THE CONSULTANT

The Newsletter of the IEEE Consultants Network of Long Island

Volume 22, Number 11 *November 2005*

Chairman
Murray Kleiner
(516) 822-1381
m.kleiner@ieee.org

First Vice Chairman
Chris Early, P.E.
(516) 764-1067
unixdev@ix.netcom.com

Second Vice Chairman
Jerry Brown
(631) 271-9714
jlbrown@essexsys.com

Treasurer
David Rost
(516) 599-6202
ConsultDPR@ieee.org

Secretary
Dr. Richard LaRosa
(516) 486-7827
r.larosa@ieee.org

Newsletter Editor
Dr. Richard LaRosa
(516) 486-7827
r.larosa@ieee.org

Jr. Past Chairman
Dr. Jack Lubowsky, P.E.
(516) 379-1083
lubowsky@erols.com

Sr. Past Chairman
Irwin Weitman, P.E.
(631) 266-2651
i.weitman@ieee.org

Alliance of IEEE Consultant Networks
Irwin Weitman, P.E.
(631) 266-2651
i.weitman@ieee.org

Voice-Message Referral Service
(516) 379-1678

Visit our web page
http://www.consult-li.com

Chairman's Corner

—Murray Kleiner, Chairman

You have heard me say this before, although we have a need to continuously promote ourselves to get new members, we are still one of the most successful organizations on Long Island. Yes, of course, there are bigger organizations, but how many have been around as long as we have, and how many of them offer the diversification of speakers and opportunities for continued education as does the LICN?

We were founded over twenty years ago (1984) by seven people and grew to fifteen members by the end of the second year. We continued to grow, but this did not happen by itself. It required the hard work of some very dedicated people, who, although they had their own businesses to run, unselfishly gave of their time to make this organization successful.

I guess it's human nature to take things for granted. That's unfortunate. It takes the same level of dedication and effort to sustain an organization as it does to get one started. Simply paying dues is not enough, and to depend on others to sustain it is being self-deceptive and certainly disrespectful to those who contribute their valuable time.

In last month's newsletter, I outlined what we accomplished in the past and offered suggestions for future activities. I am confident that with the help of our membership, we will achieve our goals.

Meetings

November 2005

7:00 PM, Wednesday, November 2, the first Wednesday of the month.

Briarcliffe College, 1055 Stewart Avenue
Bethpage, NY.

Topic: "Principled Negotiation"
Speaker: Mr. Jim Monnier
Island Learning, Inc., East Northport, NY.

Negotiation has become the preeminent form of decision making in most organizations today. As consultants, our challenge is to reach agreements that meet the client's needs, as well as our own. This session will explore the concept of Principled Negotiation, distinguish between bargaining and negotiation, and give you an opportunity to practice an actual negotiation session.

Admission is free (no charge). No pre-registration is required. For information, contact John Dunn at (516) 378-2149 or e-mail ambertec@ieee.org.
Guests are welcome.

Directions:
LIE Exit 44, South 2.77 mi on Route 135 to Exit 9, Right on Broadway 0.12 mi, Right on Cherry Avenue 0.42 mi, Right on Stewart Avenue 0.45 mi, Left at the fire house and traffic light (Pine Avenue) and you're in front of Briarcliffe College. Turn right into the second parking lot.

If coming from Southern State Parkway on Route 135, Take Exit 9 and turn Left onto Broadway. Follow the remainder of the above directions.

December 2005

7:00 PM, December 7, Briarcliffe College.

Attorney Alan Stein will speak on legal topics of interest to consultants, including protecting assets and working with companies that are in bankruptcy. He will also provide some interesting "war" stories.

THE CONSULTANT is published monthly by the IEEE Long Island Consultants Network and is available free of charge to its members.
Address All Correspondence to:

IEEE Consultants Network
Of Long Island
P.O. Box 411
Malverne, NY 11565-0411

Tel: (516) 379-1678
Web: http://www.consult-li.com

Newsletter Staff
Editor: *Dr.Richard LaRosa*
Tel: (516) 486-7827
e-mail: r.larosa@ieee.org

Associate Editors:
John Dunn, Ambertec, Inc.
Tel: (516) 378-2149,
e-mail: ambertec@ieee.org

Peter Buitenkant
Tel: (631) 491-3414
e-mail: peterbui@optonline.net

Printing and Distribution:
Dr. Richard LaRosa
Tel: (516) 486-7827
e-mail: r.larosa@ieee.org

Deadlines: Flexible
Articles for publication in ***THE CONSULTANT:*** Send them in. We need them.

The IEEE Consultants' Network of Long Island maintains a referral service of engineering, computer, managerial, and technical professionals. Call or write for more information. There is no charge to the client for this service.

