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Lighthouse

JOURNAL OF THE CANADIAN HYDROGRAPHIC ASSOCIATION

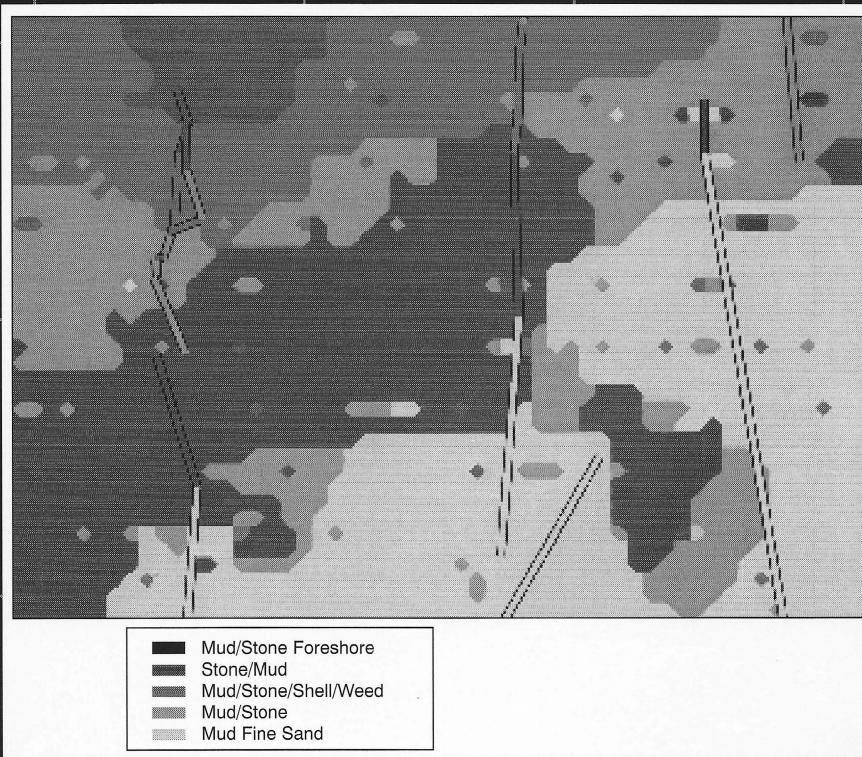
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Pour les tarifs et les spécifications publicitaires, se référer à la page 48 de cette édition.

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Back issues of Lighthouse, Editions 24 through 50 are available at a price of \$10 per copy. Please write to the Editor.

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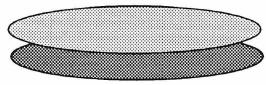
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Les opinions exprimées dans les articles de cette revue ne sont pas nécessairement celles de l'Association canadienne d'hydrographie.

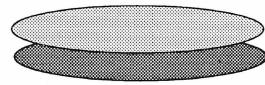
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Spring Issue	March 1/1er mars	Édition du printemps
Fall Issue	October 1/1er octobre	Édition de l'automne



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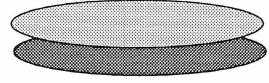
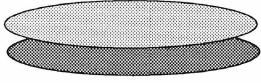
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Editor's Note:

Erratum Edition #50

Bill Crawford has brought to my attention a minor error in the last edition of Lighthouse.

On page 41 (CHS News) there is a list of publications from Bill Crawford, the last one claiming credit for an article in Lighthouse which doesn't exist. The article was in fact published in *Pacific Yachting*. He assures me that this was an honest mistake, and that he is not trying to pad out his publications list.



Message from the National President *Mot du Président national*

As you read this edition of Lighthouse you should note on the masthead that the editor has changed from Bruce Richards to Terese Herron. Bruce has passed the keyboard as it were, after leading a very capable production team for 10 editions of Lighthouse. As I reviewed these past issues in preparation for this short note I was reminded not only of the production challenges that faced Bruce in his role as editor, but also of the rapid technological changes that have taken place in our profession and perhaps more importantly, the ever-widening breadth of hydrography.

Bruce, the Lighthouse team and the authors of these fine articles have provided us all with very timely information. I would like to extend a collective thank you to all these fine folks for their superlative efforts.

Lighthouse, the journal of the Canadian Hydrographic Association will continue to be produced by members of that strong team with some changes that reflect the dynamics that we as an Association are seen to embody. Terese, in her role as editor, will lead this change. This is probably a fine spot to mention that this change can only take place if the rest of us CHA members (or non-members—there are a few out there you know, though I can not understand why) continue to provide information and articles of our activities and thoughts to the journal.

I would be amiss if I did not mention a group that provides financial strength to the publication—the advertisers. The support of this group is appreciated much beyond the revenue they bring in to assist Lighthouse; advertisers provide information about services and technologies from which we all benefit in our profession.

In closing, I would like to say a personal thank you to Bruce for his efforts and a thank you to Terese and the Lighthouse team for forging on, from all of us.

Regards,
Dave



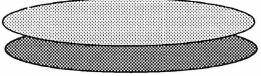
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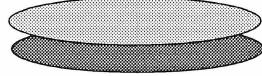
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Abstracts/Résumés



The papers included in this edition of Lighthouse have been selected from the written transcripts of the papers presented at the CHS Hydrocomm '95 Symposium.

Electronic Charts: The Course to Go

by

Captain John Pace

In February 1993, representatives from Canada Steamship Lines (CSL) met with the Canadian Hydrographic Service to discuss the 166 electronic charts that CSL needed for the new electronic chart system they were installing on their ships.

In this paper, Captain Pace describes the work involved in producing those 166 electronic charts—none existed at that time—and the experience gained by CSL in operating with Electronic Chart Display and Information System (ECDIS) over the past two years. International performance standards have not yet been agreed upon but ECDIS is a complex concept that must not wait; the benefits of using ECDIS combined with Differential Global Positioning System (DGPS) are now within reach.

The move to ECDIS was a significant challenge for CSL but showed the world that the electronic chart is the course to go.

Page 7

Reaping the Fruits of the Labour: Learning to Cope?

by

Julian Goodyear

The Electronic Chart Pilot Project begun in 1992 by the Canadian Hydrographic Service (CHS) was the beginning of a formal program to supply electronic charts to the shipping community.

This paper discusses the unusual challenges met by the Canadian Hydrographic Service during the development of electronic charts. The sudden demand for Electronic Navigation Charts (ENC's) provided a unique opportunity for the CHS to work closely with a major corporate shipping company and with an equipment manufacturer.

Feedback became important, prompting Hydrographic staff to board ships in order to study the systems in action. The mariner can now manipulate the chart data. We can expect to hear demands for new and different data in the near future.

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Les articles de cette édition du Lighthouse ont été sélectionnés parmi les textes des présentations faites au symposium Hydrocomm '95 du SHC.

Cartes électroniques: La route à suivre

par

Capitaine John Pace

En février 1993, des représentants de Canada Steamship Lines (CSL) ont rencontré le Service hydrographique du Canada pour discuter des 166 cartes électroniques dont CSL avait besoin pour le nouveau système de carte électronique qu'ils installaient sur leurs navires.

Dans cet article, le capitaine Pace décrit le travail requis dans la production de ces 166 cartes électroniques—inexistantes à ce moment-là—and l'expérience acquise par CSL dans l'utilisation du système de visualisation de cartes électroniques et d'information (SVCEI) depuis les deux dernières années. Les standards internationaux de performance n'ont pas encore tous fait l'objet d'un consensus mais le SVCEI est un système complexe qui ne peut attendre. Les avantages d'utiliser un SVCEI combiné au système de positionnement global différentiel (SPGD) sont maintenant à la portée de la main.

La décision d'aller vers le SVCEI fut un défi important pour CSL, mais cela montra au monde que la carte électronique est la route à suivre.

Page 7

Récolter les fruits de notre labeur: Apprendre à faire face aux situations?

par

Julian Goodyear

Le projet pilote de la carte électronique commencé en 1992 par le Service hydrographique du Canada (SHC) fut le commencement d'un programme formel visant à fournir des cartes électroniques à la communauté maritime.

Cet article présente les défis inhabituels rencontrés par le SHC pendant le développement des cartes électroniques. La demande soudaine des cartes électroniques de navigation (CEN) a fourni une opportunité unique pour le SHC de travailler étroitement avec une compagnie de transport maritime et avec un manufacturier d'équipement.

La rétroaction devint importante, ainsi des membres du personnel hydrographique sont montés à bord des navires pour étudier les systèmes en action. Le marin peut maintenant manipuler les données de la carte de sorte que l'on peut s'attendre à recevoir bientôt des demandes pour des données nouvelles et différentes.

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**Implementing ECDIS Worldwide:
Challenges and Opportunities**
by

Dr. Lee Alexander

The eventual employment of ECDIS will have a profound impact on all aspects of maritime navigation, safety and commerce. In order to implement ECDIS there are a number of challenges. Many involve the completion of technical and procedural issues related to international standards and specifications. For National Maritime Safety Administrations there will be policy and regulatory implications associated with ECDIS related to performance standards, type approval, classification, carriage requirements, mariner training/certification, reduced watchkeeping, required marine radionavigation systems (e.g., DGPS) and the means/process required to update electronic charts. Most likely, ECDIS will lead to dramatic changes in the type of navigation safety and waterways services that should be provided to improve both the safety and efficiency of maritime commerce in the world's increasingly congested ports and waterways. Since ECDIS is a real-time navigation system, there are opportunities to improve upon the type of real-time information that can be provided to the mariner in digital form, including tides/water levels, currents, ice coverage, weather and vessel traffic movements. There are many aspects of ECDIS implementation that will require close co-operation. Given the paradox of increasing demands for improvements in charting and navigation safety coupled with the reality of budgetary/fiscal constraints, it is crucial that government agencies, industry, education/research organisations and maritime-user groups—**work together!**

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**Meeting the need for Electronic Chart Data
World Wide**

by

Fosco Bianchetti and Brian Terry

C-MAP, a world-wide firm based in Italy, and Nautical Data International (NDI), based in Canada, have joined forces to produce and market electronic charts.

Fosco Bianchetti discusses the difficulties that C-MAP has encountered in producing top-quality electronic charts, and the challenge of working with various Hydrographic Offices (HO's) around the world. The Canadian Hydrographic Service, as a partner in NDI, has been very helpful but others have been hostile to C-MAP's efforts.

C-MAP now has 2,500 charts available for distribution; with offices in 9 countries they are well on the way to a world-wide ECDIS data base.

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**Implanter mondialement le SVCEI:
Défis et opportunités**
par

Dr. Lee Alexander

L'emploi éventuel de SVCEI aura un profond impact sur tous les aspects de la navigation, de la sécurité et du commerce maritime. Pour planter le SVCEI, il y a un bon nombre de défis. Plusieurs impliquent l'achèvement d'éléments techniques et de procédures reliés aux spécifications et aux standards internationaux. Pour la «National Maritime Safety Administrations», il y aura des implications de politiques et de règles associées au SVCEI en ce qui a trait aux standards de performance, au type d'approbation, à la classification, aux besoins de transport, à la formation/certification des marins, aux quartiers de garde réduits, aux systèmes de radionavigation requis (e.g. SPGD) et les moyens/processus requis pour la mise à jour des cartes électroniques. Fort probablement, le SVCEI mènera à des changements majeurs au niveau de la sécurité de la navigation et des services aux voies navigables qui devraient être fournis pour améliorer à la fois la sécurité et l'efficacité du commerce maritime dans les ports et les voies navigables du monde qui sont de plus en plus congestionnés. Étant donné que le SVCEI est un système de navigation en temps réel, il y a là l'opportunité d'améliorer le type d'information qui peut être fourni sous forme numérique aux navigateurs, tels les niveaux d'eau/marées, les courants, la couverture de glace, la météo et le trafic maritime. Il y a plusieurs aspects sur l'implantation du SVCEI qui demanderont une étroite collaboration. Étant donné le paradoxe entre la demande croissante d'améliorations aux cartes et à la sécurité de la navigation versus la réalité des contraintes budgétaires, il est crucial que les agences gouvernementales, l'industrie, les organisations de recherche et de formation, et les groupes d'usagers du milieu maritime **travaillent ensemble**.

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**Rencontrer le besoin de données de cartes
électroniques à la grandeur du monde**
par

Fosco Bianchetti et Brian Terry

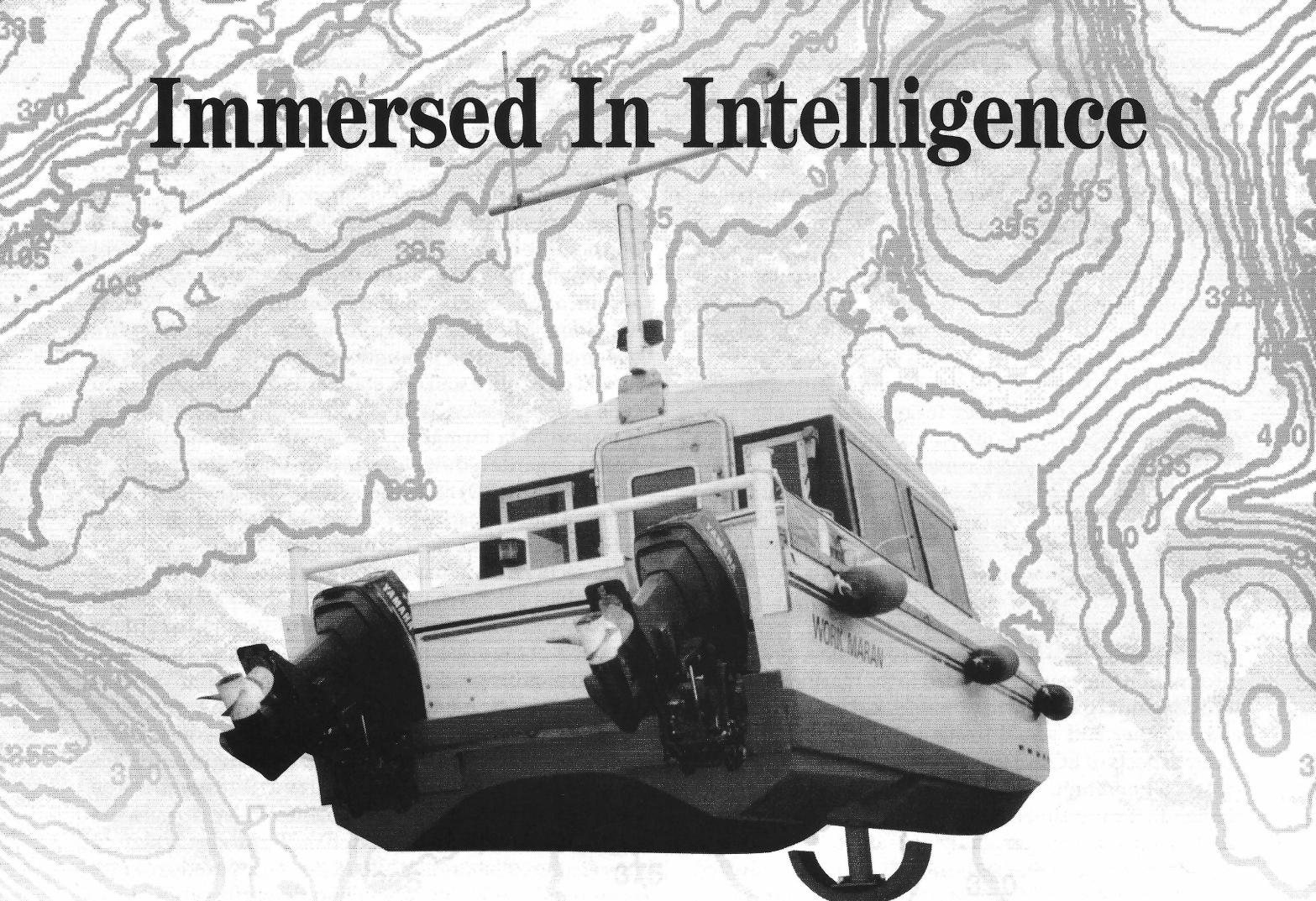
C-MAP, une firme internationale basée en Italie, et Nautical Data International (NDI) basé au Canada, ont joint leurs efforts pour produire et mettre en marché des cartes électroniques.

Le docteur Bianchetti présente les difficultés que C-MAP a rencontré dans la production de cartes électroniques de première qualité, et le défi de travailler avec les divers bureaux hydrographiques dans le monde; le Service hydrographique du Canada, partenaire avec NDI, a été une aide précieuse mais d'autres ont été hostiles aux efforts de C-MAP.

C-MAP a maintenant 2500 cartes disponibles pour la distribution; avec des bureaux dans 9 pays, ils sont en voie de réaliser une base de données mondiale du SVCEI.

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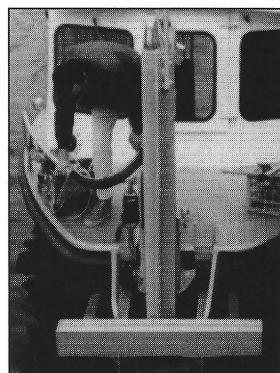


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Electronic Charts: The Course to Go

Captain John Pace

Two years ago, almost to the day, Canada Steamship Lines (CSL) met with representatives of the Canadian Hydrographic Service (CHS) in the offices of the Dominion Hydrographer, to ensure that sufficient electronic charts were available to cover navigation in the Great Lakes. What CSL needed was 166 electronic vector database charts. What the CHS had to offer was none—ZERO! Without electronic chart information CSL could not be going anywhere with Electronic Chart Display and Information Systems (ECDIS).

Fortunately, the dilemma concerning the lack of electronic chart information was overcome by the CHS in the form of a commitment to create all 166 electronic charts requested by CSL within a very accelerated time frame. With electronic charts promised, CSL could then proceed with implementing the planned ECDIS program for eleven vessels operating on the Great Lakes and Atlantic seaboard. A program which would initially entail the fleet-wide purchase of 1,826 individual electronic charts with more to come.

So, CSL would get electronic charts after all, however, not without being introduced to another ECDIS issue—what would an electronic chart look like? The mariner who anticipated a raster quality reproduction of a paper chart was about to be startled by the bold use of colour and overall change in visual appearance of the CHS electronic chart, complete with data attributes. Paper chart evolution was about to give way to electronic chart revolution! What would Captain Cook have to say about this?

Two years later, many of the issues that arose as obstacles to challenge the implementation of ECDIS have been largely resolved. Canada Steamship Lines has gained two navigation seasons of experience with ECDIS in the confined waters of the Great Lakes. The decision to go with ECDIS has already been definitively rewarded by enhanced navigation safety and improved commercial performance.

With eleven Offshore Systems Limited, ECDIS-compliant, Electronic Chart Precise Integrated Navigation Systems (ECPINS) deployed across the Great Lakes fleet, CSL is reputed to be the largest user of ECDIS in the world. With an ECPINS on each ship we have gained invaluable ship-years of experience with ECDIS during a period of rapid change and development in this new and vital technology.

