

Davis

NEWSLETTER

November 1992, Issue 03

ELECTRICITÉ DE FRANCE WAVE GENERATOR COMMISSIONED

As report in our last Newsletter, Laboratoire National d'Hydraulique (LNH) of the Electricité de France awarded a \$1.8M contract to DAVIS to supply and install a segmented wave generator in their facility in Chatou, France.

The contract called for the supply, installation and commissioning of a 56 segment piston mode wave machine, complete with the DAVIS/NRC direct digital controls system and GEDAP software package.

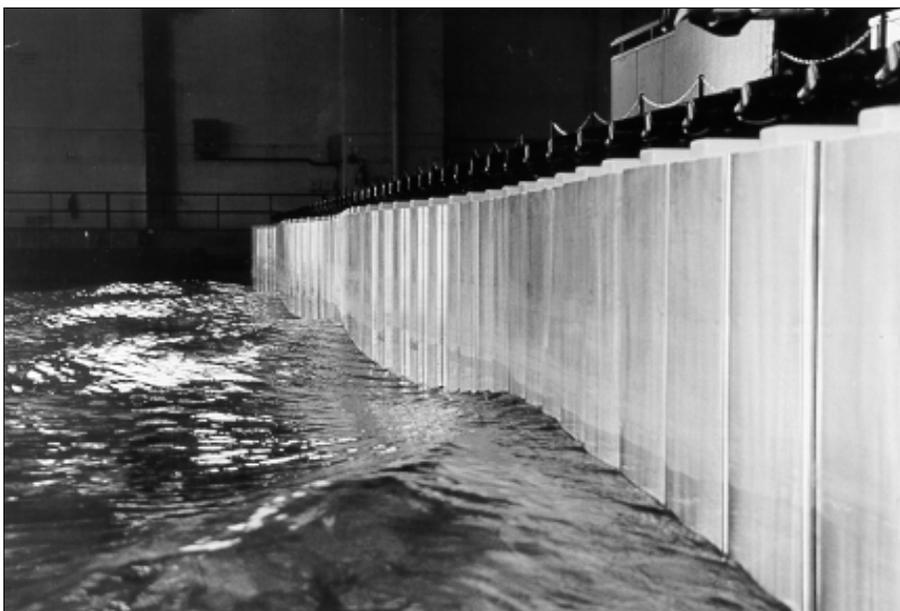
In late September of this year, the installation and commissioning of this machine was completed with great success. Reports from the client indicate that this project has been

concluded to their satisfaction and they are very happy with the system.

This project utilizes the new control system software developed by DAVIS and NRC. The control system was upgraded earlier this year to accommodate active wave absorption and take advantage of technological advances in computer hardware and this is the first system that has been installed outside of a test environment.

After some minor modifications, the system was up and running smoothly with relatively few delays, a testament to the collaborative efforts of NRC and DAVIS Engineers.

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LNH Segmented Wave Maker in Operation

Focus

The fact that it has been a full year since our last Newsletter is an indication that our priorities have been elsewhere due to an extremely harsh business climate.

The Canadian recession, shrinking defence budgets around the world and a general slowdown in the global economy has resulted in significant downsizing to meet the challenge.

However, as can be seen from the articles within, we continue to make progress with our traditional products, as well as making new initiatives.

In this regard, I am very pleased to welcome Bill MacSween to DAVIS both as a Vice President and a new Partner. Bill has already established a new business area at DAVIS (building energy management software) and we expect to announce another exciting initiative shortly.

Our first European wave generator installation (LNH) went very smoothly and the client has been quite enthusiastic in their praise for our technology and team. In addition, our second European installation, at CEPYC in Madrid, will be completed by the end of this year, giving us a strong presence in that marketplace.

Although these are difficult times, we are optimistic that the economy and our prospects will improve and we can soon look forward to starting a new growth cycle.

