An international forum for the expression of ideas and opinions pertaining to the submarine telecoms industry

Issue 29
November 2006
November’s issue marks our fifth anniversary in publishing Submarine Telecoms Forum, and attention-grabbing cable projects seem to be coming together or being awarded; and unlike years past, an interesting, albeit possibly short, time of system building seems to be at hand.

The few principles Ted and I established in the beginning, are still held dear. We promised then, and I continue to assure you, our readers:

1. That we will provide a wide range of ideas and issues;
2. That we will seek to incite, entertain and provoke in a positive manner.

This issue’s theme, Defense & Non-traditional Cable Systems, seems to be extremely timely, what with new nuclear noises from both the Korean Peninsula (a particular song from “Team America” comes to mind) and Middle East, and we hope this edition provides some excellent insight into this complimentary, tangential submarine cable market.

We profile the Comprehensive Test Ban Treaty Organization, which uses among other things, cable systems to verify compliance to nuclear non-proliferation. Rogan Hollis muses about life in ACMA, while Catherine Creese reveals the US Navy’s new office for cable support. Nigel Shaw describes his organization’s recent ventures, while Bill Barney invites industry participation at the upcoming PTC 2007. Steve Lentz updates the NEPTUNE scientific cable project, as Ian Gaitch spotlights the offshore electricity market. The cabled seabed observatory experience of Lighthouse R & D is examined while Richard Faint opines the loss of ‘communication’ during wartime. Jean Devos returns with his ever-insightful observations, and of course, our ever popular “where in the world are all those pesky cableships” is included as well.

STF is not a perfect medium, and we have surely made our share of mistakes, but we continue to hope that in the long run we have helped our industry in some small way.

Good reading.
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+1.703.444.2527
www.wfnstrategies.com
A synopsis of current news items from NewsNow, the weekly news feed available on the Submarine Telecoms Forum website.

50th Anniversary of TAT-1

BT has noted that September 25, 2006, was the 50th anniversary of the TAT-1 submarine cable system – the first transatlantic telephone cable.

www.subtelforum.com/NewsNow/1_october_2006.htm

Alcatel Awarded South Caribbean Fiber Contract

Alcatel has announced that it has signed a turnkey contract with South Caribbean Fiber (SCF), a subsidiary of the LORET Group, to deploy a new submarine cable network spanning the eastern Caribbean islands.

www.subtelforum.com/NewsNow/8_october_2006.htm

Alcatel Cable Ship Certified for Catastrophic Oil Spill Recovery

Alcatel has announced that the Ile de Bréhat cable ship has successfully passed the European Maritime Safety Agency (EMSA) inspection process and has been accredited to perform maritime environmental protection activities.

www.subtelforum.com/NewsNow/17_september_2006.htm

Asia Netcom to Recruit Talent to Support Expansion

Asia Netcom has announced that it is embarking on a major talent drive to support its regional successes.

www.subtelforum.com/NewsNow/17_september_2006.htm

AT&T to Lay Cable Under California Lake

AT&T California plans to lay a new submarine cable across Emerald Bay, in the Lake Tahoe region.

www.subtelforum.com/NewsNow/17_september_2006.htm

Axiom wins a major contract in India with Millennium Telecom Limited

Axiom announced that it has secured a contract in India with Millennium Telecom Ltd. (MTL), a joint venture between Mahanagar Telephone Nigam Ltd. (MTNL) and Bharat Sanchar Nigam Ltd. (BSNL).


BP to Build Gulf of Mexico Fiber Optic Network

BP America Inc. has released details of its plans for the construction of an 800-mile undersea fiber optic system in the Gulf of Mexico to provide continuous broadband connectivity to the company’s offshore oil and gas facilities.

www.subtelforum.com/NewsNow/13_november_2006.htm

Carriers Sign MOU for India-Europe Cable

India’s Videsh Sanchar Nigam Ltd (VSNL) has signed a Memorandum of Understanding (MoU) with global telecom service providers including Etisalat, Saudi Telecom Company, Telecom Egypt and Telecom Italia Sparkle for the construction of a new submarine cable system linking the country with Europe, Africa, Asia and the Middle East.


CTBTO Holds Special Session With Announcement of North Korea’s Underground Nuclear Test

At the Special Session of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) Preparatory Commission on 13 October in Vienna, a large number of Signatories States expressed their deep concern and regret over the announcement of the Democratic People’s Republic of Korea to have conducted an underground nuclear test on 9 October 2006.

www.subtelforum.com/NewsNow/15_october_2006.htm
CTBTO Preparatory Commission Recommends Use of Data by Tsunami Warning Organizations


CTC Acquires New High Performance Trenching, Pipelay Support Spread For 2007 North Sea Season

CTC Marine Projects Ltd., the marine trenching subsidiary of DeepOcean ASA, has placed a £7.5m contract with Soil Machine Dynamics of Newcastle for the supply of a very high performance, advanced technology, 2MW jet trenching system. www.subtelforum.com/NewsNow/22_october_2006.htm

FLAG Telecom Adds to Executive Team

In line with the objective of furthering global leadership and leading the next phase of growth in globally managed services and solutions, Reliance Communications’ FLAG Telecom has announced the appointment of two key industry figures in its Executive Team. www.subtelforum.com/NewsNow/24_september_2006.htm

Fugro Acquires OSAE Survey and Engineering

Fugro N.V. has reached an agreement with OSAE Survey and Engineering Gesellschaft für Seevermessung m.b.H. to acquire the company for a total amount of EUR 6.5 million. www.subtelforum.com/NewsNow/22_october_2006.htm

Fugro Pelagos selected to provide AUV survey requirements

Fugro Pelagos, Inc, has been selected to provide the Director, Ocean Projects Department (N9) at the US Naval Oceanographic Office (NAVO), support and execute AUV (Autonomous Underwater Vehicle) survey requirements worldwide, on an as needed basis. www.subtelforum.com/NewsNow/8_october_2006.htm

Global Crossing Selects Xtera’s Nu-Wave XLS for Ireland Upgrade

Xtera, a leading supplier of all-Raman optical transport solutions, has announced that Global Crossing has deployed the Nu-Wave XLS DWDM system on two unrepeatered submarine links between Ireland and the UK. www.subtelforum.com/NewsNow/22_october_2006.htm

Global Marine and Huawei Technologies jointly announce on-cooperation within the submarine telecommunications market

Huawei Technologies Co. Ltd., a leader in providing next generation telecommunications network solutions for operators around the world, and Global Marine Systems Limited, the independent market-leading subsea cable installation and maintenance company, today announced a partnership to jointly develop a new generation of end-to-end submarine networking solutions. www.subtelforum.com/NewsNow/6_october_2006.htm

Global Marine Executive to Keynote SubNets 2006

Global Marine Systems Limited is delivering a keynote address on 4th October at 5.10pm at Submarine Networks World 2006 to call for improvements in performance reporting within the submarine cable installation and maintenance industry. www.subtelforum.com/NewsNow/1_october_2006.htm
Hibernia Atlantic Increases Its Sales Force

Hibernia Atlantic has announced that it has added highly experienced and talented personnel to its sales and marketing teams, in response to its recent success and record-breaking customer acquisitions.

www.subtelforum.com/NewsNow/22_october_2006.htm

Hibernia Atlantic Offers First 10-Gbps Ethernet LAN-PHY Services

Hibernia Atlantic has announced that it is now the first transport provider to offer a full 10.31 Gbps Ethernet capacity, allowing for 10 full channels of fiber capacity.

www.subtelforum.com/NewsNow/15_october_2006.htm

IT Completes Cable across Lake Champlain

International Telecom (IT) announced the completion of the New York to Vermont cable across Lake Champlain.

www.subtelforum.com/NewsNow/13_november_2006.htm

Mid-Atlantic Crossroads (MAX) Deploys Ekinops PM 1001PC in 10Gbe Trans-Atlantic Network

Ekinops, a leading provider of optical transport, DWDM, and aggregation solutions, announced that Mid-Atlantic Crossroads (MAX) has deployed the Ekinops 10-Gigabit LAN PHY (local area network physical layer device) to WAN PHY (wide area network physical layer device) protocol converter to connect its 10-Gigabit Ethernet network to an OC-192/STM-64 submarine network between the US and Europe.

www.subtelforum.com/NewsNow/13_november_2006.htm

NEC Wins Capacity Upgrade Contract for EAC

Asia Netcom and NEC have announced that the companies have signed an agreement to double the capacity on the southern segment of its Pan-Asian submarine cable system, EAC.

www.subtelforum.com/NewsNow/15_october_2006.htm

New Caledonia’s OPT, Alcatel Sign Contract for New Submarine Cable

Alcatel has announced that it has signed a turnkey contract valued at EUR 42 millions with the Post & Telecommunications Office (OPT) of New Caledonia to rollout Gondwana-1, a submarine cable network connecting New Caledonia and Australia. Based on Alcatel’s optical networking solutions, the new deployment will significantly increase the capacity of OPT’s network.

www.subtelforum.com/NewsNow/15_october_2006.htm

Nexans Acquires the C/S Skagerrak

Nexans has signed a contract with Bourbon Cable AS, a Norwegian subsidiary of the French company Bourbon, to purchase the C/S Bourbon Skagerrak, one of the world’s most powerful cable-laying vessels.

www.subtelforum.com/NewsNow/13_november_2006.htm

Nexans Wins Contract for Power/Fiber Cable to Long Island

Nexans has been awarded a contract worth over 73 million Euros to design, manufacture, deliver and install a 138 kV high voltage submarine transmission link between Norwalk, Connecticut, and Northport on Long Island, New York, in the United States.

www.subtelforum.com/NewsNow/17_september_2006.htm
Nexans Wins Power/Fiber Contract in the Arabian Gulf

Nexans has been awarded a €100 million contract by the Abu Dhabi Water & Electricity Authority (ADWEA) to supply and install the submarine and land cables to create a new 132kV power link between Abu Dhabi’s mainland network and Delma Island.

www.subtelforum.com/NewsNow/24_september_2006.htm

Oceaneering Announces Umbilical Contract

Oceaneering International, Inc. has announced that it has secured a contract with an approximate value of $30 million from Mariner Energy, Inc. to supply umbilicals and the related connection hardware for the Bass Lite field development in the Gulf of Mexico.

www.subtelforum.com/NewsNow/22_october_2006.htm

Phoenix International Names Lawrence Mocniak As CFO

Phoenix International, Inc. (Phoenix) recently announced the appointment of Lawrence G. Mocniak as its Chief Financial Officer.

www.subtelforum.com/NewsNow/22_october_2006.htm

Phoenix Receives Compass Industrial Award

Phoenix International, Inc., (Phoenix) is pleased to announce receipt of the prestigious 2006 Compass Industrial Award for outstanding contributions to the advancement of science and engineering of oceanography and marine technology.

www.subtelforum.com/NewsNow/8_october_2006.htm

Phoenix Awarded Five Year Navy Contract

Phoenix International, Inc., (Phoenix) announced today the award of the Undersea Operations contract to provide the US Navy with worldwide underwater search, recovery, engineering, and technical services.

www.subtelforum.com/NewsNow/1_october_2006.htm

Pioneer Consulting Completes West African Traffic Study

Pioneer Consulting has completed a study of market demand and supply in connection with the proposed West African Festoon System (WAFS), a submarine fibre optic cable which will link nine or more West African nations to each other and provide interconnection to other intercontinental systems which connect Africa with Europe and Asia.

www.subtelforum.com/NewsNow/24_september_2006.htm

Rostelecom Connects European PoPs with High-Speed Ring

Rostelecom has connected its points of presence in Frankfurt, Stockholm and London through a high-speed ring network provided by Interoute.

