find for me as I felt that BTM and BPG were more comprehensive than company guidelines.

On reflection as an insider-researcher occurred to me that I had moved away from the company element of the process more towards a more generic solution to my research question which was producing a guide that could be used in the wider merchant navy. I feel that this metamorphosis was due to my developing vision of the greater applications of my research. I therefore re-visited my company guidelines and considered them in a more generic sense.

2. Do you think that these give us enough guidance?

All respondents felt that present guidance was not sufficient, especially in terms of ECDIS. Past experience was specifically mentioned, “Again although these are good as a reference guide I do not believe that they substitute knowledge and experience gained/passed down from others combined with personal experience” and “in order to gain any guidance, you are then left with the trusty handover notes and / or previous experience, either yours or that of a peer who is willing to divulge such ‘secret’ information”. All 3 felt that additional guidance, particularly in the use of ECDIS would be a most welcome addition to present international, national, industry and company policy.

3. If yes: Do you think that these publications offer enough on the practical considerations of presenting the plan and voyage planning with ECDIS.

Responses to question 2 were all no.

4. If no: Would a company guide or Code of Practice be helpful, particularly in terms of ECDIS?

All respondents felt that a Code of Practice would be helpful.

Subject A: “I feel quite strongly that the training given in the use of ECDIS falls far short from what is required by any Navigational Officer including the Navigator. This is in all areas from passage planning, updating charts, and managing the folio to the general day to day use. I believe that the shortcomings are evident in the college training, company guidance and easily understandable publications.”

Subject B: “A company guide or Code of Practice would be helpful; one publication which gives both statutory and practical advice and guidance would be the Holy Grail. One that states what is required, describes how to do it and if necessary explains why it is necessary to do it in such a way or ways for each step of a voyage plan would be very useful. I also feel it is important that while not being overly prescriptive, that the guide, particularly if a company specific version, should be rigid enough to have essentially a uniform format to ensure any omissions or inaccuracies can be readily identified. While trying not to use the dreaded ‘A’ word, essentially it must be rigid enough to be auditable, while still being able to be flexible enough to cover plans for any area, while still not becoming long winded for a more ‘standard’ voyage. Easy for me to say, a lot harder in practice to tick all the boxes and come up with a workable plan!”

Subject C: “It must be argued that generally there appears to be a lack of coordination and recognition of the ECDIS integration within the industry. A code of practice must attempt to cover a number of areas not currently covered in sufficient depth. A
weighting towards ECDIS planning would reflect the establishing of this new technology onboard Bridges throughout the industry. ECDIS is a widely adopted technology for which there is a differing approach to the procedures associated therewith. Passage planning still follows the guided principle of Appraisal Planning Execution & Monitoring – regardless of the technology used!”

2 predominant themes emerge from the responses; a practical guide for voyage planning with ECDIS is needed and also that the industry must do more in terms of training. The subjects all felt that the industry is not embracing the new technology as openly as it should be.

5. Please describe briefly how you plan a voyage for an area where you have not been before. I am looking for your practical steps.

The responses to questions five cannot be analysed in the statistical sense. I had asked the question of how each carried out their voyage planning process from a personal perspective. While obviously everyone has their own process, and this can be true of many evolutions / practices in the workplace, there must be a basic standard that is the most efficient. I have defined an “efficient” Voyage Plan earlier on in the report, but the question arises how does one quantify an efficient process?

In order to analyze this question I looked at each process and followed it through practically while actually constructing a Voyage Plan i.e. I wanted to determine if their process was good. Everyone works in a different manner, but what was important to me was that could the process be followed by someone else in a logical sequence.

Two of the subjects provided good in-depth planning processes, which I was able to use practically. The other subject did not provide an adequate process initially, but was able to after I followed up with him. I then utilised my process in order to produce an improved basic guide. I validated this by obtaining consensus from all three subjects. The process is reproduced in Appendix 5. It has been agreed to by each of the respondents.

6. What is in your voyage plan?

The subjects gave varying descriptions of the content of their voyage plans which were similar in most regards. This question was ill-fitting, in that it has overlapped with question 8, where minimum standards were identified, coded and numerically analysed. I should have left this out and placed question 8 in this position.

7. What else could be in it?

All 3 felt that they were producing as much as they could within the constraints of the seafaring profession i.e. workload, International Labour Organization (ILO) set hours of work, commercial pressure etc.

One respondent did feel that we could do more in regards to the weather. I had always felt that this was something that was done somewhat haphazardly and realised that this had to receive more attention. It was actually Nash (2009) who provided some guidance in this regard. A Captain whom I had previously sailed with on two vessels, had researched the effect of wind on ships and produced guidance on operating limits. The checklist that he produced was the missing “weather” link in the plan and has been added in.
8. List 10 items that you think a Voyage Plan should contain as a minimum standard.

In analysing the responses I again realised that the research process is certainly one of enlightenment. I feel that sometimes as a person I can be quite sententious. This is further aggravated by my role as an insider-researcher. As the expert I feel that I have the answers and sometimes only need clarification on my suggestions. Obviously this has not been the case, as my narrative on the analysis indicated. It was the analysis of question 8 that introduced the quantitative aspect of my research.

Initially I had identified qualitative analysis as being my focus. I realised though that I could not make a detailed analysis of this data in any way but to introduce quantitative techniques. I triangulated the data by considering government policy, industry guidance and the experiences of my subjects and myself. I initially tabulated the results and from this I identified the main themes. I was then able to quantify the main themes by numerical data analysis in the form of a pie chart.

The results are shown in Figure 3. I utilised representational colours (coding) for the main identified themes in order to enhance the visual presentation. The raw data may be found in Appendix 6.

This is a description of my coding:

**Intended Ground Track (The actual route that the vessel will follow) – Brown to indicate ground.**

The need to plan for contingencies and identify abort points and no-go areas (Changes to the actual route that the vessel will follow and identifying areas where the vessel cannot go) – Red is used to indicate emergency/danger.

**Routeing and reporting (Traffic Separation Schemes and Vessel Traffic Service reporting) – Purple, the usual colour used on navigation charts for routeing.**

**Under Keel Clearance (The available depth of navigable water beneath the keel) – Dark blue is used to indicate depth of water.**

**Position fixing (determining the position of the vessel in the most accurate manner) – Yellow for the sun, traditionally a primary source for time and position fixing.**

**Tides/Current (natural conditions of the movement of the water that influence the movement of the vessel considerably) – Light blue, another blue shade to indicate moving water.**

**The marine environment (ensuring that all possible measures are identified for the protection and preservation of the marine environment) – Green is used which is globally known colour for the environment.**

**Not-classified (an item that has no code within the identified themes) – Black is used for neutrality.**
Minimum Standards

I can therefore deduce from the findings that the majority of the focus is the intended ground track i.e. the planned track that the vessel will follow. This is not surprising, as one must get from A to B safely on a ship for the voyage to have been prosecuted properly. The rest of the results followed as to be expected. The only real surprise to me was the inclusion of meteorological conditions.

This was even more interesting when I found that subject A had not identified it in question 6. After some discussion this was attributed to the fact that the weather board was separate to the Voyage Plan Notebook, but was in essence a part of the process. Subject B had identified that more could be done about the weather in the Voyage Plan Notebook, as discussed earlier. One could argue that meteorological conditions could be coded under intended ground track, and this is a valid and logical suggestion. I have chosen to leave it un-classified in order to enhance its prominence and afford it some discussion here. In fact my decision is now to make it a theme of the voyage plan.

I utilised the percentages when drawing up my Voyage Plan Notebook Checklist (Appendix 5) to ensure that I weighted the included material according to my results.

9. How do you present your plan?

All 3 respondents indicated that they used a voyage plan notebook and the ECDIS. This is how I present my plan as well.

10. What would be the best practical way to present a voyage plan?

   b. ECDIS only.
   c. Combination of a. and b.
   d. Laptop.
All respondents answered (c) that the presentation of the plan should be a combination of a paper file (the Voyage Plan Notebook) and the ECDIS. A.893(21) p 3.3 states “The details of the voyage or passage plan should be clearly marked and recorded, as appropriate, on charts and in a voyage plan notebook or computer disk.” This is as per government policy, industry guidance and my experience. We therefore have good consensus on this point and clear triangulation.

I did throw in the idea of presenting it on a laptop to gauge what the views were on this move forward. While this is the next logical step, there are many considerations such as type approvals, dimming qualities and suitable back-up power arrangements. By integrating a tablet PC or laptop into the integrated bridge system with suitable legislative i.e. IMO, NMEA, IACS backing, we would be moving the voyage planning process into the next era. Perhaps this would be a useful research proposal for higher study?

11. **What do you think appropriate means when referring to reduced folios?**

The requirements of the Flag State, under which I operate, changed during the period of my research to eliminate the need for an appropriate folio of paper charts (APC) when ECDIS is used in the RCDS mode. They have now decided that following an approved risk assessment, no paper charts are required. This has really obviated the need for this question in my survey.