Rolly Davis, P.Eng.
President

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BILL MacSWEEN APPOINTED TO THE BOARD OF DAVIS ENGINEERING

Rolly Davis, the President of Davis Engineering, is pleased to welcome Bill MacSween as the Vice President of Business Development. In addition to, and as a result of Bill making a significant investment in DAVIS, Bill has been appointed to the Board of Directors and made an Officer of the company. Thus, Bill will contribute to DAVIS through his operational role in new business development as well as helping to formulate and guide company policy.

Bill's association with DAVIS goes back to 1983 when Bill and DAVIS Formed the jointly owned software company, DEMAC, which had a mandate to provide software consulting services as well as to develop its own software products. DEMAC grew and prospered and as a result of interest by a larger software firm, the company was sold and continued to operate under Bill's leadership. Bill subsequently resigned from that firm, now called DEMAX, but

still acts in an advisory role and the company is still doing well.



William MacSween, Vice-President

After considering several other opportunities, Bill was persuaded to devote his energies to Davis Engineering, specifically in developing new business areas in the software and electronics fields.

He has now been concentrating his efforts in two areas initially; building energy management systems and the firearm instrumentation system, or Range Tutor, as it is now called.

His efforts in the building energy management field, in association with the Department of Public Works, have already proven to be quite successful and this appears to be a growth area for DAVIS.

Due to his long association with Davis Engineering, many of our clients already know Bill and we are sure they are pleased to see this formal association with our company.

DAVIS HEATS THINGS UP

Modern computer-based Energy Management and Control System (EMCS) technology is being increasingly employed by owners and managers of large buildings and complexes to control energy consumption and more efficiently manager major building systems such as heating, air conditioning, ventilation, lighting and physical security. Recently DAVIS has entered this expanding field, filling a unique role as Canadian supplier and integrator of an innovative new technology designed to address a major problem for large building owners and managers in the public and private sector.

The problem stems from the fact that most EMCS vendors' offerings use proprietary design schemes and do not work or communicate with each other. Sticking to just one vendor's products throughout a building's life cycle of

erection, expansions and renovations helps keep the overall EMCS centralized and uniform for the building operators, but can also present new features from being introduced if the vendor chosen fails to keep up technologically. More significantly though, this approach conflicts with the established competitive bid policies used by both government and other organizations to control costs. As a result of all this, one may often find several different brands of EMCS installed over time into a single building or complex, each with its own domain of control and unique proprietary operator interface scheme. The downside of this situation ranges from equipment redundancy and greater training costs for building operators all the way to failure to realize the cost savings achievable through today's energy incentives when a cohesive, centralized control,

monitoring and reporting system for building energy management is in place.

Public Works Canada, the largest single building owner and manager in Canada, has taken steps in recent years to deal with this problem. The approach taken by PWC was to standardize those parts of the EMCS which human operators must interface with, so that variations in the functioning of lower-level control system elements of different vendors would not be visible to, or adversely impact, the building operator. The Government of Canada's revised national master building specification now imposes a requirement upon EMCS vendors bidding on new jobs to ensure that the operator workstations and master control units they furnish support the new PWC-defined standards.

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SPAIN ORDERS A NEW SEGMENTED WAVE GENERATOR

Earlier this year the Centro de Estudios de Puerto Y Costas (CEPYC) Laboratory of the Spanish Department of Public Works signed a \$2.2M contract with Davis Engineering and our representative DTA, to supply a segmented wave generator before the end of 1992. CEPYC is located in Madrid, Spain and the Laboratory carries out a variety of coastal and river studies in various tanks in the facility.

This segmented wave machine, which is very similar to that installed at Laboratoire National d'Hydraulique (LNH), is comprised of 60 segments, each one 0.4 m wide by

1.6 m high. The machine is a piston mode wave generator, complete with the new DAVIS/NRC direct digital control system and the GEDAP software package.