www.subtelforum.com/NewsNow/1_october_2006.htm

SLT and BSNL Launches Bharat Lanka Submarine Cable

Bharat Sanchar Nigam Limited (BSNL) and Sri Lanka Telecom (SLT) have inaugurated the Bharat Lanka optical fiber submarine cable between India and Sri Lanka. This cable system has been established between Tuticorin, India, and Mount Lavinia, Sri Lanka.

www.subtelforum.com/NewsNow/8_october_2006.htm
Telecom Italia Sparkle Leads in Middle East and Med Basin IP Transit market

Renesys Corporation, a leading provider of next-generation Internet Routing and Market Intelligence solutions, has announced that it has been chosen by Telecom Italia Sparkle to benchmark the performance of Seabone (Telecom Italia Sparkle’s IP global backbone) and explore IP transit, peering relationships, customer prospects and competitor strategies worldwide. [www.subtelforum.com/NewsNow/24_september_2006.htm](http://www.subtelforum.com/NewsNow/24_september_2006.htm)

Two More Countries Sign onto EASSy

Two more countries signed the Protocol to rollout the NEPAD ICT Infrastructure Project. The ICT Ministers of Botswana and Zimbabwe signed the Policy and Regulatory Framework Protocol for the NEPAD ICT Broadband Infrastructure Network recently, bringing the number of countries committed to the protocol to nine. [www.subtelforum.com/NewsNow/5_november_2006.htm](http://www.subtelforum.com/NewsNow/5_november_2006.htm)

Tyco to Construct Undersea Fiber Optic System in the Gulf of Mexico

Tyco Telecommunications has announced that it has signed a contract with Houston-based BP America Inc. to supply an undersea fiber optic system serving offshore platforms in the Gulf of Mexico. [www.subtelforum.com/NewsNow/5_november_2006.htm](http://www.subtelforum.com/NewsNow/5_november_2006.htm)

VSNL Completes 10 Gig IP Backbone Upgrade in US, Europe & Canada

VSNL Singapore Pte Ltd. (VSNL International), the international arm of Videsh Sanchar Nigam Limited, has announced the completion of a 10 Gig upgrade to 21 locations of its global IP backbone throughout the United States, Europe and Canada. [www.subtelforum.com/NewsNow/29_october_2006.htm](http://www.subtelforum.com/NewsNow/29_october_2006.htm)

Wataniya Brings Submarine Cable to the Maldives

Wataniya, a mobile phone operator in the Maldives, has announced that it is bringing a fiber optic submarine cable into the country. [www.subtelforum.com/NewsNow/5_november_2006.htm](http://www.subtelforum.com/NewsNow/5_november_2006.htm)
Summit for the undersea telecommunications industry

The world’s most important conference for this industry will present the most provocative and inspiring speakers ever, including a United States Ambassador, the publisher of a major American financial magazine and an Internet pioneer and visionary.

There will also be interactive presentations by representatives from the oil and gas industry, finance, academia, engineering and international and maritime law.

SubOptic 2007. You want to be there.

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Who we are
At the Special Session of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) Preparatory Commission on 13 October in Vienna, a large number of Signatories States expressed their deep concern and regret over the announcement of the Democratic People’s Republic of Korea to have conducted an underground nuclear test on 9 October 2006. The Provisional Technical Secretariat (PTS) also briefed on International Monitoring System data and International Data Centre products that were provided to Signatories States following the event on 9 October 2006. The Commission expressed its appreciation for the speedy provision of data and products by the PTS to Signatories States.

The Preparatory Commission
The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO Preparatory Commission) is an international organization established by the States Signatories to the Treaty on 19 November 1996. It carries out the necessary preparations for the effective implementation of the Treaty, and prepares for the first session of the Conference of the States Parties to the Treaty.

The Commission’s main task is the establishment of the 337 facility International Monitoring System and the International Data Centre, and the development of operational manuals, including for on-site inspections.

The Treaty
The Comprehensive Nuclear-Test-Ban Treaty (CTBT) is a cornerstone of the international regime on the non-proliferation of nuclear weapons and an essential foundation for the pursuit of nuclear disarmament. Its total ban of any nuclear weapon test explosion will constrain the development and qualitative improvement of nuclear weapons and end the development of advanced new types of these weapons.

The Comprehensive Nuclear-Test-Ban Treaty was adopted by the United Nations General Assembly, and was opened for signature in New York on 24 September 1996. It has achieved strong worldwide support.

The Treaty will enter into force after it has been ratified by the States listed in its Annex 2. These 44 States formally participated in the 1996 session of the Conference on Disarmament, and possess nuclear power or research reactors.

Mission Statement
The mission of the Provisional Technical Secretariat (PTS) is to support the efforts of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization - an independent, international, intergovernmental organization - in carrying out the necessary preparations for the effective implementation of the Comprehensive Nuclear-Test-Ban Treaty and preparing for the first Conference of States Parties to the Treaty. The Treaty bans the carrying out of any nuclear weapon test explosion or any other nuclear explosion.

The PTS works to establish a global verification regime to monitor compliance with the Comprehensive Nuclear-Test-Ban Treaty. It builds, tests, and provisionally operates the International Monitoring System, the International Data Centre, and the related global communications infrastructure, and prepares to carry out on-site inspections. It provides timely data, assessments and other products and services to Signatory States of the Treaty. The PTS also conducts training programs and undertakes other outreach work in support of the Treaty.
The international, multicultural staff of the PTS demonstrates the highest standards of professional expertise, efficiency and integrity.

History of the Comprehensive Nuclear-Test-Ban Treaty (CTBT)

Background
Arms control advocates had campaigned for the adoption of a treaty banning all nuclear explosions since the early 1950s, when public concern was aroused as a result of radioactive fall-out from atmospheric nuclear tests and the escalating arms race.

Over 50 nuclear explosions were registered between 16 July 1945, when the first nuclear explosive test was conducted by the United States at Alamogordo, New Mexico, and 31 December 1953.

Prime Minister Nehru of India voiced the heightened international concern in 1954, when he proposed the elimination of all nuclear test explosions worldwide.

However, within the context of the cold war, skepticism in the capability to verify compliance with a comprehensive nuclear-test-ban treaty posed a major obstacle to any agreement.

Partial Test Ban Treaty, 1963
Limited success was achieved with the signing of the Partial Test Ban Treaty in 1963, which banned nuclear tests in the atmosphere, underwater and in space. However, neither France nor China, both nuclear weapon States, signed the PTBT.

Non-proliferation Treaty, 1968
A major step towards the non-proliferation of nuclear weapons came with the signing of the Nuclear Non-proliferation Treaty (NPT) in 1968. Under the NPT, non-nuclear weapon States were prohibited from, inter alia, possessing, manufacturing or acquiring nuclear weapons or other nuclear explosive devices. All signatories were committed to the goal of nuclear disarmament.

Negotiations for the CTBT
Given the political situation prevailing in the subsequent decades, little progress was made in nuclear disarmament until 1991. Parties to the PTBT held an amendment conference that year to discuss a proposal to convert the Treaty into an instrument banning all nuclear-weapon tests; with strong support from the UN General Assembly, negotiations for a comprehensive test-ban treaty began in 1993.

Adoption of the CTBT, 1996
Intensive efforts were made over the next three years to draft the Treaty text and its two annexes, culminating in the adoption of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) on 10 September 1996 by the United Nations General Assembly in New York.

The CTBT, which prohibits all nuclear test explosions, was opened for signature in New York on 24 September 1996, when it was signed by 71 States, including the five nuclear-weapon States.

Signature and Ratification Process

Signature
The Comprehensive Nuclear-Test-Ban Treaty is open for signature by all States prior to entry into force.

The steps leading to signature of the Treaty are as follows:
1. A Government decides to sign the Treaty, and who will sign it on behalf of the State.
2. Any representative other than the Head of State or Government or the Minister for Foreign Affairs will need to possess or be issued with full powers to sign the Treaty. These powers can be delegated by the Head of State or Government or the Minister for Foreign Affairs.
3. Signature is accomplished when the authorized representative of a State signs the Treaty at the United Nations Headquarters in New York. The Chief of the Treaty Section of the Office of Legal Affairs of the United Nations should be contacted in order to make an appointment to sign the Treaty.

Ratification
Ratification of the Comprehensive Nuclear-Test-Ban Treaty is a two-step process, which has to be secured first at the national level and then at the international level. The CTBT stipulates that it should be ratified according to a State’s constitutional processes. The ratification process differs from State to State. Approval is generally required by the legislature or the executive of a State, or both. Advice on national constitutional requirements and the domestic procedures necessary to ratify the Treaty can be obtained from the responsible government office, usually the Ministry of Foreign Affairs. The instrument of ratification must be signed either by the Head of State or Government or the Minister for Foreign Affairs or by an official with full powers to sign the instrument. This signature validates the instrument of ratification.

Unsigned instruments of ratification in the form of notes verbales are not acceptable. The instrument of ratification must indicate the title of the person who has signed it and its date and place of issue. The instrument of ratification should bear the name of the Treaty. It must contain an unambiguous expression of the will of the Government, acting on behalf of
the State, to recognize itself as being bound by the Treaty and to implement its provisions. The ratification process is completed by depositing the instrument of ratification with the Secretary-General of the United Nations. This indicates the consent of the State to be bound by the Treaty.

The deposit of an instrument of ratification at United Nations Headquarters is carried out:

- Either by the representative of the Government concerned delivering the instrument of ratification to the Secretary-General, or to his representative (the Legal Counsel or the Chief of the Treaty Section of the Office of Legal Affairs);
- Or by sending the instrument of ratification to the Secretary-General by mail.

Entry into Force

The CTBT will enter into force 180 days after it has been ratified by the 44 States listed in its Annex 2. These 44 States all formally participated in the 1996 session of the Conference on Disarmament, and possess either nuclear power or research reactors.

An Overview of the Verification Regime

In order to monitor compliance with the Comprehensive Nuclear-Test-Ban Treaty, a global verification regime is being established.

This is the main task of the Preparatory Commission, which needs to ensure that the regime is operational by the time the Treaty enters into force.

The verification regime consists of the following elements:

The International Monitoring System (IMS)

Global network

The International Monitoring System (IMS) comprises a network of 321 monitoring stations and 16 radionuclide laboratories that monitor the earth for evidence of nuclear explosions in all environments. The system uses four verification methods, utilizing the most modern technology available.

Verification technologies

Seismic, hydroacoustic and infrasound stations are employed to monitor the underground, underwater and atmosphere environments, respectively.

Radionuclide stations can detect radioactive debris from atmospheric explosions or vented by underground or underwater nuclear explosions.

Location of stations

The establishment of the IMS poses engineering challenges unprecedented in the history of arms control, with many stations located in remote and inaccessible parts of the globe.

Certification of IMS stations

Once established and certified as meeting all technical requirements, monitoring stations are provisionally operated by local institutions under contracts with the PTS.

The International Data Centre (IDC)

The IMS is supported by the International Data Centre, which is based at the headquarters of the Preparatory Commission for the CTBTO in Vienna.

Purpose

The IDC supports the verification responsibilities of the States Parties by providing objective products and services necessary for effective global monitoring.

Transmission of data to the IDC

Over 100 stations are already transmitting data to the IDC, many of them continuously. Global coverage is being ensured through the Global Communications Infrastructure (GCI), which receives and distributes data and reporting products relevant to Treaty verification. Data are received and distributed through a network of three satellites. The GCI became functional in mid-1999. Five GCI hubs have been installed and GCI terminals have so far been set up at 46 IMS stations, national data centers and development sites. The GCI hubs are connected via terrestrial links to the IDC in Vienna.