Operational experience with ECDIS at sea has provided CSL navigators with an opportunity to contribute to the improvement of ECDIS while the technology is in an ongoing state of development. What started out as the brainchild of hydrographers has quickly evolved into an important navigational tool for the mariner. The mariner must continue to participate significantly in its development.

CSL proactively pursued the early acquisition of ECDIS on-board our Great Lakes fleet for one overriding reason: to achieve the highest possible level of navigation safety. Commercial shipping companies are in the business of transporting cargo by sea. The task of the mariner is to carry it out safely. Safe navigation is good for business and when safe navigation is required—ECDIS delivers.

The International Hydrographic Organization/International Maritime Organization (IHO/IMO) ECDIS Performance Standard must still be approved by the General Assembly of the IMO. There are only a very few ECDIS- or near ECDIS-compliant devices available commercially at this time. However, it is already very apparent that ECDIS development will quickly expand beyond the scope of the performance standard to encompass the fully integrated navigation bridge.

While it has been stated over and over again that electronic charts will initiate a revolution in the way mariners navigate, it is equally true that many mariners do not yet realize that the revolution is under way. So the question must be asked for the sake of the mariner: What is ECDIS and what change will it bring to the process of navigation?

The primary function of ECDIS is to contribute to safe navigation. This is where the confusion begins. The ship owner thinks "so were all the other electronic devices for which we had to fork over a whole lot of money?" Therefore, ECDIS is viewed as yet another expensive electronic device to add to the other devices that are already on the bridge. The mariner thinks that he or she is navigating just fine without ECDIS and sees new technology as unwelcome change—big change. In the marine industry when unwelcome change costs money, it adds up to resistance—resistance to ECDIS.

There are other reasons that ECDIS has not gained the early recognition that it richly deserves. Foremost amongst these reasons is that ship owners and mariners

alike do not really understand what ECDIS is all about. If they did, it would be on board now.

There are a lot of elements to ECDIS and unless time is taken to look at each element separately and then take the additional effort to consider the elements as a whole, as ECDIS, then the concept will not be understood.

The simple reality is that ECDIS is a concept more complex than the individual elements of hardware, software, information and positioning. Together the four elements add up to safe navigation because this concept for the first time begins to address the real issue, which is the human element in navigation.

Again and again the statistics cry out to be heard: 80% of marine casualties are the result of human error. In almost every casualty it has been demonstrated that the people involved had the information required to prevent the accident but they did not interpret it properly, nor in the right order, or refer to it at all.

ECDIS can correct this omission by organizing and displaying information which is critical to navigation decision-making in a way that can be interpreted by the mariner who is used to solving problems that are laid out on the flat surface of a chart. A picture is worth a thousand words.

Each element of ECDIS is important but nothing is more central to ECDIS than the electronic chart. This is no ordinary chart. Displayed on the video screen the electronic chart is interactive and can be organized to show precisely the information that the mariner needs to make navigation decisions.

If navigation is increasingly an information management process, then it follows that the electronic chart will be the window through which a high volume of navigation information may be accessed. If ECDIS is where the information is, then the mariner must be stationed in front of ECDIS. Information management skills will be as vital as seamanship skills on the ECDIS-equipped ship.

ECDIS enhances a mariner's situational awareness by providing tactical information that will improve the navigator's perception of the factors and conditions that will have an impact on the vessel's passage. Loss of situational awareness has contributed to many marine casualties.

Above all, for ECDIS to enhance navigation the display must be monitored constantly. The casual glance every once in a while, or not at all, is history. ECDIS is pure and simple instrument navigation. The navigator must be positioned in front of the ECDIS display and follow the passage plan. No more "flying by the seat of their pants" or making navigation decisions that are not supported by an instrument measurement. In navigation, what gets

measured gets done—correctly!

ECDIS will, therefore, mean a change to the way navigation is performed. It will facilitate the execution of a comprehensive navigation regime which will be fully understood and supported by all members of the bridge team and thus contribute to safe navigation.

The display of real-time water depth and current information on the electronic chart, to name just a few possibilities, will begin to realize the true potential of the electronic chart to enhance navigation safety and establish navigation parameters which will allow the mariner to increase commercial competitiveness by carrying more cargo and consuming less fuel. To do this it will be necessary to integrate ECDIS with a high volume/low cost data transmission communication system.

This vision of the future is already possible today. Now is the time to make the commitment to develop the new marine navigation infrastructure that will allow the marine industry to take advantage of the benefits which will come to the marine world through ECDIS—safe navigation, environmental protection and profitable marine business. This, of course, will be the electronic marine highway and very soon it will be the way to get to a port near you!

The traditional chart does not contain all the information that a mariner requires to prepare a passage plan. This additional information is to be found in companion volumes of sailing directions, light lists, radio aids, Notices to Mariners, local regulations, etc. The electronic chart must be structured to contain this expansive database and a means must be developed to interrogate this support data through the displayed chart.

Perhaps the biggest immediate issue that looms prominently on the electronic chart horizon is updating, or, in terms of our current experience, the lack of it. Electronic charts must be updated and the available updating processes must be tried now.

Electronic chart updating is a fundamental support infrastructure which is not presently available but must be made available soon, or the acceptance of ECDIS will be delayed. One of the first questions a mariner asks when presented with an electronic chart system is how do I correct the charts. It is a good question and mariners are waiting for the answer.

When it comes to navigating with electronic charts nothing is more critical than the real time display of the vessel's position with high precision. Fortunately, Differential Global Positioning System (DGPS) is coming on stream very quickly indeed, thanks to the parallel programs of both the Canadian and United States Coast Guards. Although the planned system design accuracy was nominally set at 10 meters it is expected that this will

quickly be surpassed. In fact, shipboard receivers are on their way to delivering centimetre position precision or better in the very near future.

How the traditional maxim of hydrographers—"Don't do more than is wanted, don't do less than is needed"—will be applied in the era of centimetre accurate DGPS positioning is wide open for speculation. We expect that mariners will clamour for more high accuracy hydrographic surveys. But perhaps these surveys will only need to be undertaken in ship channels where the absolute limits of survey accuracy will need to be put to the test. If the electronic chart will show the mariner where the ship can pass, the mariner will be able to go there with precision.

It is already apparent that with high precision positioning mariners will call on ECDIS to assist in precision manoeuvring of ships while berthing and unberthing in all weather. This is yet another application for ECDIS which may not have been initially anticipated by those who developed the performance standard but it is one of the ECDIS applications being used by the mariner today. Docking is another navigation procedure where a steady flow of information will reduce stress and increase ship handling performance. In ports, safe ship movement means good port business.

With DGPS and ECDIS we have an impressive real time navigation capability today. No longer does the mariner have to guess where the ship is moment by moment or try to assess where the ship will be based on a position fixed somewhere astern. However, the future position of the ship is foremost on the mariners' mind. If the ship is to get where it has to go, the correct navigation decisions must be made in real time to get it there. ECDIS will have to acquire a predictive capability to facilitate hitting the position target ahead of the ship, every time, again and again and in all weather.

ECDIS will allow the mariner to perform the difficult navigation feats easier, faster, more often and with greater precision. Most navigators are confident that they can keep a ship in confined waters on a straight course in reduced visibility. The difficulties begin when they have to alter course. Keeping track of a vessel through a turn using conventional navigation procedures is a challenge. The number of mariners who knew where the ship was upon entering a turn and who had no idea where the ship was on exiting the turn are prominently represented in the casualty statistics.

If ECDIS is good for the mariner on straight courses, ECDIS is even better for the mariner on turns. With the use of constant radius turns mariners can now plan the entire route including turns that can be followed with precision by using ECDIS. Constant radius turns executed with ECDIS are safer turns having a planned entry and exit and the added benefit of increased fuel

economy. The constant radius turn is an energy efficient turn—the next step is to drive the ship along the electronic course line steered by a fully automatic route steering system driven by ECDIS.

ECDIS has become the centrepiece of navigation technology on the CSL bridge. It has been clear from our earliest experience with ECDIS that the Offshore Systems Ltd. ECPINS acts as a catalyst between members of the bridge team, encouraging an atmosphere of "challenge and response" which is a fundamental requirement for effective bridge resource management and safe navigation. On the bridge of a ship, navigation information has always been a source of power to the navigator—power to make decisions. With ECDIS, information can be shared amongst the bridge team, and shared information provides the bridge team with powerful protection against marine accidents.

Now that the mariner knows where the ship is with a high level of accuracy, how does he then navigate? Navigation will emphasize following the passage plan. The critical work of the navigator will be to plan passages in detail, from berth to berth along the entire length of the route including pilotage waters. Once completed, the passage plan can be saved and improved upon conveniently with ECDIS. Actual tracks followed can be incorporated into a passage plan for future use. Information that used to be recorded in the navigator's notebook explaining details of how to execute the passage plan can now be displayed on the electronic chart by reference to a designated information icon. The old paper chart "here be dragons" symbols are going to give way to the modern counterpart "click here" for information.

Navigation procedures will be incorporated into ECDIS to enhance watch-keeping performance. Checklists designed to facilitate such activities as pre-departure and pre-arrival equipment tests and change-of-watch will all be called up on the electronic chart display and be added to the voyage record as planned procedures that will be accomplished as required and when planned.

To these simple procedural prompts will ultimately be added the capabilities inherent in a ship "expert" navigation system. On the one-man bridge, expert system software will be welcome support to the navigator and will let the navigator get on with the work that really counts—making safe navigation decisions.

ECDIS will allow the mariner to make a quantum leap in the application of advanced navigation theory to the navigation job that he or she is already performing.

With DGPS and ECDIS the navigator can closely conform with the planned route and stay within planned safety margins denoted by allowable cross-track distance in metres. There is no reason that vessels entering confined or crowded waters could not automatically be assigned

a standard pre-defined lane or track, resident in the data base and appropriate for the ship type and cargo, which the navigator would then be responsible for following with precision. Such tracks, as already exist on paper charts as recommended courses, could be extended from lakes through confined waters. Such information would be protected in the public domain and available to all. These lanes or tracks would be available in advance for training and practice with a built-in ECDIS simulator capability. Track information and ECDIS simulation functionality will even contribute to enhanced safety in areas of mandatory pilotage because the informed watch officer will be better able to contribute competent navigational support to the pilot.

The ECDIS performance standard calls for electronic charts that are equivalent to paper charts. For now that means they generally encompass the same information set and are presented in the same general "rectangular" format with corresponding catalogue numbers. We have noted that the mariner prefers to display one screen with reduced data sets, reinforcing that for the mariner, "simple" works best, so the message to the hydrographer is "keep it simple". In the future, "equivalent" will definitely not mean the same. We anticipate asking for electronic chart information for a planned route from port "A" to port "B" which provides pertinent hydrographic information along the passage corridor, but with no other lateral information in the areas that we have no intention of transiting.

With electronic charts the mariner can lose some information that is usually easy to find on a paper chart. For instance, when the mariner zooms in on an electronic chart, information such as current arrows are often lost

from view. As mariners focus on the electronic chart details, they will lose the information that is generally available in a cursory glance about the chart. Obviously this information is still important and the electronic chart must find a way to present it so that it won't be missed.

The electronic chart look-ahead function is very important. Navigators are a curious bunch, not unlike tourists, they like to know what is up ahead and often with good reason! When reviewing the future passage requirements the mariner may need to simulate navigation manoeuvres that may take some practice to accomplish safely. ECDIS should readily facilitate this with an embedded simulation function.

For CSL, the early move to ECDIS was a significant challenge and a true step into the unknown, but we were confident that ECDIS was a step in the right direction. There were many technical hurdles to be recognised and overcome. These could not have been overcome without the diligent support, commitment and expertise of Offshore Systems and the Canadian Hydrographic Service in what can only be described as a unique and historical partnership. Nor can we forget the timely availability of DGPS made available by the Canadian Coast Guard. Many of the challenges were human in scope and were met squarely by the Masters and Mates of the CSL Great Lakes fleet who accepted massive change on their bridges and in the way they worked. As a result, ECDIS has been tested thoroughly, at sea, by mariners, in the demanding testing grounds of the Great Lakes and St. Lawrence River. It is the mariners who performed the early tests with ECDIS who must receive full credit for showing the world that the electronic chart is truly: **the course to go!**

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Reaping the Fruits of the Labour: Learning to Cope?

Julian Goodyear

Introduction

I think most of you are well aware of the Electronic Chart Pilot Project that's been ongoing since mid 1992. The Pilot Project has been an intricate vehicle to realize the objects of the Canadian Electronic Chart Program. Although that was not the beginning of the Electronic Chart for CHS it did mark the beginning of a formal program and put into place the ways and means of supplying the shipping community with the required tools to do the job.

The Pilot Project Story In A Nutshell

When the program began the primary goal for the first year was to get the systems out there to prepare the base upon which the future years would stand. However, like most major endeavours that involve new players, new concepts and operations in a widely dispersed geographical area, we expected start-up 'jitters' and happen they did.

Upheaval

The Pilot Project received a major boost in credibility and system critical mass with the corporate decision of Canada Steamships Lines to equip its Great Lakes Fleet with Electronic Chart Display and Information Systems (ECDIS) and to join forces with CHS in testing and evaluation, under the auspices of the Pilot Project. The number of systems increased from 6 to 17. The major impact was the sudden demand for Electronic Navigation Charts (ENC's). However, it provided a unique opportunity for CHS to work with a major shipping company and an equipment manufacturer, to develop optional methods for data creation, quality control, packaging and delivery. What basically happened was the demand for digital data unfolded before we had a process in place; so, we made the rules as we went along. One thing I learned very early was, as in any partnership, you expose your weaknesses somewhat like airing your dirty laundry.

Exposed Our Weaknesses

In some cases the quality of the existing data was poor. The structure and content of our early digital data was not prepared with ENC production in mind. In marketing the digital data through partnerships the procedures and processes were often open for criticism as clients incited reasons for greater demand. Disclosures provoked criticism.

Data Preparedness

Because our level of preparation was low, it quickly became evident that the process of converting hard-copy paper charts into digital files required refining and re-thinking. Also, other ugly heads like data maintenance and quality assurance would require attention quickly.

Production Programs Influenced By External Events

As deadlines were imposed to meet clients' demands, routine paper chart production schedules were re-assigned or suspended. Developments in new digital chart procedures were carried out during ENC production. Working with the marine community allowed us to focus on the absolute minimum content. The strategy became to give the users the basic data they need right now, then fill in incrementally to meet the growing, yet still largely undefined, longer-term user needs. The impulse was need with very little time.

Unfamiliar Territory

In the regional offices of CHS where charts, in their respective jurisdiction, were in demand, digital cartographic offices became the centre of attention. Traditional hydrographers were drawn farther from conventional issues and progress on international programs became major issues for system manufacturers and hydrographic offices (HO's) alike as proposed standards were drafted.

High Public Exposure

As systems were being placed on vessels, feedback from the marine community became more and more important. Shortcomings in navigation operational procedures were heard and categorized as to whether they were system functionality issues affecting the manufacturer or data issues for the hydrographic office.

Early Effects - CHS

As Hydrographic staff from various offices went on board vessels carrying systems, the aesthetics of traditional products gave way to data content concerns as clients defined what they required, namely display options and customized views. The marine community, steeped in tradition, was creating a data demand monster while working in conjunction with hydrographic offices. We found over and over again that the mariners wanted to utilize ECDIS to its fullest capabilities but were unable to.

Bureaucratic Questions

During a period of fiscal restraint and dwindling resources, meeting the traditional paper chart demand as well as ENC production would require answers to some bureaucratic questions. We've worked in the paper world for 100 years, where the suppliers of charts and updates are in place. This is not so for digital charts.

Early Effects - Mariners

ECDIS was drawing mariners farther away from conventional navigation. In the paper world, the cartographer did the generalizations of source data for presentation on the chart. Although the mariner wanted a quick at-a-glance picture during route monitoring, quite often the best available (largest scale) was required for passage planning.

Hypertext Chart

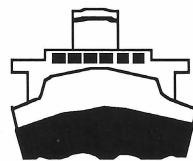
For the first time in the history of navigation, mariners now have the ability to manipulate the chart data. Generalization of source data, previously carried out by

cartographers and portrayed on the paper chart can now be performed by the navigating officers. In the future, data formats will provide the hooks, thereby allowing mariners access into denser data sets, more accurate and detailed textual information as well as real time water level or current information. We can expect to hear outstanding demands from both mariners and system manufacturers for new types of data, better attribute information and linkages into non-traditional sources of knowledge. How to accommodate such demands in light of shrinking budgets will present a real challenge to the next generation of HO senior managers.

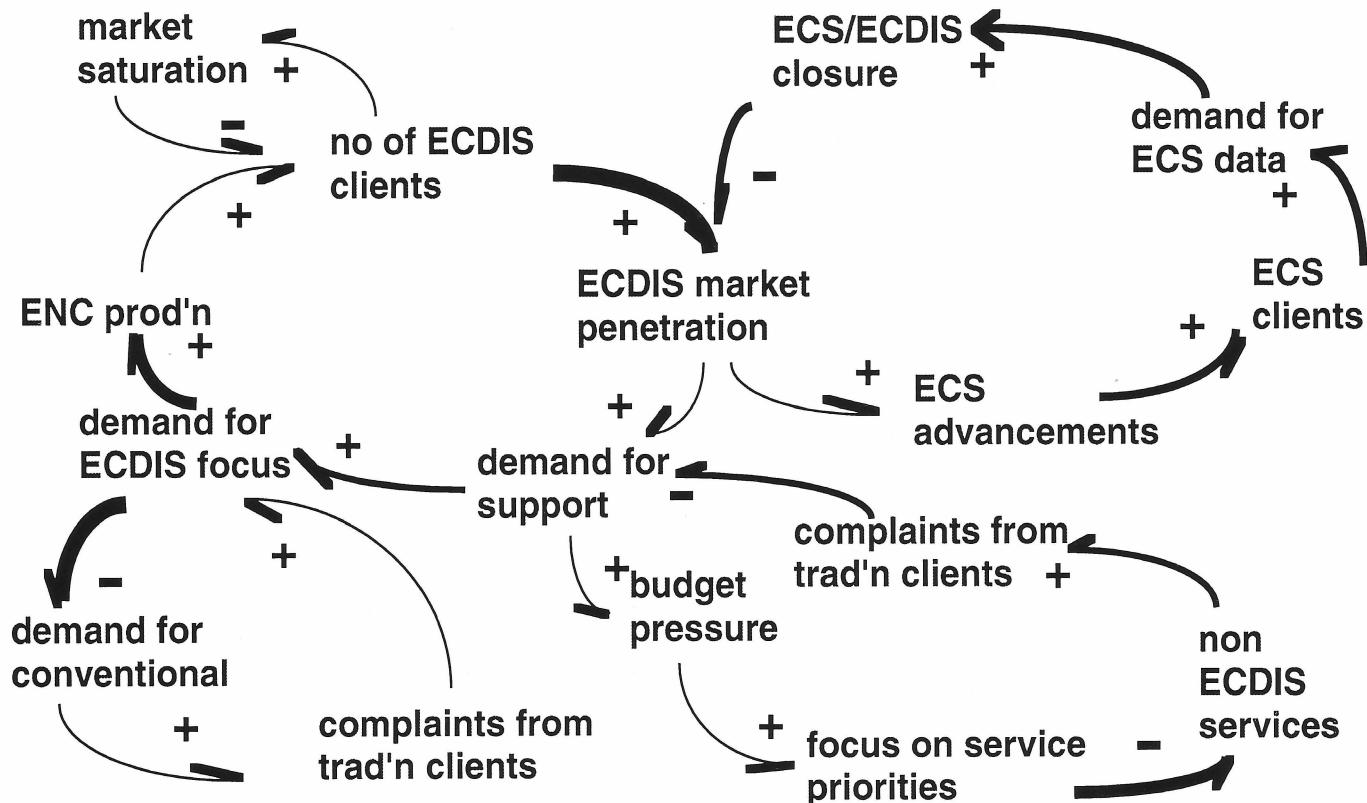
ECDIS As A Key To Wealth Creation

The demand for ECDIS will not increase just for the sake of having a new piece of equipment on the bridge. There must be some underlying economic benefit. Full utilization of Differential Global Positioning Systems (DGPS) and ECDIS must equate to dollars saved. Some or all the reasons outlined here in this view graph are reasons for shipping companies to equip their fleet.