However, during a secondary literature search on this I found that the International Hydrographic Organization (IHO) is attempting to elicit feedback from coastal states on APC. Their work is incomplete though.

My response to their responses often resulted in me going back to the literature to clarify points, search for updated material and triangulate my data.

12. **Do you think that the Captain and navigator should sign the plan?**

All respondents agreed that physical signatures were not really required, but were a nice touch for audits. I could not get consensus on this, but personally I felt that it was beneficial for audits and formalisation and doing it did not cause a problem with the process. I did consult the policy literature and from SOLAS we can see that it is mandatory for all ships which proceed to sea to construct a voyage plan which is now a legal document which is physically checked by Port State Control (PSC) inspectors. To physically sign, for example, 10 ECDIS track lists would take under a minute. I have added this in until such time as technological advances allow us the option of electronic approval/editing.

There is clearly an immediate need for ECDIS manufacturers to modify their equipment to allow for digital signing or locking of tracks. “I would like to see ECDIS systems…allow an operator to digitally sign a passage plan and for its amendments to be listed separately” and “I do believe that the Captain/Navigator should be able to password protect or lock the tracks indicating time and date of last modification to safeguard against any ‘modifications’ without the Master’s consent”.

13. **If you do or did this, how did you do it?**

All 3 respondents had answered no to question 12.
14. Do you have anything else that you think may be beneficial to the research?

Subject A: “…I believe that the advance is ECDIS is amazing and should be fully embraced, however I feel there is an extreme shortfall in the training given not only at college but by individual companies.”

Subject B: “…I have been quite exhaustive in my answers I think and have probably rambled and ranted; as hard as I have tried to avoid it, throughout! If you just pick the answers out of the preceding questions, everything else could be lumped here and probably be the longest answer, so in short, no I don’t but I have added in plenty as I’ve been going along!

Subject C: “N/A”. And then later, “I'm not sure what your thoughts are on digital security of a passage plan? I think and have probably rambled and ranted; as hard as I have tried to avoid it, throughout! If you just pick the answers out of the preceding questions, everything else could be lumped here and probably be the longest answer, so in short, no I don’t but I have added in plenty as I’ve been going along!

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On the presentation and content of my final guide, my research subjects had the following to say:

Subject A: “I have read through your appraisal checklist and to me it appears to be thoroughly written and well researched document which would certainly be useful especially to Officers new to the rank of Navigator.” And then at a later stage, “I have read all three checklists and as previously mentioned it is obvious that you have put a lot of time and effort into these….I believe that they provide an accurate and detailed guide whilst not making it an endless list of irrelevant checkpoints.”

Subject B felt that he would make use of it himself, “….I would certainly use it if I was to plan a passage again in the future…” This was an important validation for me as this subject has been out of Voyage Planning for 18 months. Now as a pilot, he had seen the pilotage aspect of the process and gave valuable insight into this area of the research. Having now also been exposed to a wide variety of plans, this is the ultimate seal of approval for me.

Subject C: “I fully agree with the checklists. They (at least to me), form a full break-down of the passage planning process.”

From the analysis of my data, I have identified five main themes which make up my findings:

1. A practical guide on Voyage Planning with ECDIS is needed.
2. A set of Company guidelines on Voyage Planning with ECDIS is necessary.
3. ECDIS training should be mandatory for deck officers.
4. Guidelines and training need to be continually refreshed.
5. There should be a facility to digitally sign or lock ECDIS tracks.

I am now in a position to verify if I have met my aim and objectives, make recommendations based on my identified themes and comment on my experience of research and more specifically researching work.
Chapter 6: Conclusions and Recommendations

In my concluding chapter, I would like to focus my discussion around these areas:

- Have I achieved my aims and objectives?
- Recommendations
- Reflections on learning

Have I achieved my aims and objectives?

My aim was “to determine the most effective and efficient method of voyage planning and then document it for future use by inexperienced navigating officers.”

In determining the presentation of my guide I decided on the checklist approach. I wanted 3 checklists for each of the items namely:

- Appraisal
- Planning
- Voyage Plan Notebook

I wanted to restrict them to two sides of an A4 sheet. This would allow them to be laminated and used as a quick reference. They were also to be detailed enough to walk an inexperienced navigator through the process in a logical sequence.

This was an immense challenge having restricted myself to approximately 2500 words (Appraisal and planning 1000 each and notebook 500). While the task was more difficult, I was more comfortable that I was producing something that was to be of some practical benefit. I was able to do this and produce three usable checklists. They are in Appendix 5. I feel that I have achieved my aim and produced a guide that will be beneficial to officers lacking in experience with respect to voyage planning in the ECDIS era.

I utilized my objectives to identify my research process. In this way I was able to chart the course of my action plan realizing subsequent objectives as I progressed. I am currently outstanding my final objective which is to, “Finalise my guide and publish it through a professional body such as the Nautical Institute.” The validation of my guide by consensus from my research subjects has certainly been important in terms of University and work requirements. What I would now like is to have it validated in the wider maritime stakeholder group. This is final step in realizing final fulfilment for this journey and represents its zenith.

Recommendations

My research has allowed me to identify six stakeholder groups whom I would like to make recommendations to according to the themes I have identified in chapter 5:

The International Maritime Organization (IMO) is recommended to:

- Make full use of current experience when designing the practical guide on voyage planning. At present the Nautical Institute generates this kind of input through their SeaGoing Correspondence Group (SGCG) of which I am a member. Input must come from a wide variety of officers with practical and current knowledge of the systems/practices in question.
- Update the voyage planning guidelines more frequently to reflect legislative changes, technological advances and any changes to common practice from lessons learned.
• Make specific voyage planning training with ECDIS mandatory for all deck officers.

Flag States are recommended to:
• Provide appropriate guidance for what constitutes “appropriate” when referring to reduced paper chart folios as back-up to ECDIS.
• While some have provided suggestions to the International Hydrographic Organization (IHO) and these can be accessed at http://www.iho-ohi.net/english/about-encs/enc-coverage/backup-paper-charts.html, all Flag States must produce guidance and this should be collated into one document.

ECDIS Manufacturers are recommended to:
• Provide a facility to digitally lock tracks once they are to be used. A list of amendments that can be retrieved would also be beneficial.

My company is recommended to:
• Publish their guidelines on Voyage Planning with ECDIS. They have been researched and a final draft is due soon. I had quite considerable input into this process.

Other companies are recommended to:
• Issue appropriate Fleet Directives covering voyage planning with ECDIS to be incorporated in their respective Safety Management Systems.
• Ensure that all officers receive formal training on voyage planning with ECDIS.
• Carefully monitor handover periods for officers in the First Officer/Navigator rank group to ensure they are commensurate with cruising patterns, experience and knowledge bases.

Middlesex University is recommended to:
• Provide Seafarers with an alternative learning environment to OasisPlus.
• This could be in the form of a CD with video clips, course materials, PowerPoint presentations and FAQs.

Reflections on Learning

I want to now relate my experiences of conducting research and researching my own work. In traditional learning, one receives formal education and one is then required to retrieve that information at a later stage in a formal assessment. As time passes you are less likely to retrieve that information, particularly if it is not something that relates to you day-to-day activities, such as work.

However with work-based learning, because the retrieval at a later stage is more closely aligned to the actual context of the learning, I feel that you achieve better retrieval. This is reinforced by increased depth and breadth of learning as the learning process is moving concurrently with work practice i.e. you can relate the two more easily. When research is introduced, the learning process is further strengthened as we now have three processes supplementing each other to produce an exceptionally powerful learning experience.

I have found that the university is concerned more with the learning process while the workplace is concerned mainly with the end-product. This is an important distinction.
that I identified early on. I realized then where I had to focus my energies in order to ensure that I had the right balance of learning and improving work practice.

So what has my unique experience been? Well, I now know that without action (learning by doing) there cannot be effective learning. One’s experiences in the workplace are a very important consideration in the learning cycle. It is certainly something that I will now pay more attention to. The work-based learning research process has taught me many important themes about my personal work ethic. It has improved the way I plan, lead, organize and control in the workplace. It has made me more aware of my relationships with my various stakeholders and the importance of these in the work-learning cycle. I feel that this process has allowed me to grow professionally, realizing greater fulfilment of my potential to work and learn, as separate entities and as an interconnected cycle.