Scientific Methods

IDC software is state-of-the-art, in line with technical and scientific progress.

Technical Assistance

Extensive support is given to the users designated by the States Parties by providing a standard software package, training courses and technical assistance.

Computer Infrastructure

The IDC operates the computer infrastructure necessary for the Provisional Technical Secretariat (PTS) to execute its mission effectively.

Consultation and Clarification Process

A State Party has the right to request clarification of any matter which may indicate possible non-compliance with the Treaty. A State Party that receives such request from another State Party has 48 hours to clarify the event in question. If the information on a suspicious event collected during the consultation and clarification process does not satisfy the State Party that asked for the information, an on-site inspection
can be requested.

**On-site Inspections**

**Request for an on-site inspection**

In the event that a suspected nuclear explosion is detected either by one of the stations of the International Monitoring System or by national technical means, any State Party can request an on-site inspection (OSI).

**Purpose of an OSI**

The purpose of an OSI would be to clarify whether a nuclear explosion has been carried out in violation of the Treaty and to gather any information which might assist in identifying the potential violator.

Such inspection would be regarded as a final verification measure and would only occur once the Treaty has entered into force.

**Nature of an OSI**

The inspection would be conducted in the least intrusive manner to protect the national security interests of the Inspected State Party.

The disclosure of confidential information unrelated to the purpose of the inspection would be prevented.

**OSI Operational Manual**

One of the top priorities of the Preparatory Commission at this time is the development of an Operational Manual for On-Site Inspections, providing details of procedures for the implementation of OSIs.

All future inspection activities will be based on this document.

**Inspection Equipment**

Passive seismological monitoring for aftershocks is one of the key inspection activities during the initial period of an OSI. Testing of inspection equipment related to seismic monitoring of aftershocks began in 2000 and is ongoing.

The first priority of the Testing Programme is to verify that the Seismic Aftershock Monitoring System (SAMS) can meet functional and operational requirements within the inspection environment. The objective of SAMS is to produce results that localize the search area and facilitate determination of the nature of the event triggering the OSI request.

The results of the first phase of the SAMS testing, conducted by PTS with the assistance of seismologists from States Signatories, demonstrated several interesting and useful technical results.

**Confidence-building Measures**

The purpose of confidence-building measures is twofold:

1. To contribute to the timely resolution of any compliance concerns arising from possible misinterpretation of verification data relating to chemical explosions, such as, for example, large mining explosions; and
2. To assist in the calibration of stations that are part of the IMS.

**Verification Technologies: Seismology**

**Seismic network**

The seismological monitoring system detects and locates seismic events.

The CTBT seismic network is composed of 50 primary stations, which send their data in real time to the International Data Centre (IDC) in Vienna, and 120 auxiliary stations that make their data available upon request from the IDC.

The principal use of the seismic data in the verification system is to locate seismic events and to distinguish between an underground nuclear explosion and the numerous earthquakes that occur around the globe.

There are two different types of seismic stations:

1. Three-component stations have sensors at a single site to measure the three components of the waves (up/down, east/west and north/south) caused by seismic events including earthquakes and explosions.

2. Array stations are sets of 9-25 geometrically arranged seismic sensors distributed over an area of up to 500 km². Seismic array stations have an enhanced detection capacity and independently measure the direction of and distance to the source of an event.
Verification Technologies: Hydroacoustics

Hydroacoustic network

Hydroacoustic monitoring detects acoustic waves produced by natural and man-made phenomena in the oceans.

The CTBT hydroacoustic network comprises eleven stations and covers the world’s oceans, which make up 70% of the surface area of the earth. Few stations are required because of the very efficient propagation of acoustic energy in the oceans.

The network comprises two different types of stations: “hydrophone” stations and “T-phase” (seismic) stations. The CTBT’s six hydrophone stations use underwater microphones (hydrophones) that capture signals underwater and then transmit them via cable to the shore station. Hydrophone stations are extremely sensitive and pick up acoustic waves from underwater events, including explosions, occurring very far away.

Such stations are expensive to install and costly to maintain, so the network also consists of five T-phase (seismic) stations. These stations are located on oceanic islands and use seismometers to detect the acoustic waves that are converted to seismic waves when they hit the island.

The data from the hydroacoustic stations are used in the verification system to distinguish between underwater explosions and other phenomena, such as sub-sea volcanoes and earthquakes, which also propagate acoustic energy into the oceans.
Verification Technologies: Radionuclide

Radionuclide network

The radionuclide network of 80 stations uses air samplers to detect radioactive particles released from atmospheric explosions and vented from underground or underwater explosions. The relative abundance of different radionuclides in these samples can distinguish between materials produced by a nuclear reactor and a nuclear explosion. The presence of specific radionuclides provides unambiguous evidence of a nuclear explosion.

Half of the stations in the radionuclide network also have the capacity to detect noble gases. The presence of noble gases can indicate if an underground explosion has taken place.

Under CTBT, a global system of monitoring stations, using four complementary technologies, is being established to record data necessary to verify compliance with the Treaty.

Supported by 16 radionuclide laboratories, the network of 321 monitoring stations will be capable of registering shock waves emanating from a nuclear explosion underground, in the seas and in the air, as well as detecting radioactive debris released into the atmosphere.

The location of the stations has been carefully chosen for optimal and cost-effective global coverage. The monitoring stations will transmit, via satellite, the data to the International Data Centre (IDC) within the CTBTO Preparatory Commission in Vienna, where the data will be used to detect, locate and characterize events.

These data and IDC products will be made available to the States Signatories for final analysis.

Image of Radionuclide Station RN23 in the Cook Islands. The air sampler and the satellite communications dish are in the foreground.

Verification Technologies: Infrasound

Infrasound network

The CTBT infrasound network of 60 stations uses microbarographs (acoustic pressure sensors) to detect very low-frequency sound waves in the atmosphere produced by natural and man-made events. These stations are arrays of 4-8 sensors which are located 1 to 3 km apart.

The IDC also uses the data to locate and to distinguish between atmospheric explosions and natural phenomena such as meteorites, explosive volcanoes and meteorological events and man-made phenomena such as re-entering space debris, rocket launches and supersonic aircraft.

Sample of a radionuclide air filter spectrum
Geographical Map of Monitoring Facilities
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Each bi-monthly edition includes commentary and information on system and service provision, and issues critical to the industry.

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Why are Welshmen wearing kilts? Because the sheep got used to the sound of zips. Now, if you’re Welsh and you know that I’m English, you will probably have one of two reactions. You’ll either sigh resignedly and attribute this gratuitous and tedious insult to yet another example of English arrogance, or you’ll get very angry and write a mad letter in Welsh to your local MP denouncing English colonialism and demanding instant and fearsome retribution. Speaking of colonies, if you’re an Aussie or a Kiwi male you will probably want to know where you can get hold of a kilt. And if you’re from North Carolina and you already have a kilt, you will be wondering how you can get your wife to dress up as a sheep.

By now readers will be wondering what is the point of all this, and the point is that different races react in different ways to the same situation, and within races there are individually different reactions too. Nothing particularly new there, so I tried to say it in a new way. Working with the forum that is known as the Atlantic Cable Maintenance Agreement – the ACMA – for the past 7 years has been like I imagine membership in the United Nations would be; frustrating, maddening, fun, and always interesting and chock full of a huge range of characters. Like the UN, the ACMA has its “Security Council”; the members that are at all of the important meetings and really make most of the decisions (AT&T, BT, C&W, Deutsche Telekom, Embratel try, France Telecom, Sprint, Telefonica, and Telecom Denmark in the person of the mad Viking, Claus Nielsen). Like the UN, the ACMA tries hard to listen to its “smaller members” – some of them give you no choice! And like the UN, ultimately I believe the ACMA is a good idea, but it will always be flawed because it consists of people, and people are the darnedest things.

I would like to take up some of your time by recalling some of the characters that I have worked with in the ACMA and by tracing the evolution of the Agreement from the time I joined in January 1999 up until now, when I must sadly leave.

The common image of Germans today is I guess probably of an efficient, organised and slightly cold – or unemotional – race. My first ACMA meeting was hosted by Deutsche Telekom (in one of their corporate guises, I can’t remember exactly which one at the time) in what seemed to be a military boot camp in freezing January in a place called Ismaning near Munich. DT must have organised this cold, efficient location to avoid any possibility of being distracted by outside interests, because it was the most spartan and functional place that I think I’ve ever been to with ACMA. To be fair, DT did host another meeting years later within a few metres of Checkpoint Charlie, and I can recommend Berlin as a fascinating place to visit. Anyway, back to frozen Ismaning, and the meeting was hosted by a very proper former East German named Hubert Pruss. Hubert was handing over his responsibilities to the young Hartmut Kipar, and so Ismaning was to be Hubert’s last meeting (perhaps that’s why he took us there, to get his revenge in first, knowing he couldn’t be caught!) as well as mine and Hartmut’s first.

There was another first that week, the first time that Hubert (and obviously myself and I gather many of the ACMA delegates) met a young lady by the name of Ellen Brain. Ellen was a character with a capital K; she filled her language with enough expletives to make the very correct Hubert wince (I saw him almost in tears at lunch the second day, thus disproving the unemotional stereotype, shaking his...
head in his hands and moaning “that woman……”) and her speeches often went off down blind alleys from which her very personal grasp of English could not rescue her. Yes, Ellen was American. I think she may have been related to Tony Soprano. Ellen was with AT&T at the time (although she has since she may have been related to Tony Soprano. Ellen was with AT&T at the time (although she has since been succeeded as FT rep by Alain Polloni, he of Napoleonic stature and walrus moustache. One of the frustrations of the ACMA, and an aspect that one must understand to thrive in ACMA, which was unfortunately brief, coincided with the rise of Spain, so strategically Juan was a perfect choice. Telefonica are now the largest voting bloc within the ACMA, and they are determined to flex their muscles, but when I joined in 1999 they were represented by the charming Jose Luis Eguidazu – or “Eggy” as he came to be known.

Eggy had at one time been on an old C&W cableship so he had a soft spot for the C&W reps…. I shall always remember a meeting in Montreal, drafting a new Agreement, when I turned and saw Eggy with his ever-present unlit cigar hanging from his lips, fast asleep. Brilliant. (Speaking of Montreal, I can’t let this article pass without mention of a wonderful and true gentleman, George Venditti. George is about the only guy in the ACMA that I have never heard anyone speak a bad word about, and that says it all). Eggy was full of wise sayings that no-one understood, like “In my country we have a saying, when the birds fly backwards the wind will be strong” (that isn’t an actual quote, you understand, but it’s as close as I could get to the inestimable Eggy). Eggy went off to a well earned retirement and has been replaced by a coterie of elegant Spanish gentlemen, lead by “El Guapo” Ramon Fernandez, with impressive support from Alberto Delgado and Agustin Gutierrez. I was once chased all over San Francisco by the Telefonica guys at a particularly exciting stage of forming the current ACMA contract, since I seemed to be the only person who could mediate between Spain and their predecessors as the most powerful Party, AT&T.

AT&T brings me to my best friend from my ACMA experience, someone who I have decided must be half English since he is too intelligent, funny and charming to be all American. I have also
been welcomed as an illegitimate member of his family, I think, since he calls me a Limey bastard. I speak, of course, of Jim Coble. Many of you readers will know Jim either personally or through reputation, but before you condemn him, let me say that behind that brash façade there lays a real softy. He drives a Volkswagen Beetle, you know; my wife calls it his Barbie car. Yet another interesting character who has added to the rich tapestry of my trip through the ACMA, and whom I am proud to call my half-brother. He’s 50 next year by the way.