System Dynamics



HYDROCOMM 95 Presentation



Some General Lessons Learned

The problem is, of course, an ECDIS is far more than a simple machine rendering of the paper chart. An ECDIS integrates the ENC with other navigational aids such as gyro, DGPS, radar, etc. It must be capable of processing and filtering data. And, fundamentally the hydrographer has to be put in the navigator's shoes to understand what is required. Many of the issues arising span other agencies' turf. To give the Bridge Officers the full power of ECDIS will require close co-operation between hydrographic offices, maritime administrations, data distributors, data producers and International Electrotechnical Commission, etc. Of course when any one of these groups tries to be innovative and go it alone the risk of making an uninformed decision increases.

In the ENC production line, often if you make what may seem to be a minor change in the early stages you don't see the full impact, but downstream the impact of the minor change will give you grief. If you don't get to the root of the problem and instead provide only a surficial fix, it will eventually resurface and cause damage. We all speak of a win/win/win solution involving the hydrographic office, the equipment manufacturers and the end user, but these solutions are hard to find.

Major Conclusions

Based upon our experience with the Pilot Project it is becoming increasingly clear that mariners want large scale information for docking and manoeuvring, as well as for restricted fairways. Because of some of the uncertainty with the existing data, especially where new and old data merge, sometimes it may be necessary for HO's to field-verify ENC's. This has been brought on mainly because many of our charts are on datums that are ill-

defined and are unsuitable for use in conjunction with DGPS.

DGPS service is now being planned for most of North America. If the accompanying accuracy of the ENC is not comparable, the displayed ship's position relative to the chart may not be true and human nature is such that as mariners get accustomed to using ECDIS, there will be an accompanying tendency to increasingly rely on the real time display. Once exposed to the use of ECDIS, it is not hard to see where ECDIS will be integrated into a much larger information system whereby navigators on the bridge of a vessel will be able to superimpose other pertinent data on the screen. Whether it is from other vessels in the area, or transmission from shore facilities, ECDIS can be the central focus where mariners have vital information at their fingertips.

When we explore the types of applications presently being used on the information highway, it is not difficult to see how this type of structure is highly applicable to the shipping industry. The nature of the shipping industry in Canada and our own geographical area demand that a multi-model data transmission strategy be developed which may involve satellite, micro-wave and cellular telephone transmission media. In addition, a broad based Wide Area Network linking CHS Regional Offices and its data brokers, and likewise data brokers with the shipping industry, will probably be established allowing access to chart information on demand.

And, finally those who still think that ENC production is a one-time project, a word of caution: beware, because whatever we think today will be outdated or incomplete tomorrow.

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Implementing ECDIS Worldwide: Challenges and Opportunities

Dr. Lee Alexander

The Electronic Chart Display Information System (ECDIS) has emerged as a new navigation aid that will result in significant benefits to maritime navigation, safety and commerce. With the implementation of NAVSTAR Global Positioning System (GPS) and the installation of Differential GPS (DGPS) Broadcast Service in North American and European waters, mariners will increasingly rely on ECDIS and other types of electronic chart systems to improve both the safety and efficiency of navigation.

Given the importance of ECDIS as a new technology, there are a number of challenges and opportunities related to the implementation and use of ECDIS. For Maritime Safety Agencies, such as U.S. Coast Guard (USCG) and Canadian Coast Guard (CCG), there are policy and regulatory considerations associated with ECDIS performance standards, type approval, carriage requirements and mariner training/certification. For National Hydrographic Offices (HO's), such as National Ocean Service/NOAA (NOS/NOAA) or the Canadian Hydrographic Service (CHS), there are major challenges associated with the production and distribution of Electronic Navigation Chart (ENC) data, and to establish the necessary government infrastructure to provide the ECDIS updating service.

Standards/Specifications

IMO Performance Standard

In May 1994 the Draft Performance Standards for ECDIS were approved for adoption by the Maritime Safety Committee (MSC) of the International Maritime Safety Organization (IMO). Formal adoption is expected in November, 1995. When adopted, ECDIS can be considered "equivalent to" (i.e., as effective as) the up-to-date charts required by regulation V/20 of the 1974 SOLAS Convention. In the interim, IMO has issued the Performance Standards for ECDIS as MSC/Circ. 637. In the MSC Circular, Member Governments are requested to have their National Hydrographic Offices (HO's) produce digital nautical charts and the associated updating service as soon as possible, and to ensure that manufacturers conform to the performance standards when designing and producing ECDIS.

IHO Standards

In conjunction with the development of IMO Performance Standards for ECDIS, the International Hydro-

graphic Organization (IHO) has developed technical standards and specifications related to the digital data format, and specifications for the ECDIS content and display. IHO Special Publication 57 (IHO S-57) is the IHO Transfer Standard for Digital Hydrographic Data. It includes a theoretical model, object catalog and DX-90 format. The current version 2.0 (Nov. 3) is considered stable, and will not be revised before 1996. IHO Special Publication 52 (IHO S-52) is the IHO Specification for Chart Content and Display of ECDIS. It includes three appendices related to the means/process for updating, colour and symbol specifications, and a glossary of ECDIS-related terms. Both IHO S-57 and S-52 are specified in the IMO Performance Standards for ECDIS.

IEC Standard

At the request of IMO, the International Electrotechnical Commission (IEC) Technical Committee No. 80/Working Group 7 (IEC TC80/WG7) is working to identify and describe the necessary performance tests and checks for ECDIS equipment, associated with the specifications and standards for ECDIS established by IMO and IHO. In close cooperation with the IMO/IHO Harmonization Group on ECDIS, this effort has been ongoing since 1992. Scheduled completion date for the IEC ECDIS Performance Standard (IEC Publication 1174) is March, 1996. Formal adoption by IEC will likely occur in mid-1997. After adoption, the IEC Performance Standard will become the basis for the development of type approval specifications related to operational methods of testing and required test results for an IMO-compliant ECDIS.

Implementation Process

A series of steps are required in order to implement ECDIS:

May 94	IMO MSC 63	What is required (MSC/Circ.631)
Nov. 95	IMO (19th)	Formal Adoption/Legal Basis
Mar. 96	IEC TC80/WG7	Test Methods/Procedure (IEC Pub. 1174)
1997	Type Approval Lab/Classification Society	Process/Basis for Compliance
1997 ?	Maritime Safety Administrations	Type Approval/Certification granted
1997 ?	Maritime Safety Administrations	Carriage requirements, Mariner training/certification
1997 ?	National HO's	ENC/ENC's Available
1997 ?	HO's /Maritime Safety Administrations	ENC Updating Service

ENC Data/Display

An ENC Product Specification is a detailed guide on how to use the existing IHO S-57 standard to create an ENC for ECDIS. It includes those specifications needed by all HO's to produce a consistent ENC, and for manufacturers to be able to economically use this data such that it satisfies the IMO Performance Specification for ECDIS. A standardized, consistent ENC is crucial in terms of providing the necessary information to generate the Base and Standard Display, Colours and Symbols, and for updating. Recently, an ENC Product Specification Working Group has been formed within IHO, and is working diligently to finalize an ENC Product Specification by early 1996.

What is an ENC?

Most individuals think of charting information in terms of a paper chart of a specified scale, geographic area of coverage and source (e.g., CHS or NOS/NOAA). For Mariners, the longer the voyage, the more paper charts are needed. These are often obtained from a variety of sources. If an ENC is the digital data contained within an ECDIS that is "equivalent to" paper charts, in terms of geographic area or coverage, "What is an ENC?"

In many respects, it depends who you ask. For a National HO, an ENC could be equivalent to the entire list of paper charts currently provided—or any subset. This will likely be the case for a Regional Electronic Chart Center (RECC) that distributes data from a number of different HO's. On the other hand, both manufacturers and mariners will probably regard an ENC as only that data contained within the ECDIS that is required for the intended voyage, regardless of source. This issue of "What is an ENC?" has major implications in terms of the means or process required for HO's and Maritime Safety Administrations to provide, and for mariners to receive and apply updates in an efficient and timely manner. In my view, the most efficient and reliable way to provide ECDIS updates to the mariner will be to offer an "on-demand" service via the "information highway". This ECDIS Updating Service will need to be tailored to the specific ENC carried by a vessel for that intended voyage.

User Interface Issues

Performance Standards for ECDIS have been developed by IMO, and specifications/guidance on data, updates, colours and symbols, etc. have been developed by IHO. However, less attention has been given to human interface issues. Since ECDIS is the sum of its parts, the human interface is essential to effective functioning and meaningful use of the whole system. Experience with radar and ARPA (automated radar piloting aid) shows that interface design differs between various manufacturers to such an extent that a mariner facing an unfamiliar model may be unable to operate it. Ideally, this should be avoided with ECDIS.

Last year an Ad Hoc ECDIS User Interface Working

Group was formed to develop guidelines for the ECDIS interface. The overall aim was to recommend some uniformity between the interface of the commercial ECDIS. Comprised primarily of experienced mariners, this relatively small group took on three basic goals:

Commonality : a mariner familiar with one type of ECDIS will know intuitively how to operate another.

Effectiveness: ensure safe operation of ECDIS through effective operator control.

Flexibility: the inherent flexibility of ECDIS should not be lost through limitations in the interface.

Several issues that warrant attention have been identified:

ENC Chart Portfolio/Index
ECDIS Terminology
Route Planning/Monitoring
Screen Display Layout
Single Action Controls
Training/Tutorial

USCG Cutter JUNIPER

The U.S. Coast Guard's newest class of Cutter will have many state-of-the-art systems—including ECDIS. The 225' JUNIPER Class WLB is the replacement class for 180' ocean-going buoy tenders. Under construction at Marinette Shipyard, in Marinette, Wisconsin, the JUNIPER's maiden voyage is scheduled for early December, 1995. The stated goal of the JUNIPER'S first Commanding Officer is to "sail the entire route from Marinette, Wisconsin to New London, Connecticut without ever having to rely on a paper chart". The main challenge (or "opportunity") will be to come up with the necessary ENC data for the entire voyage! Most likely this will require the use of different types of electronic chart data (e.g., both vector and raster) obtained from a variety of sources.

ECDIS and VTS

Rapid technological advances in shipboard communications will lead to dramatic changes in the types of Vessel Traffic Service (VTS) that will be operated to benefit the efficiency and safety of maritime commerce. An important component of the VTS of the future will be the increased employment of ECDIS-related technology. Instead of relying primarily on voice communications, vessels will most likely have GPS/DGPS transponders that will communicate with one another or to a VTS Center. With a standard format and protocol (e.g., vessel ID location, course, speed and time), it would be possible for each vessel to display on the ECDIS the location and movement of other vessels. At the VTS Center, a digital Navigation Safety Broadcast Service ("silent VTS") will provide information back to ships regarding the location

and movement of vessels within the VTS area of operation. Likewise, it is also expected that other navigation-related information such as ECDIS updating, automated notice to mariners, currents, water levels, and ice coverage information will be provided in digital form via a Navigation Safety Broadcast.

Real-time Information

Since ECDIS is capable of continuously displaying a ship's position on the electronic chart, there is an increased benefit of having other real-time information available that can be used to increase the safety and efficiency of the voyage. Timely information on water levels and current flow can be of significant benefit to a mariner in terms of optimizing the timing of vessel transits, or the amount of vessel cargo loading. This can be crucial for ocean-going vessels in confined waterways such as the lower Mississippi River or St. Lawrence River. The time has come to develop the means, processes and infrastructure required to provide real-time information on water levels—both present conditions and projected, current flow, visibility, ice coverage, etc. to the mariner in a timely and efficient manner. Two promising approaches are the Physical Oceanographic Real-Time System (PORTS) developed by NOS/NOAA and the Coastal and Ocean Water Level Information System (COWLIS) under development by CHS.

Looking to the Future

During the next few years, it will be crucial that the United States and Canada continue to work pro-actively on meeting challenges and seizing opportunities associated with implementing ECDIS in North America. Since ECDIS is a technology that will benefit the entire international maritime community, there are many aspects of its implementation that require close co-operation with European and Asian countries, and international organisations. More so than in the past, we must more actively pursue co-operative ECDIS research, development, test and evaluation in terms of government-industry-maritime user group partnerships. Each participant, whether they are government agencies struggling with "re-inventing" themselves, or ECDIS manufacturers who need achievable performance standards and specifications, or shipping companies/port authorities wanting to become more efficient and competitive, or mariners wondering about the source of ENC data or concerned about the implications of this new technology in regard to training/certification—each will benefit from increased co-operation with one another. Given the paradox of increasing demands for improvements in charting and navigation safety coupled with the reality of budgetary/fiscal constraints, **it pays to work together!**

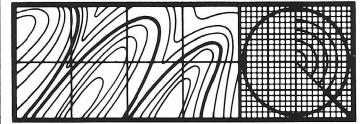
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Meeting the Need for Electronic Chart Data World Wide

Fosco Bianchetti
Brian Terry

As a preface to my speech, I would like to define the scope of the subject because electronic charts can be used for many different purposes in the marine field: research, recreational boating (which has been historically the source of our success), fishing, education and also commercial navigation.

What I am addressing today refers mainly or perhaps solely to commercial navigation, so it has to be interpreted in that way. C-MAP is one of the very few organizations in the world, public or private, which has set for itself the ambitious task of providing electronic chart coverage of all navigable waters. I can only cite the Defense Mapping Agency (DMA) as the best example of another entity committed to the same objective. But clearly, they have different purposes, different strategies and even more different resources.

Most other organizations that we have heard from so far have only tried to offer local solutions, for a nation or a region: none are trying to produce centralized data for the whole world. C-MAP's intent can appear pretentious if put in this way, but in reality our job is very humble. We are not attempting to chart the world, we are only translating the data collected by far more respectable organizations into a form intelligible to computers. We are not competing with Hydrographic Offices (HO's). Nevertheless, if the job is humble, the vastness of the undertaking should not be underestimated.

In this paper I will give you another view of what we are doing, our strategy, our difficulties and our suggestions. I stress once again that what we are doing is just translating HO data that we can mainly find on paper charts, but not necessarily so, into a form which can be used by Electronic Chart Display and Information Systems (ECDIS) equipment—that is our main mission. That is not enough. This data, if not underwritten or certified by HO's, will not have the respectability, the dignity, to be used as a real aid to navigation. That is part of the mission—to get certification for our data. Another part of our mission is to then make this data easily available to all users all over the world and that has to do with the format, how we package the data and how we distribute the data to ships all over the world. The world market must be economically viable for us because we are not paid by any public organization, we are self-financing our efforts. So one day or another, we expect a payback and things should be organized in such a way that there are hopes of a payback.

The path we are following is difficult because in spite of the fact that all the data are on paper already, the way paper charts were prepared creates many problems. The scale consistency is a concern; we have our own different possible scales which are derived from the convenience of a piece of paper for the mariner. But these are not so easily put together when you are trying to produce a seamless database, because the same scale does not always refer to the same intent. The hydrographer/cartographer may have had coastal navigation or harbour navigation in mind when designing the paper chart but that is not always reflected by the chart scale, so when you work on them you have to keep that in mind.

Working all over the world you get problems with alphabets and symbology—think of charts which are written in Chinese or Russian or have symbology which is still not totally standardized. Only recently HO's have started using international standards for their paper charts and we have to deal with all of this information. There is some historical clutter on paper charts in the sense that the information which is put on the paper charts is of very different origin. Not every HO had in mind the navigation of big ships; there may be information on the chart for the scientist or the little fisherman, and you have to navigate in this clutter.

The other difficulty is what we call HO hostility. Now, it's improper to talk about HO hostility in Canada where we have a very good relationship with the CHS—they have set an example to the world of how to co-operate with the private industry—but it is not so all over the world. Some countries are more or less the same and some are neutral and some are what I would call hostile to private companies doing this kind of work. And this hostility takes different forms. It can take the form of denial—they just cannot accept that somebody other than a HO touches hydrographic data so they deny our existence, they don't want to talk to us or have anything to do with us. Fortunately, all that is fading away, and fewer and fewer HO's take this approach. Some others accept that we exist but they see us as competition, and so, even if apparently they are co-operating, they are doing what they can to put us at a disadvantage because they think eventually they could do better and this task belongs to them. Some others see the electronic chart-making process as a gold mine. They think they can turn their financial problems around with the advent of electronic charts so they try to charge very heavy royalties to

the users of the data. That is a big problem, not so much for our profits, because you know whatever is charged we will pass to the end user. But for the market itself, if the electronic chart is too expensive nobody will buy it and we won't sell any.

The other difficult thing is what they call the economic telephone syndrome. You know, when you are establishing a network of some kind, you need users but you cannot have users if there is no network, so we are in the same Catch 22 situation, where, to be able to sell data you need ECDIS systems but to sell ECDIS systems you need data. So you have to break this circle at one point. So our strategy for the future has many directions. The main direction is to try and change the attitude of HO's towards us, so we try to support HO's the best we can with the production of electronic data. In some cases we actually digitize data and sell or give data free of charge just to get some kind of approval from them. We try to facilitate the task of the HO towards electronic data. But some of them are interested in producing the data themselves, and in that case we are able and willing to provide them with our digitization tools, which we believe are very efficient, have been proven for a long time and produce at a high rate.