Daniel Wood
4th January 2010

Word Count: 8515
References


Part 1: Questionnaire

Please answer all of these questions by ticking in the Yes or No column.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Has the project proposal and ethical considerations in draft been</td>
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<tr>
<td>completed and submitted to your first supervisor?</td>
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<td>2 Will the project involve an intervention or change to an existing</td>
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<td>situation that may affect people and/or an evaluation of outcomes of an</td>
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<td>intervention?</td>
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<td>If yes, have participants been given information about the aims,</td>
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<td>procedure and possible risks involved, in easily understood language?</td>
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<td>(Attach a copy of any information sheet you may have provided, or intend</td>
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<td>to provide)</td>
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<td>3 Will any person’s position, treatment or care be in any way prejudice</td>
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<td>d if they choose not to participate in the project?</td>
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<td>4 Can participants freely withdraw from the project at any stage</td>
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<td>without risk or prejudice?</td>
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<td>5 Will the project involve working with or studying minors (i.e. persons</td>
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<td>under 16 years of age)?</td>
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<td>If yes, will signed parental consent or in loco parentis be obtained?</td>
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<td>6 Are there any questions or procedures likely to be considered in any</td>
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<td>way offensive or inappropriate?</td>
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<td>7 Have all necessary steps been taken to protect the privacy of</td>
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<td>participants and the need for anonymity?</td>
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<td>Is there provision for the safekeeping of written data and video/</td>
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<td>audio recordings of participants?</td>
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<td>8 If applicable, is there provision for debriefing participants after the</td>
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<td>intervention or project?</td>
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<td>9 If any specialised instruments, for example psychometric instruments</td>
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<td>are to be employed, will their use be controlled and supervised by a</td>
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<td>qualified practitioner e.g. a psychologist?</td>
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<tr>
<td>10 Will you need to put your proposal through an ethics committee</td>
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<td>related to your professional work?</td>
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If you have ticked any of the white boxes, please provide further information.
Part 2: Ethics release form signatories sheet

Daniel Wood

BA (Hons) Professional Practice

A Guide to Voyage Planning

Molly Bellamy

I confirm that the information provided on the ethics release form is correct:

Student’s signature

Given the information provided, I support the approval of this proposal on ethical grounds:

Signature of programme adviser

Note that the University signature on the learning agreement cover sheet (section 6.1) covers agreement to the completed ethics release form(s).

Any further comments
November 10, 2009

Academic Advisor
The Institute for Work Based Learning
Administration Office
Middlesex University
College House
Hendon Campus
London
NW4 4BT

Dear Sir/Madam:

Daniel Wood – Line Manager Approval Letter for Work Based Project

I have sailed with Daniel for the last year on Ruby Princess, where he has fulfilled the role of Voyage Planning Officer. Daniel has spent the last three years in this role on both the Carnival UK and Princess Cruises brands and as such, has considerable experience of the voyage planning process covering varied itineraries.

Daniel is currently researching the voyage planning process for his BA (Hons) in Professional Practice through your institution. The title of his project is “A Guide to Voyage Planning”.

He undertook this programme for self-enrichment, but more importantly was his concern regarding the degradation of skills in the very important process of effectively planning a voyage. This is primarily due to the global shortage of suitably qualified officers which has been compounded by an unprecedented boom in the cruise sector.

This is to confirm that Daniel has full approval for his research. He has been transparent in all his undertakings. He has considered all ethical aspects of the process and is not transgressing any company regulations.

Sincerely,

Gavin Pears
Staff Captain
Appendix 3

Voyage Planning Letter

Dear Simon, Phil and Dave

I am doing a research project for topping up my HND to a BA (Hons) through Middlesex University. You have probably seen the advert in the Telegraph. It has been a quite demanding process, but very rewarding so far. I would recommend it to each of you. The title of my project is “A Guide to Voyage Planning”. I started work on this before undertaking the degree, as I was concerned about the dilution of knowledge in the company, particularly in the skills of voyage planning.

I want to approach this project from a qualitative approach, using the input of 3 other senior navigators. My criteria where that:

- I know you, your work ethic and knowledge base.
- You have or have had at least 2 years experience as navigator.
- Your experience has been varied across brands and cruising patterns.
- You were highly regarded by your seniors.
- This was something that you may have been interested in.
- You have had experience with ECDIS and limited folios as navigator.

While the degree course is obviously for personal gain i.e. status, I always intended this to be used for new navigators, to assist them and to prevent the erosion of our knowledge levels and standards of voyage planning. There is only so much you can pass on in handover notes and during the handover. My guide will be in the form of a descriptive checklist that explains how to appraise and plan and how to display the plan. I will focus mainly on planning with reduced paper folios. I aim to standardise the layout of the plans across the fleet and also how navigators actually plan.

I would like to farm this out to industry eventually. Your names and responses will of course remain totally confidential. I will of course acknowledge your assistance. I have experience from this type of process through my membership of the SGCG of the Nautical Institute. I have consulted ethical guidelines during the planning for this and so far everything appears sound. I have the nod from my Captain and have also informed the BTCC lot. I was actually asked to attend a voyage planning workshop, for my views. I have and continue to give Gabriele advice on his voyage planning project.

I would like your thoughts, methods and ideas. I obviously do not want to take up too much of your time and have designed a questionnaire. I would be very grateful if you could send me your responses and also complete the piloting checklist. I may then amend it and elicit some more feedback from a few others.

I am only interested in the appraisal and planning stages of the process.

I will probably ask you to expand on a few issues when I need advice or clarification on issues. This may well be in the form of a phone call or e-mail. I would greatly value your input and assistance.

You will all of course receive a copy of my final project.
Thanking you all in advance,

Kindest regards
Dan

Questions

15. What publications do we have that give us guidance on voyage planning?
16. Do you think that these give us enough guidance?

17. If yes: Do you think that these publications offer enough on the practical considerations of presenting the plan and voyage planning with ECDIS.

18. If no: Would a company guide or Code of Practice be helpful, particularly in terms of ECDIS?

19. Please describe briefly how you plan a voyage for an area where you have not been before. I am looking for your practical steps.

20. What is in your voyage plan?

21. What else could be in it?

22. List 10 items that you think a Voyage Plan should contain as a minimum standard.

23. How do you present your plan?

24. What would be the best practical way to present a voyage plan.

   b. ECDIS only.
   c. Combination of a. and b.
   d. Laptop.

25. What do you think appropriate means when referring to reduced folios?

26. Do you think that the Captain and navigator should sign the plan?

27. If you do or did this, how did you do it?

28. Do you have anything else that you think may be beneficial to the research?

Thank you for your time.
Appendix 4

Reflections on Learning

December 2008

“I have chosen to do ‘A Guide to Voyage Planning’. This I hope will serve to standardise Voyage Planning in my organisation. My project will also allow me to expand further, should I wish to pursue a Master's Degree. I also hope to submit something similar to the Nautical Institute, as a professional paper, which will enhance my standing and be of benefit to the industry as a whole.

When evaluating my choice further, I also wanted to make a contribution to improve the serious problem that we are experiencing in the industry as a whole, that being the dilution of knowledge. Massive officer shortages and high turnover rates are resulting in a gradual degradation of knowledge bases in a number of areas. Good quality voyage planning is one of them. Thus I am attempting to at least set a standard which can be used and followed by future officers.”

January 2009

“I continually strive to consider the ethical implications of my research during every phase of the process. I always keep the following 3 questions foremost in my mind:

How will this affect the people around me?
How will this affect the economics of my company?
How will this effect the environment in which I live, work and research?

The question of ethics is not a straightforward one. The whole process is one of continual reflection. My research learning has definitely taught me this. What may seem to be ethically sound one day may not be on another in a continually changing social environment. This is especially true during this section of the research project where the research families, research approaches and research tools are being studied and their application considered towards the final project.”

February 2009

“I have focused my last month on studying, deliberating and deciding upon the intricacies and semantics of my approach to my research project in terms of an overall strategy, specific tactics and associated tools for the collection and analysis of the data.

When looking at the main purpose of my research, it is in essence a project to record and standardise a procedure. This is for the improvement of practice in my workplace. My role in this process is that of an expert insider researcher. I want to cover established facts, but would like to transform a combination of historical facts, established practice and expert experience into a document that will form the basis for future improved practice i.e. by using a combination of resources and methodologies; I want to establish a new standard practice.”
March 2009

“I am now so much more aware of figures that are thrown at me in terms of reports, survey, studies etc. On reflection, my studies have enabled me to evaluate not only in my personal life, but also in the workplace, when considering promulgated research data. This has proved to be an exceptional additional tool in my management arsenal when conducting the planning, leading, organising and controlling of the navigational team onboard. I now no longer just accept the various media I am subjected to at just face value. I constantly analyse and make critical evaluations, which has ensured a more rounded view of and approach to my work ethic.”

April 2009

“My final entry before submission of my project proposal has been an exercise in cementing my consideration of the specifics of being a seafarer worker / researcher. My background reading, research, reflection and drafting of my diary entry have resulted in a better understanding of the concepts of being a participant observer in our unique work environment. The WBL process, through sharing drafts, gaining feedback, learning at work and ultimately reflexivity has achieved its objectives. I approach the end phase of this module with new found knowledge, determination, enthusiasm and vigour.”

July 2009

“Seafarers, traditionally, possess a natural tendency towards a ‘resistance to change (RTC)’ attitude. This tradition and conservatism in the maritime world often result in the slow introduction of technological advances into legislation and indeed day-to-day practice. This can sometimes be to the detriment of safe and efficient navigation and cost-effective fleet operation.”

