

REPORT ON THE IEEE TECHNICAL TOUR OF THE PANAMA CANAL ON MARCH 3RD THROUGH MARCH 10TH OF 2010

The IEEE Technical Tour of the Panama Canal on March 3rd through March 10th of 2010 was the first offering of the first technical tour developed for the IEEE. The sponsoring organization in the IEEE was the IEEE Life Member Committee (LMC) which is currently developing through an IEEE Technical Tours Subcommittee additional tours, all of which are intended to be repeatable. Furthermore, it is the intention of the LMC that each of these tours, whenever possible, will be organized to highlight one or more of the IEEE History Milestones as its theme.

The IEEE Technical Tours Subcommittee in 2008 and 2009 consisted of Theodore A. Bickart, Lyle Feisel, Luis T. Gandia, and Enrique Tejera. Ted Bickart served as chair of the subcommittee and Enrique Tejera, an IEEE member in Panama City and a manager for the Panama Canal Authority, served as a consulting member of the Subcommittee. Following a decision of the LMC at its fall 2008 meeting the Panama Canal was affirmed as the focus for the first IEEE Technical Tour. Further discussion at its spring 2009 meeting led to Ted Bickart traveling to Panama City and together with Enrique Tejera carefully considering the activities for the tour, starting from a list of possible activities previously suggested by Enrique, and discussing them with a representative of the tour provider later requested to manage the tour, namely Pesantez Tours. After vetting the activities for the tour by the Subcommittee, an article describing the tour features, following as Section 1 of this report, was prepared for and published in the spring 2009 Life Member Newsletter. After organization of the tour was completed by Pesantez Tours and vetted by the subcommittee, the tour promotion brochure, following as Section 2 of this report, was prepared and posted on the IEEE website. Advertising was primarily a subsequent email announcement of the tour with a link to the promotion brochure. The FAQ Sheet, following as Section 3 of this report, was prepared and a link to it was provided to all who expressed interest in the tour. The Tour as it took place was wonderfully recorded by Tour participant Richard Chelius in his Tour Diary entitled *Panama Canal Adventure*, following as Section 4 of this report. (Inserted pictures were provided by Ted Bickart.) In the late afternoon of Day 6 of the Tour, the group met informally in the poolside lounge area of the El Panama Hotel to discuss “aspects of the Tour that met expectations”, “aspects of the Tour that didn’t meet expectations”, and “suggestions of changes to improve the Tour, when offered again, and to benefit other future IEEE Technical Tours”. These aspects and suggestions are to found in Section 5 of this report. A post-tour survey seeking feedback on the Tour from participants and suggestions that might benefit future IEEE Technical Tours was conducted by Scott Atkinson, chair of the 2010 IEEE Technical Tours Subcommittee. The results of that survey are to be separately reported to the LMC.

Theodore A. Bickart
March 30, 2010

SECTION 1: TOUR ARTICLE



The IEEE History Center's Milestones celebrate technological breakthroughs or turning points around which the Life Member Committee (LMC) intends to organize a number of technology themed tours. These IEEE Tech Tours will complement, maybe even in some instances supplement, the video technical tours developed and being developed for the [WWW.IEEE.TV](http://www.ieee.tv) Technical Tours website. The first of the LMC's IEEE Tech Tours will be of the Panama Canal in the middle of February 2010. The Milestone, in this instance, is of the Panama Canal Electrical and Control Installations of 1914. The dedication was held on 4 April 2003 under the auspices of the Panama Section. The lead paragraph from the commentary on the award, copied from the IEEE History Center website (http://www.ieeehn.org/wiki/index.php/Milestones:Panama_Canal_Electrical_and_Control_Installations%2C_1914), is provided to the right:

The Panama Canal project included one of the largest and most important electrical installations in the world early in the 20th century. The use of 1022 electric motors with an installed capacity of 28,290 horsepower largely replaced the steam and water powered equipment then in common use. Reliability and safety were also engineered into the innovative electrical control system, enabling remote lock operation from a central location.

The tour will start with a partial (or, possibly, complete) transit of the canal from the Pacific toward (or to) the Atlantic, returning by bus. The next day will given over to a special, technology oriented tour and presentation at the Panama Canal Visitors Center adjacent to the Miraflores Locks and to the power and control facilities for these locks that were the basis for the IEEE's designation of the Panama Canal as a History Milestone.



During the last part of the second day, the participants will be hosted to a presentation at the CATHALAC research, learning, and technology transfer center to learn about their efforts with respect to water resources in Latin America and the Caribbean. CATHALAC seeks to benefit the establishment of sustainable agriculture, preservation of natural habitats, and preparation for natural, often catastrophic events. (To learn more about this organization committed to *Science, Education, and Policy for People* see www.cathalac.org.)