During my service with the ACMA the Agreement has become immeasurably more commercial and professional. Of course, it’s not all due to me, but I do think I can perhaps claim a little of the credit. We have gone from 7 ships costing about $120 million per annum down to 4 ships costing just over $40 million, and in the process we have taken most of the ship-owning interests out of the running of the Agreement (despite what I said earlier about my friend Alain, FT graciously do not attend the Contract Management Group meetings or any of the Procurement Groups, since they do not want to be in a position of conflict of interest). That reminds me of one of the more extraordinary ACMA sights. We were having an annual Management Committee meeting in Argentina, and Mike Kelly was representing the Tyco ship interests, a difficult task that day because they had done something or other to upset the cable owners. Having graciously taken his beating, Mike got up, moved a few chairs along the table, and it was announced that he was now representing the Tyco cable owners!! One of the reasons why we no longer have the ship owners at our annual meetings….). We no longer have a combined Cable Owners Agreement / Ship Agreement; instead, we now have one Agreement between the Cable Owners and a separate Contract with the Service Providers.

This split has meant that the ship operators have much more clearly defined responsibilities and it enabled us to go to competitive tender for the contract, which in turn has enabled us to introduce Key Performance Indicators and Liquidated Damages and Guarantees for cable owners.

The Agreement itself is a living document that has undergone a number of modifications and improvements since it was first drafted, in part in Montreal with Eggy’s soporific assistance (and with my own Bajan Bacon contribution to ACMA folklore, for more details of which you will have to ask Steve Balk of Sprint). The challenge for the ACMA, much like the UN, is how to remain representative of the smaller Parties, and give them a voice at the table, whilst acknowledging that the real power must lie properly with the larger Parties. Part of the strength both of the UN and of the ACMA is that they are inclusive arrangements. Any cable owner can join the ACMA and gain from the enormous experience that sits around that table. The ACMA has often been called a “Gentleman’s Club”, and often that has been meant to be derogatory. Well I am proud to have been part of that club, and I hope that most of the time I have been a gentleman. Membership of the ACMA has enriched my life, even if I have had to try and concentrate and decipher the Spanglish ramblings of a manic CANTV representative from time to time; at least I have done it in good company. To my friends, I salute you, and I wish you all the best in developing the future of the ACMA. I recommend membership to all.

Rogan Hollis recently left Cable & Wireless after receiving his Long Service Award for fifteen years of Occasionally Distinguished Duty ("ODD"). From 1999 Rogan represented Cable & Wireless in the Atlantic Cable Maintenance Agreement and it is on his ACMA experience that Rogan draws for this article. In addition to his ACMA duties Rogan held a number of other roles for C&W, most recently as Director of Commercial Development for Submarine Networks, and before that Director of Marketing, Business Development and Sales and also Head of Sales & Marketing for the submarine engineering business, Global Operations Engineering Services – “GOES”. Prior to his stint with C&W plc Rogan worked for the Marine subsidiaries of both Cable & Wireless and BT, giving him a range of experience from both the cable owner and the service provider aspects of the submarine industry. Before joining BT Marine in 1991 Rogan worked for Vosper Thornycroft and Marconi. Rogan is married and has one beautiful daughter.
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The International Cable Protection Committee (ICPC) is planning its next Plenary meeting in Manila, Philippines during the period 13 – 15 March 2007 inclusive.

All of the World’s major telecommunications companies are represented within the ICPC whose principal purpose is to promote the safeguarding of submarine cables against man-made and natural hazards. This unique and prestigious organisation also serves as a forum for the exchange of technical, environmental and legal information concerning the marine aspects of both telecommunications and power submarine cable systems.

The theme of this Plenary will be:

Submarine Cables: Critical Infrastructure on a Global Scale

The Executive Committee (EC) therefore seeks presentations from interested parties highlighting the strategic importance of submarine cables to the modern world. Topics could include but are not limited to:

- **Submarine Network Resilience**
  - e.g. Diversity ; Restoration ; Future Design Considerations ; Implications for a Modern Economy

- **Legal & Regulatory**
  - e.g. Government Policies ; Cable Owners’ Obligations / Expectations / Experiences ; Coastal State Encroachment ; Continental Shelf Issues ; Impact of National Legislation ;

- **Environmental Interaction**
  - e.g. Cable Decommissioning ; Marine Life ; Documenting Ecosystem Impacts ; The Precautionary Principle ; Native Fauna ; Climate Change

- **Cable Protection**
  - e.g. Potential Uses of New Technology ; Cable Owners’ Experiences ; Regional Domestic Systems ; Fishing Activities;

Prospective presenters are respectfully advised that papers which are overtly marketing a product or service will not be accepted.

Presentations should be 25 minutes long including time for questions. The EC will evaluate all submissions based on content and quality.

*NB: Commercial exhibits may be displayed near the ICPC meeting room by special arrangement. Please contact the Secretary for further details.*

Abstracts should be sent via email to plenary@iscpc.org no later than 31 January 2007.
The information age might have encountered a partial technical glitch during the telecoms bubble bust, but following the reboot of the digital economy, it is finally living up to its promise of delivering unprecedented economic growth, unparalleled social change and yes, rapid growth in the demand for bandwidth.

There is plenty of excitement in the industry for not only organic growth of demand, but new applications, new business models, new opportunities. More importantly, telecommunications has evolved, becoming an industry that reaches out across multiple disciplines, across technologies and cultures.

This will be one of the central themes at this year’s Pacific Telecommunications Council’s “Beyond Telecom” conference, to be held at the Hilton Hawaiian Village, in Honolulu, Hawaii on 14-17 January 2007.

Of course, the road to this second coming of the digital future was not without glitches. Despite unprecedented growth rates in computer and Internet penetration, the market, perhaps facilitated by the increasing free flow of information, simply couldn’t wait for reality to run its due course.

Investors committed billions of dollars in the construction of fiber optic cable systems in the sea, over ground and into buildings and homes in the hope of capturing the pending explosion of Internet users reaching out for bandwidth. At the same time, mobile operators saw the immense potential of delivering Internet services to mobile phones over wireless networks and spent billions of dollars to acquire spectrum licenses for 3G services.

The result was the birth of the telecoms bubble, which came to a grinding halt as both fixed and mobile carriers crumbled under a mountain of debt and seeing only a fraction of the anticipated growth of market projections. This was followed by major bankruptcy filings, corporate retrenchments and the collapse of confidence for all things technological.

The early 90s saw the systematic digitization of information and transmissions technologies, presenting the world with a picture of the future where everything is digitized and connected. That future doesn’t happen overnight, as the market has learned, but the vision of the future remains, and perhaps is more valid today.
The Asian economy was impacted by the bubble burst, just like other regions, but the region that is home to half of the world’s population had the advantage of being a near green field site for the deployment of digital services. During the initial euphoria of the tech bubble, Asian companies found much needed foreign investment, which they put back into the region by building much needed infrastructure both regionally and domestically.

While some of these companies were also impacted by the economic downturn, their efforts meant that millions upon millions of homes were connected to the national, then international grid. Wireless networks sprung up where previously there was no such thing as communications services.

**The Hype becoming Reality**

While demand for advanced Internet and mobile services did not exactly grow fast enough to support a quick return on the multi-billion dollar investments of the telecoms bubble, the industry was growing at unprecedented rates nonetheless. In particular, Asia started to take the lead. Free of legacy infrastructure, the region began to leverage the latest technology, the most powerful services, and the coolest gadgets.

More importantly, Asian governments began to believe that technology is a critical factor in securing a place in the digital age.

In Asia, demand exploded as a result of more than just digitization, but deregulation and rapid technology advancement. A decade ago, less than 5% of the population in Asia had a choice for telecoms services. Today, close to 90% of the people in Asia have access to competitive carriers due to market deregulation measures by the region’s governments.

At the same time, technological advancements in both devices and services have led to a massive growth in bandwidth demand. For example, in 1995, most computers connected to the Internet at a “blazing” 14.4 kbps. Today, some 50% of the Internet users in Asia now connect to the Internet through a multi-Megabit broadband connection. Before users accessed text-based Web pages; now they are viewing live streaming video, downloading music and playing online games.

Meanwhile, the acceleration of technical capabilities is accompanied by a rapid commoditization of equipment and hardware. Mobile phones which had cost in excess of US$2,000 are now available for US$400 and with far greater functionality such as color screens, integrated cameras, the ability to access the Internet, play music, games, and so on.

All these factors – deregulation, accelerated technology innovation, and rapid equipment commoditization – gave birth to a market where everything is more accessible, more powerful and more affordable for consumers. The reality is that more and more people joined the information age and got online, for longer periods and from more places than ever before.

According to statistics from research firm Telegeography, total volume of intra-Asia Internet traffic from 1998 to 2005 grew from 0.3 Gbps to some 290.8 Gbps, equaling an astounding 96,000%, or a CAGR (compound annual growth rate) of some 322%.
The Changing Nature of Networks

But rapid growth in consumption is no longer the only story. More sophisticated applications are finding their way onto networks. Multimedia content such as music and video have become a staple for Internet users in markets such as Japan, Korea, Singapore and Hong Kong.

At the same time, corporations are now deploying more advanced systems and applications as part of their core technology infrastructure. Mission critical data, real-time voice as well as traditional productivity enhancers are now on increasingly sophisticated private networks.

So while demand is surging, the nature of the network is changing, from connectivity, to services, from access to applications. Each type of user, each type of application, is reaching out for different types of solutions; each demanding different cost structures, different service quality, and different support infrastructure.

These are the challenges for the next evolutionary stage of the digital revolution and the topic for executives at this year’s PTC’07. More importantly, going “Beyond Telecom” will certainly involve more than building more and more networks, or adding new and better technologies. This new digital age will be about the people, how they communicate, how they live, how they play, and how they work.

BILL BARNEY was promoted to President and CEO of Asia Netcom in November 2005. Prior to that, Barney was Chief Operating Officer of the company, a position he has held since joining Asia Global Crossing (AGC) in 2002. During his period at Asia Netcom, Barney presided over the transformation of one of Asia’s first Chapter 11 casualties (AGC), into one of Asia’s leaders in IP and WAN services. Since Asia Netcom’s launch in 2003, the company has achieved key financial targets and won numerous industry recognitions including Frost & Sullivan’s “Data Communications Service Provider of the Year” for 2005 and 2006. Barney previously served as President of Asia Pacific at MCI WorldCom where he managed the industry’s fastest growing regional company through an industry leading three-digit growth phase. During Barney’s tenure at WorldCom and UUNET, the company received numerous accolades for its technology leadership in IP services while also being recognized twice as Asia’s Telecom Employer of the Year. Prior to joining WorldCom, Barney was Vice President of Global One, where he managed operations in the Middle East, South Asia and Africa. Barney began his career with AT&T, where he held a number of key sales and management roles in the international division and domestic sales group. Barney received his MBA from Columbia University and a Bachelor of Arts degree from Wesleyan University.
The demand for increased bandwidth has been one of the key telecom industry trends during 2006. However, the role of cable installers helping to meet extra demand for capacity is not limited just to the telecoms industry. Whilst the skills of subsea telecom cable installation and maintenance are highly specialized, they are also highly adaptable, for example, Global Marine work in a variety of other industry sectors outside of telecoms, such as Oil and Gas, Power, Scientific Research and Renewable Energy.

Global power markets are buoyant and energy prices are continuing to rise, but whilst the UK takes for granted an efficient energy market, based on multiple companies providing a virtually guaranteed supply of electricity, this is not necessarily the case in other parts of the world.