August and September 2009

“I have learnt that there are vast applications for the use of the Gantt Chart. My requirements were merely for a graphical representation of my research activities within my 12-week time frame. I needed something simple to help me not only plan, but manage my project as well. I had decided to use a basic excel spreadsheet to define my activities and their relationship with my time frame. Although I had considered incorporating schedule status and some form of percentage complete indicator into the chart, I discounted this as I felt that the time invested would outweigh the benefits. Also being I seafarer, I knew that I had to remain a little more flexible given the ever-changing nature of our work environment. I have made an A3 printout of the chart which I am manually marking with a highlighter to indicate progress.”

October 2009

“As I trawled through the literature, there were two quotes that I made me aware of the process and its objectives once again. I feel that I may have become too involved in conducting the research and had not been reflecting enough on my own learning.

‘In each, action informs reflection and is informed by it. The reflection produces the learning (in action learning) or research (in action research). Think of both learning and research as understanding. In both, the action is changed as a result of the learning/research, and leads to more learning/research.’
I was made aware that I was learning as I researched, not only about the research process, but also about my work practices. I had not previously in my working life, considered what I did which such breadth and depth. I also realised that my action learning cycle was creating and inspiring learning, knowledge generation and understanding for my research subjects, critical friends and fellow practitioners.

‘Doing your research helps you to examine your own practice and see whether it lives up to your own expectations of yourself in your work. If you say you hold certain values, how can you show that you are living in their direction?’

As we go through the motions of our working life, we tend not to test or question ourselves too much. We are creatures of habit and generally do not like to move out of comfort zones. Action learning and research, I feel has generated a greater capacity within me to improve the way I work and deal with people. I find that I am paying more attention to planning, leading, organising and controlling my work practices. I am also integrating my social values more into my relationships with peers in the workplace.’
### GLOSSARY OF TERMS

<table>
<thead>
<tr>
<th>ARCS</th>
<th>Admiralty Raster Chart Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVCS</td>
<td>Admiralty Vector Chart Service</td>
</tr>
<tr>
<td>CSO</td>
<td>Company Security Officer</td>
</tr>
<tr>
<td>ECDIS</td>
<td>Electronic Chart Display and Information System</td>
</tr>
<tr>
<td>ENC</td>
<td>Electronic Navigational Chart</td>
</tr>
<tr>
<td>EOCC</td>
<td>End of Course Card</td>
</tr>
<tr>
<td>ETA</td>
<td>Estimated Time of Arrival</td>
</tr>
<tr>
<td>ETD</td>
<td>Estimated Time of Departure</td>
</tr>
<tr>
<td>FAOP</td>
<td>Full Away on Passage</td>
</tr>
<tr>
<td>FW</td>
<td>Fresh Water</td>
</tr>
<tr>
<td>GC</td>
<td>Great Circle</td>
</tr>
<tr>
<td>GMDSS</td>
<td>Global Maritime Distress and Safety System</td>
</tr>
<tr>
<td>HFO</td>
<td>Heavy Fuel Oil</td>
</tr>
<tr>
<td>HW</td>
<td>High Water</td>
</tr>
<tr>
<td>IALA</td>
<td>International Association of Marine Aids to Navigation and Lighthouse Authorities</td>
</tr>
<tr>
<td>IC-ENC</td>
<td>The International Centre for ENCs</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organization</td>
</tr>
<tr>
<td>LW</td>
<td>Low Water</td>
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<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto</td>
</tr>
<tr>
<td>MCA</td>
<td>United Kingdom Maritime and Coastguard Agency</td>
</tr>
<tr>
<td>MGN</td>
<td>Marine Guidance Note</td>
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<tr>
<td>OOW</td>
<td>Officer of the Watch</td>
</tr>
<tr>
<td>POB</td>
<td>Pilot On Board</td>
</tr>
<tr>
<td>PSC</td>
<td>Port State Control</td>
</tr>
<tr>
<td>RL</td>
<td>Rhumb Line</td>
</tr>
<tr>
<td>RNC</td>
<td>Raster Navigational Chart</td>
</tr>
<tr>
<td>ROE</td>
<td>Ring On/Off Engines</td>
</tr>
<tr>
<td>RoT</td>
<td>Rate of Turn</td>
</tr>
<tr>
<td>SBB</td>
<td>Stand By Below</td>
</tr>
<tr>
<td>SECA</td>
<td>Sulphur Emission Control Area</td>
</tr>
<tr>
<td>SMS</td>
<td>Safety Management System</td>
</tr>
<tr>
<td>SR</td>
<td>Sunrise</td>
</tr>
<tr>
<td>SS</td>
<td>Sunset</td>
</tr>
<tr>
<td>SSO</td>
<td>Ship Security Officer</td>
</tr>
<tr>
<td>T's and P's</td>
<td>Temporary and Preliminary Notices</td>
</tr>
<tr>
<td>UKC</td>
<td>Under Keel Clearance</td>
</tr>
<tr>
<td>WTD</td>
<td>Watertight Door</td>
</tr>
</tbody>
</table>
APPRaisal PHASE CHECKLIST

Before any planning on an ECDIS can commence, a full appraisal of the intended voyage must take place using the following checklist. Appraisal is the process of gathering together all information that is pertinent and relevant to the voyage to be undertaken. Once this has been done a risk assessment strategy should be followed that identifies all risks and critical areas of the voyage. This is only effective once a full appraisal has taken place.

Officers appraising a voyage with ECDIS must have undergone the necessary type-specific equipment and generic ECDIS training. All equipment must be type-approved. The vessel must have in place a Letter of Equivalency issued by the Flag State and a Risk Assessment must have been carried out as per MGN 285.

<table>
<thead>
<tr>
<th>Publication</th>
<th>Narrative</th>
<th>Check</th>
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</thead>
<tbody>
<tr>
<td>SOLAS Chapter V</td>
<td>Must be consulted to ensure that you are familiar with the primary legislation. Included in this is IMO Resolution A.893 (20), Guidelines for Voyage Planning and MCA Guidance Notes Annex 24 Voyage Planning.</td>
<td></td>
</tr>
<tr>
<td>Company SMS</td>
<td>Your company SMS will provide you with good guidance.</td>
<td></td>
</tr>
<tr>
<td>Industry Guidelines</td>
<td>ICS Bridge Procedures Guide 2007 Chapter 2 – Passage Planning and NI Bridge Team Management Chapter 2 – Passage Appraisal are both good reference guides for those embarking on the process for the first time.</td>
<td></td>
</tr>
<tr>
<td>Chart Coverage</td>
<td>Ensure sufficient ENC coverage for the intended voyage. Obtaining is done via Primar, AVCS or your chart supplier. Where there is no ENC coverage ensure adequate RNC coverage. Guidance on Flag State requirements may be found in the publication “Facts about electronic charts and carriage requirements” Prepared by Primar Seaways &amp; IC-ENC Joint Information Working Group (IWG) available from <a href="https://www.primar.com/page/news-article?articleID=12">link</a>. As with paper chart coverage, ENC data for possible contingency ports should also be ordered. Permits must be ordered well in advance to facilitate adequate time for appraisal. Appraisal should only take place on official ENC’s.</td>
<td></td>
</tr>
<tr>
<td>T’s and P’s</td>
<td>Consult the latest T’s and P’s for the areas in which the voyage is taking place. A file identifying all T’s and P’s must be maintained at all times for the voyage areas on ECDIS ships.</td>
<td></td>
</tr>
<tr>
<td>Navigational warnings</td>
<td>Check the latest warnings for the area concerned. You may have to utilize a local area authority rather than the Flag State for the most detailed information.</td>
<td></td>
</tr>
<tr>
<td>Past experience</td>
<td>There is no substitute for past experience. Consult the bridge team to find out who has been to the area before. All relevant information should be collected from the last company ship to conduct the specific voyage; this includes: The Voyage Plan including navigation and environmental schedules, charts used (obtain the relevant basins file if possible to compare it your coverage), ECDIS chart objects, ECDIS tracks, port notes, mooring and berthing plans, blind pilotage plans, port photographs and check log book entries.</td>
<td></td>
</tr>
<tr>
<td>Local agents</td>
<td>Can provide good local advice as per your requirements. A good tactic is to send a standard e-mail covering all of your information requirements. Berthing and conflict schedules are probably the most useful information.</td>
<td></td>
</tr>
<tr>
<td>Pilot associations</td>
<td>Standard forms as detailed in the Bridge Procedures Guide (Checklists A1 and A2) are very useful in exchanging advance information. This can be done well in advance of the intended voyage. Pilotage waypoints and or the pilotage plan may also be obtained. The ship’s pilot card may also be sent in advance to allow them to appraise the pilotage plan.</td>
<td></td>
</tr>
</tbody>
</table>