For this installation, DAVIS will be working with our representative in Madrid, DTA, who will be responsible for the installation of the machine under our supervision.

This is the third DAVIS wave generator to use electric actuators to independently control the motion of each segment. The electric ball screw actuators have several distinct advantages over the hydraulic actuators, namely ease of use, less

maintenance, higher reliability and higher energy efficiency.

DAVIS was awarded this contract after an international competition with other suppliers from Europe and the U.S.A. It is significant that this is our second wave generator contract award in the European market and has come before completing the installation at LNH. We were supported by the Hydraulics Laboratory of the National Research Council through the marketing and proposal stage of the competition, and will continue to be supported during the installation and commissioning.

DAVIS LAUNCHES FIREARMS TRAINING SYSTEM - RANGE TUTOR

Much public attention has been focused on the use of lethal force by police officers both in Canada and elsewhere. Also, law enforcement agencies are recognizing that inadequate firearms training can result in not only lost lives but expensive legal liability costs. Improvements in firearms proficiency are now of increased interest to all parties.

Firearms instructors have always striven to achieve high proficiency

standards with their trainees. Faced with tight budgets, growing classes and a broadening diversity of student's physical abilities, many trainers are hard pressed to maintain, yet alone improve, officers' proficiency levels.

Since 1988, DAVIS has been at work on a concept originated by RCMP firearms instructors to provide both shooter and instructor with immediate visual feedback of actual performance in the two key shooting

fundamentals of grip and trigger control. Problems here however, are common causes of poor shooting accuracy and consistency. With support of the RCMP and Canadian Police Research Centre in Ottawa, DAVIS built two prototypes in 1988 which yielded good results but had several limitations. Over the last year though, DAVIS has redesigned the system to achieve a more reliable, functional and yet less expensive tool for trainers. Unlike the earlier approach which could only support revolvers like those used in Canada, the new design can support the wide range of automatic pistols used by police in the United States.

DAVIS recently announced the new system, named Range-Tutor, at an international police chiefs association conference and show in Detroit, Michigan and through a mailing to over two thousand instructors worldwide. Production units are now being built for use and study at key training sites in Canada. The data collected during initial use is expected to prove out Range-Tutor's potential for improving both the efficiency and effectiveness of current police handgun training.



Range-Tutor System in Use

SPAR SPACECRAFT TRANSPORTATION

In 1991 DAVIS was awarded a contract by the Satellite and Communications Systems Division of SPAR Aerospace Limited to design modifications to the ANIK-E Spacecraft Transportation Container (STC).

The STC is used for transporting spacecraft and components thereof between manufacturing, assembly and testing facilities, and ultimately to the launch site. The container is transported via an air ride truck or Belfast freight aircraft. SPAR decided to modify the existing STC so that it can perform similar functions for the Radarsat and MSAT Satellite programs.

The new spacecraft have mounting and envelope requirements that differ considerably from ANIK-E. The modifications required the design of completely new support frames with spacecraft dependant shock and vibration isolation systems, as well as a new container end wall and lid assembly, new lifting system, upgraded wheel assemblies and an upgraded environmental control and monitoring system.

This project involved a significant amount of static and dynamic analysis using Finite Element Methods (ANSYS), especially in the design of the spacecraft support frames.

The design of the support frame for Radarsat was especially challenging as this spacecraft had to be transported on its side because of the excessive overall height. This involved the design of a support structure that would support the sensitive spacecraft at multiple locations.

A coupled analysis using the DAVIS support frame model and the SPAR spacecraft model was undertaken as a team effort by SPAR and DAVIS to ensure compatibility of the complete system.

Subsequent to completing the design, DAVIS was awarded the contract to implement the modifications. This included the complete fabrication and assembly of the aluminum and steel structures and painting of the final assemblies. A rigorous quality program to AQAP 4 was followed throughout the project.

The STC was delivered on schedule and it has successfully been used for transportation of one of the MSAT modules to date.