The third day will be spent touring the three cities now enveloped by Panama City—Old Panama from the days of the conquistadores (1500s), Casco Viejo from the days of the pirates who destroyed Old Panama (1800s), and the new and cosmopolitan City of Panama. This tour will include stops at museums and historic buildings, such as the Panama Canal Museum and the National Theater, and at traditional markets, from produce to arts and crafts to souvenirs. Lunch will be in a typical Panamanian restaurant and dinner will be at another restaurant, in this case serving up local cuisine with traditional dance for entertainment.

The next days, though still being negotiated, are most likely to adhere to the following description of days four through six.

The fourth day will be given over to boat trip into the tropical rain forest to the native Embera Indian Village to gain a sense of their lives and of the crafts that provides their income. En route to or from this excursion there will be a stop at the botanical gardens and the zoo.

The fifth day will be given over to activities of choice by tour participants, such as visits to galleries, museums, historic sites, and shopping for the usual gifts for friends and family members. And, an evening at another traditional restaurant with entertainment will be organized as participants wish.

The morning into early afternoon of the sixth day will be an excursion into the rain forest on a nature tour by canoe or will be spent on a Gatun Lake island in the responsible care of the Smithsonian as a nature reserve. Sometime in mid-afternoon, the group will arrive at the Gamboa Rainforest Resort for an Aerial Tram ride over the rainforest and/or to climb into the rainforest canopy.

Stay alert for the announcement of the tour. As you might imagine, the size of the tour group will be limited by the size of the group that the Panama Canal Authority can accommodate at their facilities. So, make a reservation early to experience the history of the Panama Canal and the life of Panama.

SECTION 2: TOUR BROCHURE

The IEEE History Center's Milestones celebrate technological breakthroughs or turning points around a number of which the IEEE Life Member Committee is organizing technology themed tours. The first of the IEEE Tech Tours will be of the Panama Canal with further opportunities to experience the environment and culture of Panama itself. The Milestone is of the Panama Canal Electrical and Control Installations of 1914. The dedicatory event was held on April 3, 2003, under the auspices of the Panama Section. The lead paragraph from the commentary on the award, copied from the IEEE History Center website, appears below.

The Panama Canal project included one of the largest and most important electrical installations in the world early in the 20th century. The use of 1022 electric motors with an installed capacity of 28,290 horsepower largely replaced the steam and water powered equipment then in common use. Reliability and safety were also engineered into the innovative electrical control system, enabling remote lock operation from a central location.

The day-by-day description of the tour below includes a partial transit of the canal on Day 2. Day 3 includes a visit to the Miraflores Visitors Center, a special presentation by canal personnel, and a special visit to the ordinarily restricted Control House at the Miraflores Locks. And, every day after you will have a growing awareness of just how deeply the Panama Canal's existence defines the country and its culture.

Day 1 [Arrival Day]: Wednesday, March 3rd

Arrive at the international airport in Panama City. After going through Panamanian immigration and customs check points, you will be met by an agent of the tour provider, Pesantez Tours, for transfer to El Panama Hotel.* Rest assured, your guide and driver will be at the airport and identifiable by a sign with the name of our group—IEEE Tech Tour.

Dinner is not provided, but there is very enjoyable dining at the hotel and at nearby restaurants.

Day 2: Thursday, March 4th

09:30 am Transfer to pier for a partial transit of the Panama Canal, including a mid-day meal and a visit to the Smithsonian Marine Exhibition Center.

11:00 am Boat departure.

The partial transit includes passage through through the Pedro Miguel Locks and the Miraflores Locks. This is a unique experience, allowing you to observe, and hear the explanations about, the functioning of the Panama Canal. In addition to the transit itself, there will be a snack and a brunch on board the ship. After debarking the ship you will visit the Stri Marine Exhibition Center, where you can

learn about the marine life of the surrounding seas—the Pacific Ocean and the Caribbean Sea.

05:00 pm Return to hotel to rest prior to dinner.

07:30 pm Dinner at Tinajas Restaurant (typical Panamanian food and show).

Las Tinajas Restaurant is a place where visitors have an opportunity to sample and appreciate Panamanian culture. The ambience cannot be surpassed in Panama City. The evening will begin with a welcome cocktail followed by typical “picadas” (appetizers), the dinner, and a show.



10:00 pm Return to hotel for the night.

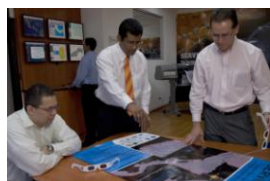
Day 3: Friday, March 5th

09:00 am Depart for the Canal Authority’s new Miraflores Visitors Center with exhibits and a presentation followed by a buffet lunch, including a non-alcoholic beverage, in the Miraflores Restaurant at the Center. The afternoon will include a number of stops, one of which will be a visit to CATHALAC, an organization dedicated to sustainable development.



From the Miraflores Locks Overlook at the Visitors Center, we will observe how the Canal works with the passage of vessels through the locks and a special visit to the ordinarily restricted Control House for the Miraflores Locks. In our time in the Visitors Center we will enjoy incredible displays of the construction effort and technology that went into creation of the Canal and the high technology audiovisual exposition that shows essentially everything related to the operation of the Canal. In addition, the Canal Authority has authorized a special presentation for this IEEE Tech Tour group. The included buffet lunch at the VIP Miraflores Restaurant rewards diners with an exceptional view of the Canal.