When I say verification tools, it is normally the production verification tools which allow a convenient way to compare the paper charts to the digital data, so you have all kinds of raster over vector superimposition, plus a syntax analyzer or a rules verifier for formats like S-57. We try to get into distribution agreements with HO's which are willing to do so, again trying to improve the availability of electronic data to the user. Some HO's are not well structured to distribute electronic data in a form convenient to the user so in that case we try to help.

On the other side, as we are seeing, we are trying to break this vicious circle. We support ECDIS manufacturers by providing data in a format called a System Electronic Navigation Chart (SENC), which becomes the database which normally resides inside the ECDIS equipment itself. Computers, to be fast and efficient, normally cannot handle DX-90 and S-57 data directly (that is, they cannot handle directly the Electronic Navigation Chart—ENC—provided by the HO). Some kind of translation to get data into binary form or structure for the use on the machine has to be performed. This translation process has its own problems, so what we try to do is create a common translation structure which can be used by everybody, and then solve some of the problems which can arise on board the ship. As part of these efforts we also test on real ECDIS units which we get from the manufacturer, using the data that we produce to be sure that there are no glitches in the data format, which, experience has shown, can break down the system or have the system hang up and not perform properly.

We also assist in distributing the data worldwide and providing updating services. As part of this effort we have tried to strike strategic alliances with some of our competitors that are doing the same job. The best example is Nautical Data International (NDI), once one of our competitors; now we are working together to the same end. ISO 9000 has been mentioned before and is of course an important part of our strategy.

Current status

- 2,500 charts included in the January 1995 release of C-MAP's CD:
 - 400 with full topology (DX-90 quality)
 - 1,150 with reduced topology (sub DX-90 quality)
 - 950 of positional reference quality (for recreational boating);
- 950 full topology charts ready for next CD release;
- Catalogue of 8500 charts digitized at a lower grade.

The current situation is that we have released the CD with 2250 charts in January, 1995, which is our latest update. Four hundred of them have full departure, which means they are S-57 compliant. We believe the full departure charts could be approved by HO's in their present form.

Current effort

- 36 digitizing workstations in 6 countries;
- 3rd generation in-house tools + CARIS;
- 200 full topology charts a month;
- Cooperation with Italian HO (C-MAP);
- Partnership with CHS (NDI).

But it's even more important to see what our current ability is now. We have 36 digitizing work stations operating in 6 different countries and we have just started to use our third generation tools that we have designed in-house, allowing us to digitize directly into the DX-90/S-57 format. That is very powerful, and has increased our production capability very much. CARIS translation has also been implemented, actually it's nearly finished and will soon be operating, again providing a good vehicle of communication with HO's.

Our current production capability is 200 full topology charts and maps. We already co-operate with the Italian HO by producing standardized S-57 charts for them. We co-operate with the Canadian Hydrographic Service through NDI. We have offices in 9 countries and 11 manufacturers are using our SENC. We feel that we have a solution. We have produced a lot of charts in an HO approved standard and our production capability is such that we can, without doubt, provide the coverage over the whole world in this year, 1995, in an accepted international format. We have the technical solution—what we need is the political recognition of this solution, which means that HO's accept this data and in the end are willing to certify it; because without certification our data

has very little value. It will be wasted if there is no backing from HO's.

In conclusion, the world-wide ECDIS database could exist in one year, so production is now a non-issue as far

as we see it. The ECDIS system could be saving lives and environments and property sooner than everybody is thinking, but that is only possible if the HO's co-operate with private industry. This co-operation, we believe, will benefit everybody.

About the Authors:

Mr. Fosco Bianchetti is the Director, President and Chief Executive Officer of C-MAP, which he founded in 1986. A registered engineer, Mr. Bianchetti has been an innovative force in the field of marine electronics and a pioneer of electronic cartographic products. He also conceived the first commercially successful electronic chart plotter when he co-founded Navionics in 1984. Mr. Bianchetti oversees the design, manufacturing, marketing and updating of C-MAP's proprietary cartridge-based electronic marine cartography system.

For more information please contact:

Mr. Fosco Bianchetti
C-MAP
Via Caboto, 9-54036
Marina di Carrara
(MS) ITALY

Mr. Brian Terry is the President and Founder of Nautical Data International. Mr. Terry has held senior management positions at Matrix Technologies, Canada Centre for Marine Communications and Compusult Ltd. He has significant management experience relating to marine telecommunications, research and development.

For more information please contact:

Mr. Brian Terry
Nautical Data International
P.O. Box 127, Station C
St. John's, Newfoundland A1C 5H5
Tel: 709-576-0634
Fax: 709-576-0636

CHA Annual General Meeting Assemblée générale annuelle de l'ACH

By Conference Call
October 4, 1995
11:00 am (EDT)



par conférence
téléphonique
le 4 octobre 1995
à 11 heures (HAE)

Contact your local VP for site details

Communiquez avec votre VP
de section pour les détails du site

Coming Events

Événements à venir

17th International Cartographic Conference Barcelona '95

The 17th International Cartographic Conference and 10th General Assembly of ICA will be held in Barcelona, Spain, September 3-9, 1995. The theme of this conference is "Cartography Crossing Borders".

ICC '95 is organized for the International Cartographic Association by Sociedad Española de Cartografía, Fotogrametría y Teledetección.

Papers will be presented on a variety of topics including GIS, Digital Cartography, Thematic Cartography, Remote Sensing, Spatial Data Handling, Hydrographic Mapping and Navigation Systems.

For more information please contact:

Jaume Miranda i Canals, Chairman
Institut Cartogràfic de Catalunya
Balmes, 209-211 - E-08006
Barcelona, Catlunya, Spain

The Hydrographic Society

The Hydrographic Society's UK Branch, Southern Region announces a one day symposium entitled "Hydrography and the Environment". The symposium will be held at The Conference Suite, Berkshire Brewery, Reading on Monday October 9, 1995.

For further information please contact:

Colin Waters
HR Wallingford Ltd.
Wallingford, Oxon
OX10 8Ba

Tel: 01419 835381
Fax: 01491 826344

HYDRO 96

The Hydrographic Society's tenth international biennial symposium will be held at the De Doelen Congress and Exhibition Centre, Rotterdam, from September 24-26, 1996.

Organised by The Society's Benelux Branch and expected to attract worldwide participation, Symposium topics will be wide-ranging and addressed to key hydrographic issues affecting port and other applications. They include: Port and Coastal Surveys, Port and Coast Geodesy and Navigation, Dredging Surveys, Mapping, and Water Management.

Proceedings will be supported by an exhibition of equipment and services at which the Port of Rotterdam will be a major participant.

Prospective speakers and organisations wishing to participate should contact:

Mrs. P.Y. van den Berg
Hydro 96 Organising Committee
Oceanographic Company of the Netherlands
P.O. Box 7429
2701AK oetermeer, The Netherlands
(Tel: +31 7942 8316, Fax: +31 7941 5084)



PRELIMINARY ANNOUNCEMENT

1996 Canadian Hydrographic Conference

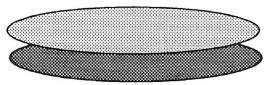
June 4, 5 & 6
Halifax, Nova Scotia

Conference Focus:
high-tech and emerging technologies related to
the following topics:

- Differential Global Positioning System (DGPS)
for both marine navigation and unique new hydrographic applications
- Multi-Beam Acoustic Survey Systems
- Electronic Chart Display and Information System (ECDIS)

Questions or enquiries should be directed to:

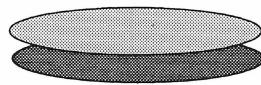
Chair, 1996 Canadian Hydrographic Conference
Canadian Hydrographic Service
Department of Fisheries and Oceans
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia
Canada B2Y 4A2
Tel.902/426-3497
Fax.902/426-1893
email:sgrant@bionet.bio.ns.ca
betty.rumley@scotia.dfo.ca



Lighthouse Puzzler

Casse-tête du Lighthouse

by Beth Weller



Lighthouse Puzzler # 12

Four hydrographers were contemplating early retirement with mixed feelings, but when Spring Fever hit, each of them decided to undertake a new marine venture with her/his spouse. Overhearing a conversation at the next CHA meeting, and knowing that Jane and Larry were on their honeymoon a couple of years ago, can you figure out who is doing what and with whom?

The clues:

1. Adam has never left western Canada.
2. Jane, Carol and the couple from Scotland met the people that bought the lighthouse.
3. Bob enjoys researching and writing the guide books.
4. Larry lives in the United States; the marina is in Newfoundland.
5. Marg had to get a new passport.

	Adam	Weather station	Newfoundland	Norfolk, VA
Jane	Larry	Lighthouse	Marina	Victoria, BC
Judith	Rob		Guide books	Scotland
Carol	Bob			
Marg				
Newfoundland				
Victoria, BC				
Scotland				
Norfolk, VA				
Weather station				
Lighthouse				
Marina				
Guide books				

Solution to Fall Puzzler (#11)

By elimination, Berry's team ran out of gas at Trent River (clues 1 & 4), and Dreyer had no problems (clues 4 & 5). It was not Halsall (clue 1) so it must have been Richmond who examined 19 shoals with the wrong co-ordinates at Long Reach, and Halsall who hit the road sign at West Lake (clue 5).

So Dreyer, at Picton (clue 5) with no problems, must have found the wreck (clues 2 & 3), meaning Halsall, at West Lake, was picking blueberries (clue 3) and Berry was the one delayed at the nudist colony.



Sustaining Members

Membres de soutien



Sustaining membership allows companies closely linked with the hydrographic field to become more involved with the activities of the CHA and to maintain closer contact with users of their products. Through Lighthouse these Sustaining Members are also able to reach a world-wide hydrographic audience. The benefits of Sustaining Membership include:

- a certificate suitable for framing;
- three copies of each issue of Lighthouse;
- copies of the local Branch newsletters, where available;
- an invitation to participate in CHA seminars;
- an annual listing in Lighthouse;
- an annual 250 word description in Lighthouse; and
- discounted advertising rates in Lighthouse.

Annual dues for CHA Sustaining Membership are \$150.00 (Canadian).
Current Sustaining Members are listed below.

Aanderaa Instruments Ltd.
100 - 4243 Glanford Avenue
Victoria, British Columbia
Canada V8Z 4B9
Fax: (604) 479-6588
contact: Gail Gabel
(affiliation - CHA Pacific Branch)

Cansel Survey Equipment
3751 Napier Street
Burnaby, British Columbia
Canada V5C 3E4
Fax: (604) 299-1998
contact: Bo Skapski
(affiliation - CHA Captain Vancouver Branch)

Datasonics Inc.
P.O. Box 8
1400 Route 28A
Cataumet, Massachusetts
USA 02534
Fax: (508) 563-9312
contact: Paul Igo
(affiliation - CHA Central Branch)

Garde Côtière canadienne
104 rue Dalhousie, Suite 311
Québec, Québec
Canada G1K 4B8
Télec: (418) 648-4236
contact: Claude Duval
(affiliation - ACH Section du Québec)

l'Institut maritime du Québec
53 St-Germain Ouest
Rimouski, Québec
Canada G5L 4B4
Téléc: (418) 724-0606
contact: Claude Jean
(affiliation - ACH Section du Québec)

Quester Tangent Corporation
9865 West Saanich Road
Sidney, British Columbia
Canada V8L 3S3
Fax: (604) 655-4696
contact: John Watt
(affiliation - CHA Pacific Branch)

Racal Positioning Systems Ltd.
118 Burlington Road
New Malden, Surrey
United Kingdom KT3 4NR
Fax: 44 81 942-6630
contact: Paul Deslandes
(affiliation - CHA Central Branch)

Sea Beam Instruments Inc.
141 Washington Street
East Walpole, Massachusetts
USA 02032-1155
Fax: (508) 660-6061
contact: Steve Withrow
(affiliation - CHA Central Branch)

Simrad Mesotech Systems Ltd.
202 Brownlow Avenue
Dartmouth, Nova Scotia
Canada B3B 1T5
Fax: (902) 468-2217
contact: John Gillis
(affiliation - CHA Central Branch)

terra surveys ltd.
1962 Mills Road,
Sidney, British Columbia
Canada V8L 3S1
Fax: (604) 656-4604
contact: Rick Quinn
(affiliation - CHA Pacific Branch)

Terra has been post-processing and studying bottom quality, water column characteristics (including fish), bathymetry and video shoreline from a LIDAR survey conducted in February and March, near Comox, B.C. The company is presently involved with a route survey for the Ucluelet sewer upgrade involving bathymetry, side-scan, and geo-physics. As well, a Vancouver Harbour bathymetry survey started in May and video mapping in the B.C. interior is in the works.

Quester Tangent Corporation

In conjunction with the CHA and Universiti Tecknologi Malaysia, QTC recently installed and presented training for their products for the Canadian International Development Agency (CIDA)-Malaysia project. QTC has sold QTCView Seabed Classification Systems to companies in the US, UK, Australia and to DFO in Newfoundland. Recently, Public Works Canada in New Brunswick commissioned a 16-channel ISAH-S system for the MIRAMICHI SURVEYOR. The Canadian Coast Guard also contracted for the delivery of a 33-channel sweep system. The ISAH-S and HYDAS (Hydrographic Data Acquisition System) will be used on the CCG SMITH to locate water column targets. QTC also recently delivered an oil production barge positioning monitor system to the French company ELF for use in the Congo.

L’Institut maritime du Québec

L’Institut maritime du Québec peut maintenant compter sur deux nouveaux simulateurs ultramodernes pour assurer la formation et le perfectionnement de la main-d’oeuvre de l’industrie maritime au Québec. Le jeudi 10 novembre dernier, lors d’une brève cérémonie à laquelle prenaient part des représentants de la Garde côtière canadienne, section sécurité des navires, des membres du Comité consultatif de l’Institut et quelques invités, l’Institut maritime du Québec prenait officiellement possession d’un tout nouveau simulateur de salle des machines.

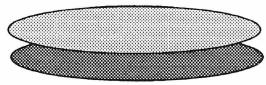
Conçu par l’entreprise norvégienne Norcontrol, en collaboration avec la firme Atlantis Aerospace du Canada, le simulateur et ses aménagements occupent une partie du deuxième étage de la nouvelle aile qui abrite le Centre de formation en plongée professionnelle, au siège social de l’Institut maritime du Québec, à Rimouski. Ce simulateur comprend une salle des machines, une salle de contrôle central, une salle d’exercices et d’examens sur ordinateur comportant cinq postes de travail, une salle de conférences et de projection et une console pour l’enseignant ou l’enseignante. Ultramoderne, il permet des mises en situation avec différents types de systèmes de propulsion.

Recommandée par l’Organisation maritime internationale (O.M.I.) et agréée par le Conseil consultatif canadien de la marine, la formation sur simulateur est maintenant requise au Canada pour tous les mécaniciens de marine. Ce nouvel équipement, unique au Québec et évalué à un peu plus de un million de dollars, servira à la formation des élèves inscrits en génie mécanique de marine à l’Institut et aussi au perfectionnement des mécaniciens de marine qui désirent obtenir un brevet supérieur ou une mention de maintien de compétences à leur brevet. Au cours des cinq prochaines années, l’Institut maritime du Québec prévoit accueillir, pour des périodes de deux ou trois semaines selon le cas, plus de cinq cents mécaniciennes ou mécaniciens de navire venus se perfectionner et se soumettre à l’examen de la Garde côtière canadienne sur le simulateur.

Simulateur de navigation électronique

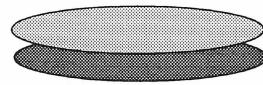
Bientôt, l’Institut maritime du Québec se verra aussi confier officiellement par Transport Canada la gestion d’un tout nouveau simulateur de navigation électronique à son centre de formation continue à Québec. Très sophistiqué, ce nouveau système permet la simulation quasi parfaite de la réalité et offre des possibilités étendues à l’enseignante ou à l’enseignant comme, par exemple, de modifier les paramètres d’une simulation en plein exercice.

Depuis cinquante ans au service de l’industrie maritime canadienne, l’Institut maritime du Québec est aujourd’hui encore plus persuadé d’être en mesure de répondre aux besoins de formation et de perfectionnement de la main-d’oeuvre du milieu maritime non seulement grâce à ses équipements ultramodernes mais aussi et surtout grâce à la compétence de son personnel.



Canadian Hydrographic Association

Association canadienne d'hydrographie



The Canadian Hydrographic Association (CHA) is a non-profit, scientific and technical group of about 500 members with the objectives of:

- advancing the development of hydrography, marine cartography and associated activities in Canada;
- furthering the knowledge and professional development of its members;
- enhancing and demonstrating the public need for hydrography;
- assisting in the development of hydrographic sciences in the developing countries.

It is the only national hydrographic organization in Canada. It embraces the disciplines of:

- hydrographic surveying;
- marine cartography;
- marine geodesy;
- offshore exploration;
- tidal and tidal current studies.

The Canadian Hydrographic Association is formally affiliated with the Canadian Institute of Geomatics. It is informally associated with the Hydrographic Society.

What the CHA Can Do For You

- advance your knowledge of hydrography, cartography and associated disciplines, and keep you abreast of the latest development in these disciplines;
- enable you to develop and maintain contacts with others involved with hydrography, nationally and internationally.

These benefits are provided through the publication of **LIGHTHOUSE** (one of only three journals in the world devoted exclusively to hydrography), through the sponsorship of seminars, colloquiums, training programs, national conferences, and branch and national meetings.

Lighthouse

The journal of the Canadian Hydrographic Association, **LIGHTHOUSE**, is published twice yearly and distributed free to its members. Timely scientific, technical and non-technical papers and articles appear in the journal with authors from national and international academia, industry and government. Present circulation of **LIGHTHOUSE** is approximately 900.

Membership

Membership is open to all hydrographers, those working in associated disciplines, and those interested in hydrography and marine cartography.

Branch & Regional Activities

The Canadian Hydrographic Association has eight (8) branches located across Canada. National headquarters is located in Ottawa.

For further information write to:

National President
Canadian Hydrographic Association
P.O. Box 5378, Station F
Ottawa, Ontario
Canada
K2C 3J1

L'Association canadienne d'hydrographie (ACH) est un organisme sans but lucratif réunissant un groupe scientifique et technique de plus de 500 membres ayant des objectifs communs, comme:

- faire progresser le développement de l'hydrographie, de la cartographie marine et de leurs sphères d'activités au Canada
- permettre les échanges d'idées et le développement professionnel de ses membres
- rehausser et démontrer l'importance de l'hydrographie auprès de public
- assister au développement des sciences de l'hydrographie dans les pays en voie de développement

Au Canada, l'Association est la seule organisation hydrographique qui embrasse les disciplines suivantes:

- levé hydrographique
- cartographie marine
- géodésie marine
- exploration extra-côtier
- étude des marées et courants

L'Association canadienne d'hydrographie est affiliée à l'Association canadienne des sciences géomatiques, et non-officiellement liée à la Société de l'hydrographie.