A Guide to Voyage Planning by Daniel Wood – Appraisal Phase Checklist

1 | Page
<table>
<thead>
<tr>
<th>Publication</th>
<th>Narrative</th>
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</thead>
<tbody>
<tr>
<td>Port Authorities</td>
<td>Information on websites is easy to access and can provide details on regulations, berth, channel and harbour dimensions, services, tug, local weather etc. Can also provide berthing and conflict information.</td>
</tr>
<tr>
<td>Ocean Passages for the World (NP 136)</td>
<td>Excellent for ocean planning, it includes selection of routes with distances between ports and important positions. Details of weather, currents and ice hazards are also included together with numerous route diagrams and charts showing the effects of climate, wave heights and local line zones.</td>
</tr>
<tr>
<td>Routing Charts</td>
<td>Each chart documents prevailing weather patterns - wind, currents, wave heights, visibility, surface pressure, sea surface temperature, and ice caps for 20 sections of the world’s oceans for a given month of the year.</td>
</tr>
<tr>
<td>Sailing Directions and Pilot Books (Book and CD)</td>
<td>Provide comprehensive information on navigational hazards, buoys, radar systems, pilotage, regulations, general notes on the countries, port facilities, seasonal currents, ice and climatic conditions. Very useful for prevailing wind and current conditions.</td>
</tr>
<tr>
<td>Admiralty Digital List of Lights</td>
<td>Provides a detailed listing of over 70000 lighthouses, lightships, light vessels and other aids to navigation.</td>
</tr>
<tr>
<td>Tidal and Current Information</td>
<td>Tidal and Current Information includes: Admiralty Tidal Software - includes tidal predictions for over 70000 ports and 50000 tidal stream stations. Admiralty Tidal Stream Atlases display the major tidal streams for selected waters of north-western Europe, including direction and rate at hourly intervals. Local tidal and current information should also be obtained from local authorities.</td>
</tr>
<tr>
<td>Admiralty Digital Radio Signals Vol 6</td>
<td>Provides detailed maritime radio-communications information for port services, vessel traffic services and port operations for more than 3000 service locations around the world.</td>
</tr>
<tr>
<td>Admiralty List of Radio Signals Vol’s 1-5</td>
<td>Maritime Radio Stations; Radio Aids to Navigation, Satellite Navigation Systems, Legal Time, Radio Time Signals and Electronic Position Fixing Systems; Maritime Safety Information Services; Meteorological Observation Stations and GMDSS.</td>
</tr>
<tr>
<td>Master’s Handbook (NP 100)</td>
<td>Essential information on charts; operations and regulations; tides, currents and characteristics of the sea; basic meteorology; navigation in ice, hazards and restrictions to navigation; and the IALA Buoyage system.</td>
</tr>
<tr>
<td>IMO Ship’s Routing</td>
<td>Details of all ships’ routing and mandatory reporting systems adopted by IMO, including traffic separation schemes, two-way routes, recommended tracks, deep water routes, precautionary areas and areas to be avoided.</td>
</tr>
<tr>
<td>Weather and climate information</td>
<td>Climatic information must always be updated with the latest weather information. Consider weather routing. The internet is an excellent tool if available. Always obtain and compare information from as many reliable sources as possible.</td>
</tr>
<tr>
<td>Guide to Port Entry (Book and CD)</td>
<td>Detailed information, plans and diagrams for over 8000 ports updated bi-annually. Also include 2000 reports of Actual Conditions Experienced (ACE).</td>
</tr>
<tr>
<td>Vessel characteristics</td>
<td>Specifically maneuvering characteristics and maximum dimensions for the consideration of narrow channels, shallow water, bridge and cable clearances and locks.</td>
</tr>
<tr>
<td>Stability</td>
<td>Predicted drafts, HFO and FW bunkering and any special requirements for the voyage.</td>
</tr>
<tr>
<td>Bridge equipment</td>
<td>What is the state of the bridge equipment? Will this affect any aspect of the voyage?</td>
</tr>
<tr>
<td>Environmental</td>
<td>Consider MARPOL requirements, Special Areas and SECA’s and National and Local Regulations. Pay particular attention to ballast operations, garbage and sludge discharge and incinerator operation.</td>
</tr>
<tr>
<td>Security</td>
<td>Consider security levels en route and in the ports. The CSO or SSO will be able to advise on any specific requirements for the voyage.</td>
</tr>
</tbody>
</table>

A Guide to Voyage Planning by Daniel Wood—Appraisal Phase Checklist

Page 2
PLANNING PHASE CHECKLIST

The officer responsible for voyage planning is specifically delegated this task by the Captain and is referred to as the Planning Officer. The Captain should also designate another officer to check the plan before it is submitted to him for final approval. Planning should be conducted using the following checklist for guidance and should cover the entire voyage from berth-to-berth including areas where a pilot will be engaged.

Officers planning a voyage with ECDIS must have undergone the necessary type-specific equipment and generic ECDIS training. All equipment must be type-approved. The vessel must have in place a Letter of Equivalency issued by the Flag State and a Risk Assessment must have been carried out as per MGN 265.

<table>
<thead>
<tr>
<th>Element</th>
<th>Narrative</th>
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</thead>
<tbody>
<tr>
<td>Current Updates</td>
<td>Have ENC’s and ARCS been updated to the latest available NIM and are the relevant ECDIS permits valid for the planned voyage?</td>
<td></td>
</tr>
<tr>
<td>ENC Layers</td>
<td>Ensure that ENC &quot;ALL&quot; is selected for any planning. All text labels should also be selected.</td>
<td></td>
</tr>
<tr>
<td>Depth Contours and Limits</td>
<td>Establish a defined set of parameters (standard settings) with the Master for the voyage appropriate to the individual vessel, its squad characteristics and an acceptable UKC. Settings should only be adjusted with the Master and Planning Officer’s agreement. Limits can be adjusted as necessary for transit of shallower waters at slow speed and (with prior agreement), but not simply by personal preference. All watch-keepers must understand limits and shading schemes (white is best and dark blue worst) with special reference to alternative night palette displays. As a general rule, the safety contour should not be less than draft + 15%.</td>
<td></td>
</tr>
<tr>
<td>No-Go Areas</td>
<td>All areas where the ship cannot go should now be marked. Do this using the ECDIS chart object option function. Allow for a margin of safety when determining the limits of the no-go area.</td>
<td></td>
</tr>
<tr>
<td>Open Water Tracks</td>
<td>Drive the open water tracks on the ENC, utilizing the overview/general scale (usage bands 1 and 2). Evaluate passage distances and routes leaving two or three options (i.e. GC v RL, north vs. south around intervening land masses). This phase should take into account routing charts, weather predictions, etc., depending on the route geography. At this point you should have a general route with rough waypoints to be fine tuned later. This could generally be from FAOP (ROE) to SBB (EOCC).</td>
<td></td>
</tr>
<tr>
<td>Arrival Track</td>
<td>Draw the approach track utilizing coastal, approach and harbour scales (usage bands 3, 4 and 5). Divide this section up further into SBB to Pilot boarding position (you should have the exact boarding position from the appraisals stage) to Harbour entrance to swinging basin and finally to position off berth. This depends on the port layout.</td>
<td></td>
</tr>
<tr>
<td>Arrival Port</td>
<td>Now re-check tidal conditions, current and wind, sunrise and sunset times, reporting requirements, port restrictions, overhead clearances, navigation marks and tug availability. Fine tune the preferred track and then interrogate it to determine suitability in terms of channel width, clearance from beacons, breakwaters and overhead obstructions etc. Determine safe and unsafe tidal windows dependent on UKC and/or tidal stream as necessary. Know the wind limits for your vessel and the port.</td>
<td></td>
</tr>
<tr>
<td>Arrival Manoeuvre</td>
<td>Make sure that you know the berth details and which side to you will berth well in advance. Now determine the manoeuvre by investigating available swinging room and shallow areas. Determine transit and clearing headings (i.e. visual references) which help to maintain a picture of position to compare to the ECDIS representation. This on the harbour and berthing scale (usage bands 5 and 6).</td>
<td></td>
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</tbody>
</table>