After lunch our group will go through Albrook, a former military base turned into a beautiful residential and commercial zone. We will visit the Craft Market, tour the Balboa area where the Administration Building of the Panama Canal is located, and some port areas. We will also visit Amador, the zone with the highest level of touristic development in Panama City.



Sometime during the afternoon, the group will visit CATHALAC (the Water Center for the Humid Tropics of Latin America and the Caribbean), an international

organization established in 1992 to serve the humid tropics of Latin America and the Caribbean. Its mission is to promote sustainable development through applied research and development, education, and technology transfer on water resources and the environment. In order to address this, CATHALAC's working agenda focuses on four thematic areas: Integrated Watershed Management, Climate Change, Environmental Modeling and Analysis, and Risk Management, acting as a bridge between science and policy.

- 04:00 pm Return to hotel to rest prior to dinner.
- 07:00 pm Dinner at Los Años Locos, a first class restaurant well known for its meat dishes. (It also serves chicken, pork, and fish dishes.)
- 10:00 pm Return to hotel for the night.

Day 4: Saturday, March 6th

- 09:00 am Depart for a Panama City Tour including visits to the Old City, the Canal Museum, the National Theater, and the Modern City. Midway through our day's excursion, we will enjoy a served lunch at the Casablanca Restaurant, with one non-alcoholic beverage included.

The first destination is Old Panama, first city founded on the Pacific Ocean shore, whose magnificent ruins can be appreciated followed by a visit to the viewpoint of the Tower of the Cathedral and time to purchase local arts and crafts.

We will then proceed to the most commercial area of the city, encompassing the baking area, Bella Vista, Punta Paitilla Avenue, and Balboa; the colonial sector with its San Felipe neighborhood where the Independence Plaza is located; and we will stroll to observe and, in some instances, visit the Metropolitan Cathedral, the Hotel Central, the Canal Museum, the National Theater; and the Municipality.



As we continue our excursion, we will visit Las Bovedas and the France Plaza, enjoy a panoramic view of the city and the Pacific entry to the Panama Canal, and walk through Bolivar Square where the National Theater is situated.

- 04:00 pm Return to hotel to rest prior to dinner.
- 07:00 pm Dinner at the Pencas Restaurant in Amador. The Pencas Restaurant is a favorite in Panama, specializing in Caribbean-style food with a menu that offers many other options. It is located at Amador Causeway facing the Pacific Ocean.
- 10:00 pm Return to hotel for the night.

Day 5: Sunday, March 7th

07:00 am Departure for Barro Colorado Island.

08:00 am Boat departs.

We will explore the interior of the lands traversed by the rivers, the channels, lakes, and tropical rainforests that are part of or adjacent to the Panama Canal zone. We will navigate Gatun Lake, one of the largest artificial lakes, and hike through the tropical rainforest of the Barro.

Colorado Natural Monument, which is in the Panama Canal zone, is one of the most complex and rich biologically diverse ecosystem in the world. It has some 560 bird species, 125 reptile and amphibian species, and 160 mammal species and more than 1,400 species of plants and trees. Collectively, they contribute to the maintenance of a delicate ecosystem whose abundant rains enable the Panama Canal Locks to function. We will visit the laboratories of the Smithsonian Tropical Research Institute, which are located at the Colorado Natural Monument. The Institute has generated over 1,500 publications in its 66 years of existence.

03:30 pm Boat departs from Colorado Island.

04:15 pm Boat returns to port for departure to hotel.

05:00 pm Arrive at hotel to rest prior to dinner on our own.

Day 6: Monday, March 8th

08:00 am Departure for Embera excursion, including lunch and snacks.

Visit a community of Choco or Embera Indians who established themselves during the '60's in the Chagres National Park. This excursion includes a boat trip through Alahuella Lake to the Chagres River. (The various elements of this excursion will depend upon weather conditions, the flow volume and turbulence level of the waters in the rivers and the consequent physical effort required of the tour members.) Visitors will enjoy the natural beauty of the tropical rainforest and come to appreciate the costumes and crafts of the natives.

04:00 pm Return to hotel to rest prior to dinner on our own.

Day 7: Tuesday, March 9th

08:00 am Transfer to Gamboa for Gatun Lake Tour, including lunch.

Today's excursion will provide a reasonably close-up view of the work being done to expand the Panama Canal, along with a history of the construction of the Canal. We will navigate the rendezvous site for container ships, cruise ships and boats, and a variety of other vessels that cross the Panama Canal; experience close encounters with some of the rain forest animal species such as monkeys, sloths, toucans and crocodiles; and discover the exotic flora available in the area. We will enjoy a canoe excursion through Lake Gatun, ending at a pristine water hole and cascade where we can bathe, fish, swim and kayak as part of the afternoon activities. We will also enjoy a typical Panamanian lunch.

04:00 pm Return to hotel to rest prior to dinner on our own.