Black outs and power shortages are still common in other parts of the world but as these developing energy markets become more efficient there is a growing demand from the electricity industry to create almost “regional network” style power cable solutions. These would connect electricity grids from different countries to enable a greater and more efficient supply of power to be transported between the two countries.

An example of this process is the recent Estlink project, which Global Marine provided cable installation and burial services for. Estlink has connected the electricity grids of Estonia and Finland, enabling power generated to be shared between the two states.

Typically, these types of installations are large and Estlink involved 2 x 75 kilometres of high voltage power cable, which weighed approximately 4,000 tonnes. To date, Estlink is one of Global Marine’s biggest power cable installation projects and a first for the company, simultaneously installing 2 bundled cables, utilising purpose built loading arms, trackway and a 5 metre chute to accommodate the scale of the installation.

However, the project enabled Global Marine to use many of our standard cable installation and post-lay burial techniques. as well as touch down monitoring, which involves using an ROV to monitor that a cable is not laid too tightly or loosely or over sea floor obstructions, which would both damage the
life of the cable.

In conclusion, the development of global electricity markets arguably mirrors that of telecoms in some aspects. On a global basis, power markets are becoming more efficient, with more liberalized regulation which is encouraging greater competition to provide the end user with a better quality of service. With its leading edge technology and expertise, our industry therefore has a vital part to play in enabling the electricity industry to meet its strategic goals, and cable operators and installers should see the power industry as a major market opportunity and a long-term component of their business strategies.
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The NEPTUNE Canada Cabled Ocean Observatory System is an underwater cable system built specifically to support scientific research. For the first time, NEPTUNE will enable collection of oceanographic, seismic, climate, and ecosystem data from deep under the ocean continuously in real time, over its planned service life of twenty-five years. NEPTUNE Canada is the first stage of a joint Canada - US network envisioned to provide access to the entire Juan de Fuca tectonic plate, an area of over 200,000 km² off the coasts of British Columbia, Washington, and Oregon. The University of Victoria (UVic) leads a consortium of 12 Canadian universities responsible for implementation and operation of NEPTUNE Canada with funding provided by the Canada Foundation for Innovation and British Columbia Knowledge Development Fund. Funding for the US portion of NEPTUNE is being sought from the US National Science Foundation.

NEPTUNE represents a fundamental step forward for the science of Oceanography. Oceanographers have traditionally relied on ships, buoys, or deep water moorings to collect data. Ships can remain on station for only a limited time within a narrow weather window, while buoys and moorings have limited electrical power and data bandwidth, as well as limited reliability. Out of commission telecom and military cables have been used for scientific research, but these may not be in ideal locations and also have power or bandwidth limitations. Cabled observatories have been built off the coast of Japan to support a seismic network; however, these observatories, built to a submarine telecommunications system design, have been unable to offer users the power required for a wide range of their instruments and experiments. Several “near-shore” single-site observatories located a few tens of kilometers off shore have been built and operated successfully; NEPTUNE will stretch this limit to multiple sites and hundreds of kilometers. NEPTUNE’s ability to provide access to the deep ocean environment, frequent data collection, real time data delivery, instantaneous command and control, and continuous long term observation goes far beyond the capabilities of conventional oceanography. While these new capabilities are of great interest to researchers, NEPTUNE will also provide an outreach function for the science of Oceanography by delivering real time video, still photographs and data to schools, universities, policy-makers, and the public throughout the world.

Major research themes for NEPTUNE are plate tectonics, seabed fluid dynamics including gas hydrate formation, ocean climate change, marine biology, and deep sea ecosystems. Initially, one site on the continental shelf, two sites on the continental slope and two sites in deep water have been selected for connection to NEPTUNE. The shelf site is Folger Passage, located just
offshore from the Alberni inlet. The slope sites are Barkley Canyon, a site of upwelling that is rich in ocean life, and includes exposed layers of gas hydrates; and Ocean Drilling Program (ODP) borehole 889, where there are several existing drill holes and proximity to gas hydrate mounds. The deep water sites are ODP 1027, a drill hole site in the middle of the plate adjacent to two sea mounts; and the Endeavour Ridge, the site of numerous "black smokers" which emit seawater heated to 375°C and which support a food chain based on sulfide consuming bacteria and Archea, believed to be among the oldest forms of life on Earth. A branching unit and spur cable will be installed to permit addition of the Middle Valley site, which is part of the same vent system as Endeavour. Extension nodes will be added as funding and resources permit.

To achieve these ambitious goals, a network infrastructure incorporating many novel design elements is required. The NEPTUNE network infrastructure consists of a conventional submarine cable and repeaters configured in an 800 km loop with both ends terminated in the former TPC-4 cable station at Port Alberni, which has been purchased by UVic. Underwater nodes are connected to the backbone cable by means of branching units which provide power switching for control and fault isolation. Optical signals are directed to and from each node using a distributed DWDM scheme. The use of repeaters and DWDM allows a single fiber pair to serve all node locations. The node itself consists of a large frame with two underwater housings: one containing a power converter and the other containing the communications equipment. Two protected Gigabit Ethernet channels are provided between each node and the shore station. NEPTUNE relies on Ethernet and TCP/IP for communications between instruments and a shore based Data Management and Archive System (DMAS). Precision timing is transmitted to the instruments using the IEEE 1588 Precision Time Protocol.

This network infrastructure represents a paradigm shift for submarine cable technology by providing communications to the seabed rather than just across it. At each subsea node location, the optical line must be terminated and Ethernet switches distribute communications to the scientific instruments or to extension cables. This means that terminal equipment normally housed in an environmentally controlled cable station must be adapted for use in underwater housings. The use of a repeatered solution allows conventional 2.5 Gb/s transponders to be used while still reaching locations that may be several hundred kilometers from shore.
Along with data to and from the seabed, NEPTUNE can deliver up to 120 kW of electrical power for operation of communications equipment, sensors, cameras, lights, and potentially remotely operated vehicles. This level of power delivery is made possible by increasing the line current from around 1 ampere in a typical telecom system to as much as 10 amperes while maintaining a voltage of 10kV on each shore end. At each node, a custom built DC-DC voltage converter accepts an input voltage from 5 to 10 kV and provides a 400 V, 10 kW output. Seawater provides the return path from each node to the shore station. Since each node provides a load between the cable and seawater, the loads seen by the power feed are in parallel, rather than in series as in a conventional repeatered system. The 400V intermediate voltage is used for local distribution.

Scientific instruments are connected to the node through a series of junction boxes, each connected by means of underwater mateable connectors, with each connector providing an Ethernet communications interface and power. The junction boxes not only increase the number of available connection points, but also allow instruments to share extension cables. Because the junction boxes are relatively simple and low cost as compared to the nodes, they can be deployed in locations where there is a higher risk of damage from seabed activity.

Interfaces will be standardized to allow instruments built by many researchers to be connected. Instruments will be deployed on the seabed, within sea floor boreholes and on cables buoyed up through the water column at particular locations.

Following an extensive RFP process, the prime contract for the NEPTUNE Canada backbone cable and nodes was awarded to Alcatel in October 2005. Alcatel is supported by two key subcontractors: L3 Maripro and Texcel. L3 Maripro will design and assembly the nodes; Texcel will provide custom control and power circuitry for use within the node. Cable laying operations are scheduled for summer of 2007, at which time a set of test instruments will be deployed. Finally, the main scientific instruments will be deployed and connected to the network during the summer of 2008. The operations and maintenance phase will include annual cruises to repair and replace instruments as well as on-demand cable ship repairs when failures occur in the network infrastructure.

In addition to all the usual challenges of permitting, coordination with other seabed users and supplier management, NEPTUNE has several unique concerns. The nature of the scientific sites means the seabed installation is, to say the least, complex. Deployment of the nodes and instruments will require ROV operations. Instruments have to be adapted, or designed from scratch, to work on a cabled network rather than batteries. A data management and archiving system has to be designed to handle the unprecedented amounts of oceanographic data. And, because NEPTUNE has the potential to collect sensitive acoustic data, national security has become a matter of some importance, requiring dialogue with the Canadian and US Navies.

Reliability has been an overriding goal throughout the design process and there are many network features that address reliability. First, the network forms a ring, so every node has two paths to shore. All node components have at least 1:1 redundancy. The power converter consists of a stack of building block units which provide multiple...
levels of redundancy. Single points of failure, such as repeaters and branching units, are built to the levels of reliability established for commercial telecom cable systems. In spite of the reliability and redundancy, many of the node components are Commercial-off-the-Shelf (COTS) and failures are inevitable. When failures occur, the node housings can be detached from the base frame and floated to the surface by an ROV. Syntactic foam ensures neutral buoyancy. The node can be immediately replaced with a spare, or refurbished and redeployed later. While it sounds counterintuitive, computer modeling shows the best maintenance strategy is to wait for a complete failure (i.e. both redundant components have failed) before undertaking a repair. Because of the down-time involved in making a repair, proactively replacing failed units actually results in more unavailable time than waiting for a failure, even though a longer outage will be experienced when a complete failure occurs. Overall network availability is expected to be in the range of 96% to 97%, which is surprisingly good considering that a node repair may take days or weeks.

One of the exciting aspects of NEPTUNE is the potential to utilize the technology in other applications. The availability of broadband communications and generous amounts of power at locations hundreds of kilometers from shore opens up many new possibilities for both scientific research and for equipment development and qualification. Communications systems for remote monitoring and control of well heads, continuous seismic monitoring of oil fields, and communications to high risk work areas are some of the areas in which NEPTUNE technology could be used, and in which NEPTUNE could be used as an equipment proving ground. Military and port security applications are also possible; use of an off-the-shelf solution which can support hydrophone arrays and other sensors would reduce or eliminate development effort for new sensor networks. Given NEPTUNE’s position as a research facility, it is likely some of these new concepts and applications will be tested on NEPTUNE itself before deployment elsewhere.

Steve Lentz has over fifteen years experience in the construction and operation of optical communications networks including metropolitan area networks, national networks, and international submarine cable networks. He has served as VP Network Engineering and Deployment for 360networks’ submarine division where he developed the network architecture, functional requirements, and performance specifications for international submarine cable networks and supervised testing, commissioning, and verification of compliance with contractual requirements. He was Manager of Transmission Engineering for Time Telekom, Sdn. Bhd. located in Kuala Lumpur Malaysia, and Director of Systems Engineering for Lightwave Spectrum, Inc. He joined WFN Strategies in 2005 as Project Manager, and has supported telecom projects in Oklahoma and the Gulf of Mexico.
The U.S. Navy has a long history of working with seafloor cables and continues with that work today. The Navy’s most recent development is the establishment of the Naval Seafloor Cable Protection Office (NSCPO). This article is intended to inform the readers in industry and government about the NSCPO and its role within the submarine cable community. The views expressed here are solely the author’s and do not necessarily reflect the policy of the U.S. Department of Defense (DoD), the U.S. Navy, or its components.

U.S. Navy Cable History

The U.S. Navy’s history with communications cables began with the first attempts to lay a trans-Atlantic telegraph cable, according to the records of the U.S. Naval Historical Society. The USS Niagara, a 5540-ton steam screw frigate built at the New York Navy Yard, was commissioned in April 1857. Designed for speed, she was the Navy’s largest ship when built. Soon after entering service Niagara was sent to England to help HMS Agamemnon lay the world’s first trans-Atlantic telegraph cable.

Though this effort failed when the cable broke in August 1857, a repeat attempt succeeded a year later, again with Niagara’s participation. During its few weeks of operation, this cable provided virtually instant communication between Europe and North America, an achievement much celebrated at that time, and for decades to come.