A Guide to Voyage Planning by Daniel Wood – Planning Phase Checklist
<table>
<thead>
<tr>
<th>Element</th>
<th>Narrative</th>
<th>Check</th>
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</thead>
<tbody>
<tr>
<td>Complete Arrival</td>
<td>From here, work back, considering Master's preference, pilot's recommendations, ship’s characteristics and prevailing weather to determine approximate speeds at each leg from S&amp;B to berth. This has to be done alongside determining appropriate turn radii and RoT.</td>
<td></td>
</tr>
<tr>
<td>Blind Pilotage Plan</td>
<td>Construct a secondary plan for the arrival allowing for the possibility of restricted visibility and use utilizing associated monitoring techniques. This may be done in the form of marked chartlets or by using ECDIS shipshape and parallel indexing (PI) on the ENC.</td>
<td></td>
</tr>
<tr>
<td>Port Navigational Notes</td>
<td>While conducting the arrival phase, start constructing detailed port navigation notes for inclusion in the Voyage Plan.</td>
<td></td>
</tr>
<tr>
<td>Departure</td>
<td>Conduct the same routine as described above for departure, completing the port navigation notes.</td>
<td></td>
</tr>
<tr>
<td>Close Navigation</td>
<td>Referring back to the open water route now complete a similar procedure as for arrival or departure for any pertinent section on passage, close coastal pass, navigation through a narrow channel etc.</td>
<td></td>
</tr>
<tr>
<td>Finalise Passage</td>
<td>Follow the entire from A-B (using the best scale for each leg), re-checking it as you go. Add chart user items (notes) such as PI's, W/O references, speed restrictions, WTD status, bridge manning levels, radio reporting points, change of machinery status, environmental limits and security limits. At the same time this enables you to double check all aspects of the route for hidden 'surprises' such as rigs, fish farms, mine fields etc. Waypoints should be precisely determined at this point.</td>
<td></td>
</tr>
<tr>
<td>Cross Track Error (XTE)/Track Limit</td>
<td>While working on the PI's, the XTE can also be determined for each leg of the voyage. As a general rule the limit should be half the safe distance from the nearest obstruction. A set XTE allows a safety margin if anything untoward occurs and also gives the bridge team an indication of allowable track deviation.</td>
<td></td>
</tr>
<tr>
<td>Position-Fixing</td>
<td>Determine primary/secondary fixing methods for each leg of the voyage and mark it in the track notes so that it is visible to the OOW at all times.</td>
<td></td>
</tr>
<tr>
<td>Waypoints (WP)</td>
<td>Labeled in relation to geographical/char features and/or navigational requirements (“Fairway Bogy”, “Pilot Off”). WP's should always be rounded off (dotted). Determine safe turn radii at each waypoint. Check RoT for turn radii. W/O points are not the same as WP’s. Establish visual and radar monitoring at each W/O, through the alteration and for the new track, where practicable for comparison with the ECDIS.</td>
<td></td>
</tr>
<tr>
<td>Aborts and Contingencies</td>
<td>This is the last point at which an approach can be aborted before the ship is committed proceed in. This must be drawn using the ECDIS track function to ensure that the vessel can actually make the turn. Try and allow for a first and final abort is possible. Once the abort is passed, have contingency plans for emergency action. These can be anchor and/or drift positions and should be clearly marked on the ENC as such.</td>
<td></td>
</tr>
<tr>
<td>ECDIS/Track Checking</td>
<td>Use the automatic checking feature of the ECDIS as an additional check.</td>
<td></td>
</tr>
<tr>
<td>Track Storing</td>
<td>Ensure that the final track is numbered and stored in an appropriate folder. There must be no ambiguity about the track in use and this should be clearly indicated in the Voyage Plan.</td>
<td></td>
</tr>
<tr>
<td>Scheduling</td>
<td>Note that the accuracy of the track is complete from berth to berth, the final distance will be known, and coupled with departure times and river distances, ETA's at pertinent points and passage speeds can be determined and speeds adjusted as required for any daylight transit/tidal windows which may be required for departure/arrival or indeed for any point on passage. Detailed navigation, environmental, WTD status and bridge manning schedules may be drawn up at this time.</td>
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</tbody>
</table>
# VOYAGE PLAN NOTEBOOK CHECKLIST

IMO Resolution A.893 (21), Guidelines for Voyage Planning, section 3.3 states “The details of the voyage or passage plan should be clearly marked and recorded, as appropriate, on charts and in a voyage plan notebook”. This checklist provides guidance on the requirements for the voyage plan notebook, which will be a folder located at the conn station.

The guidelines further state, “Each voyage or passage plan, should be approved by the ship’s master prior to the commencement of the voyage or passage”. This should take the form of a voyage plan briefing with all officers and the Chief (an endorsement is to be made in the Deck Log Book to this effect). The Chief is able to make recommendations on fuel requirements and technical aspects affecting the voyage. Once this has been done, the tracks should be digitally signed and locked in the ECDIS. At present there is no facility to do this, and thus the Master and Planning Officer should countersign the ECDIS track printouts within the voyage plan notebook for formal acceptance. This is beneficial for FSC and auditing purposes.

<table>
<thead>
<tr>
<th>Element</th>
<th>Narrative</th>
<th>Check</th>
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<tbody>
<tr>
<td>Navigation/Voyage Schedule</td>
<td>This takes the form of spreadsheet with formulas with time, speeds and</td>
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<tr>
<td></td>
<td>distances. It includes departure port(s) and date, arrival port(s) and</td>
<td></td>
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<tr>
<td></td>
<td>date, time zone, BTD, ETA, FAOP time, SBB time, POB time, river distance,</td>
<td></td>
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<tr>
<td></td>
<td>passage distance, passage speed required, steaming time, port time, SR/SS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>times and HW/LW heights and times. Berth details, conflicts, time changes,</td>
<td></td>
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<tr>
<td></td>
<td>ECDIS track numbers and general notes are also to be included.</td>
<td></td>
</tr>
<tr>
<td>Environmental Schedule</td>
<td>A spreadsheet which indicates times when the vessel can conduct</td>
<td></td>
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<tr>
<td></td>
<td>operations affecting the marine environment. This can show times when</td>
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<tr>
<td></td>
<td>the vessel is inside/outside 4NM/12NM from land, within MARPOL Special</td>
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<td></td>
<td>Areas and/or SECA’s, within Marine Sanctuaries and when incinerators may</td>
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<tr>
<td></td>
<td>be operated. It can be amended according to ship type, company requirements and operating areas.</td>
<td></td>
</tr>
<tr>
<td>WTD Status Schedule</td>
<td>A spreadsheet which shows when the voyage condition is potentially</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hazardous (PH) or normal.</td>
<td></td>
</tr>
<tr>
<td>Bridge-Manning Schedule</td>
<td>A spreadsheet which lists the times when bridge manning is enhanced due</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to arrivals/departures, pilotage, close navigation, heavy traffic etc.</td>
<td></td>
</tr>
<tr>
<td>ECDIS Track Print-Outs</td>
<td>These should include waypoint (WP) numbers, WP names, WP co-ordinates,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>track type (RL/CG), track true direction for each leg, track distance for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>each leg, track distance to go at each WP, track distance remaining at WP,</td>
<td></td>
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<tr>
<td></td>
<td>planned speed, turn radius, RoT, XTE (Track line) and track notes.</td>
<td></td>
</tr>
<tr>
<td>Blind Pilotage Plans</td>
<td>Should be held in the notebook for ease of reference.</td>
<td></td>
</tr>
<tr>
<td>Port Navigational Notes</td>
<td>These should be a detailed description of the arrival from SBB to the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>berth, departure from the berth to FAOP and berthing/unberthing movements.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>They should list prevailing weather conditions, expected currents, pilotage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>details, reporting requirements, berth details, shore gangway details and</td>
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<td></td>
<td>port security requirements. Any item not displayed on the ECDIS should</td>
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<td></td>
<td>be incorporated into these notes.</td>
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<tr>
<td>Passage Notes</td>
<td>To be used as the port notes above for any constrained parts of the voyage.</td>
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<tr>
<td>Mooring Plans</td>
<td>Diagrams showing berth dimensions, location of mooring lines, bollards,</td>
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<td></td>
<td>positions of gangways and bridge marks.</td>
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<tr>
<td>Port Photographs</td>
<td>Digital images of the vessel alongside, terminal set-up, approach</td>
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<td>channels, pilot boats etc. are very handy for new officers and for</td>
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<td>subsequent calls.</td>
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<tr>
<td>Tides and Currents</td>
<td>Print-outs from tidal prediction software for mooring and gangway</td>
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<td>considerations.</td>
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<tr>
<td>Meteorological Notes</td>
<td>List internet sites to be used and wind limits for the vessel and ports.</td>
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<tr>
<td>Additional Notes</td>
<td>Any additional notes/information specific to the ship and its operation.</td>
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<td>Some examples are true slip tables, agent communications, specific</td>
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<tr>
<td></td>
<td>company requirements etc.</td>
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</table>

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<th>Experiential</th>
<th>Subject A</th>
<th>Subject B</th>
<th>Subject C</th>
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<tr>
<td>Intended track with true direction</td>
<td>Planned track showing the true course of each leg</td>
<td>Track print outs, including waypoint information, courses, speeds, distances, ETA’s, XTE and track parameters</td>
<td>Appropriate Charts</td>
<td>Courses</td>
<td>Waypoint information</td>
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<tr>
<td>Safe speed</td>
<td>Leg distances</td>
<td>Port arrival and departure notes</td>
<td>Course Card</td>
<td>Distances</td>
<td>Tidal Data</td>
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<tr>
<td>Necessary speed alteration en route</td>
<td>Any speed changes required en route</td>
<td>Passage Notes</td>
<td>Danger Highlights</td>
<td>ETA/Speeds</td>
<td>Current Data</td>
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<td>Minimum UKC</td>
<td>Abort/ Cancellation points for critical manoeuvres</td>
<td>Minimum UKC</td>
<td>Tidal information</td>
<td>Means of position fixing</td>
<td>Radio channels for Port and Pilot</td>
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<td>Change in machinery status</td>
<td>Wheel over position for each course alteration</td>
<td>Radio Reporting Points</td>
<td>Minimum UKC</td>
<td>Parallel indexing</td>
<td>Radio Reporting Requirements</td>
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<tr>
<td>Course alteration points, taking into account vessel's turning circle</td>
<td>Turn radius for each course alteration</td>
<td>Environmental restrictions</td>
<td>VTS Reporting Points</td>
<td>Minimum UKC</td>
<td>Description of the route</td>
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<td>Method and frequency of position fixing</td>
<td>Maximum allowable off-track margins for each leg</td>
<td>Tidal/Current Information</td>
<td>Times/ETA's</td>
<td>Probable “Hot Spots”</td>
<td>Chart References</td>
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<td>Ship's routeing and reporting systems and VTS</td>
<td>Shallow waters and minimum clearing distances</td>
<td>Means of position fixing</td>
<td>Distances/Speeds</td>
<td>Radio Reporting Points</td>
<td>Emergency Contingencies</td>
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<td>Protection of the marine environment</td>
<td>Monitoring the ship’s position</td>
<td>No-go areas</td>
<td>Environmental restrictions</td>
<td>Cross Track Error (XTE)</td>
<td>Abort points</td>
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<td>Contingency plans</td>
<td>Contingency actions</td>
<td>Abort points and contingencies</td>
<td>Meteorological conditions</td>
<td>Tidal information</td>
<td>Tug information</td>
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| 25/60 | 42% |
| 10/60 | 17% |
| 6/60 | 10% |
| 5/60 | 8% |
| 5/60 | 8% |
| 3/60 | 5% |
| 1/60 | 2% |
| 60/60 | 100 |