Day 8 [Departure Day]: Wednesday, March 10th

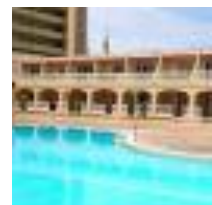
10:00 am Depart for a shopping excursion to the Albrook Mall. Lunch will be on our own.

Visit the crafts stores and a mall (Albrook Mall, Multi Plaza, Los Pueblos) where articles from all over the world are available at very modest prices, including stores that offer electronics at Free Zone prices (tax free) with delivery to the International Airport.

04:00 pm* Return to hotel (with the time to be adjusted in accordance with the various individual departure times) to recover luggage, for dinner (according to individual departure times) on our own, and transfer to the international airport in Panama City (according to individual departure times).

*Those adding days before or after this IEEE Tech Tour are responsible for negotiating their airport pick-up and drop-off times and any other details of their extended time in conjunction with this Tour.

♦Our hotel, El Panama, is situated in a vibrant neighborhood including numerous interesting shops within Panama City's financial and commercial district. Its courtyard includes an outdoor pool and poolside bar with access to a health club, including a sauna. The hotel has several restaurants, a nightclub, and a casino. Wireless Internet access is offered both in the public areas and in the guestrooms.



A tour opportunity commissioned by the IEEE Life Member Committee and provided by

Pesantez Tours
PO Box 0831-00716
Paitilla, Panama

TEL 507 223 5374
FAX 507 263 7860

EMAIL leineth@pesantez-tours.com [Leineth Jimenez]

The cost of the tour, exclusive of travel in and out of Panama City, is as follows:

Single Room:	\$2053.00 per person
Double Room:	\$1520.00 per person
Triple Room:	\$1374.00 per person

The hotel provides a buffet-style continental breakfast each morning at no additional cost. The Tour provides lunches and dinners on days specified above. No other meals are covered by these Tour costs. Please also note that gratuities are not included for guides, drivers, or hotel housekeeping staff members.

After reserving and paying the appropriate above cost, you must to make your flight reservations to and from Panama City. You must then notify Pesantez Tours of your itinerary so that they can make the appropriate pick-up and drop-off arrangements. Pesantez Tours is willing to help you choose and book pre- and post-tour activities should you want to have an extended stay in Panama and countries nearby in Central and South America. You can learn more about this company from their website at:

<http://www.pesantez-tours.com>

Each person joining the Tour is responsible for having (1) a passport with an expiration date not earlier than six months following the date of planned departure from Panama and (2) an entry visa for Panama. Currently, for visitors from the US, a tourist card valid for 90 days can be purchased at the airport of departure for Panama or the airport of arrival in Panama in lieu of a visa. For those wishing to confirm this matter or learn more about entry to Panama, visit the website for the US State Department website at:

http://travel.state.gov/travel/travel_1744.html

Numerous websites detail the visa requirements for entry to Panama from other countries than the US. Each person is also responsible for having immunizations/vaccinations required for entry to Panama. Information about what is required and recommended can be found at the US Centers for Disease Control and Prevention website at:

<http://www.cdc.gov> (Click the Traveler's Health button.)

For those who want travel insurance, Pesantez Tours will be happy to secure coverage. You may, of course, secure coverage through another travel agency, such as the one you regularly use. In either case, you will need to know the costs of the tour and the flight for each person in your party. Note that such insurance often needs to be secured within a couple of weeks of first payments for aspects of a tour, such as deposits for the tour itself or airfare for the flights to and from the tour location. So, a good rule-of-thumb is to get the initial insurance contract at, or shortly thereafter, the time of the first payment and acquire supplements to the initial contract.

You can reserve a place, or two or more, on the IEEE Tech Tour to the Panama Canal with deposit of just \$200.00 per person that is non-refundable after November 3rd. Final payment will be due on or before January 3, 2010. Since the size of the tour group is limited to sections of 20 to 25, with the number of sections beyond the first still in negotiation, later reservation requests will be wait-listed with the deposit to be refunded in early January if a vacancy does not become available. However, a request may be made to not be wait-listed and for the check or credit card authorization for the deposit to be returned.

If this is a tour such as you have often imagined or that now captures your imagination, then make a request to join it by completing and submitting the Request to Join the IEEE Tech Tour to the Panama Canal on the next page. It can be completed and

- (1) mailed with a check or
 - (2) emailed or called or faxed in with a credit authorization or
 - (3) submitted through a secured website with a credit authorization
- to Pesantez Tours.

Request to Join the IEEE Tech Tour of the Panama Canal

Name _____ IEEE Membership Number _____
Address _____

Telephone Number (include country code) _____
Email Address _____

Accompanied by (1) _____
(2) _____

A deposit of \$200.00 per person is required that is non-refundable after November 3rd. Final payment will be due on or before the 3rd of January 2010. Since the size of the tour group is limited to sections of 20 to 25, with the number of sections beyond the first still in negotiation, later reservation requests will be wait-listed with the deposit to be refunded in early January if a vacancy does not become available. However, a request may be made to not be wait-listed and for the check or credit card authorization for the deposit to be returned.