Navy Cables Today

Since that early beginning, the Navy has continued to install, operate and maintain submarine cables. The DoD, often using Navy resources, has installed tens of thousands of kilometers of undersea cable. Today these cables include communications cables,
undersea training ranges, acoustic and magnetic sensor systems, power cables, and even forward-deployable range and calibration systems for our ships.

Many of these systems are built and installed by the manufacturers and contractors of the commercial telecommunications industry. Early Navy systems had custom cable designs. Industry’s current products, however, work as well for some governmental applications as they do for commercial deployments. At the present time, the Navy is revitalizing several of the older generation of ranges through cable and sensor augmentations using current commercial “off the shelf” products and technology. In addition, new construction projects, like the recent FOCUS cable upgrade, also utilize off the shelf cables, jointing technology, and installation procedures.

Some older Navy cable systems have been turned over to scientific endeavors. Former Navy cables are currently used by oceanographic institutions for mammal monitoring programs, tracking oceanographic trends including global and ocean warming, and for other research programs.

**Creation of the NSCPO**

As a cable owner, the U.S. Navy shares many of the concerns of other cable owners regarding careful installation, maintenance, data management and interaction with other seabed users. Like other cable owners, the Navy suffers from cable failures.

Prior to the commercial cable industry boom in the late 1990’s, the installers most likely to operate in the vicinity of Navy cables often had business connections with the local Navy cable owners with whom they shared the seabed. Many had even been involved in the installation of the Navy cables. In other cases, they had contacts with local government agencies with knowledge of local seabed cables. The boom brought an increase in the numbers of contractors installing cables around the world and not all shared this past experience and informal knowledge base. After suffering a series of cable breaks, the U.S. Navy decided that a more visible, more easily accessible, centralized cable protection structure was required to reduce conflicts with the industry.

The Naval Seafloor Cable Protection Office (NSCPO) was created in 2000. NSCPO is now the official point of contact for all Navy cables. Its mission is to protect the Navy’s interests with respect to seafloor cables by providing internal coordination and external representation of those interests to the U.S. government and the industry. Primarily this involves the Navy’s existing systems, but it also works with industry to ensure the protection of existing commercial cables in the event that the Navy builds a new cable or range. NSCPO’s mission was expanded in 2006 to include protection responsibilities for all DoD cables.

NSCPO is an office within the Ocean Facilities Program of the Naval Facilities Engineering Command located at the Washington Navy Yard. This structure illustrates the Navy’s facility-oriented view of subsea cable systems: a cable is a critical component of a larger infrastructure designed to provide a service. This is a similar perspective to that of many other cable system owners.

**NSCPO’s Scope**

Similar to commercial cables which pass through territorial seas, cross continental shelves and international waters, the Navy’s interests reach beyond U.S. coastal waters. NSCPO’s protection responsibilities therefore do as well. It does this through liaison with both the U.S. domestic and international cable industry, and occasionally in cooperation with other governments and their navies. The U.S. Navy has a history of working with other world navies on cable related projects. Perhaps the most notable example of this since Niagara and Agamemnon was the installation of the first Sound Surveillance System (SOSUS) array by HMS Alert in the 1950’s, as noted on the website of the Commander, Undersea Surveillance.

The Navy’s ability to communicate with commercial industry is key to protecting our systems. NSCPO’s participation in international forums is a critical part of this liaison with industry. The U.S. Navy has been a member of
the International Cable Protection Committee for almost two decades; the delegates to that organization are now from NSCPO. NSCPO also participates in information exchanges through American national cable protection forums, and in forums regarding cabled research observatories.

Most Navy installations that have waterfront have some type of seafloor cable, including short power cables and telecommunications cables. Like other locally managed projects within large organizations, these systems are documented primarily on local files. One of NSCPO’s missions is to provide a central database for these files. NSCPO is in the process of consolidating this data in a geographic information system with our existing databases of governmental and commercial cables. This database provides the Navy with a central source for information. To industry, this means that they need only to remember to call one office instead of many around the country.

Internally to the U.S. government, NSCPO represents the interests of all Navy cable owners in policy discussions. This approach allows the Navy to present a single, unified, and coordinated approach to cable protection, and environmental, regulatory and other policy issues. The Navy, as a cable owner, shares many of the concerns of commercial cable owners in the U.S. In many circumstances the NSCPO is in a unique position to express these common concerns. In other instances, like state level rulemaking procedures, NSCPO’s position within the federal government limits it with more stringent constraints.

Working with NSCPO

Many Navy systems are accurately charted. This provides the Navy and industry with a starting point for discussion regarding repairs and construction, and an indication of potential for conflict. The majority of our ranges, for example, are within U.S. waters and appear on coastal charts. An instance of this is a training range called the Southern California Offshore Range (SCORE) in southern California. Owners and installers familiar with San Clemente Island will have noticed boxes marked as cable areas and two cables charted with landings on the

Figure 2. Excerpts from NOAA charts 18740 and 18762 of San Clemente Island, CA with an overlay of the SCORE range limits.
island. These chart markings of SCORE show the portions of it which are of interest to typical mariners. This charting protocol is similar to that used by NOAA for commercial cables. The cabled arrays at San Clemente, however, extend far beyond the area documented on the NOAA charts. The attached chartlet illustrates this. This additional information has been distributed to many industry planners along with data for other older ranges. The nautical charts should be taken as preliminary guidance. Installers should contact NSCPO prior to finalizing any new construction plans in proximity to any charted range.

However, certain information regarding the Navy's systems cannot be published. In these cases, only a direct contact can determine whether or not a potential problem exists. The best way to ensure a clear route for a new cable installation is to call NSCPO early in the planning stages. Industry's best tool to avoid Navy equipment, and the easiest way for the Navy to avoid commercial systems is to communicate early about a new route. When possible, the parties will exchange detailed information. When that is not practical, NSCPO will work with the company to find a mutually acceptable route or burial plan.

NSCPO requests that system planners, surveyors, and installation contractors contact us early in the planning process of a new system. It is easier to reduce conflicts early than to make last minute changes to avoid a system. When convenient, NSCPO would appreciate being on distribution lists of as-built information that is provided to charting organizations such as NOAA and the UK Hydrographic Office. NSCPO requests that when practical, cable owners contact it with route position list updates from repairs. The data that is provided to NSCPO will be treated as commercially proprietary and will not be releasable.

Catherine Creese was appointed as the Assistant Director of the Naval Seafloor Cable Protection Office in May 2006 after eleven years at Tyco Telecommunications (US) Inc. At Tyco, she held positions in cable system route engineering, permitting and sales. She was also Tyco's delegate on the Executive Committee of the International Cable Protection Committee for four years and was a Director of the North American Submarine Cable Association. A former Coast Guard officer, Catherine is a US Coast Guard Academy graduate with a bachelor's degree in Marine Engineering. Catherine also holds a master's degree in Technology Management from Stevens Institute of Technology. You can reach her, and the rest of the NSCPO office at +1 (202) 433-9700 or via the web at nscpo@navy.mil.
General Offshore Ltd
Back and working hard
By Nigel Shaw

The name General Offshore has been well known in the cable industry for many years; however, it all but disappeared from view during the mergers and acquisitions of the 1990s. Nevertheless, the passions and experience of the people who made up General Offshore did not, and now with the backing of three companies, MUSC, Pelagian and Falmouth Divers, General Offshore has reformed.

General Offshore has retained key members of the original team including Graham, Andy and Nigel Shaw, Chris Butler and Steve Roue. They have been joined by newcomers such as Lee Waghorn, Ivan Lees and Simon Jones, who bring significant expertise in route clearance, cable recovery, ROV operations and administrative support. In addition, General Offshore is supported by the resources and personnel (totalling more than 40) of the three companies listed above.

General Offshore continues to work within the shallow water industry and has also diversified into areas such as diving, route clearance, cable recovery and security aspects of the industry as a result of the significant expertise available to the company. Nigel Shaw, General Offshore’s Planning Manager, shares his diary notes from some of the projects carried out by the team during its first year back in “shallow waters”.

**The Western Approaches**

“Our first contract came in last autumn, and involved the recovery of some 70 cables and the installation of another 20 cables for a trials range in the Western Approaches off Scotland. A tricky confined beach, it gave us plenty of practice in handling and landing cables and brought the skills and experience of the team quickly back into focus.”

**Extreme tides in the Channel Isles**

“During the spring and early summer, we installed two cables in the challenging conditions of the Channel Islands, north of the French coast. The tidal range is up to 10 metres around the islands and, as a result, the tidal streams can peak at up to 7 knots. Adding to the complexity of the job is the seabed which is very rocky with some rocks breaking the surface disconcertingly close to the cable route. Landing, laying and post-lay burying the cables from a shallow draft vessel, required careful planning and co-ordination of our resources in order to complete these operations successfully.”

![Working all hours – landing another cable at night in the Western Approaches off Scotland](image1)

![Smile, you’re on TV! – Guernsey Cable landing being recorded by a TV crew.](image2)
To overcome the difficulties posed by the location, we selected the landing craft Terramare 1 and mobilised with a cable laying spread which included a cable tank, cable engine and overboard chute. Terramare 1 was supported by the anchor handling tug, Willpower. Having loaded the cables at Global Marine’s cable storage facility at Portland (UK), the Terramare 1 sailed for the island of Guernsey. Once we had successfully landed and surface laid each cable, the jetting tool, Sabre, was mobilised to post-lay bury the cables to the target depth of 1 metre.”

“The Guernsey Harbour Authority’s vessel, Sarnia, was chartered to complete the burial of the inshore section of one of the cables so that the moorings for the local fishing boats could be quickly reinstated. The Sarnia was equipped with diving and air-lift equipment so that divers could bury the cable as a separate operation without interrupting activities on the Terramare 1.”
PLGR and Route Clearance in the English Channel

“While we were in the final stages of completing our cable installation project in the Channel Islands, preparations were already underway for our next project – this time in the deeper waters offshore in the English Channel. This involved pre-lay grapnel runs (PLGR) and cable recovery operations of out-of-service (OOS) cables along a cable route. For this project, we selected the 65m anchor handling tug, Granit, which we fitted out with our PLGR and cable recovery equipment including our full range of detrenching and cutting grapnels.”

“During the PLGR and cable recovery operations 35 sections of OOS cables were recovered, totalling 25.5 km. Some of these were identified as sections of cables that were laid in the 1920s/30s, such as Borkum-Fayal and Lisbon-La Panne. Our team was operating on board the Granit for 46 days during which time we enjoyed close co-operation with the crew.

Cable Recovery East Coast and English Channel

“Not only have we recovered many sections of OOS cables from deep waters offshore, but we have also assisted in the recovery of the inshore sections of a number of OOS cables that were installed on the east coast of England. For these operations, we used our landing craft, Grey Bear, which hauled buried cables to the surface of the seabed by under-running them with a suitable block from the beach out to a selected position offshore where a cable vessel could recover them. We also recovered 4 km of cable on board (having been cut into short lengths) in the shallow waters off Broadstairs.

All hands up for the Maldives

“Variety being the spice of life, we are currently working on a totally different project, where we are providing shore end support to a major cable manufacturer and installation company in various countries around the world, including India, the Maldives, Iran and Sudan. Unsurprisingly there has been no shortage of volunteers for the Maldives cable landings! At the time of writing this article, we have successfully completed all three cable landings in the Maldives and we are now in the final stages of providing suitable protection to the cables in the shallow waters and reefs lying off the beaches.”
Going further afield in India, Iran and Sudan

“Next, we are off to Iran, followed by India and Port Sudan, which will take us into 2007. In the New Year, it will be time to prepare for our next pre-laid shore end, which is in Brittany on the French coast. Due to the characteristics of the landing area, this project will require a completely different solution to the landings that we carried out a few miles to the north on Guernsey earlier in the year. So it will be down to the team to use their tools, creativity and invaluable practical experience to install yet another cable and land it successfully ashore.”