Spacecraft Transportation Container at SPAR-DFL

DAVIS Heats Things Up *continued from page 2*

Recognizing that not all EMCS vendors would respond quickly to the new standards and requirements however, PWC also separately sponsored development of a standardized operator interface console (SOIC) and a series of "gateway" units to act as translators between the proprietary master control units and the SOICs.

While some EMCS vendors have already implemented their own gateway units, DAVIS anticipates much activity with the Interpreter/MV technology through its various roles. Two contracts for provision and installation of the Interpreter/MV technology have already been received and further projects are already slated for the near future which call for conformance to the new PWC standards. Direct

contracts for software development and promotional activity are also expected.

Given the significant benefits and availability of this powerful new technology, DAVIS is optimistic that this new area of endeavour will not only benefit DAVIS but also many building owners and managers as awareness builds and the field of building automation progresses.

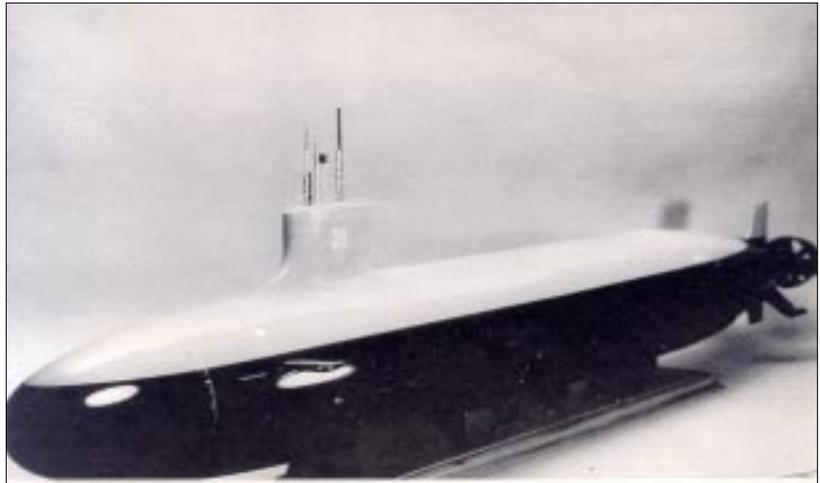
USN "SEAWOLF" ATTACK SUBMARINE

Earlier this year, DAVIS signed a contract with the Electric Boat Division of General Dynamics to supply custom-built Active Shaft Grounding systems for the Seawolf class submarine.

The Seawolf is the U.S. Navy's newest attack submarine and will have the highest tactical speed of any U.S. submarine. In addition, much of the design effort was focused on noise and it is expected that the fully coated boat will restore the level of acoustic advantage which the USN has enjoyed for the last three decades.

The Seawolf has been the centre of a large controversy due to the decline of the Cold War and the shrinking defence budget. This has caused the number of boats in the class to drop to two or three, and come very close to being cancelled altogether.

The specification of the Active Shaft Grounding system for this U.S.N.