Deposit Amount (\$200 for each person) \$ _____

Check if true: Please do not put us on a wait-list for an opening in the Tour group. In this case, please promptly return our check or credit card authorization for the deposit.

Method of payment (check only one): enclosed check (preferred form of payment)
 credit card (provide information below)

Please provide the following credit card information. Note: The response **same** for contact information is acceptable:

Name _____
Address _____

Telephone Number (include country code) _____

Card (check only one): VISA
 Master Card
 American Express

Card Number _____ Amount \$ _____
Expiration Date _____
Security Code (rightmost three digits on the back of the card) _____

The contact information for email or call or fax submission is:

Pesantez Tours
PO Box 0831-00716
Paitilla, Panama

EMAIL leineth@pesantez-tours.com
TEL 507 223 5374
FAX 507 263 7860

SECTION 3: TOUR FAQ SHEET

How many Life Members typically go on these trips?

This is the first ever IEEE Tech Tour, so we have no experience that speaks to our response to this question. However, we anticipate that most IEEE members will be accompanied by their spouses, or significant others. Consequently, the Tour group will be composed of half to somewhat more than half IEEE members; most of whom we believe will be life members. The Tour group will be 20 to 25, but may be increased to 40 to 45 or 60 to 65. This will require approval of the Canal Authority and an available bus to accommodate the larger number of Tour members. This suggests upwards of 10 to 13 life members, but possibly 20 to 26 or 30 to 39.

Can separate air and ground arrangements usually be made?

The Tour will include only excursions, food, and accommodations from arrival in Panama City to departure from Panama City, including transfers between the airport and the hotel. Many, but not all, lunches and dinners are included.

It is essential to transit the entire Canal, end-to-end!

This is a statement that the Life Member Committee believed when it began to plan the Tour. It was then learned that a transit is available only three days a week during the first three months of the year and only one transit in each month is a full (end-to-end) transit. We concluded, echoed by the advice of the Tour provider, that the partial transit from Panama City to Gatun Lake, with the return by bus, would provide the experience of passage through locks and views of the incredible engineering and construction challenges that were met, including Gatun Lake, in the creation of the Panama Canal.

Will there be a program for spouses during the technical days?

Our intention is for spouses to attend all of the activities included in the Tour, including the more technically oriented activities. But, it is possible, if the Canal Authority limits the number of Tour members that can visit the Control House, that we might divide the group into members and spouses. This would allow us to enroll a larger Tour group while meeting the Canal Authority's limit on the number visiting the Control House.

Do you expect mostly just engineers alone?

With the Tour providing a considerable number of excursions that explore the environment and illuminate the cultures of Panama, we anticipate that most IEEE members will be accompanied by one or more of their family members.

Some events may be too strenuous for retired members! Will there be alternatives?

We don't believe that the daily excursions will prove too strenuous, but sometimes we misjudge the capacity of others, and even ourselves sometimes, to walk and hike for days on end. Sometimes we need time off from closely managed time, which is the character of most tours. The dominant alternative will be, for those needing a break, to stay at the hotel, enjoying its courtyard and swimming pool, or to stroll in the neighborhood of our hotel.

What vaccinations are required or recommended?

Recommendations for immunizations/vaccinations for entry to Panama are posted on the website of the US Centers for Disease Control and Prevention at:

<http://www.cdc.gov> (Click the Traveler's Health button.)

As a resident of Panama, I would like to join your tour for the day(s) that it visits the Canal! Is such an arrangement possible?

The level of interest in this Tour—the whole Tour—is quite high. Consequently, we will not be able to accommodate partial participation at a reduced fee. We wish that this might be otherwise.

I expect ... [the Tour] to be oversubscribed! Maybe you will consider a second tour section at the same time visiting the locations on different days or making this an annual tour until all have a chance to attend!

We are considering the possibility of increasing the Tour group size as described in the response to the first question. However, the Canal Authority might cap the number of group participants allowed into the Control House at one time and the number of times. This would determine the limit on the size of the group or, to accommodate a larger group, it might require us to limit entry to the Control House to just IEEE members. In addition, availability of buses of the right capacity will limit the final group size. It is the case that the Canal Authority feels that repeating the one-time opportunity approved for this Tour would be contingent upon their finding their Canal services were not impaired by our time in the Control House. If this is the case, then they can imagine repeated tours, but most likely not less than a year apart. There is every reason to believe that this IEEE Tech Tour of the Panama Canal will become a regular event.

Do I have to be an IEEE Life Member to become a member of the IEEE Tech Tour?

Though the Tour is organized by the IEEE Live Member Committee and was initially reported in considerable detail in the recent IEEE Life Member Newsletter, the Tour is open to any IEEE member and accompanying guests.

Can separate air and ground arrangements be made?