Referral Service and Voice Mail:

516-379-1678

Web Page: http://www.consult-li.com

Taming Hurricanes

Dr. Richard LaRosa, sealevelontrol.com

The devastation caused by hurricanes Katrina, Rita, and Wilma points to the need to cool the sea surface in the tropics. Hurricanes gain energy when passing over warm water. The critical sea surface temperature is about 27 – 29°C, and the NOAA satellite map shows 29°C in the Yucatan Strait and the Western Gulf of Mexico for 10/23–25/2005. A large area was above 28°C, and this was when Wilma was crossing the Florida Peninsula.

The frustrating aspect of this situation is that there is a vast reservoir of very cold water supplied by the Deep Western Boundary Current which runs along the continental slope between the Labrador Sea and South America. Some of this cold water sneaks into the Caribbean Sea via deep passages between the smaller Antilles Islands, and some of the Caribbean water gets through a narrow 1600 meter-deep cut in the Yucatan Strait. Some 7°C water manages to get into the bottom of the Florida Current.

The warm water at the surface is insulated from the cold water at the bottom by the thermocline layer. A stable temperature gradient is maintained in the thermocline because the warm water is less dense and stays on top. Buoyancy suppresses vertical motion, so there is little mixing between the different-temperature layers. Still water is a poor heat conductor.

An analysis seems to show that to cool the surface at a certain rate, the power required to pump cooling water from the bottom all the way up to the top in one pass is the same as the power required to pump water up in stages and let it mix along the way. Therefore calculations were done for a fleet of pumping plants stationed in the deep water off the continental shelf in an area where cold water pumped up from the bottom would mix with the surface water and pass through the wider surface passages into the Caribbean Sea. This would cool the Caribbean Sea and the Gulf of Mexico surface without depending on the restricted cold water supply to these seas. The pumping plants would have vertical pipes 1600 meters long for cold water supply.

The following proposed system was sized to remove the solar radiation input in excess of the infrared back radiation over a 1000km x 1600 km area. The net radiation input to be cooled averages 156 W m^{-2} over the area of interest, so the required cooling rate is 2.5 x 10^{11} kw. Since there are 4.186 kw s per kcal, the cooling rate is 5.97 x 10^{10} kcal s^{-1}. If the cooling water is 5°C and the surface water is 25°C, each kg of water brought up will remove 20 kcal of heat, so the pumping rate is 2.99 x 10^9 kg s^{-1}. The density of the cold water is about 1027.7 kg m^{-3}, so 2.9 x 10^6 m^3 s^{-1} flow rate is required. This is about 10% of the transport of the Florida Current near Grand Bahama Island.

The pumps must lift water whose density is slightly higher than the average density of the water outside of the pipe. For a 1600-meter pipe somewhat north of the location considered here, the density difference is 0.76 kg m^{-3} and the pump suction pressure required is 1.19 x 10^4 N m^{-2}. The flow rate times the pressure gives a required pump power of 3.45 x 10^{10} W or 34.5 GW. This power can be derived from heat engines using the temperature difference between the top and bottom water.

Much theoretical and experimental work, including pilot plant design and operation has been done with government and private funding since the early 70's on Ocean Thermal Energy Conversion (OTEC). A detailed design by Dr. Luis Vega of the Pacific International Center for High Technology Research for a 5.26 MW-output OTEC plant was used as the basis for the present estimate. The Vega design uses 13.9 m^3 s^{-1} of cold water. Scaling by the power ratio gives a requirement of 9.12 x 10^4 m^3 s^{-1} of cold water required by the OTEC plant to provide power for the cooling system pumps. The OTEC cooling water flow is only 3.1% of the surface cooling water requirement.

This is a big project - a megaproject. Yet its cost may be justified if can prevent the economic losses and human suffering caused by future hurricanes. Note that by cooling the surface water in the tropics, less heat is transported to the higher latitudes by the Florida Current and the Gulf Stream. Also note that while the Florida Current and Gulf Stream transport heat to the higher latitudes, they also serve to transport heat away from the tropics. Previously proposed schemes to reduce ice sheet destruction by slowing these currents would raise tropical water temperatures. We have here a manifestation of Peter Buitenkant's "Law of Unintended Consequences."

Irwin Weitman asked what the current-slowing would do to the tropical water temperature. The answer then was that it might be a problem for future consideration. Well, the future arrived with Katrina, Rita, and Wilma. Surface cooling in the tropics now replaces current-slowing. The previous investigation provides the realization that we cannot derive more than a few gigawatts of electric power from the Florida Current and Gulf Stream without adding to the hurricane problem.