Ce qu'elle peut faire pour vous

L'ACH vous offre des avantages tels que:

- parfaire vos connaissances de l'hydrographie, de la cartographie et des disciplines connexes, tout en vous tenant au courant des nouvelles techniques et des derniers développements réalisés dans ces domaines;
- établir et maintenir des contacts avec ceux qui oeuvrent en hydrographie, au niveau national et international.

Ces avantages sont transmis par l'entremise de **LIGHTHOUSE** (une des trois revues au monde traitant exclusivement d'hydrographie) et par la tenue de séminaires, de colloques, de programmes de formation et d'assemblées régionales et nationales.

Lighthouse

La revue de l'Association canadienne d'hydrographie. **LIGHTHOUSE**, est publiée deux fois l'an et distribuée gratuitement aux membres. Des articles scientifiques, techniques et non techniques, provenant du milieu de l'industrie ou du gouvernement autant national qu'international, apparaissent dans cette revue. Le tirage actuel de la revue est d'environ 900 copies.

Comment devenir membre

Le statut de membre est offert aux hydrographes et à tout ceux oeuvrant ou ayant un intérêt dans des disciplines associées à hydrographie ou à la cartographie marine.

Sections et activités régionales

L'Association canadienne d'hydrographie possède huit (8) sections à travers le Canada. L'administration centrale se trouve à Ottawa.

Pour plus d'informations, s'adresser au:

Président national
Association canadienne d'hydrographie
C.P. 5378, station F
Ottawa, Ontario
Canada
K2C 3J1



News From Industry

Nouvelles d l'industrie

QUBIT

QUBIT is part of Kelvin Hughes Ltd., the Naval and Marine Division of Smiths Industries Aerospace. Kelvin Hughes Ltd. has a worldwide reputation for naval and marine radar and electronic navigation display systems. QUBIT has unrivalled expertise in the design and manufacture of marine integrated navigation, data acquisition and processing systems for hydrographic, oceanographic, research and other specialist maritime operations.

As a specialist company with a wealth of practical industry-wide experience, QUBIT has the ability to identify and respond quickly to customers' specific needs. The customer could be a Government Hydrographic Office, a ship owner or operator, or a shipyard which has contracted Qubit to provide full turnkey project management and consultancy services.

Project definition studies, the preparation of detailed equipment integration and installation specifications and the provision of advice regarding the procurement of third party equipment, all represent ways in which QUBIT can work closely with its customers to ensure that system designs fully meet performance expectations. After the installation, setting to work, commissioning and testing of the system by QUBIT, the customer can accept delivery with total confidence.

Through-life support offered by QUBIT includes training courses, both ashore and afloat, and prompt engineering support through 24 hour telephone help-lines and on-site engineer visits. It also includes a commitment with system upgrade and modification support. Operators in the offshore engineering industry, in particular, need to address continually changing standards, practices and the introduction of new survey devices and sensors. System flexibility by design, and through-life software support are paramount.

QUBIT has an established reputation for technical excellence and high standards of service. QUBIT operates under ISO 9001 accreditation. With many hundreds of TRAC navigation survey systems in service worldwide, both with navies and specialist commercial operators, their customers have the confidence of using proven products. As part of the Kelvin Hughes organisation, support through regional offices and local agents is guaranteed throughout the world.

The Hydrographic Society, U.K.

A comparison of algorithms for determining speed of sound in sea water, based on a report originally prepared for Shell UK Exploration & Production by Metocean Plc, has been published by The Hydrographic Society.

Containing a detailed study of algorithms relating pressure to depth, latitude, water temperature and salinity, the fully illustrated 20 page publication also includes a series of formulae and tables.

It is available for £5 from The Hydrographic Society, University of East London, Longbridge Road, Dagenham, Essex RM8 2AS, UK (Tel: 081-597 1946, Fax: 081-590 9730).

HYDRO 94 Proceedings Published

Proceedings of Hydro 94, The Hydrographic Society's ninth biennial international symposium held in Aberdeen last September, have been published for general distribution.

They comprise nearly 30 papers presented by leading hydrographic specialists from Canada, Denmark, France, Monaco, The Netherlands, Norway, Trinidad & Tobago, UK and the US. Main topics covered include The Changing Face of Hydrography, Hydrography & The Environment, Port Applications, ECDIS, Digital Charting & Quality, Multibeam Surveying, GPS and Training.

Bound copies of the 210-page publication are available at £40 for Society members and £50 for non-members from The Hydrographic Society, University of East London, Longbridge Road, Dagenham, Essex RM8 2AS, UK (Tel: 081-597 1946, Fax: 081-590 9730).

GENEQ Inc.

GENEQ is proud to introduce to the Canadian market, the MC-GPS from Corvallis Microtechnology, Inc. It is the first product to integrate GIS data collection and GPS technology in a waterproof hand-held unit. Arguably the most powerful hand-held GIS/GPS unit to enter the market, the MC-GPS allows the user to collect multiple layers of GIS data and attach it to the GPS coordinates that are being continuously collected by the hand-held unit. The GIS and GPS data collected by the MC-GPS is

compatible with AutoCAD and ARC/INFO as well as a number of other GIS and CAD systems.

Targeted at GIS and CAD users who want an automated field mapping tool, users can perform GPS data collection missions and comprehensive GIS data collection on the same hand-held at the same time...saving time and increasing efficiency.

When first turned on, the MC-GPS greets the user with friendly, menu-driven software and a graphical user interface (GUI). The software lets the user define the fields of a powerful 4-layer hierarchical database. The user defines the job name, features, attributes and value.

One or more GPS coordinates are attached to each feature, attribute and value when it is collected in the field. The user may select Lat./Long./Alt., UTM and State Plane Coordinate systems as well as over 50 different datums including NAD 27, NAD 83 and WGS 84.

The internal GPS receiver is a 6-channel, continuous-tracking receiver providing 1-5 metre accuracy (with differential correction). The user can operate quickly with a fast satellite acquisition time (less than 40 seconds). Position updates are available every second. 1MByte of data storage is standard (2MByte/4MByte optional).

A sub-metre accuracy system providing a 10-30 cm accuracy for short base-line length (<10 Km) is available, as well as a 12-channel (C/A code and L1 carrier phase) base station.

A patch antenna is mounted on the MC-GPS at an angle comfortable for the user to operate. The patch antenna can easily be removed and an external antenna attached (range pole and magnetic mount optional).

The MC-GPS is designed to be used in harsh environments. It is waterproof, lightweight, shock resistant, and completely sealed against water, dust and other substances that are harmful to electronic equipment. With its built-in heater, it can be used in conditions as cold as -40°C (-40°F) with its internal heater on, and in temperatures as hot as 54°C (129°F). The crisp 8 line X 21 character display is back-lit for use in low-light conditions and provides impressive graphics.

Bar code readers, laser distance-measuring devices and other RS-232 input devices may be used to make sure data entry is accurate and efficient in the field.

A comprehensive Windows-based PC software package is available that allows the user to perform over 100 powerful functions including: differential correction, GIS formatting, data editing (cut & paste, coordinate conversion, etc.), data analysis (search by attributes & values, etc.), printing, plotting and GPS mission planning.

Ross Laboratories



Ross Laboratories has developed the next generation of hydrographic survey sounders. The Ross 850 series "Smart" sounders are advanced "paperless" survey sounders with magnetic or permanent optical storage instead of paper. The elimination of paper greatly reduces operating costs, but if desired, paper output can still be produced on standard PC printers.

All "Smart" sounder models are lightweight portables enclosed in a NEMA 4 package. They are all controlled by advanced software that processes the analog signal to provide a graphical display of the return signal levels; other advanced features include a reliable bottom-following gate. The software also provides comfortable user controls that include a smart bar check mode to adjust for vessel draft and sound velocity.

There is a competitively priced "Smart" sounder for almost any budget, from the dual frequency model with an active TFT colour display and optical storage to a single frequency monochrome model with magnetic storage.

**Product
Development Systems, Inc.**

MS940 Color Sonar for Windows

SIMRAD Mesotech Systems Ltd. introduces the MS940 Color Sonar for Windows for use with the complete line of standard 971-type sonar heads.

The MS940 features a circuit board, power supply and operating software for use with an IBM compatible personal computer. The MS940 sonar for Windows converts an IBM compatible into a full function scanning or sidescan sonar processor, ideally suited for industrial, engineering, profiling, ROV and imaging applications.

Flexible software provides basic or advanced operation. On-screen toolbar provides quick access for measuring sonar target height, length and area. Standard Windows (with pull down menus) presentation of sonar image, sensor and system status information, sonar configuration information, control buttons and bars allows for quick access to crucial information.

Profile data output allows storage of profiles to disk. Raw data imports to spreadsheet programs for analysis.

The MS940 prints current or disk-recorded images, or profiles in color, along with complete on-screen annotation of targets for hard copy records. Image export options allow transfer to other programs.

Using the standard P.C. RS-232 input, the MS940 allows NMEA input of GPS, compass or other nav info. A simple user-configurable input displays virtually any serial data.

Interfacing the MS940 with an existing video capture card allows simultaneous viewing of real-time video from an underwater camera.

Universal Systems Ltd.

On October 15th, 1994, Universal Systems Ltd., developer of CARIS Geographic Information Systems, will open its first overseas subsidiary office, "CARIS B.V.", in Enschede, The Netherlands.

For the last three years, Radio Holland Marine B.V. has been European Distributor and Support Centre for marine applications of CARIS. During these years the number of CARIS users, including those in non-marine fields, has grown substantially. In the field of hydrographic surveying and nautical cartography, CARIS has even become the undisputed market leader. Over 41 national hydrographic services and marine organisations in 19 countries world-wide use the system for their everyday operations.

The growing CARIS user base requires expansion of user support facilities in Europe. For this reason, Radio Holland Marine and Universal Systems agree that the

time has come for USL to establish its own European office. CARIS B.V. will provide closer support to the European users and strategic partners in both land and marine applications and carry out training programs on the use of CARIS. CARIS B.V. will also initiate marketing activities in territories not covered by USL's current strategic partners.

Enschede, home of the International Institute for Aerospace Survey and Earth Sciences (ITC), and the Technical University Twente, is ideally located. It has a direct connection with Schiphol Airport, and is within two hours by car from Bremen, Hannover, Duisburg, Rotterdam and Amsterdam.

Laser Technology, Inc. New Dealer Announcement

Laser Technology, Inc. announces the appointment of POSITIONING RESOURCES LTD. as an authorized survey and mapping products dealer serving the GIS, mapping, GPS and hydrographic markets in the United Kingdom (England, Ireland, Scotland and Wales). Positioning Resources Ltd. carries a complete *Criterion* line of products and offers service and technical assistance.

Laser Technology, Inc. is a leading manufacturer of laser-based surveying, mapping and measurement systems, with headquarters in Englewood, Colorado, USA.

Klein Associates, Inc.

Klein Associates is pleased to announce a free service to match sellers of older generation Klein side scan sonar equipment with buyers seeking to purchase such equipment.

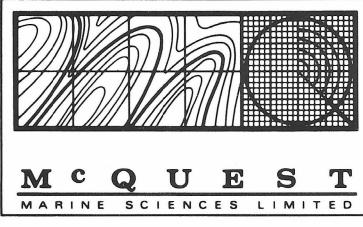
Due to the high design standards and quality of Klein products, many Klein sonar systems remain in operation years after their introduction. Such older generation equipment can provide acceptably high performance for many first-time user applications. The demands of the

HYDRO

Hydrographic Surveying Software.

Designed to bring the power and convenience of today's modern personal computer to the hydrographic surveying industry.

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Hydrographic, Geophysical and Environmental
Surveys and Consulting Services

seasoned professional, however, will continue to be met through use of Klein's HYDROSCAN 590 side scan sonars or the newly introduced, all-digital side scan sonar, SYSTEM 2000.

Present owners seeking buyers for their older generation Klein side scan sonar equipment and first time operators looking to purchase this gear have not had a suitable forum for matching requirements. This service is intended to provide a forum for buyers and sellers of used Klein equipment.

In keeping with its policy of providing Klein customers with unparalleled industry support, Klein Associates will not charge a fee for this service. Klein, acting in the role of a non-negotiating party, will match buyer-seller requirements and forward relevant information to the appropriate parties at no cost to either party. This service is restricted to Klein equipment only. All that one has to do is call or fax Klein giving the particulars of the equipment to be bought or sold. Any business arrangements resulting from such contacts will be between the buyer and seller only.

At the buyer's or seller's request, Klein Associates can provide, at a nominal fee, a technical evaluation of the sonar system so that both parties have an objective and full understanding of the operational condition of the sonar system under sale consideration.

Klein Associates, Inc. has been the leading designer and manufacturer of side scan sonar equipment for over 25 years.

Marketing Manager

Jean Schwartz has returned as Marketing Manager at Klein Associates of Salem, NH, USA. Klein designs, manufactures and markets world-wide side scan sonar and sub-bottom profiling systems. Klein Associates has been a world leader in quality sonars since 1968 and recently released its new SYSTEM 2000.

Jean was involved in marketing Klein products from 1975 through 1984 and returned after marketing British sonars in North America as well as owning a small publishing business in Vermont. A world-wide network of representatives, marketing & sales, and customer services are part of Jean's new responsibilities.

Klein's sonar products are used in over 50 countries and the company is the recognized technical leader in side scan sonars. Its new SYSTEM 2000 represents the latest technology in acquiring and processing marine sonar data for commercial, military, and academic clients for both shallow and full ocean depth operations.



**Sutron Model 8200
Data Recorder/Transmitter**

"Remote Hydromet Data Acquisition and Telemetry"

The Sutron Corporation introduces their Model 8200 series data recorder/transmitter. The 8200 is an environmentally hardened data recorder, able to perform in temperature extremes from -40° C to +60° C. As a result, the 8200 is ideal for remote hydrometeorological monitoring applications such as general remote process monitoring, waterlevel stations, auto dial-out flood warning stations, precipitation networks and weather stations.

The 8200 features front panel programming with a 16 character LED display, touch sensitive keypad and user prompting software which eliminates the need to carry around a computer terminal. Input capabilities include 5 analog and 5 digital inputs, as well as SDI-12 and RS-232 data interfaces. Low power battery operation with memory for 64,000 data values ensures long-term unattended monitoring.

A rampack data cartridge port allows for cold weather downloading of data from the log. Several real-time data communication options are available including direct serial port connection, synthesized voice/data modem, simplex or duplex terrestrial radio, cellular and satellite radio. User-defined alarm level monitoring for each measured parameter ensures that you will be alerted immediately, in real time, should any emergency conditions arise.

All model 8200's include Sutron's powerful supporting software communications, statistical analysis, and data plotting.

VTS Training Simulator

The Canadian Coast Guard has ordered a versatile simulation trainer for vessel traffic service personnel from Norcontrol Limited, our Canadian subsidiary. Many innovative features are being incorporated into the VTS simulator to provide realistic experiences for the people responsible for vessel traffic safety, search and rescue operations and protection of Canada's maritime and coastal environments.

The VTS training simulator, which will be installed at the Canadian Coast Guard College in Sydney, Nova Scotia, is designed to enrich the curriculum of the College and provide learning experiences to speed up mastery of Canadian Marine Traffic Regulator procedures.

This challenging project was awarded to Norcontrol following competitive international bidding. What are some of the criteria that led to selecting Norcontrol? "The Canadian Coast Guard is in the forefront of VTS usage and an advocate of verifiable professionalism in training, competence and education," says Henry Tremblay, Managing Director of Norcontrol Limited. "In turn, Norcontrol is a respected supplier of sophisticated, hands-on training simulators, vessel traffic service systems, and effective teaching techniques."

Norcontrol Limited is a key supplier of marine simulator trainers to Canada's Coast Guard and Navy training centres and has developed and manufactured six VTS systems for the Canadian Coast Guard. A Critical Design Review team from Canada arrived at Norcontrol headquarters in Horten, Norway, in late March as part of the project's management.

Ship-to-Shore

Ship-to-shore communications are an important part of training activities using the Coast Guard College's VTS simulator. Working at eight Marine Traffic Regulator workstations (to use the Canadian terminology), students perform all the duties expected of them: target identification and tracking, communications, safe-passage advisories and emergency actions. Their workstation activities depend on voice communications with the vessels they are tracking and on the guidance of their instructors (stationed at as many as three workstations). At the same time, the movement of up to 160 ships can be realistically simulated on eight ship operator workstations where shore-based 'VHS' voice commands are received and executed by changing speed and direction and manoeuvring through potentially dangerous 'waterways'.

Realism

In all, the VTS simulator combines the active features of shiphandling simulators and vessel traffic service systems: radio communications, radar & ADS tracking and manoeuvring using map overlays, automated warnings of hazardous conditions, simulated navigation with turns at charted waypoints, and part-task training and emergency responses using an array of 20 PC-based computer workstations. Realism is maintained through simulation techniques that reproduce radar phenomena such as target fade and disappearance as a vessel moves out of range or its radar echo is lost in tall waves, sea and rain clutter, shadows and reflections. A special 'Outside World' workstation provides real-world communication exercises for trainees through simulated contact with search and rescue craft, fire, police, medical units and pollution response teams—even the press and the mayor's office!

The Canadian Coast Guard is widely respected for its leadership in vessel traffic management and training. The same respect is accorded the Coast Guard's dedication to maritime education and in-service training and seafarer certification. The Coast Guard College at Sydney receives students from around the world for VTS studies, and many maritime authorities refer to the Coast Guard's marine training curriculum as a standard to guide their own training needs.

Canadian Navy

A very large and complex training simulator with a total of eight replica ships' bridges will be developed and built for the Canadian Navy by Norcontrol, under subcontract to Atlantis Aerospace Corp. To support team training and part-task training for navy vessels, the 8 own-ships' bridge areas will be equipped with surveillance, communications navigation, manoeuvring and other naval systems. The simulator will be installed at the Naval Officer Training Centre at Esquimalt, located on Vancouver Island, British Columbia.

The Department of National Defence has configured the integrated hands-on simulators, instructor stations, and debriefing and classroom facilities to accommodate the installation of visual displays surrounding four of the simulated bridges: one wrap-around 360-degree visual system and three 270-degree visual displays. Contracts for these impressive visual systems are currently out to international tender. The other four own-ship replicas, also outfitted with a suite of bridge instruments, equipment and communications gear, serve as 'blind pilotage' radar and navigation trainers. By working in conjunction with another of the simulator's bridge replicas, a blind pilotage cubicle can also be employed in simulation training of naval operations room (ops room) procedures.