Indeed, that is expected. The Tour will only include excursions, most meals, and accommodations from arrival in Panama City to departure from Panama City, including transfers between the airport and the hotel. All breakfasts and many, but not all, lunches and dinners are included. These are noted in the Tour brochure. Tour participants must make their own travel arrangements, for money or miles.

SECTION 4: PANAMA CANAL ADVENTURE

The Tour Diary of Richard Chelius

Day 1 - Wednesday, March 3, 2010

It all started when the alarm went off at three in the morning.

It takes an hour and fifteen minutes from getting out of bed to walking out of the house and we had to be at the airport two hours before our flight would take off. We were in the car and on the way by four fifteen on the thirty-five minute run to the airport. We put the car in an open-air lot run by the airport for close-in parking. Not really close though. It was a long hike in bitter cold temperature hauling our luggage on rollers. We make it up an escalator to the departure floor and checked in just barely an hour and a half before flight time. There were only a few people nuts enough to launch at that hour so getting through security did not hold us up. At six thirty we were airborne and on our way to Miami.

We were off on the first leg of a trip to realize my life-long dream to see the Panama Canal. We didn't have to pay extra to check our two bags I guess because we had an international trip connection. We flew from Jacksonville to Miami to catch a plane to Panama City. It was a short hour and a half flight to Miami on a turboprop aircraft.

The irony was that we had to get up at three in the morning and then wait two hours in Miami for a ten thirty flight to Panama City. While waiting, we watched three sparrows chase breadcrumbs on the waiting room carpet and read books. Happily, Miami to Panama City was only a three-hour and a quarter flight and we stayed in the same time zone. We learned that there was no food on board so we bought sandwiches to eat on the way. Only soft drinks and coffee and tea were offered enroute. We got that much on the flight from Jacksonville.

Did you know that the Miami is east of Jacksonville? And that the Panama Canal is east of Miami? Check that on a map.

There's more. The country of Panama is an isthmus that lies west to east between Costa Rica and Columbia. And the Panama Canal actually runs north to south from the Atlantic Ocean (the Caribbean Sea) to the Pacific Ocean. From the Atlantic, ships sail south through the canal and from the Pacific north. None of this really matters for the operation of the canal itself, of course.



It's like the illusion about the Niagara River. We tend to think it flows west to east because Lake Erie lies to the west of Lake Ontario. But no, the Niagara River and Niagara Falls flow north between Lake Erie and Lake Ontario (the lakes overlap). It's something no one thinks about. The Welland Ship Canal in Canada that is parallel to the Niagara River to bypass Niagara Falls also runs north-south. It has eight locks to transfer ships between Lake Erie (325 feet - 99 meters - higher) and Lake Ontario.

We had read about this trip to visit the Panama Canal nine months ago in the June 2009 IEEE Life Members Newsletter - the voice for 26,000 Life Members of the Institute of Electrical and Electronic Engineers of which I have been a member since college days as an electrical engineering student. The headline was "IEEE Technical Tour to Cruise Panama Canal in 2010."

Thirty-two of us, twelve couples and eight singles, jumped at the chance to sign up and see the Panama Canal. The tour was open to all comers, but a feature for Life Members probably because that is a group that could more easily afford the trip. One becomes a Life Member when age plus the number of years as a member of IEEE equals one hundred or more. The original number of persons signed-up was thirteen couples plus eight singles. One couple dropped out.

Participants were from Canada (3), Japan (2), Panama (1) and from States across the US (26). In all, there were twelve women and twenty men. Average age? Most of the men were retired except for five who were working of which one was well up in years. A detailed list of all the participants accompanies this diary of the tour.

The Panama Canal trip was the first of a new initiative by the IEEE to organize tours to celebrate historical milestone electrical and electronic achievements in the world. As stated in the announcement, "The Panama Canal project included one of the largest and most important electric installations in the world early in the 20th century. The use of 1,022 electric motors with an installed capacity of 28,290 horsepower largely replaced commonly used steam and water powered equipment. Reliability and safety were also engineered into an innovative electrical control system, enabling remote lock operation from a central location."

At 10:30 a.m. on Wednesday, March 3, 2010 we were feet on the ground at Panama City's Tocumen International Airport. We were worried about getting a visa to visit Panama. We read in our guidebook that for short time stays, such as our eight-day visit, one could get a visa card for five dollars at the entry airport. But we were cleared through customs and a visa was stamped free in our passports. No problem. But we were charged a \$20 per ticket tax when we left Panama.

A young lady from Pesantez Tours holding up an IEEE sign met us as we came out of customs. She greeted us and, along with another single participant in the tour from the Boston area, Jonathan Watson, turned us over to Moses (!) a Panamanian Pesantez driver who took us to our hotel in a modern van.

The ten-mile ride to downtown Panama City was filled with contrasts. The four-lane limited access highway runs along the Panama Bay waterfront. We passed a large expanse of vacant shore land being filled in with dirt dug from the construction cuts for a new set of canal locks being built for the super tanker length ships.

The tide was out and it was clear that the huge Pacific twice a day tide was at least 20 feet (we were told six meters).