“It is the wide variation in the coastal conditions encountered from one shore end to another that makes life so interesting for the shallow water cable installer and, needless to say, we look forward to another busy year in 2007.”

General Offshore’s head office is on board the HQS Wellington, London (The Wellington was built as a Royal Navy sloop in 1935)

Having served in the Royal Navy for 25 years as a seaman officer and helicopter pilot, Nigel joined General Offshore in 1992. He spent most of his time in the company installing shallow water cables and shore ends in various parts of the world as a Project Manager. When General Offshore was purchased by Cable & Wireless (Marine), he then became involved in developing the company’s interests in the offshore renewable energy industry. This included winning the cable installation contract for the world’s first major offshore wind farm, Horns Rev. By this time, C&W (M) had become Global Marine Systems Ltd, and in 2002 Nigel left the company and joined Maritime and Underwater Security Consultants, which also owns the cable installation company, Wellington Offshore. Nigel was a member of the team that re-formed General Offshore in late 2004 and he is currently the Planning Manager and Quality Manager.

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General Offshore
The Sub-Sea Specialists

Shallow water cable installation,
shore end operations,
cable burial,
route clearance,
pre-lay grapnel runs, ...........

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I am not alone in finding the present situation frightening and wonder what kind of war we are looking for and who wants it. There is an assumption (probably quite a right assumption) that Osama Bin Laden was responsible for the atrocities in New York (9/11) and America (now the biggest kid on the block – i.e. NATO) must take this “war” to Afghanistan. This on the assumption that Osama Bin Laden is still in Afghanistan and, presumably, that no-one else was involved other than Bin Laden. The ‘weapons of mass destruction’ argument for going into Iraq is a different argument. Whether the intelligence behind that was correct is only now being properly examined and tested.

America quite rightly reacted strongly to the attack on the World Trade Centre but is proving to the rest of the world that they are the biggest kid on the block the right approach? For the moment Bush has displayed considerable constraint and not thrown America’s undoubted ability to wage a high tech attack into the equation.

Before anything else we - and I speak mainly, but not only, of Britain - must decide (and then advise our American cousins of our decision) what we think the correct reaction should be. While I do agree that we should back America and support America (I am not a supporter of the anti-America brigade) America must also listen and take account of our decision before tipping the world into a holocaust.

As Paddy Ashdown mentioned in an article, Afghanistan is a fractured and divided land. When not at war with outsiders it has been almost permanently at war with itself.

This almost permanent state of war is, to most westerners; difficult to put alongside the claim that ISLAM is peace. But that is not the problem here.

President Bush reacted by declaring a war on terrorism and stating his intention to make that an international war on terrorism. If it is international then it is natural that America looks to her British cousins for support and Britain can do its part by attempting to keep the American reply within the bounds of reasonableness. We cannot stop them from doing “what a man has to do”.

But what is this idea of a reasonable war? Is it a war that we, the British, want (and can we persuade our cousins that “war” is not the right reaction)? Is it a declaration of war that is required or a police action?

America and the rest of the world – leaving out fundamentalists of any hue – were rightly appalled at the attack on the twin towers. Care must be given (and hopefully is being given) to the right reaction. Terrorists have over the years claimed to be waging war for various reasons. I believe (but could be wrong) that a future Prime Minister of Israel blew up the King David Hotel, in what was then Palestine, en route from being a terrorist/freedom fighter to respected politician.
The IRA claimed to have been fighting a war against Britain and Britain took the right response of refusing to treat it as a war.

We have the mechanics in place to treat acts of terrorism under the laws of the land. Anti-terrorists acts have been strengthened as required but, in brief, acts of terrorism are treated as acts of violence against society and dealt with by the police and the Courts. They are not treated as acts of war.

There is a logical basis for this. Generally war is between states and, leaving aside Central American “Football Wars” - and the argument that religion causes wars - comes about when diplomacy fails.

As far as I am aware there has been no formal declaration of war by any state (I will say something about the Taleban later) and no acceptance by America of any declaration of war against America. Declarations of war against capitalism and declarations of war against the “infidel” are not the same thing.

The idea that the IRA is the vanguard of a Catholic army is awful and rightly discarded by all right thinking people. The correct response is to keep up and improve the police action (even where it has, at times required military assistance.) That is not to excuse in any way the actions and reactions of the Protestant extremists who also need police (and possibly military) action to control their excess as well.

The idea that Osama Bin Laden is the vanguard of a Muslim army is, again, awful but in the light of the attacks in New York and the claims that there is evidence to show his involvement, cannot be so easily discarded. It is, surely, an idea that is disowned by all true followers of Islam.

Of course it is possible for one state to make its declaration of war through action rather than words. Pearl Harbour is the obvious example and America accepted that act as a declaration of war by Japan. If one, or more, state(s) were behind the attack in New York then America would be right to accept that act as a declaration of war. The correct response would not then be a police action and would be outside of the American Courts and fall into International law.

To my mind it is a fault of Islam that it has not replied loudly enough on the claims made by Osama Bin Laden and some semi-literate clerics in some of the poorest countries of the world. We have some half educated mullahs making claims that the known centres of Islamic studies, such as Cairo, do not support. Islamic countries must make public and keep public the true meaning of Islam (peace) and stress that suicide bombing is against Islam and not a free ticket to paradise.

In Afghanistan we had a country that was divided both in its politics and in its ethnic mix. Not all Muslims are Arabs and Afghans are most definitively not Arabs. Historically there is a mix of Farsi speaking Tadiks (to the north) and Pashtu speaking Pashtuns (to the south) with the remnants of Genghis Khan’s warriors, called the Hazara, stuck in the middle who are the underdogs in Afghanistan. Following on from the withdrawal of the Russians and the civil war we had the creation of the Taleban. In a none Arabic country this band of Sunni clerics, who take their name from an Arabic word meaning “the seekers”, came into power with the assistance of Pakistan and active involvement of the Middle East Arab world. They are not really to the liking of the Shia Muslim world.

With the money came Osama Bin Laden and with the publicity came many Muslims of different races. Bin Laden still has a private army, mostly Arabs but with Muslims of other races and, if the propaganda is correct, now including some British and European Muslims and even American converts.

But it is still a private army. Even if a private army is fanatical, fundamentalist and full of potentials martyrs they cannot go around declaring war on independent states and we most certainly cannot have such declarations of war being accepted by an independent state. If it could, then the world would truly descend into chaos. The lunatics would truly be in charge of the asylum.

Bin Laden clearly wants America to accept his declaration of war against them. That (or those declarations) being made separately from the acts of terrorism against the World Trade Towers (which if they had been carried out by an independent country could only be a de facto declaration of war.) But, if America does accept that declaration and carries the war to Bin Laden, that would be a war against his religion.

I doubt if that is really acceptable to most Americans and it would certainly not be acceptable to Britain. We are not looking for a religious war and we must be sure that our Muslim friends are not pushed politically into a position where they are obliged to support their Muslim brothers.
This cannot be stressed enough. The woolly headed anti-American brigade, that includes Muslim and none Muslim, must accept that any action taken by America will not be because of a religious aspect. This has become even more important following the claim by Mr. Bernasconi (now thankfully departed from scene) that his Western (by implication Christian) culture is superior to “their” Islamic culture. Apart from showing an amazing ignorance of the importance of Arab and Islamic culture on us all perhaps someone should remind Mr. Bernasconi that “Rome” has stood down from the edict that Catholicism is the one true religion.

Any reaction must be secular and there is no way that anyone can support a medieval “righteous crusade” against Islam. We do not want any part of any religious crusade. It is not good for anyone and is most definitely not good for business.

It is said, by the woolly heads, that America brought this terrorist attack on itself because America is guilty of killing innocent Muslims in Iraq. What do they say of the chemical and gas attacks carried out on the Kurds in the North or on the Marsh Arabs in the South? What about the Taleban attacks on Sunni Muslims within Afghanistan? What about the atrocious attacks by the Muslim north on the non-Muslim south in Sudan? Do Muslim on Muslim attacks fall into the same liberal “permissible” attacks category as black on black in South Africa? To me it seems that woolly heads give much more time to deriding white on black attacks. Both are wrong and result in injury to someone. It is hard to see the American influence in such attacks and it must be that the woolly heads do not get the same satisfaction in such discussions as they can obviously get in attacking capitalist America.

I would agree that America must get its act together before they can hope to carry forward any war on terrorism. There is undoubtedly resentment in the Muslim world at the way the Palestinians are treated and the way that Israeli Arabs are treated within Israel. This is understandable when you are looking at a Jewish settlement on your (Arab) land with clean water supplies from your home, on the same land, with its own water supply being a muddy well. The arrogance of Israeli Prime Ministers is breathtaking in its stupidity and cannot be supported.

Recently we have heard, but not yet seen, that America is applying pressure on Israel to find a solution. I would suggest that that pressure is made public and that America makes it clear that its funding of Israel will be governed by the progress made towards a solution with the Palestinians. Israel is no shining innocent and has resorted to kidnapping people abroad when it suits its purpose. Does this constitute an act of terrorism or protection?

Finally America must look at how it will deal with terrorists that are closer to home. It is well known that a great deal of funding for the IRA comes from America. Certain American politicians have been vocal in their support of the IRA despite such atrocities such as Omagh. There is hope that this has now changed on a permanent basis.

So what kind of war do we want?
world of trading even if it were to upset some merchant or private bankers.

It is not an all out war that we require (at least it has been agreed that there will be no “D-Day” landings) but it is a new kind of police action that may end up as being very close to war.

Before anything else America must establish facts and be certain that Bin Laden alone was behind these attacks. Where possible those caught and arrested must be put on trial in a public Court. But it must deal with all such terrorists (be they Bin Laden supporters, Irish terrorists, or even Jewish terrorists in state supported acts of retaliation) in the same way.

If the Taleban do make a come back and take over the declaration of war on behalf of Afghanistan as a Country then the correct reaction from America (and NATO under Article 5) could be very different. If Afghanistan declares war then the use of massive force against Afghanistan becomes more feasible.

Apart from a bunch of mad mullahs who have done extreme damage to their own country and countrymen there seems little worth attacking in a war against Afghanistan.

Let us hope that we all settle for a police action against terrorists that normal Muslims will accept. If that removes the Taleban and improves the quality of life for the Afghani people so much the better. It will not turn them into raving capitalists overnight.

The alternative is that the fundamentalists will win and that normal Muslims, true believers in Islam, will also end up in a similar state to their Muslim brothers in Afghanistan and that they must dearly want to avoid.

Does this affect the commercial world? You can bet your bottom dollar it does.

It is free trade that will drive the world forward. It will drive the need for better and faster and more secure communications.

Communication is a very funny vehicle. It runs only one way. Once people communicate barriers of all sorts come down.

All business requires better communication to develop. Between different cultures it is even more important to have better communication in place. It is sound business practice for any industry to promote better exchanges between different peoples.

It is very difficult for the politicians, or the clerics, to take better communication away from people, but – if it is done the damage to trust is extremely difficult to put right.

The telecommunications industry should be leading the way to ensure that there are no barriers to communication and that the actions of their politicians, or clerics, do not stop communication between cultures.

As said above this is not only common sense but sound commercial practice.

As part of your business plan you should make sure that the politicians communicate properly and ensure that this ‘war’ is a police action. In a real war the first casualty is the truth and that would mean government interference in communications.