Norcontrol has supplied shiphandling simulators, blind pilotage trainers and propulsion plant trainers to marine academies across the country, including the extensive, ultra-modern Centre for Marine Simulation at the Fisheries and Marine Institute at St. John's, Newfoundland where bridge officers aboard the fully equipped 14-ton wheelhouse, which pitches and heels above its 6-degrees-of-freedom hydraulic motion platform, have virtually life-like out-of-the-window viewing.

C-MAP

C-MAP Electronic Charts Keep Current

Because electronic charts are digitized versions of paper charts, one could assume that the problem with paper chart updates is also the problem with electronic chart updates, but this assumption is wrong!

When a C-MAP Electronic Chart is updated, every correction from the Notice to Mariners (NTM) Updates issued for the corresponding paper chart is corrected on the C-MAP Electronic Chart. Changes made to navigational aids such as light characteristics, number and location are right at your fingertips on C-MAP charts.

C-MAP Electronic Chart cartridges are updated on a regular basis, with the most popular charts and charts requiring many changes being updated first. These regular updates make C-MAP's chart library the most current library of charts available.

Every customer who purchases C-MAP Electronic Charts is encouraged to register with C-MAP so notification of updates can be sent promptly by mail. C-MAP dealers also receive notice of updates for their local area via C-MAP's Sprint FAX® program. Updating a C-MAP cartridge costs only \$60. Simply return the cartridge to C-MAP, and the updated cartridge can be returned to you within 24 hours if a rush is requested.

If the Source of Data is Lost, Accuracy is Compromised
An updated C-MAP chart is traceable to the source, meaning that end-users can safely use the electronic chart in conjunction with the most current paper charts available to them. This is how electronic charts are supposed to be used, as a complement to paper charts. And because C-MAP Electronic Charts are easily referenced to the paper charts, all NTM corrections are clear. With other makes of electronic charts, however, end-

users have no way to verify the source of the charts used because it is lost during the manufacturing process. When end-users cannot reference back to the corresponding paper chart, they cannot accurately pinpoint NTM corrections.

In addition to Light List information, a C-MAP update may contain hydrographic changes. This information, including additions and deletions of contours, shorelines, and facilities (marinas, piers, etc.), is all included in the new release.

Electronic Charts Only as Accurate as Paper Charts? Wrong!

Electronic charts are not a substitute for paper charts. In fact, mariners are encouraged to always refer to their paper charts when using electronic charts. It's important to note that C-MAP's update process makes C-MAP Electronic Charts the most current charts on the market today and the perfect complement to the paper chart!

Racal Survey Limited

Racal Survey and Chelsea Environmental have formed a worldwide alliance which will enable the two companies to provide a full range of marine environmental survey services to the offshore exploration, dredging, telecommunications and marine engineering markets.

Racal Survey is the offshore survey and positioning subsidiary of Racal Electronics Plc. Chelsea Environmental is part of the Chelsea Technology Group based in East Molesey, UK, and specialises in coastal, estuarine and offshore marine environmental studies and research. The two companies have already worked together successfully on a number of projects, the most recent being the major Yacheng pipeline offshore China and the monitoring of ocean currents for a drilling programme offshore Myanmar.

The new services are being made available through Racal Survey's worldwide network of operations offices. Under the agreement, Racal Survey and Chelsea Environmental are bringing together proven in-house based technologies and expertise which will enable them to provide a competitive and advanced capability for the provision of all physical, geophysical, geodetic, chemical and biological surveys in the marine environment. This combination, together with the established positioning

and survey services already available from Racal Survey, now results in a unique range of survey services becoming available to the marine community.

Racal Electronics Singapore has been awarded a US\$7.7 million (£4.8 million) maritime telecommunications contract in South East Asia.

Under the terms of the contract awarded by the Directorate General of Sea Communications of the Indonesian Ministry of Communications, Racal will design, supply and install fifteen coastal and eleven shipboard radio stations. The work, which forms part of the Indonesian Maritime Telecommunications System Development Project, Phase III, Package B, is expected to be completed within two years.

The new radio stations will be compliant with the Global Maritime Distress and Safety System specification developed by the International Maritime Organisation to ensure reliable communications between ships in distress and search and rescue authorities.

Announcing the contract, Duncan Fisken, director and general manager of Racal Electronics Singapore, said: "This contract reaffirms Racal's worldwide reputation in radio communications and underlines the increasing importance of being able to offer a value-added systems integration capability. One of our key strengths is our ability to draw on the extensive and diverse resources within the Racal Group to provide a turnkey solution, covering almost the entire spectrum of voice and data communications."

"This is the latest in a number of prestigious contracts won with governmental and major corporate organisations in South East Asia in the past twelve months, which has seen us record a 33 percent growth. We are strategically placed in a very dynamic and rapidly growing market place, both geographically and technologically," he added.

Singapore is Racal Electronics' key trading hub in the Asia/Pacific region. Among recent initiatives in the territory are a strategic alliance with Singapore Telecom's commercial arm, Telecom Equipment, and the opening of an office in Beijing, China.



Canadian Hydrographic Service



Retirements



Neil Anderson, Ross Douglas and Earl Brown at the Southern Alberta Institute of Technology, 1960

Ross Douglas

Like many of Canada's hydrographers, Ross is from the prairies—Gull Lake, Saskatchewan.

Ross was one of four members of the 1960 graduating class of the Southern Alberta Institute of Technology (Surveying) who joined the Canadian Hydrographic Service in May 1960 (the other three were Neil Anderson, Earl Brown and Eldon Bruns). Ross later completed a degree in Geology at Dalhousie University.

After several years of working in the field, Ross served for 12 years at the Bedford Institute of Oceanography as Head of Hydrographic Development and Assistant Director, Hydrography. In 1978 Ross was appointed Director, Hydrography, Central and Arctic Region in Burlington, Ontario.

Ross has been active in the technological thrusts of the Canadian Hydrographic Service and pioneered a number of early developments in field data logging and processing systems. In 1981, he received a Commission as a Canada Lands Surveyor.

In 1987, he was appointed Dominion Hydrographer and Director General of the Canadian Hydrographic Service. During his tenure as Dominion Hydrographer, the CHS underwent many changes in response to changing technologies and new political and economic realities.

Ross was the president of the Canadian Institute of Surveying and Mapping (now called the Canadian Insti-

tute of Geomatics) in 1990 and 1991. This was the first time a hydrographer had served in this position.

Ross's friends and colleagues held a "Rendez-Vous for Ross" on March 1, 1995. Ross received tributes from members of the hydrographic community across Canada. As a memento of his time with the CHS, just before his retirement, Ross was given a new companion: a schnauzer, "Our Boy Wilhelm of Barrhaven", otherwise known as "Willie".

Ross will still be active in the hydrographic community. In the fall of 1995 he begins his term as President of the Hydrographic Society.

Neil Anderson

Neil is a native of Turtleford, Saskatchewan. Neil obtained his education from the Southern Alberta Institute of Technology in Land Surveying and from the University of Victoria in Computer Mathematics. Neil spent eight years as a field hydrographer, specializing in Arctic hydrographic surveying. He has headed technology development sections both in support of field hydrographic surveying and charting and in cartography for the development of interactive computer graphics systems for nautical chart production.

In 1979 Neil was appointed Director of Planning and Development for the Canadian Hydrographic Service. In this capacity he was responsible for co-ordinating the national R&D programs for hydrography and marine



From L to R: Neil Anderson, Earl Brown and Ross Douglas

cartography. Neil was involved with many different types of technology development projects related to hydrographic surveying and nautical charts, including electronic charts, the Global Positioning System, geographic information systems, multibeam sonar systems, marine robotics and data communication. Neil was a leader in the development of Geomatics as a science and engineering discipline that is emerging out of the collective impact of these new technologies. Neil developed and participated in many government-industry cooperative projects, at both the national and international levels.

Neil presented his retirement dissertation, "Phonelution: the evolution of my phone-based telecommunication in the 1960-1995 period", on April 25. Many of Neil's friends and colleagues were on hand to share their stories of Neil's evolution and escapades during this period.

Although retired from CHS, Neil has definitely not retired from hydrography. Neil has now joined Nautical Data International as the Vice-President, International Development.

•OBITUARY•

It is with regret that we announce that Larry Murdock passed away on July 14, 1995. Larry, a native of Ottawa, joined the Canadian Hydrographic Service in November, 1947 as a field hydrographer and worked primarily in the Maritimes. During his years there, Larry served as Hydrographer in Charge of the shore party at Sheet Harbour, NS for several years as well as HIC on the *Cartier*, *Kapuskasing*, *Acadia* and *Anderson*. Larry's 1962 survey on the *Anderson*, from Yarmouth to Cape Sable Island, was the first ship survey to use Hi-fix. Larry also served as Acting Assistant Regional Hydrographer in Atlantic Region for an extended period. In the mid-sixties Larry returned to Ottawa to head the newly formed GEBCO (General Bathymetric Chart of the Oceans) unit at CHS Headquarters. Larry then became the Head of the Hydrographic Information Unit. Shortly after his retirement in 1981 Larry moved to Brockville to be closer to his cottage on one of the Thousand Islands.

We extend our sympathies to Larry's wife Edie and their three children and their families.

Central And Arctic Region

Awards



Earl Brown

Burton Ayles, the Regional Director General, presented Earl Brown with his 35 year service medallion during an all-staff meeting on June 16. Earl graduated from the Southern Alberta Institute of Technology in 1960, and on May 24, 1960 began working for the Canadian Hydrographic Service. He worked as a field hydrographer on several ship- and shore-based surveys in James Bay, Hudson Bay, the east coast of Newfoundland and the St. Lawrence River. From 1966 to 1968 Earl was the Hydrographer In Charge of the Georgian Bay Survey. In 1969 Earl became the Manager of the Hydrographic Development Section, then in 1973 took the position of Assistant Regional Hydrographer. Earl had several opportunities to Act as Regional Hydrographer from 1983 until 1988 when he became the Regional Director of Hydrography, Central and Arctic Region.

Ken Hipkin

Ken Hipkin, Head of the Field Quality Control Section, accepted an award for promoting CHS products by organizing exhibits at many boat shows in Ontario.

Print On Demand Team

Sean Hinds, Dave Sosnoski, Paola Travaglini and Keith Weaver received an award for their contributions towards the production of a colour nautical chart on an electrostatic plotter.

Lac du Bonnet Team

Bob Covey, Rudy Cutillo, Paul Davies, Ken Dexel, Chris Gorski, Ken Hipkin, Russ McColl and Peter Wills received an award for their efforts in surveying a portion of the Winnipeg River in eastern Manitoba and producing the chart in a timely manner.

1995 Arctic Survey Program

Rankin Inlet

The Government of the Northwest Territories (GNWT) has determined that there is a requirement for a deep draft marine distribution centre situated centrally in the Keewatin Region. Hydrographic surveys and new charts are required to ensure safe navigation into the port. As a result, the CHS will survey the approaches to Rankin Inlet. Based on board the Department of Fisheries and Oceans vessel CSS HUDSON, the survey will take place in August and September and is partially funded by the GNWT. Data will be used to update existing charts and to depict the harbour at a large scale.

Victoria Strait

The CHS was asked to verify that a safe shipping channel exists in the southern Northwest Passage, in order that freighters could move ore to market. Since existing charts were based on incomplete or reconnaissance surveys, a survey program was initiated in 1993 to survey a corridor from Dolphin and Union Strait, through Coronation Gulf and Dease Strait, to Victoria Strait. This year in February, the Central and Arctic Region of CHS began a winter 'through-the-ice' survey in Victoria Strait. The survey, which is funded by the GNWT, Metall Mining Corporation, Natural Resources Canada and the Department of Indian Affairs and Northern Development, was completed in mid-April. Data was collected with TIBS (Towed In-flight Bathymetry System) and supplemented by spot soundings. The survey has determined that a safe shipping channel exists. The data will be used by Pacific Region to produce up-to-date charts.

1995 Great Lakes Survey Program

Lake Huron

In 1991 the CHS began a program to survey the west side of the Bruce Peninsula in Lake Huron from Tobermory to Point Clarke. The survey started with a LIDAR (airborne laser bathymetry) survey in 1991, and was followed up by launch surveys to examine shoals and to collect data in deeper water. This will be the final year of the survey. Based in Kincardine, the survey will run from mid-June to the end of July. Data collected will be used to produce new charts.

Nottawasaga Bay

At the south end of Georgian Bay, the CHS will conduct a hydrographic survey of Nottawasaga Bay. The survey will be based on board the Canadian Coast Guard Ship GRIFFON and will run from mid-May to mid-June. The survey data will be used to compile a new larger-scale chart of Nottawasaga Bay.

Revisory

Annual Revisory surveys are conducted to collect data needed to update CHS products. Areas to be reviewed in 1995 include the North Channel of Lake Huron (McGregor Bay) and the St. Lawrence River (Cornwall area). In addition to these charts, the survey will verify

the horizontal accuracy of several Lake Superior charts that were constructed at the turn of the century.

1995 Chart Production Program

Pelly Bay

In January the Pelly Bay Chart 7578 (Arctic) was completed and released for sale. This chart cancels the provisional chart issued for 1994 navigation into the harbour. The new Print-On-Demand (POD) chart allows supply vessels to reach the village of Pelly Bay. This represents significant savings when compared to air transportation, which was previously required for this community.

St. Lawrence River

Two new charts (1435 and 1434) extending from Cardinal to Whaleback Shoal will be completed. These two charts will replace existing charts 1415, 1416 and 1417. After the completion of charts 1434 and 1435 work will begin on the last three new charts of this series (1433, 1432 and 1431).

Rideau Waterway

A New Edition of chart 1513 (Smiths Falls to Kingston) is nearing completion to update coverage on this portion of the Rideau Waterway.

Lake Ontario

New harbour Chart 2047 of the Petro Canada and St. Lawrence Cement wharves at Clarkson was just recently completed and released in April. This commercial POD chart (scale 1:7,500) will cancel the existing non-datum plan on chart 2070 (Harbours in Lake Ontario).

Georgian Bay

The Southern Georgian Bay harbour series was completed this year with the production of New Charts 2212 (Wiarton) and 2213 (Owen Sound). The Wiarton Harbour chart was produced at a scale of 1:8,000 and depicts the new harbour facilities in Wiarton. It was completed in March and represents the first large scale CHS chart coverage of this harbour. The Owen Sound Harbour chart was produced at a scale of 1:12,000. It reflects virtually the same coverage as the existing unknown datum plan of Owen Sound on chart 2271, but contains new survey information and is recompiled to NAD83, for compatibility with GPS positioning systems. Chart 2213 was completed in March and cancels existing chart 2271 (Plans of Georgian Bay). A New Edition of Midland Harbour chart 2221 will be completed in 1995. This will incorporate the many changes in harbour facilities at Midland.

Lac du Bonnet

It has been only eight months since the Lac du Bonnet survey was completed, but already the digital field data has been processed and archived and the new chart is at the colour proof stage. Two hydrographers from the survey each worked on a sheet of the recreational strip chart.

The completed chart will be printed and ready for distribution in time for the 1995 navigation season.

Unknown Datum Chart Conversion

A New Edition of Chart 2282 (Cabot Head to Cape Rich) is nearing completion. The current chart has an unknown horizontal datum since it was originally constructed at the turn of the century, and will be adjusted to NAD83 to allow for the accurate use of GPS in this area. This chart will also be converted to metric and modified to 1:80,000 (from 91,900), to conform to current charting specifications. A New Edition of chart 2289 (Giants Tomb Island to Lone Rock) is underway and will be completed in time for the 1996 navigation season. This chart is being reconstructed to NAD83, its scale will be modified to 1:50,000 (from 1:49,000) and it will also be converted to metric.

Improved Chart Distribution

The Director, Hydrography attended the signing of a new federal/provincial agreement that will enhance the distribution of nautical charts. The agreement was signed on November 29, 1994, by the Honourable Fernand Robichaud, Secretary of State for Agriculture and Agri-Food, Fisheries and Oceans and the Honourable Albert Driedger, Minister of the Manitoba Department of Natural Resources. The new partnership between CHS and the Province of Manitoba improves market access for nautical charts. CHS charts will be sold through a provincial network of more than 140 dealers in Manitoba, northwestern Ontario and bordering states.

New Information Card

A new wallet-size information card has been developed to pass on important information to our clients when we meet with them at boat shows and other public events. The front of the card contains the Central and Arctic Region address and phone/fax numbers, the CHS Ottawa Chart Distribution phone number and an Internet address for obtaining information on CHS, including which chart dealers are nearby. The back of the card contains the phone numbers for voice-announcing water level gauges in the Great Lakes.

Boat Shows and Exhibits

The CHS, Central and Arctic Region decided not to exhibit at the 1995 Toronto International Boat Show. Instead, local chart dealers were asked to offer support in promoting our products at this and other boat shows. By working together we hope to provide better product and dealer promotion, and to provide better service to our dealers and the boating public. Cost savings were substantial, both in O&M and overtime.

CHS participated in a number of other boat shows and exhibits. In December the Ontario Marina Operators Association meeting at Midland was attended by Ed Thompson from Burlington and Boyd Thorson and Jacques Dupras from Ottawa. In February the Region set

up a cooperative exhibit with Marlon Marina at the Western New York Boat Show. A shared display with Marlon Marina promoted CHS charts at the Seaway Mall in Welland. Regional staff met with representatives from Discovery Bay in Penetanguishene to arrange for the 1995 CHS exhibit. The Seaway Mall in Welland held a Boat/Marine Show from February 20 to March 5. The Port Colborne CHS dealer, Marlon Marine, invited the CHS to be a part of their display. The CHS provided a large triangular display of area charts and supplied catalogues and pamphlets. In March, the CHS exhibited at the London International Boat Show.

Tides and Water Levels Meetings

In December, Ron Solvason attended a workshop in Toronto on "The future of hydrometric monitoring in Canada—Canada's network in crisis", organized by the Canadian Water Resources Association and the Canadian Society for Hydrological Sciences. The purpose of the workshop was to discuss the impacts that the changing priorities, budget cuts and re-engineering of data collection programs in Environment Canada will have on the hydrometric data network. Rick Sandilands attended the 57th meeting of the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data at the offices of the US Army Corps of Engineers, Detroit District. In January, Rick Sandilands attended a CHS Tides and Water Levels Committee meeting at IOS. Ron Solvason attended a demonstration of the INFOMAR system at the St. Lawrence Seaway Authority offices in Montreal.

Training

All staff attended a "Managing Organizational and Cultural Change" course. Most staff attended a seminar on Macintosh System 7.5 and Applemail. All staff attended a special Applemail course in preparation for the switch from Quickmail. In February, a number of staff attended a one day seminar on Starting A Small Business. Most staff attended Hydrocomm '95.