The first part of the city we encountered was in this fill area where an entirely new district with high-rise buildings was under construction. It was called Panama Point. The most prominent building under construction was a Trump mixed-use tower (condos, shops, parking) that had a sail-like curve up one entire side as its prominent feature.

We were soon in a maze of properly paved streets. Many were so narrow they were one-way passages. One must know the map of Panama very, very well to navigate in the city. The city is built on rolling hills that mount almost from the water's edge. The streets grew up on easiest-route paths from several hundred years ago - back to the 1500's.



The hotel selected by IEEE is a first class moderately tall building with 330 rooms. It was built in 1951 and has been modernized several times over the years. The Hotel El Panama was for many years Panama's premier hotel. It has a large, shapely swimming pool with water right up to grade - a beautiful sight - with two stories of cabana rooms overlooking the setting. The main restaurant looks out on the pool and has outdoor seating under umbrellas. The main attraction is that the hotel is centrally located in Panama City on Via Espana. It is very near the beautiful Carmen Church (Iglesia del Carmen) whose bells chime every hour starting at six in the morning.



The lobby area is grand, all in tile, with shops and a main entrance where the trade breezes waft through. There are large seating areas where groups can meet for day-trip planning sessions. Quite obvious were hotel security people in dark business suits who monitored people coming and going at the hotel. We were to learn that security is a problem throughout the city. The streets around the hotel are safe for walking and window shopping in the daytime, but riskier at night. We were advised to use the hotel cars rather than the yellow taxicabs, for the drivers were known to overcharge tourists.

Our room had a city view of a dozen skyscrapers (many under construction) that are salt and peppered into the old downtown area. It was startling to see such modern works planted in the midst of pitiful downtown slum areas. Important four-lane streets have been cut through the maze and there are impressive shopping areas just like in New York City nevertheless.

On one side of our hotel (down the hill) the street was poor indeed. On the other side, a short walk led to a modern shopping street with all the commonly known worldwide brands.

The currency in Panama is the American dollar. The 'balboa' is the name for Panamanian currency that exists only as coins that match the size and denomination of US coins (so they can be used in American-made vending machines). It is traded on a par value with the US dollar.

There were Subway, McDonald, KFC eateries as well as others known in the States. At Subway, the foot long sandwich was \$4.00 (\$5 in the States).

The El Panama Hotel is connected to a Casino next door. The hotel also has large convention center spaces. It is equipped with a business room with computers. However, we found that the connection to the Internet was not always certain. We sent four e-mails to our daughter and we wondered why she did not acknowledge them. We learned later that she had received only one of the e-mails. After the tour we learned that participants who had their own computers wired into the hotel's Internet service from their rooms did not have a problem sending their email messages.

Our hotel room was huge, easily 15 x 25 feet (five by eight meters) with windows across the end. The floors were in beautiful tile as was the bathroom with tile from floor to ceiling. Bathroom fixtures were modern and clean. The water pressure was impressive and the shower marvelous. We had two queen beds, side tables, a small round breakfast table, a desk, an armoire, bed lamps and excellent lighting. There were draperies at the end of the window expanse and double hand-pulled curtains on tracks - one a see-through sun shade and the other an opaque closure to keep out the light.

The very best thing about the hotel was the buffet breakfast included in the arrangements. It was in the main dining room overlooking the swimming pool. There were five tables of fruit, cold cuts, hot dishes, cooked-to-order eggs, cereals, and breads. It was a veritable feast in pleasant surroundings with seating inside or outside by the pool.



One thing in the restaurant we could not escape was a television tuned to the soccer game of the day all day long. Happily, the sound was set quite low.



That Flamingo Restaurant was the main eatery in the hotel. There was also a poolside bar and restaurant that was very pleasant, too. The Flamingo had an evening buffet meal for \$20 that would be a challenge for any restaurant to beat.

The hotel had an outdoor park with trees built on top of the convention center portion of the building. The park even included a large fountain (that was not operating while we were there). That side of the hotel was three stories above street level so the park was up in the air with good views of the city around. It was pleasant to walk around that park in the evening to see the city lights.



The IEEE tour organizer for the Life Member Committee (LMC) and, otherwise, a regular tour participant, was Ted Bickart, retired President of the Colorado School of Mines. He held a get-acquainted meeting in the lobby with everyone at 9:30 p.m. on the day of arrival. Each participant spoke up with name and a brief rundown of his hometown and career.

Unfortunately, there was no list of the participants so we had to catch what they said and make our own notes to try to tie names to people, hometowns, and careers. A list was published after the tour that was e-mailed to us at home.

Day 2 - Thursday, March 4, 2010

We gathered at 8:30 a.m. in the lobby to meet our Panamanian Tour Guide. He was a fourth generation Jamaican whose ancestor was among the original workers brought in by the French Canal Company. Fortunately, he spoke English well and was a pleasant, enjoyable man to have guiding us. He knew a tremendous lot about the history of Panama and the saga of the Canal.