Literature A refers to government policy (SOLAS) and literature B refers to industry guidance (the Bridge Procedures Guide).
MODULE WBS 3828
LITERATURE SEARCH AND REVIEW

LITERATURE REVIEW
A GUIDE TO VOYAGE PLANNING

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Introduction

A literature review is a major element of any research degree. I am conducting this review of literature as a preface to my research project “A Guide to Voyage Planning”. While some literature reviews are an integral part of project report, thesis or dissertation, in this case I will compile a self-contained review that will stand on its own.

As a serving navigator in one of the largest cruise ship companies in the world, I was becoming increasingly concerned about the erosion of knowledge bases and dilution of critical skills and knowledge within my rank group. This has come about as a direct result of an unprecedented boom in the cruise industry, coupled with a global shortage of qualified navigating officers.

The very necessary skill of voyage planning (ships need to get from A to B safely) is not something that can be easily taught in a classroom. It is something that is acquired through passing down knowledge from the more experienced to the less experienced and then developing and fine tuning those skills as one actively plans and learns. I felt that a guide would help in this process.

The ability to search for literature in a particular subject area and then discuss, summarise, synthesise, interpret and analyse it, is an important skill for any work based researcher. As insider researchers though, I think that sometimes we can be a little dismissive of this important aspect of our research journey, as we feel that we already know where the material is and what the answers are.

Aim

The aim of this review is to follow the literature search and review process in a methodical approach in support of my research project. Not only do I seek justification for my project in published literature, I also want to provide myself with a solid background in my field.

I will establish what has been published on the guidance for voyage planning with particular emphasis on using what is available out there and then summarise and synthesise it.

I further seek to develop my thoughts and ideas as I learn from previously published material during this process. I am confident that this will contribute to my understanding of my research topic, maintain the currency of my knowledge and also guard against the danger of that inherent quality of the expert insider researcher to think that we know what is out there.

Scope

The act of legislating and the subsequent documentation that stems from statute in the maritime world, is both a unique and interesting process. I will therefore cover policy literature, specifically international maritime convention and their teeth-giving national shipping acts and regulations.

In terms of subject specific literature, I will highlight and analyse the recommended codes, guides and good practice documents.
Finally, I will delve into unchartered waters for me personally, when I summarize the contributions of significant specific studies on voyage planning. As seafarers we are sufficiently versed in all aspects of global shipping legislation as this is an integral part of our daily life. What we sometimes lack is the recourse to and understanding of published professional knowledge in specific areas. This, I feel, is due to the extremely limited manner in which we disseminate information within our industry.

Policy Literature

Shipping is indeed the most international of the globe’s industries. More than 90% of global trade is conveyed by shipping. It is the most cost effective method of transporting huge quantities of cargo around the world in a safe, efficient and environmentally sound manner.

The operation, management and ownership of a ship can be under a complex mix of many different countries. My vessel for example is registered in Bermuda (which is a class 1 British registry), is US-owned, is crewed by 44 different nationalities, carries 60 different nationalities of passenger and operates between countries as diverse as Turkey and Mexico. Operating primarily out of the US during the northern hemisphere winter and carrying mostly American passengers, we are additionally strictly regulated by the United States Coast Guard and US statute regarding the well-being of their citizens.

We therefore have to have international standards to regulate shipping which can then be adopted by all. International treaties to regulate shipping are nothing new. They have been around since the 19th century. The tragedy of the Titanic in 1912 actually gave rise to International Convention for the Safety of Life at Sea (SOLAS). SOLAS continues to be the most important convention governing the safety of shipping.

The International Maritime Organization (IMO) is a specialized agency of the United Nations which has been in existence since 1958. It has 168 member states. IMO is responsible for ensuring that conventions are kept-up-date. Conventions generally fall into 3 main categories; safety, pollution prevention and compensation. Member states adopt these conventions into their national law and thus they become enforceable.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) sets basic standards for seafarers on a global level. It is SOLAS and STCW which I will be focusing on, as these are the primary conventions dealing with and driving safe navigation and more specifically voyage planning.

Before conducting my search and review, I revisited and reflected on my two main research questions:

“What is the most efficient and practical method to voyage plan successfully?”

“What is the best way to present a standard voyage plan?”

SOLAS (2004, Chapter V Regulation 34) is quite specific in its requirements:

“Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area
concerned, taking into account the guidelines and recommendations developed by the Organization.”

SOLAS therefore makes it mandatory for all ships which proceed to sea to construct a voyage plan which is now a legal document and can be checked by Port State Control (PSC) inspectors. * Refers to Resolution A.893(21), IMO Guidelines for Voyage Planning.

Perhaps it is worth mentioning how a convention becomes law in the United Kingdom. This is done through the Merchant Shipping Act. The UK Maritime and Coastguard Agency (MCA), the agency of the Department of Environment, Transport and the Regions, enforce the requirements of the Merchant Shipping Act. They are responsible for defining the legal technicalities of the conventions through Statutory Instruments, Merchant Shipping Notices and Marine Guidance Notices.

These are the tactics to the overall strategy if you like. While IMO does give us guidance in A.893(21) the MCA gives further guidance in MCA Guidance Notes (SOLAS), Annex 24, Voyage Planning. They also incorporate A.893(21) into Annex 25. These two documents both support and complement each other.

I would now like to address these two documents and establish what they say in relation to my research questions. Annex 24 discusses the 4 main stages of voyage planning namely appraisal, planning, execution and monitoring (APEM). These are bread and butter for any seafarer and are taught at officer of the watch level. These skills are built upon and improved as one gains experience.

Good advice is given on appraisal and planning in A.893(21) and any inexperienced navigator would benefit greatly from following this advice. A more systematic approach would assist though. We all know to plan berth-to-berth and it is in pilotage areas where the policy literature fails. Annex 24 “much of what will have been planned may have to be adjusted or changed after embarking the pilot”. Many good port authorities are already addressing this by supplying their passage plans on request. I would incorporate this into my guidelines.

On presentation we have from Annex 24 “The main details of the voyage plan should be recorded in a bridge notebook used specially for this purpose to allow reference to details of the plan at the conning position without the need to consult the chart.”

A.893(21) p 3.3 states “The details of the voyage or passage plan should be clearly marked and recorded, as appropriate, on charts and in a voyage plan notebook or computer disk.”

This is far too woolly and requires more detailed description and better standardization. This, at the end of the day, is the most important document on the vessel. The reference to “computer disk” is extremely vague and could also perhaps do with some updating.

Finally, I would like to highlight and evaluate what STCW has to offer. STCW was introduced to standardise watchkeeping globally and should cover voyage planning in some depth.

The chapter on watchkeeping in the Convention has nothing on voyage planning and one first finds reference to it in the Code Part A. It was in fact STCW 78 which made the initial, formal suggestions of a dedicated voyage plan, although there were no
guidelines. Part 2 paragraph 3 states “the intended voyage shall be planned in advance….” Paragraph 6 goes on “the planned route shall be clearly displayed on appropriate charts and shall be continuously available to the officer of the watch…”

Not much was done to rectify this with STCW 95 as the Code Part B PART 2 – GUIDANCE ON VOYAGE PLANNING states “(No provisions)”. Thus in terms of policy literature we have some guidance which is good, but lacking in the standardization and format of a voyage plan.

**Subject specific literature**

Industry guidelines are available in the form of those two superb publications, Bridge Team Management (BTM) and Bridge Procedures Guide (BPG). Many companies will have guidance within their Safety Management Systems (SMS). My company has the section “Conduct of Sea Passages” and while covering general principles, we still find little practical advice and indeed once again no standard layout.