That would be really bad for business.
For over four decades, Lighthouse R & D Enterprises founder, Lou Tapscott, has been mystified by the ocean. From diver to CEO Mr. Tapscott has been involved with and intrigued by the great mysteries of the sea. His thirst for knowledge has forged a quest to better understand current direction, eddies and earthquakes and the potential impact of such ocean phenomena on communities.

From tsunamis to ocean currents Mr. Tapscott has explored the very depths of our biggest mystery, the ocean. Many do not realize that we have a greater understanding of outer space than the movement and mysteries of our ocean. As we gain oceanographic knowledge, we continually improve our ability to predict and proactively respond to opportunities and challenges presented by ocean phenomena. For instance, the oil & gas industry will have a better understanding of its offshore environment, potentially leading to higher returns on its investment. As well, the data Lighthouse gathers and documents contributes to a better understanding in general of the eco system of our ocean community, including impact on ocean wildlife, natural cyclical marine changes, and mapping of patterns to help predict likely pollution migration. Lighthouse’s commitment to advance oceanographic understanding that will positively impact residential and commercial ocean communities is what fuels its determination to unlock these mysteries.

Lighthouse’s flagship project is L.O.R.I. (Lighthouse Oceans Research Initiative), which has its primary installation off the coast of Oman. Through his earlier work in the Gulf of Mexico with one of Deep Star’s projects, Met Ocean, Mr. Tapscott became aware of the importance of loop currents in the Gulf of Mexico. With a vision of the potential impact globally of such patterns in deeper water, Mr. Tapscott continued research in this field. The Gulf of Oman is one area that revealed a major loop current. With the interest and crucial support of Oman’s Ministry of Fisheries and Agriculture, in 2005 Lighthouse completed Phases I and II of the L.O.R.I. program in Oman.

As a result of its position at the northern margin of the Arabian Sea, the Gulf of Oman is a dynamic marine environment driven by the seasonal extremes of regional monsoon events. Aside from environmental perturbations, the Arabian Gulf is subject to real and potential pollution from the heavy traffic of large oil tankers entering and leaving the Arabian Gulf (Figure 1). Ballast water discharges, spills, and other effluents associated with such traffic are a continuing concern of Oman, whose pristine Batinah coast is under development as a national resource for underutilized fisheries and an emerging recreational industry exploiting sport fishing, diving, and other tourist attractions. The Sultanate of Oman has a vital interest in preserving and protecting the Coast. A recent deployment of oceanographic sensors is providing essential data necessary for monitoring existing conditions as well as providing the basis for prediction of environmental impacts in the event of an accidental release of substances, which might threaten the coastal habitat.

The global oceanographic community is mobilizing and planning instrumented seabed arrays to monitor ocean parameters through cabled instrument strings reporting to a coastal station where data are fed to researchers. Several such
links are in place in Canada, the Pacific (Hawaii), Japan, the east coast of the United States and elsewhere. The European community plans for extensive observatories under the “ESONET” program where over eleven countries will share marine data.

In the past year, the Sultanate of Oman’s Ministry of Agriculture and Fisheries has fielded an array of instruments to record current speed and direction, temperature, salinity, oxygen, and turbidity (Figure 2), leading the way to a Middle-Eastern data collection system in a vital region not yet studied in detail. The Sultanate of Oman’s Marine Science and Fisheries Center (OMSFC). These data form the basis for environmental assessments to measure seasonal variations associated with monsoon perturbation. The array was positioned to intercept signals from any release from the Arabian Gulf shipping traffic, as well as to monitor parameters essential to water quality assessments meaningful to fisheries (salinity, temperature, oxygen, etc.). It provides detailed information on water motion and density; both are critical to the modeling and prediction of spill behavior.

Four seabed nodes are connected to base arrays containing the full suite of sensors mentioned above. A fiber optic cable connects the nodes, and it leaves the water at Abu Bakara, where the data collection, storage and early analyses on the health and performance of the system is constantly monitored. The cabled observatory thus extends about 60 km northeast across the Al Batinah coastal shelf, providing real-time ocean data, which monitors the health and potential threats from natural and possible anthropogenic causes. Closest to shore, designated 1-1, is a stand-alone seabed measurement system sited at a depth of about 65 meters. Since the current speed and direction are acoustically measured in thin (2 meters thick) “layers” (cells, or “bins”) to a height of 50 meters above each sensor, 1-1 is monitoring currents in nearly all the water column. The other seven sensor packages are shown in the profile of deployments in Figure 2, and the 50-meter layer shown in the water column above each package is sampled for current speed and direction in the red box positioned above the meters (See Figure 3 for an example of current velocity data). Thus array 4-1 and its moored instruments at two levels above the seabed (and likewise the single moorings above 2-1 and 3-1) provide a real-time snapshot of water motion in the overlying shelf waters.

The base of each array is housed in a trawl-proof cage, which protects all sensors from fishing damage while acting as an instrumented tether for the deeper buoyed arrays. They weigh about 37,000 pounds (~17,000 kilos) and are designed to withstand any dragging or other displacement of observatory components.

To increase the accuracy of numeric modeling, three autonomous moorings were set 60 nm off of Oman’s Cape Ras Al Hadd. These arrays are positioned to monitor the currents coming out of the Arabian Gulf, currents coming up the coast from the Red Sea, and within the convergence area off the Cape. Another stand-alone array is set off the South Eastern Margin of the Murray Ridge in the Northern Arabian Sea. Data from all four autonomous moorings are retrieved annually.

Cabled seabed observatories are generally considered prototype installations and as such they have not been without problems. The Al Batinah deployment has been no exception. Electronic systems in the sea are always subject to numerous hazards, and the Batinah systems have seen sensor failures, power interruptions and mechanical problems related to complex instruments operating continuously hundreds of feet below the surface. The cabled observatory is a prototype, which through troubleshooting, analyses and repair provide confidence in continued and improved data collection.

Continuing interest in the Sultanate of Oman for ocean measurements and monitoring for public safety is leading to its critical role in developing the ongoing Indian Ocean Tsunami Warning System (IOTWS). As a result of the tragic December 2004 tsunami, twenty-seven nations have joined the IOTWS under a multinational program being directed by the Intergovernmental Oceanographic Commission under the United Nations Education, Science and Cultural Organization.

The IOTWS effort has been launched through at least sixteen international coordination meetings in which a team of experts representing the IOC/UNESCO-led meetings in many of the coastal states who participate in IOTWS. The Oman meeting was held in Muscat 7-9 June 2005 (See UNESCO Mission Report No. 21), which was coordinated by Dr. Ahmed H.M. Al-Harthi, acting Director of Meteorology, Ministry of Transport and Telecommunications. The purpose of each national
assessment is to help coastal states establish and operate a tsunami warning and mitigation system, assess available organizational resources, and identify capacity building needs. Dr. Al-Harthi (a.alharthi@met.gov.om) is the designated official Omani contact for receiving instant transmissions of both Pacific Tsunami Warning Center and Japan Meteorological Agency bulletins, which provide warnings of possible tsunami threat (See IOC/UNESCO Communications Plan Report by Hagenmeyer, 2006). Dr. Al-Harthi was encouraged by the Omani participation which included fifty-two representatives from eleven agencies of ministries during the three-day meeting.

The IOC/UNESCO Communications Plan regarding early warning and public awareness mentions the need for monitoring the Makran tectonic zone of eastern Iran/western Pakistan. This active zone produced a tsunami in 1945, which reached the Omani coast within 30-60 minutes. It suggests a tripartite cooperative venture in the installation of a real-time warning system around the Makran region.

By applying lessons learned in the current cabled seafloor observatory experience Lighthouse R & D Enterprises, Inc. is developing a seismic / tsunami system and hopes to field the first prototype system in the Gulf of Oman in December of 2006. The development of this program will be reported in a forthcoming paper.

Beginning in a youthful fascination with the coastal waters of California, Lou Tapscott’s focused work and creative vision have culminated in a dream made reality – L.O.R.I. – understanding of ocean phenomena that benefits commercial and residential ocean communities.

Figure 1. Gulf of Oman, Strait of Hormuz and Arabian Gulf commercial traffic pattern. The Strait and the Gulf exhibit one of the highest densities of oil and gas shipping in the world. South-bound traffic exiting the Arabian Gulf oil fields pass near the cabled seafloor array.
Figure 2. Schematic profile of deployment elements. Red boxes are insonified layers of the water column yielding current speed and direction data (see text under “Seabed Deployment”).
Figure 3. RDCP Studio example of current strength data from mooring 3-2 (see Figure 2 for location and depth of sensor 3-2).
Topics include:
- Convergence of communications & entertainment services on IP
- Disaster management
- Distance learning
- Health care
- VoIP
- Video, youth, and lifestyle marketing
- Cyber communities & gaming
- Next generation service licensing
- Net neutrality & IPTV
- Satellite
- Submarine Cable

For more information, visit www.ptc07.org
A global guide to the latest known locations of the world's cableships*, as of November 2006. Information Provided by Llyods List.

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Letter to a friend
from Jean Devos

My dear friends from India,

Shame on me, I have never been to India other than a couple of stop-overs between Europe and the Far East. I spent 20 years -1977, 1997- in charge of Sales & Marketing for Alcatel Submarine Systems, travelling for business reasons all around the world, but at that time the business never requested me in India! When I joined the business, the Madras (Chennai) – Penang cable was already built (in the very early 70’s), and I remember well one tender for a Bombay (Mumbai)-Karachi-UAE cable. We put in a bid, but were never called to the table. At that time, this was very simply a British project, something that a French company could not even dream of! Even the very first Sea-me-we did not involve India; the cable stopped in Sri Lanka for technical reason! Sea-me-we 1 was designed to serve the traffic needs between South-East-Asia and Europe and all the countries on that route were perceived as an obligation, even as unavoidable risk and not as opportunities.

And today, India is at the gravity centre of our activity and this is great news! India is the engine boosting our activity. Indian companies such as Tata/VSFNL or Reliance /FLAG, Barthi own a very significant part of the global network, and they seem to have very ambitious plan to further upgrade and expand their networks. They are determined to take advantage of the hesitations of the incumbent carriers in Asia and elsewhere to invest in infrastructures! These companies are sort of a new model, a new type of animal! We have often discussed Carriers versus Private entrepreneurs. Here we have both. Tata group and Reliance are huge conglomerates who have come in the Telecom field as a diversification. They have deep pockets and at the same time, they have traffic needs to serve their end customers. They are together carriers and investors!

It is interesting to note that at the same time where these private companies work out their big plan, the government of India is pushing its own companies MTNL and BSNL to build their own international network. Can you explain this to me, my dear friends from Bangalore, Mumbai, and Delhi?

Can you give me the comfort that this entire plan will not end up in a big economical disaster? Is there a way by which these companies could cooperate in co-building their networks, while competing at the services level? I know that wisdom and wealth does not go well with each other, but where is the logic of building so large an infrastructure? Why do we put huge sums of money in the water, doing nothing?

The TIC cable between India and Singapore is an 8 fibre pairs, 7 terabits of potential capacity! Why don’t we look at it as if it was 8 parallel cables? Same applies to TGN pac, another 8 fibre pairs!!

The global network should be like a stadium, available for everyone’s competition. I dream of a global network, optimized for everyone’s needs, upgraded and extended at the path of the real needs! Money well spent!

This is still a dream, but I keep hope that the country of the Mahatma Gandhi will bring this to our business: Self-discipline and non-violence.

I wait for your answer, in confidence

Jean Devos
### UPCOMING CONFERENCES AND EXHIBITIONS

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<td><a href="http://www.suboptic.org">www.suboptic.org</a></td>
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