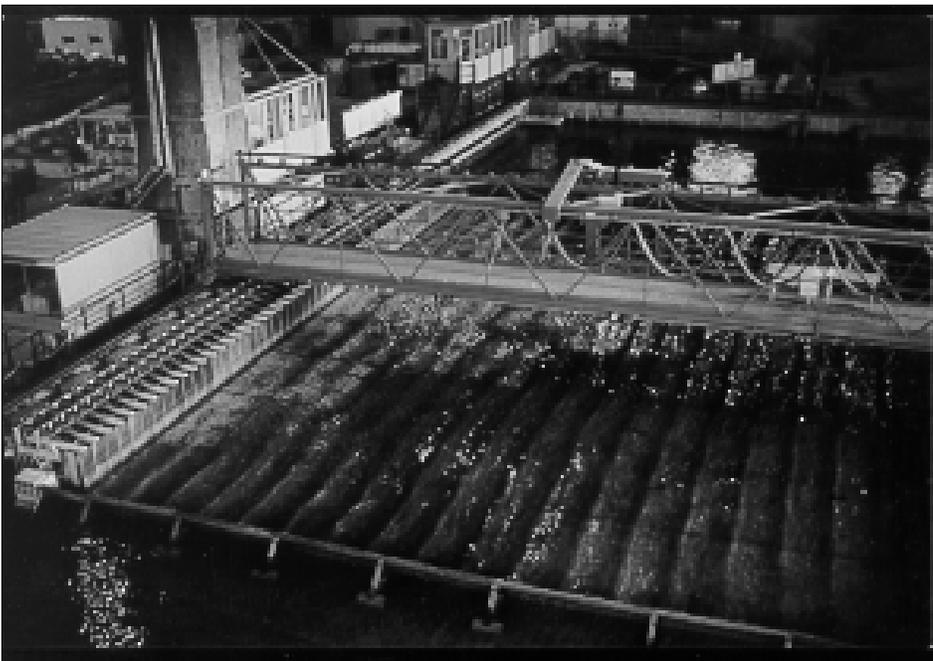
Model of Seawolf Submarine

submarine is a significant milestone in the acceptance of the system by the international navy community. We anticipate the Active Shaft Grounding

system will be specified on all new naval construction of the USN, including both surface ships and submarines.

DAVIS Heats Things Up

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LNH Laboratory Showing Installed Wave Generator

This control system will eventually provide the capability for active wave absorption. Active wave absorption implementation is currently in progress as the second phase of the same development project.

This is the first DAVIS wave generator to use electric ball screw actuators, which have been shown to have several distinct advantages over hydraulic actuators. The suppliers of the actuators worked closely with DAVIS in this, their first wave generator application.

DAVIS gratefully acknowledges the support given by the National Research Council during this phase of the project. As well, GBG, a Paris based company, provided excellent support for the mechanical installation of the wave generator.

HMCS HALIFAX "IR TRIALS"

As described in Issue 01, the DAVIS DRES Ball Infrared Suppression System, was successfully tested during the August 1990 Platform Trials. During these tests, metal temperature, plume temperature and back pressure were measured throughout the device, and all of the performance parameters significantly exceeded that predicted by the 1/4 scale testing.

In September 1991, through the joint efforts of External Affairs and the Department of National Defence, HMCS Halifax sailed to Baltimore, Maryland for a Technical Showcase of the technology incorporated on the ship. Three major subcontractors made presentations during the showcase and other subcontractors, such as Davis Engineering, were present to answer any questions about their specific technologies. The Technical Showcase was very well received and members of the U.S. Marine community were very impressed with the Canadian technology.

Through existing Bilateral agreements, NAVSEA tasked the U.S. Naval Research Laboratory to perform



Canadian Patrol Frigate "HMCS Halifax" in the IR Spectrum

extensive IR Trials on the Halifax while it was in Chesapeake Bay. These included shore based testing, helicopter fly past testing and the use of simulated IR missile seekers. The results of this extensive testing were extremely good. The accompanying photos show the HMCS Halifax at approximately 20 knots in the IR spectrum as taken from the shore based facility. As can be seen in the first photo, there is no indication of

the hot metal or gas around the gas turbine outlet. The second photo shows the marked contrast between an IR flare decoy and the ship's signature.

The confidential results of this IR Trial have been made available to the Canadian Navy and in part, presented to various NATO working groups. In addition, the non-confidential footage has been incorporated into a promotional video which is available to interested parties upon request.



"HMCS Halifax" in IR Spectrum with Flare Countermeasures

For further information please contact:

Rolly Davis or Carol Anderson
W.R. Davis Engineering Limited
1260 Old Innes Road
Ottawa, Ontario
K1B 3V3

Tel: (613) 748-5500
Fax: (613) 748-3972