BPG is generally acknowledged to be the principal industry guide on the subject of bridge procedures. It incorporates IMO recommendations and international standards into a very useful practical guide with associated checklists that are utilised by a vast and varied maritime audience globally. It was created and is maintained by the International Chamber of Shipping, the trade association that represents over 70% of the world’s tonnage.

BPG dedicates a whole chapter to passage planning and includes a passage planning appraisal checklist. ICS (2007, p. 24) states “The passage plan should incorporate the following details:…..”, and goes on to list 7 crucial items. This is the first reference we have to more than just tracks and no-go areas and is almost suggesting comprehensive waypoint lists. This is more relevant and up-to-date when we include ECDIS in our voyage planning, with its ability to print out waypoint lists. When we see that the publication is a fourth edition, being revised as recently as 2007, we can rely on this as probably the most up-to-date and relevant text on this subject.

Unfortunately BPG is found wanting when we seek guidance on the format of the plan. “Appropriate details of the passage plan may be copied so that the plan can be readily referred to at the main conning position” ICS (2007, p. 25). Why wasn’t appropriate defined properly? This is exactly what I am setting out to do.

In terms of the plan in pilotage waters, BPG offers excellent advice. This goes some way in filling the gaps left by the IMO Recommendations. ICS (2007, p. 28) “An information exchange initiated by the ship approximately 24 hours before the pilot’s ETA will allow sufficient time for more detailed planning to take place both on the ship and ashore.” I would suggest that this could be done well in advance of the 24 hours suggested, being incorporated into the advance appraisal and planning stages of the voyage planning process. The guide offers two good checklists to facilitate this advance planning.

All of this good work is undone, however, in Chapter 6 Maritime Pilotage. ICS (2007, p. 71) “Whilst charts, pilot books and port guidelines provide much of this information directly, masters should recognise that not all of this information may be available in sufficient detail to complete the passage plan until the pilot has boarded the ship.” Well, it should be.
The guide is a thorough and detailed publication that any prudent navigator should consult prior to embarking on a voyage plan. My insights only highlight small discrepancies and I hope to address these during my research. My final observation is in the title of Chapter 2, namely Passage Planning. The title should really have included Voyage Planning or indeed made reference to it in the text. Planning is a requirement for both voyages and passages.

I like BTM, because it focuses more on the human element. No matter how much we legislate, regulate, recommend and guide; people will still make mistakes. The fundamental APEM process is covered in explicit detail, incorporating the planning, organising, leading and control of the bridge team and its associated procedures. Written by a simulator trainer, it draws from the practical experiences of over 3000 officers who underwent training courses. This in itself is invaluable.

The publication has recently been updated (2004) in its second edition and now includes a chapter on navigating with ECDIS and is therefore relatively current.

Chapter 2 on passage appraisal lists 23 sources of information (including the all-important past experience) and goes on to provide a brief description of each. Used in conjunction with the checklist and advice in BPG and following a set-procedure, I feel that all the bases will be covered. It is the set-procedure that I am researching from a practical perspective and will aim to standardise the process.

The section on passage planning is in-depth, well-illustrated and leaves no stone unturned. The advice given is predominantly for planning with paper charts and while this can be adjusted and modified for ECDIS, terms and techniques are different between the two. Certain aspects of these differences are dealt with in the ECDIS chapter, but there is not enough practical experience coming through in the text.

What of the presentation of the plan then? Swift (2004, p. 37) makes reference to a Planning Book, “……certain information may be better written in a planning book, e.g. times of high and low water, times of sunrise and sunset, VHF working frequencies, etc. Where a ship uses a port regularly the navigator may prefer to put the whole of his plan into a planning book in addition to the chart, so that it can be referred to at a later date. He may choose to hold such information on a computer, where it can be accessed and modified when making a return visit.”

Excellent advice and the first reference we have to what type additional information should be in the plan. I disagree with the suggestion that this should be done for a vessel which only visits a port regularly. This should be done for all ports in the voyage with the information being captured and stored at the appraisal stage.

Furthermore we have the Conning Notebook, “Depending upon the length and complexity of the passage, or certain parts of it, it is good practice for an abbreviated edition of the plan to be made into a notebook. The person having the con can then update himself, as and when required, without having to leave the conning position to look at the chart.”

The person having the con on an ECDIS ship, has the electronic chart with the plan on it. He should never have to leave the conning position. The formalised voyage plan with its waypoint list printouts and standardised ancillary information should be available to him at the conning position. This is what I would like to see being done. My research will discuss formalising this.
The voyage plan is thus a combination of the Planning Book and Conning Notebook as described by Swift (2004, p. 37). Swift (2004, p. 92) further reinforces this in his commentary on IMO's A.893(21), “Most of the passage planning can be shown on the relevant charts. In some areas there may not be sufficient space to show everything but even so details can be shown on areas of land or water where the ship cannot go. A voyage plan notebook may be used to detail parts of the plan and in any case, such details should be permanently recorded in the notebook or on a computer disk. This allows recall at a later date, should the vessel revisit the port.”

Thus I have my term “Voyage Plan Notebook”. Now I can look to standardising its presentation and formalising its content, use and how to regulate it.

Published research report literature

Perhaps the best example of a research paper on passage planning with ECDIS is Captain Sam Mead’s “Passage Planning made efficient and cost-effective”. While quite dated now, it is over 10 years old and deals exclusively with ARCS charts, it deals with principles that are unquestionably crucial in respect of this review and certainly relevant even today.

Mead, an experienced seagoing Master and at that time a shore management vessel operation assessor with Shell UK, was tasked with standardising company approved passage plans. He did this in consultation with all the serving senior masters. Mead (1999: p. 2) wanted to “increase safety and to ensure compliance with regulations” by having company approved routes for their entire UK coastal tanker fleet.

Basic minimum standards were laid down for the narratives accompanying the passage plan. The company became actively involved in the construction, maintenance, training, execution and monitoring of the plan. Serving Masters were accorded full consultation in the process, and as such, that element of resistance to change and to their authority being undermined was certainly dampened and even nullified.

The benefits of this research project were unparalleled. A huge workload was taken from the shoulders of seagoing staff as routes were all pre-planned and company approved. The development of some 300 routes was the anticipated final result, with Masters still retaining the ultimate responsibility for the safety of the vessel.

Shell recognised the germination of the problems that are causing major concerns today at a very early stage. Mead (1999, pp. 8-9) “In the present climate of checklists, procedures and other ISM related tasks, and the problems in many fleets where there is such a rapid turnover of personnel that the Master may be unable to assess an individual’s ability to formulate an acceptable passage plan at short notice, a ready made plan complete with appropriate checklists may be essential.”

While they certainly dealt with the problem, they didn’t address the core issues of having suitably trained navigators that are able to plan effectively. Essentially, this was a little short-sighted. Mead did however mention training, but this was focused more on operating the system than how to actually plan, as this had already been done. One could argue that this is acceptable for the coastal trade, but what of the officer that moves deep-sea and/or even to another company. What skills do they possess in passage planning after never having actually done it?
Harry Gale’s “From Paper Charts to ECDIS – A Practical Voyage Plan” sponsored by the Nautical Institute NI, recognised that ECDIS skills are still limited and offers guidance to the seafaring community on how to alleviate this. The publication is very recent, having been released in March of this year and includes contributions from serving seafarers who are members of the NI’s Sea Going Correspondence Group (SGCG). I was, in fact, asked to comment on his paper, based on my experience with ECDIS.

The paper is extremely beneficial to the industry as it draws on a wealth of operator experience. It does not cover voyage planning in much detail though and is rather more generic in its content. This is obviously fine, as the target audience is the seafaring industry as a whole. What is needed now is a guide on how to voyage plan effectively with ECDIS.

**Reflection and conclusion**

The process of work based learning is one that requires tremendous self-dedication and self-discipline. It can be a lonely process and is certainly not something that is taken on lightly. I was initially sceptical when I embarked on this module. I felt that I was close to getting started on my dissertation properly and contemplated on what more I could learn regarding searching for literature, which I perceived as a fairly simple process.

Work based learners, I think, can also tend towards sententiousness. In the end we are the ones who are experts in our field. What can we learn about seeking information in what is essentially our area of expertise, our niche?

These thoughts jolted me to embark on a process that I had nearly forgotten about and reminded me of a term that I had defined in an earlier module, reflexivity. I couldn’t remember exactly what it said, so I revisited it. My definition was this “This is the pursuit of the insider researcher to continually critically self-appraise and evaluate her own subjectivity during the research process in order to remain as objective as possible.”

I re-evaluated and re-addressed my response to the module with this foremost in my mind. What have I learned? Well, I have learned the overall strategy of conducting a literature review with its associated searching, summarising and synthesising tactics. I have learned that conducting a literature review is an important stepping stone in the research process. No, a crucial element in fact! I have learned that the process of reviewing literature allows you to indentify major themes and possibly even new themes that you did not even know existed. The most important aspect though, is that I am glad that it reminded me to be reflexive during all stages of my research journey.

Daniel Wood
22nd August 2009

**Word Count: 3597**
Bibliography