Volunteers and Students

During the spring school term and into the summer, Central and Arctic Region has had 10 volunteer staff and students assisting with various duties. A. Puga, W. van Ooyen, and D. Neagu are all Secondary School Cooperative placements; they worked with the Navigation Information Unit. Brock University students G. Eliopoulos and R. McDougall completed a work assignment in the Navigation Information Unit. M. Marsden and D. Andrec volunteered in the Navigation Information and Chart Production Units, respectively. M. Down from Laurentian University, along with A. Puga and W. van Ooyen, is working with K. Hipkin in the Field Quality Control Section for the summer. L. Sandilands and J. Walker from McMaster University are working in the Navigation Information Unit. These people are working on many different digital projects, and contributing significantly to overall production in Nautical Publications and Field Quality Control.

Re-engineering

On March 8 the Director and Regional Managers met with a consultant from Fusion Consulting Inc. to discuss the methodology of restructuring. During the one-day session the management team developed an action plan which included: a stakeholder review; a discussion of CHS Direction including Key Result Areas; a review of our structure and system including evaluation of our processes and the development of an ideal organisation; and then a review of people issues that may affect an ideal organisation. The managers spent two days the following week reviewing our stakeholders' needs and the products and services that meet those needs, and developing a future vision. On March 27 an all-staff meeting was held as the first step in soliciting staff input into the restructuring process. Discussion groups, each facilitated by a Manager, met in April to review and refine the information.

French Language Training

Dennis St. Jacques, Manager of the Hydrographic Development Division, began French language training in February. It is expected that the training will continue for approximately nine months.

Pacific Region

Hydrographic Surveys

Despite the distractions and extra work associated with the reorganization, last year's projects are completed, or nearly so, and preparations for the 1995 season are underway. Digital data files, contour plots and additional plots requested by the Pacific Geoscience Centre from the fall NACOM coordinated Dolphin EM-100 work in the Strait of Georgia have been delivered. Backscatter plots have not yet arrived from GeoResources Ltd.

A contract with Terra Surveys to use LIDAR and other remote sensing techniques for surveys in Baynes Sound was carried out in February and March. In addition to collecting bathymetric data, Terra Surveys is also assessing the potential of LIDAR for substrata classification and for herring spawn mapping. CHS provided tidal data, plus RoxAnn substrata classification information and acoustic bathymetry for LIDAR ground truthing.

The John P. Tully (Mike Woodward, HIC) left IOS on March 29 on a three week mission to install 14 current meter moorings, measure surface currents and measure water properties in Queen Charlotte Sound. This is the final survey of a multi-year program, supported by PERD, to measure surface currents in northern B.C. waters.

Kal Czotter and Peter Milner are preparing for ENC verification and revisory surveys along the B.C. coast this coming season. An OSL ECPINS is being installed on the

R.B. Young to assist with this work. Similarly, Alex Raymond met with CG officials in Hay River in late March to discuss preparations, modifications and scheduling for our use of the CCGS Nahidik this summer in the Arctic.

A preliminary report "A Seamless Vertical Reference Surface for Acquisition, Management, and Display (ECDIS) of Hydrographic Data" prepared under contract by UNB was received and is being reviewed. Our comments and recommendations will provide guidance for the effective completion of this contract.

Nautical Publications

The final quarter of this fiscal year concluded with Chart Production's relocation to room 2500. Production highlights include chart releases for two New Charts, three New Editions and two Reprints. The two New Charts cover previously uncharted water between Douglas Island and Harrison Mills on the Fraser River, in strip format. A further two New Charts, two New Editions, four Reprints and six Reruns are at press together with the cover for Chart 3313.

Nineteen-ninety-five is again destined to be a year of changing priorities. The impact on priorities continues to be reinforced with the requirement for digital data to meet client needs. Eight ENC's required updating, checking and dispatch to HQ. Existing ENC's are being kept up to date through Notices to Mariners on an ongoing basis. Resources for further ENC production will be reinforced following the completion of Chart 3313.

Fourteen West Coast charts have been scanned and vectorized under contract to Develtech Ltd. of Saskatoon. All contract charts are scheduled for completion at the end of March. NDI provided Pacific Region with all line elements for two charts required for future New Editions and they are being vectorized in-house.

Geomatics Engineering

The physical reorganization of the Division took place this quarter. Most people moved their offices in February. Renovation work was done throughout the period. In March, as is often the case, considerable effort was devoted to major acquisition of computer equipment.

Software creation for the Tide and Current Table Project progressed, consuming the bulk of the people/time available. Bodo de Lange Boom was assigned to support current surveys throughout the period. Routine requests for information on tides and currents were handled daily. Sherman Oraas attended Hydrographic Information Network meetings in Halifax.

The Chart 7083 project continued, with the assistance of a U. Victoria co-op student and with digitizing work contracted to Develtech Ltd. Mike Woods made a poster presentation at GIS'95 in Vancouver on this work.

Steve Forbes and Herman Varma visited Pacific Region to do their interviews for the Source Data Base functional/structural analysis. They also attended GIS'95 for the announcement of Oracle MD. Rob Hare worked on the multibeam sounding systems acquisition and on error analysis projects.

Carol Nowak worked with Ron Bell (Nautical Publications) on the quality control of 12 charts digitized by Develtech for eventual electronic chart production.

Ottawa

The past six months have been an eventful time for CHS headquarters, marked by significant changes in personnel. We have said farewell to several members of our staff, all of whom have made notable contributions to the Canadian Hydrographic Service. At the same time, we look forward to working with our new staff members.

Ross Douglas stepped down as Dominion Hydrographer on January 3, 1995. Ross worked on a special assignment relating to the amalgamation of the Canadian Coast Guard and the Department of Fisheries and Oceans (DFO), until his retirement on May 31.

As mentioned in the last edition of Lighthouse, the new Dominion Hydrographer is Stephen MacPhee, formerly the Regional Director of Science for the Scotia-Fundy Region of the Department of Fisheries and Oceans.

Neil Anderson, Director of Hydrographic Development and Research also retired on May 31, 1995. Mike Casey is filling the position on an acting basis for a six-month period.

Boyd Thorson, Manager of Chart Maintenance and Distribution also retired on March 31, after 35 years (to the day!) with the CHS. Ron Lemieux is now the supervisor of the Reprints and Nautical Information/Notices to Mariners units. The Chart Warehouse, Sales and Corrections units now report to Dick MacDougall.

Bob Blakeney, Special Advisor to the Dominion Hydrographer retired in February 1995. Bob's position has been staffed by Léo Lanthier, who joined us from the DFO Finance and Administration Directorate. Bernice Allard, Executive Secretary to the Dominion Hydrographer officially resigned this spring. Colleen Johnstone is now filling this position; Colleen was formerly with DFO's Personnel Directorate. Diana Pantalone, a multi-disciplinary hydrographer with the Electronic Charting section retired on March 31, after 35 years with the CHS. Richard Dumas resigned from his position with the chart sales office in April, 1995.

Steve Glavin, of the Electronic Charting section, is on a special assignment with Nautical Data International in St. John's, Newfoundland.

Hydrocomm '95

The first weeks of 1995 were particularly busy as Headquarters staff prepared for Hydrocomm '95, the first CHS conference to be broadcast across North America. The use of the video conference technique meant that for the first time all CHS personnel were able to participate in a CHS conference, along with colleagues from other agencies, industry and the academic communities. Over 600 delegates participated in Hydrocomm '95 at ten different sites, including two in the United States. This new conference format was very well received.

In addition to the work of the organizing committee here in Ottawa, and the contribution of a particularly strong slate of speakers, the conference could not have been possible without the assistance of the coordinators and chairpersons at the different sites.

Hydrographic Planning and Research

Data Base Research and Standards

In January, Tim Evangelatos chaired a two-day workshop "Building a Hydrographic Data Base with Oracle MultiDimension" to explore using Oracle MultiDimension for managing very large volumes of hydrographic data. The workshop was sponsored by the Coastal Multibeam Working Group of the United States - Canada Hydrographic Commission. Two dozen specialists from five nations participated in reviewing the new technology and discussing its potential application for storing, managing and accessing large volumes of hydrographic data in their own organisations.

Lynn MacDonald and Don Vachon attended the GIS '95 Conference in Vancouver, where Oracle MultiDimension was officially released.

The CHS hosted a Digital Geographic Information Working Group (DGWIG)/Digest workshop here in Ottawa; the workshop was attended by 24 participants from 9 countries and chaired by Tim Evangelatos.

In the midst of a June heat wave, CHS Headquarters was the site for two workshops on Electronic Chart Display and Information System (ECDIS) and ice: the workshop on ECDIS in Ice Infested Water and the workshop on International Standards for Ice Information and ECDIS. Both were attended by Canadian, German and American participants.

Peter Kielland presented a paper at the Differential Satellite Navigation Systems (DSNS)'95 Global Positioning Systems conference in Bergen, Norway on using DGPS to measure the heave motion of hydrographic survey vessels. From Bergen, Peter travelled to the International

Maritime Academy in Trieste, Italy, where he lectured for four days on the use of geostatistics for Quality Control of bathymetric data. After the course in Trieste, he spent three days at the International Hydrographic Bureau in Monaco where he helped to draft an updated version of S-44 (the International Hydrographic Organization standard governing data collection). The new S-44 will be more in-tune with digital hydrographic techniques and will set out guidelines to ensure that statistical error analysis is used to guide data collection.

Planning

Jake Kean organised a Voice and Data Communications and Integration Workshop, sponsored by the Interdepartmental Program Coordination and Review Committee Working Group. This workshop, held on January 19, 1995, brought together representatives from federal agencies dealing with the transmission of navigational, hydrographic and other essential information.

National Hydrographic Projects

Dave Pugh organised a one-day workshop on Coastal and Ocean Mapping for Fisheries, held on Feb. 10. This workshop brought together representatives from the Department of Fisheries and Oceans, industry and the academic community, to begin to identify a program to develop hydroacoustic techniques to assist in managing the world's fisheries resources.

The section is continuing to develop new technology-assisted training models and is also continuing to support cartographic training at Cabot College.

Marine Geomatics

Nautical Publications and Distribution

Steve MacPhee and Dick MacDougall visited Washington DC to meet with their US and UK counterparts to discuss exchange of data agreements. These discussions continued when two British representatives visited the CHS in June.

In March, Dick MacDougall, Neil Anderson, Denis Hains and Julian Goodyear represented the CHS at the Maritime Law Conference in New Orleans to gain insight into how government copyright, liability and other issues surrounding the Electronic Chart are perceived by the maritime legal community.

In June, Dick MacDougall met with the US National Ocean Service and Strategy, Research and Action (SRA), a firm of marketing and research consultants, to discuss sharing the results of a marketing study on the use of charts in boundary waters. The study is being conducted by SRA for the International Map Trade Association.

Nautical Publications

Three updated publications have been released this year:

- British Columbia, Vol. 2 Sailing Directions has been reprinted with a supplement containing notices to

mariners;

- new edition of Sailing Directions (ATL) 102, Newfoundland, East and South Coasts has been issued; and
- a corrected reprint of the Rideau Waterway Small Craft Guide has also been released.

The production of the Tide and Current Tables continues on schedule.

Electronic Charting

During the first quarter of 1995, Ottawa received 138 Electronic Navigation Charts (ENCs), checked 68 against the Digital Chart File Standards, customized 101, checked 65 on the Offshore Systems Limited (OSL) viewing package, and released 27. As of June 26, 1995, approximately 400 ENC's have been produced nationally, of which 225 have been officially released.

During this same time period, efforts have been underway to implement the ChartNet system for digital product management and dissemination. This system will be operational by early summer. It will help provide an integrated solution across CHS for the production, management, and dissemination of ENC's.

On the development side, efforts have been continuing to establish CHS production capability in S-57. The Computer Assisted Resource Information System (CARIS) Object Manager and related programs have been undergoing thorough use and evaluation in cooperation with the development staff in the Database Research and Standards division, Universal Systems, and with our alpha-sites, M3i Systems in Montreal, and Offshore Systems in North Vancouver. Progress is good, and it is expected that a production version will be installed in the regions in the summer of 1995 and S-57/Object Manager training will begin at that time.

To facilitate the migration to S-57, some preliminary training of regional staff has already taken place. A newer, significantly more robust version of the Digital Chart File Standards (version 2) has been developed by a national working group. This work, as well as the development of an IHO Product Specification at the international level, has provided a strong foundation for the move to S-57 over the coming months.

Two representatives from each region traveled to Ottawa at the end of March to attend preliminary Compusult Integrated Data Access System (CIDAS) training. The three-day session included presentations and training sessions provided by staff from Compusult Ltd.

A new small scale (1:500,000) digital bathymetric map of the Great Lakes is being produced using 110 gridded data sets supplied by the US National Geologic Data Center in Boulder, Colorado. The map will also be numbered and marketed as a new CHS product.

Ends of the Earth

A New Lighthouse feature *Ends of the Earth* (inspired by J. Halsall), describes the activities of hydrographers and those practising related disciplines afield. We encourage readers everywhere to send accounts of their own work. Remember that a survey in Halifax Harbour is at the other end of the earth to a reader in New Zealand.

The following is an report by Peter Knight (a CHA Central Branch member) of John Halsall's recent experiences on the South China Sea. John Halsall gave a very interesting talk and slide presentation at the spring Central Branch CHA meeting detailing his recent surveying and dredging endeavours in China.

J. Halsall Hydrographic Surveys has been in operation since 1987. In addition to surveying expertise, John has often been involved with supervision of certain aspects of marine construction. From June '94 until March '95 John worked on the dredging and back-filling of two gas pipelines in the south China Sea. The first pipeline was a gas trunk-line from southern China to Hong Kong (a mega project involving over 700 km of pipeline). The second was a smaller pipeline from an offshore gas field to Hainan Island off the southernmost region of China.

The pipeline project was led by an American/Chinese gas consortium. The larger of the pipelines is intended to be uniquely dedicated to an electricity plant near Hong Kong. The base of operations for the Hong Kong line was in Shekou, within the Shenzhen 'Special Economic Zone' on the mainland coast near Hong Kong. This restricted zone serves as a buffer between the world economy and the internal economy of China.

Between China and Hong Kong is the congested shipping channel known as the Urmston Roads. John remarked that working there was like crossing a twelve lane highway blindfolded. With the variety and number of ships (some unlighted) ever threatening a collision in the Roads, one requirement of the dredges working on the project was that they could not spud down. John told of the difficulties dredging a channel, at the mercy of the



Hainan Island, South China Sea

tides, in a variable 'soup' composed of past dredging spoils (another giant nearby project is the Hong Kong Airport construction), sewage and other effluent from a nearby river.

Almost half of the world's dredging fleet has been recently concentrated in the Hong Kong area. John worked with Dutch, Belgian, Chinese, and Hong Kong ships, and British, Dutch, Belgian, American, Chinese, Filipino and Singaporian crews and construction personnel. He told of a two-week period aboard a Chinese vessel during which he lived on rice and black mushrooms (in an apparent attempt to avoid the fish gleaned by the crew from the dredging spoil). Differences in taste aside, John gave the impression of having worked well with, and achieved a mutual respect for the Chinese sub-contractors in the face of their common difficulties.

During the back-filling of the pipeline trench, small Chinese vessels would bring loads of stone to the rock dumping vessels charged with placing the material neatly into the trench in which the pipeline had been laid. John described the technique of the Chinese crane operators as they swung the boulders out to the larger ship accompanied by the roar of unmuffled engines. As not all boulders can be aimed with the same precision, the topsides became razed of railings and other structures as the work progressed.



A vessel used for back-filling (rock dumping)

Positioning for the southern project near Hainan Island was achieved using differential GPS. The usual practice in engineering projects of this nature is to back up the primary positioning system with an independent secondary system. Because of the practical difficulties of establishing shore stations in southern China the usual requirement of a satellite and a terrestrial system was modified to allow a check on position by a second GPS system. The primary and secondary DGPS systems utilized different and independent differential stations and receiver hardware/software.

For the process of backfilling, the GPS positions were used in conjunction with the ship's dynamic positioning and various sonar tools that 'view' the sea floor as the work progresses. Dynamic positioning allows for precise vessel manoeuvring with respect to the sea floor despite the effects of wind, waves and tide. It is an automated (ideally 'hands off') method of controlling the ship's 360 degree stern propellers and bow thruster using input from the positioning systems and user-entered dumping tracks and speeds. The sonar tool (Mesotech 971 Scanning Sonar) gave video images of the falling stone and the trench and served a second purpose of providing exceptional pre-backfilling, interim, and post-backfilling profiles digitally for onboard plotting. Dutch survey software allowed scanned profiles to be viewed in real-time on the video monitor. Profiles every 2.5 m across the trench were achieved in this manner.

With an obvious affinity for the mechanical as well as electronic tools, John described the electro-mechanical sophistication required for the hydraulic rams that pushed the loads of stone over the vessel's sides. Balanced pressures are maintained automatically to prevent jamming of the rams.

The logistics of the work were complex, with loads of stone arriving at all hours of day and night, and days-off few and well earned. Despite the schedule John was able to visit the city of Sanya on a number of occasions. Unlike the unique 'Special Economic Zone' further north, Sanya offered a glimpse of China with less of a western, capitalist influence, which influence was nevertheless evident in the odd anglicized place and highway name such as "Deer Run" and "End of the Earth".



CHA News

Nouvelles de l'ACH



Section du Québec

La Section du Québec a de nouveau participé au Salon du Livre de Rimouski qui se tenait à l'Hotel Rimouski du 27 au 30 octobre 1994. Cette année le thème du Salon du Livre était "La plume ou le clavier?" afin de mettre en relief l'évolution du monde de l'édition. Inspiré de ce thème, nous avons préparé une présentation qui s'intitulait "Du plomb de sonde à la carte électronique" et qui traitait de l'évolution de l'hydrographie et de la cartographie marine au Canada. L'Institut maritime du Québec nous a prêté un démonstrateur d'une carte électronique fonctionnant sur ordinateur portable, ce qui a facilité d'autant notre présentation.

Le 6 décembre 1994, la Section du Québec a organisé une soirée-conférence sur le GPS et la carte électronique. Dans un premier temps, monsieur Guy Marceau de la Garde côtière canadienne a traité des aspects pratiques du GPS pour la navigation de plaisance et commerciale. Il a été suivi de monsieur Daniel Langelier du Service hydrographique du Canada qui a traité des cartes électroniques actuelles et à venir ainsi que des difficultés à représenter l'information de façon dynamique. Le NAVICLUB de Québec a accepté notre offre de venir montrer plusieurs types de récepteur GPS disponibles sur le marché. Cela a rehaussé l'intérêt des 75 personnes présentes dont 50 étaient du grand public en général.

La saison hivernale marque la préparation de la parution de notre Carnet de bord. Nous en sommes maintenant à notre quatrième édition. Pour une deuxième année consécutive, la Section du Québec a présenté au Service hydrographique du Canada (SHC), région du Québec, un projet de publicité en commun des dépositaires de cartes marines *COPILOTE*. En plus de faire connaître les produits essentiels à bord de toute embarcation pour une navigation sécuritaire, l'Association bénéficie d'une publicité à la grandeur du Québec.

