



THE CONSULTANT

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Chairman's Corner — John Dunn, President, *Ambertec, Inc.*

I have had the planned-for surgery done on my right foot. It was performed on August 15th, five days ago at this writing. I cannot overstate how difficult and painful the entire situation has been.

In the last two weeks or so leading up to the operation, I could be walking along and then quite suddenly be rendered unable to take the next step. The recovery from surgery, especially during the first day, was more painful than anything I can ever remember. Even now, I cannot stay seated at this computer for very long, I cannot climb stairs and it is a painful struggle using a walker just to get across the room.

Why do I report all this? For several reasons, all derived from this experience.

1) I couldn't help but think how, as difficult as all of this has been, it all happened to me in a benign environment. I have had the blessing of being well taken care of by my loving wife and my two loving sons.

Now imagine being in the armed forces and having an injury of similar magnitude, or worse, in a hostile environment. I'm certain that I cannot really grasp the scope of that, but it has, for me, put what faces our armed forces in at least a revised perspective that I felt I should share.

2) When I was being taken into surgery, I saw the overhead lighting fixture above me and something in the middle of that fixture that I could not identify. Without my eyeglasses, I had no idea what that thing was, so I asked. "It's a handle." someone said and with having had that simple question answered, I suddenly found myself extremely happy. If things had not gone well and I'd failed to come through, for the sake of having that answer, I would at least have died a happy man.

That small moment of happiness is now vivid in my mind. It makes me realize how very important and very valuable even the smallest act of kindness can be.

3) I have discovered that some of even the simplest things one might take for granted no longer are. I was watching some television (yes, it wasn't anything interesting) and as I saw people come and go, walking back and forth with seemingly no effort at all, I detected in myself a very strong sense of envy at their abilities to do what I for now, cannot. I hate to imagine how terrible it would be if this incapacity were permanent.

I am extremely grateful for the promise of eventual recovery and I think I can feel what might be a modified sense of empathy for others whose situations are not predicted to resolve themselves.

Chair's Corner continued

I may or may not physically be at the September meeting, but part of me will be there. Enjoy all of it. It is a great privilege.

Meetings

LICN September 2006

**7:00 PM, Wednesday, September 6, the first Wednesday of the month.
Briarcliffe College, 1055 Stewart Avenue, Bethpage, NY
See website for directions: www.consult-li.com**

Topic: "Uninterruptible Power Supplies"

Speaker: John Liguori, MSEE, PE

Refreshments will be served and 0.1 CEU credit is available for those who register and pay the fee. There is no fee for those who do not want credit. Abstract of talk and speaker biography are available on our website, www.consult-li.com - click on "Next Meeting". Register for CEU on the Long Island Section website, www.ieee.li. Click on "Events Calendar". Abstract and speaker biography are available there, and both sites have links for additional information.

Circuits and Systems Society, Long Island Chapter September 2006

6:30 PM, Wednesday, September 27 at

**Telebyte, Inc.
270 Pulaski Road
Greenlawn, NY 11740**

Topic: "Mixed-Signal Systems-on-Chip: Architectures and Design Tools"

Speaker: Dr. Alex Doboli, Stony Brook University

This seminar is free and all are invited. Refreshments will be served. All must register at www.ieee.li. 0.1 CEU is available, for which there is a \$20 fee. Abstract and Speaker Bio are available on the website.

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Hurricane Suppression — *Dr. Richard LaRosa, sealevelcontrol.com*

Sea-surface height contours in the Gulf of Mexico can be accessed via Google Search. Enter "sea surface height" and then click on "Gulf of Mexico Near Real-Time Altimeter Data Viewer". Accept all the default parameters and view the plot. Right now, August 26, the Loop Current has made a loop and ring that extends to 92W and 28N. The Mississippi Delta ends at 89W and 29N. The ring is almost separated from the Loop Current, which is a situation quite similar to last year when Katrina was passing through the Gulf. At the present time Tropical Storm Ernesto is nearing Jamaica and is intensifying. If it passes over the deep pools of warm water collected by the loop and warm-core ring, it might intensify to the same level as Katrina.

When watching the behavior of the Loop Current, it seems as if the Florida Straits acts as a constriction which backs up the flow. The Loop Current has to take a circuitous route in order to raise the level of the Gulf of Mexico. This might add enough hydrostatic pressure to achieve the necessary flow through the Straits. The Caribbean Current is fed by the North Equatorial Current and the part of the South Equatorial Current that splits off at the Brazil coast and goes north. These currents are wind driven and they force water into the Caribbean Sea and the Gulf of Mexico. The piling up of water in the Gulf is complicated by the diurnal and semi-diurnal tides. Two diurnal tide components beat with each other, and when they reinforce each other they can exceed the Loop Current volume transport. The total flow through the Yucatan Channel can be negative - water flows back toward the Caribbean Sea. The Yucatan Channel is 2000 m deep and the tidal flow is fairly uniform over the channel cross section, so its effect on the fast-moving surface current is hardly noticeable.

It would seem from the preceding paragraph that the Gulf of Mexico must be drained by gravity via the Straits of Florida. This can be a considerable restriction and it affects the two methods of hurricane suppression that are being studied. These are: a guide that directs the Loop Current into the Florida Straits, and the pumping of cold water up from the bottom.

The guide is envisioned as a vertical screen following an arc of a circle extending from the Yucatan Peninsula to the Florida Straits. Its top is about 40 meters below the sea surface in order to avoid interference with marine surface traffic. Floats might be spaced 200 m apart along the guide, and they will be above the top of the screen. This will require ships to navigate between the floats. The bottom of the screen will be a few hundred meters deep, rather than the full 800 m depth of the Loop Current. The flow restriction of the Florida Straits and the Florida Current path will be relieved by the Loop Current escaping into the Gulf over the top and under the bottom of the guide screen. This will allow two remnants of the current to penetrate into the Gulf of Mexico. The one at the surface will have the warmest and fastest water but it may not penetrate as far as the full Loop Current does now and it will not collect as much warm water in the interior of the loop. Therefore the danger of hurricane intensification should be reduced by the intervention.

In the second method of hurricane suppression, cold water is pumped up from 1000 m depth and distributed at the top by long perforated fabric hoses extending downstream. This adds to the volume transport of the surface current because the cold water that is pumped up is readily replaced by deep cold water via the Yucatan Channel, Windward Passage, and Jungfern Passage. Cold water must be pumped up at the rate of one million cubic meters per second in order to reduce the temperature at the top of the surface current by a few degrees Celcius. This increases the current by 3.3% to 4%, depending on what value is assumed for the Florida Current transport. This will increase the back up caused by the flow restriction of the Florida Straits. Perhaps spreading the pumps along the path through the Caribbean Sea might allow more opportunity for the excess flow to spread out over a greater area. But this can be problem reserved for the future. The more immediate problem is to design an OTEC-powered pumping station that works.