Dame Nature nous a fait des siennes le 5 avril dernier en laissant 37 cm de neige sur Rimouski. Le C.A. a dû annuler la soirée-conférence prévue à la capitainerie de la marina de Rimouski-Est. Nous profitions du passage d'une délégation égyptienne dans la région pour présenter les besoins hydrographiques sur le Nil. Sous l'égide de l'ACDI, la firme SNC-Lavalin est à mettre en place un Service hydrographique égyptien civil. Cette dernière a sollicité l'expertise du SHC, région du Québec, l'automne dernier pour évaluer les infrastructures déjà en place et pour établir les besoins futurs à combler. Par ailleurs, la

Section a aussi fourni des renseignements à SNC-Lavalin en lui donnant une liste de personnes ressources. Elle reste aussi toujours disponible pour autres demandes d'information sur ce sujet.

Dimanche le 9 avril 1995, les membres et amis était conviés à notre journée traditionnelle à la cabane à sucre. Nous étions environ 50 personnes, grands et petits, qui se sont retrouvés à l'érablière de monsieur Charles-Eugène Deschênes, de Saint-Gabriel-de-Rimouski. Nous avons eu droit à un excellent repas, de la bonne tire d'érable et à une belle journée sans précipitation de neige.

Ottawa Branch

Social Activities

The branch held several meetings and continued with its regular annual events as well as a new event, a sleigh ride in February.

On December 13, 1994, the annual Christmas Luncheon was held at Sala San Marco. Although there were fewer members attending this year, it was still a very good turnout, with approximately 60 people attending. A delicious meal was served and ample door prizes were awarded. Thanks again to our generous sponsors.

On February 19, 1995, a CHA Sleigh Ride was held at the Nepean Log Farm. It was a lovely, cold sunny winter's day, and only 11 hardy people turned out to have a great time on the sleigh ride and also toasting hot dogs and marshmallows. We had a great snowball fight and several people were shoved gently off the sleigh (no injuries).

Lunch Time Seminars

The Branch has sponsored a number of presentations recently:

- "Currents and Modeling for Navigation", presented by oceanographer Bill Crawford.
- "Using DGPS to measure the Heave Motion of Hydrographic Survey Vessels", presented by Peter Kielland.
- "An Informal Discussion of the ECDIS Presentation Library", conducted by Mike Eaton.

The Branch also sponsored a demonstration by Universal Systems Ltd. of their product CARIS PC.

Meetings

At the branch Annual General Meeting held in April, 1995, the following executive were elected :

Vice President	Ilona Monahan
Past VP	Sheila Acheson
Secretary/Treasurer	Joel Box
Directors	Richard Horrigan Denis Pigeon Michel Blondin George Medynski

General

Ottawa branch also sponsored a coffee break at Hydrocomm '95 in February.

Several Ottawa Branch members have retired in recent months: Ross Douglas, Neil Anderson, Diana Pantalone, Boyd Thorson, and Ron Wallis. Ross, Neil, Diana and Boyd are all well known in the hydrographic community, each finished thirty-five year careers with the Canadian Hydrographic Service. Although Ron Wallis started his career in the early sixties as a member of the CHS, he soon transferred to what is now called Natural Resources Canada. However, Ron never forgot his roots and he has been a long-time member of the CHA. We hope that all our recently retired members of the branch thoroughly enjoy their retirement, but also that all will remain as active CHA members.

Congratulations to Dave Black and his wife Marjorie on the recent birth of their second child, Andrew David.

Best wishes to Lynn MacDonald and Avery Patterson who were married on June 30, 1995. Lynn is a systems analyst with the CHS headquarters Data Base Research and Standards Unit.

Congratulations to George and Nancy Medynski on the birth of their first grandchild, Ryan.

Congratulations go to the first place team which consisted of skip Dave Pyatt, vice Neils Madsen, second Joe Gabriele and lead, Paola Travaglini. Paola is rapidly rising to the top in the curling world. If you recall, it was only in 1993 that she won the "Most Hogs Award" (ie., short of the hog line).

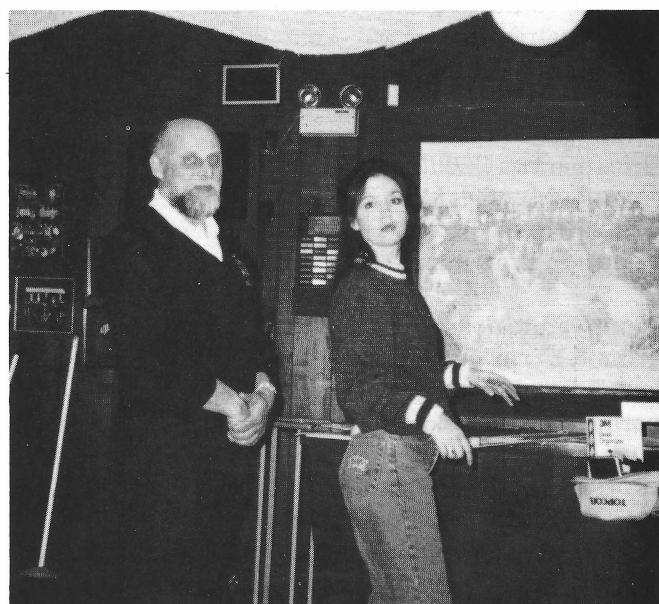


Champions from L to R: Joe Gabriele, Dave Pyatt, Neils Madsen and Paola Travaglini.

Thanks to our sponsors:

Canadian Hydrographic Service
CCIW United Way Campaign (they donated a leftover fundraising cookbook, not money from the campaign!)

Emma's Back Porch
Knudsen Engineering Ltd.
Kev Tech
Norman Wade Company Ltd.
Quester Tangent Corporation



H₂O Bonspiel organisers Brian Power and Jackie Miles

General

The Vice-President Central Branch, Terese Herron, the Secretary Treasurer Andrew Leyzack and executive member Jon Biggar were all involved in the CHS Arctic survey in Coronation Gulf from February through April. We welcome the return of our VP and note that Andrew is off again to Nares Strait in the High Arctic, even before re-climatizing.

We are accessible through the Internet using the address format: (surname)@burdfo.bur.dfo.ca. If you are inclined to "surf the net" send us some news, we would like to hear from our members. As well, there is a CHA InfoServer on the World Wide Web (WWW). The Universal Resource Locator (URL) to access Canada Centre for Inland Waters (CCIW) is <http://www.cciw.ca>. The CHA information can be found within the CCIW home page hierarchy under Bayfield Institute, Fisheries and Oceans, Canadian Hydrographic Service, CHA (Professional Affiliates).

The Central Branch of the CHA has met twice in 1995, on 18 January, and on 3 May. The tulips in Sam and Beth Weller's garden had just begun to show their flowers in time for the May 3rd meeting. Hydrographers gathered to hear John Halsall tell stories of his recent adventures in the South China Sea.

Our fall meetings are scheduled for 20 September, 24 October and 7 December. If you are in the area and would like to come out for a meeting please let us know.

Surveyor

Excitement is in the air surrounding the launch *Surveyor* and her crew as the Louisbourg, Nova Scotia expedition takes shape. Eleven people, including three women and a child will travel to Louisbourg, on Cape Breton Island, for historical commemorations of the siege of 1745, taking place at the Fortress of Louisbourg over the weekend of July 28-30. Twenty tall ships including the *Bounty* and the *Bluenose* are expected to be at the event that includes among its sponsors the War Museum, the Town of Louisbourg, the Louisbourg 1995 Committee and many other patrons.

Surveyor is having her first taste of salt water in the company of the ship that has made her design famous. It was the redoubtable Captain Bligh who sailed *Surveyor*'s early twin in a desperate crossing of the Pacific Ocean in 1789. *Surveyor* has eight rowing positions and is steered by a coxswain; she will be used during the Louisbourg weekend as a ship's long boat carrying people between the tall ships at anchor in Gabarous Bay west of Louisbourg, and the encampments on shore.

Period dress is required of the participants who will also be camping in period tents under the walls of the fortress at the Frederic Gate. Evenings will be electric light free, with food and drink consumed in the style and sounds of the times.

Surveyor is scheduled for participation in two other events for the summer of '95: In Hamilton on July 22nd and 23rd for Aquafest and a sail on the Nottawasaga River on August 11th, 12th, and 13th with the Royal Newfoundland Regiment, to commemorate 1814 events.

Prairie Schooner Branch

Branch members have been carrying on as reported in the 1994 volumes of Lighthouse.

While Andrew Brebner continues to manage his office he has also been involved in extensive native land claims in the Territories.

John Bridgen has been working overseas recently, in Vietnam and elsewhere. He is now working in India.

Bruce Calderbank has been working in Canada and Vietnam, and presently in the North Sea.

Elizabeth Cannon and Gerard Lachapelle continue to lecture and conduct geomatics research at the University of Calgary.

Mike Chorney is supervising ocean bottom and land seismic surveys in Holland.

Frank Colton continues to explore different ways of applying information technology.

Glen Harvey has continued to carry out GIS and mapping surveys in northwest British Columbia.

Alex Hittel has been involved in extensive native land claims in the Territories and has recently returned from Argentina.

Lorraine Hortness continues to provide office support and technical expertise for her company.

Hal Janes is now the manager of his company's Edmonton office and has been involved in extensive native land claims in the Territories.

David Thomson has continued to manage his company, which provides survey services in Canada, Kenya and Thailand.

Pacific Branch

General

CHA Pacific Branch has been relatively active since the last Lighthouse edition. We've started to establish a CHA "corner" at IOS, with the installation of a CHA bulletin board and a more or less permanent home for the CHA bookcase, where we keep back issues of Lighthouse, Newsletters, The Hydrographic Journal, Geomatica and the Resolution (journal of the Maritime Museum of B.C.). Here we also plan to keep the BBBB and H₂O Bonspiel trophies on display.

We held a contest to find a name for our branch newsletter. The winning entry, "Sounding Board", was submitted by Mike Hohl, followed closely by "Echo", entered by Graham Whincup, both of CHS, Chart Production. Congratulations and a cheque for \$25.00 go to Mike for his submission. Thanks go to CHA Central Branch executive for judging the entries.

Social News

The 24th annual Beer, Bun and Bellowing Bash took place on January 25th at the Superior Street Legion Hall. Ross Douglas, recently retired Director General of CHS attended, but failed to win the coveted trophy. This year's honours went to Mike Bolton and Ken Holman.

The 8th annual Pacific Branch H₂O Bonspiel was held at Glen Meadows Golf and Country Club on February 26th. The winning rink was the team of Ken Halcro, Carol Nowak, and Doug Popejoy. A gift exchange was once again held and there were several door prizes given away. The \$24 50/50 draw prize was won by Doug Popejoy, with the other half going to CHA Pacific Branch.

The Photo Contest is planned again for this year. This will be the fourth year for this CHA Pacific Branch event. We are planning to have a summer BBQ at the end of June.

Member's activities

James Wilcox took a temporary assignment to Central Region, working out of Cambridge Bay on the Towed In-flight Bathymetry System (TIBS) survey of Victoria Strait.

Radim Zizka has left Terra Surveys and gone to work for a company in Houston, Texas. By now he's probably in Abu Dhabi. Good luck Radim!

Doug Cartwright, George Schlagintweit and Rob Hare jumped out of an airplane on April 1st—no fooling! Al Scholfield and Rob Hare both managed to finish the Times-Colonist Garden City 10K road race in respectable times around the 50 minute mark—the so-called serious recreational jogger class.

Many CHA members took advantage of the tremendous snow year at Mt. Washington—well over 6 metres! For much of the season Ken Halcro and Carol Nowak spent more time at the condo than at work and numerous other members took advantage of the facility and the great spring skiing conditions, to return to work with browned faces.

Other CHA members were busy too. Take a look at the CHS Pacific Region news and the News from Industry to see what they were up to or what they will be doing this summer.

Seminars and conferences

Peter Kielland (CHA Ottawa Branch) gave a seminar on January 25th on using DGPS for heave estimation. On March 7th, Dr. Bill Crawford gave a presentation on the North Coast Current project aboard the John P. Tully. A luncheon seminar will be given at Glen Meadows Golf and Country Club on May 10th. Barry Lusk and Tom McCulloch will talk about the CIDA Malaysia Training project.

The first-ever hydrographic video conference (Hydrocomm '95) was held on February 15th. The concept was generally well-received, but the lack of interaction after each paper was noted by some as a drawback. With costs of video conferencing decreasing rapidly, next year's version is likely to be more interactive. CHA provided the continental breakfast and coffee services for the conference at IOS, and the post-conference celebratory beverages across the road at Quester Tangent Corporation.



Lighthouse

Revue de l'Association canadienne d'hydrographie
Journal of the Canadian Hydrographic Association

Originalement à l'hiver 1969, **LIGHTHOUSE** était le journal de l'Association canadienne des hydrographes (ACH). Il représentait un moyen pour stimuler les discussions entre les Sections de l'ACH. De par les années, **LIGHTHOUSE** est devenue la revue hydrographique nationale du Canada. Elle reste fidèle à

son but original de fournir une source d'information technique, historique et sociale à ceux qui s'intéressent à l'hydrographie au Canada. Son tirage a augmenté pour inclure au-delà de 1000 membres, compagnies et organisations hydrographiques au Canada et dans le monde entier.

Tarifs publicitaires 1995

EMPLACEMENTS

L'approbation et l'emplacement de l'annonce sont à la discrétion de l'éditeur. Cependant, toute demande d'emplacement spécifique sera considérée si une prime de 25 \$ est ajoutée à la demande de parution.

EXIGENCES MÉCANIQUES

L'annonce publicitaire doit être un prêt à photographier ou sur film négatif (les couleurs supplémentaires doivent être sur film négatif) et être fournie aux dates de tombée. La préparation de copie couleur, à fond perdu et de photos sera chargée au tarif de l'imprimeur plus 10 %. Les épreuves devraient être fournies avec tous les suppléments.

Les insertions d'une page seront chargées au tarif d'une pleine page. Le matériel devra être fourni par le client.

DIMENSIONS DE LA PUBLICITÉ

	(Hauteur)	(Largeur)
Dimension de la revue:	8.5"	x 11.0"
Encart libre:	7.0"	x 10.0"
Publicité à fond perdu:	8.75"	x 11.25"
Insertion d'une page:	8.25"	x 10.75"

Grandeur standards des suppléments:

Pleine page:	7.0"	x 10.0"
Demie-page:	6.875"	x 4.75"
ou:	3.375"	x 9.75"

DATE DE TOMBÉE

LIGHTHOUSE est publiée deux fois par année, au printemps et à l'automne. Les dates de tombée sont le **15 mars** et le **15 octobre** respectivement.

IMPRESSION

Internégatif tramé à 133 lignes au pouce.

TARIFS

Tous les tarifs sont en devises canadiennes. Les membres de soutien ont droit à un rabais de 10 %.

	N & B	Couleur
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Les tarifs sont assurés aux termes des contrats publicitaires jusqu'à concurrence d'un an. Les annulations ne sont pas acceptées après la date de tombée.

Tout le matériel publicitaire doit être acheminé à:

Monsieur K. Weaver, Directeur de la publicité
LIGHTHOUSE
P.O. Box 5050
867 Lakeshore Road
Burlington, Ontario
CANADA L7R 4A6
Téléphone: (905) 336-4538
Télécopieur: (905) 336-8916



Spring 1995

Lighthouse

Journal of the Canadian Hydrographic Association
Revue de l'Association canadienne d'hydrographie

LIGHTHOUSE originally began as an internal newsletter of the Canadian Hydrographers' Association (CHA) in the winter of 1969. It was conceived as a means of stimulating discussion between the branches of CHA. Over the years, **LIGHTHOUSE** has become Canada's national hydrographic journal. It still remains faithful to

the original goal of providing a mix of technical, historical and social information of interest to those associated with hydrography in Canada. But its circulation has expanded to include over 1,000 individuals, companies and hydrographic organisations in Canada and around the world!

1995 Advertising Rates

POSITIONING

The acceptance and positioning of advertising material is under the sole jurisdiction of the publisher. However, requests for a specified position will be considered if the position premium of \$25 has been included in the insertion order.

MECHANICAL REQUIREMENTS

Advertising material must be supplied by the closing dates as camera-ready copy or film negatives (Colour ads must be film negatives). Copy preparation, including colour, bleed and photos will be charged at the printer's cost plus 10%. Proofs should be furnished with all ads.

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LIGHTHOUSE is published twice yearly in Spring and Fall. The closing dates are **March 15th** and **October 15th** respectively.

PRINTING

Offset screened at 133 lines per inch.

RATES

All rates are quoted in Canadian Funds. Sustaining members receive a 10% discount.

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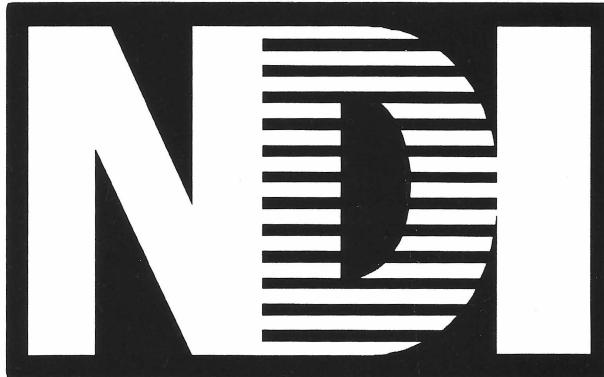
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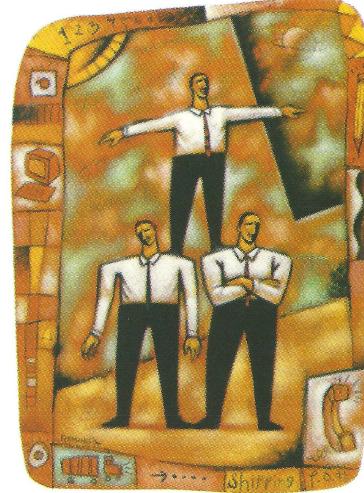




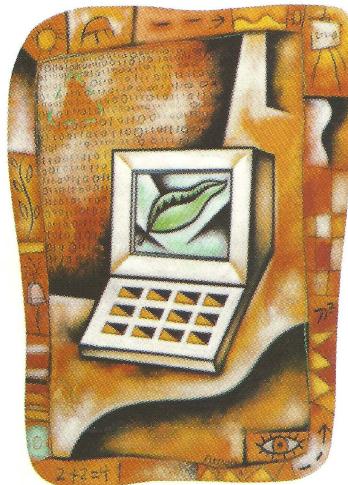
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