This first day was filled with excitement for we were going to start off the tour from the Pacific side in an excursion boat and go up through the two Miraflores Locks, the Miraflores Lake, and the Pedro Miquel Lock to emerge on Gatun Lake 85 feet above sea level.

Pesantez Tours had a first class tour bus with a capacity for 36 persons. It was perfect for our tour with air-conditioning, comfortable seats, microphone and speaker system so we could easily hear our guide's comments. Large windows provided every row with good views as we rolled along.

We left the hotel and wound our way through the maze of one-way streets to the causeway from Panama City out into the Bay of Panama that connects to one of the many islands far out from the city waterfront. The causeway serves as a border of the Bay where ships lined up for their turn to enter the locks that were two miles from the outer island.

The causeway is also city park with benches spotted along the entire two-mile length with places to rent bicycles, sports facilities, restaurants and other shops. The causeway borders a shelter for private yachts and sailboats owned by residents and visitors to Panama.

At the seaward end of the causeway we came to a substantial boat docking area where we boarded the *Pacific Queen* tourist boat of three decks on which we were to transit the Miraflores and Pedro Miquel Locks to reach Gatun Lake.



All ships and boats that go through the Panama Canal are scheduled for a specific time to approach the first lock. There were a dozen freighters anchored at the entrance to Panama Bay waiting for their time to come up.

Staffers in a control center on top of the island at the seaward end of the causeway direct the order in which ships are called to move and follow progress.



Soon our turn came to move toward the first lock. When we got about halfway there a tugboat came up along side to deliver a ship's pilot who came to take charge of our tourist boat all the way through the locks. All ships and boats, big or small must have a pilot on board to direct the vessels' movements.

American Highway. That highway is interrupted after Panama because the jungle and mountains from there into Columbia have been too much of a challenge for construction.

As we approached the locks, we saw a huge electrified arrow hanging on a tower where the lock entry channel walls start. The front half of the arrow was green and the back half was red. On this day, the green of the arrow pointed to the right hand lock for us to enter. On the Pacific side (and on the Atlantic side) there are



two locks side-by-side in a series of three double locks to raise ships 85-foot to Gatun Lake.

Use of the lock system is very flexible. The locks can be run as a street, one side in one direction and the other side the other way. Or, they can be run in both directions either way. Occasionally, one side might be used for both directions when the other side is closed for maintenance. When we were there, the side-by-side locks were both running ships north in the morning until 12 o'clock noon. Then at 2 o'clock p.m., the direction was changed to south.

Generally, big ships cross the Panama Canal only in daylight. However, in recent years more lights have been installed at the narrow points of the passage through Gatun Lake to enable ships up to a moderate size to cross in the dark.

Ships whose sides almost rub against the lock walls and whose length challenges the space in the lock do not go through the locks under their own power. Electric locomotives that run on a cog-wheel line on each side of the lock, one at each of the 'four corners' of the ship, control the spacing using cables kept taught by winches on the locomotives. By pulling backwards and forwards and from side to side they keep the ship in position as the water level rises or falls to match the next step in the lock system.

When the levels match, the lock gates open and the locomotives pull the ship into the next step in the locks. Ships start to move on their own power only when released by the locomotives after they have guided them out of the final lock.

At the Miraflores Locks, the ships go up two steps and then cross the small Miraflores Lake to reach the final step of the three locks, Pedro Miquel Lock.

Once out of the Pedro Miquel Lock, ships continue on to cross more than 35 miles of Gatun Lake to reach an equivalent set of locks on the Atlantic side and exit the canal. It takes a ship eight or nine hours to transit the Panama Canal.



When it came the turn for our *Pacific Queen* excursion boat, we entered the first lock under our own power because we were a small craft and had a pilot on board to guide the steering.

Along with us came two other small craft. One was a smaller excursion boat (built in 1912 and still active) and a 35-foot private sailboat. We were three boats in the huge lock (965 feet long), each with a pilot.

Our boat and the smaller excursion boat had fenders on board that were put on the starboard (right) side to protect the boats as they were 'held' to the wall of the lock. Spring lines were thrown up to men on top of the lock wall who hand-held the boats up against the wall as the water was raised to the level of the next step in the lock system. The sailboat, with appropriate fenders, was tied to the port (left) side of our excursion boat to ride up the rising water side-by-side with us.

The crew on the sailboat was made up of four men and four women. They tied off the stern of their sailboat to our boat but failed to bring the bowline taught. The water bubbling up from the bottom of the lock to raise us up caused the bow of the sailboat to swing cross-wise in the canal.

The pilot on the sailboat rushed forward and all hands pulled on the front spring line to bring the bow back to the side of our excursion boat and secure it in place. Had the sailboat continued to turn it would have wound up headed backwards in the lock with its stern tied to our stern. Had it gone that far it would have taken some powerful manhandling to get it turned back around and may have delayed our passage.

Our *Pacific Queen* excursion boat had three decks. The capacity of the boat is about 100 people. There were two other non-related tourist groups along with us. The bottom deck was where we boarded, where crew quarters are, where the toilets are, and where the dining and bar areas are located. This deck is enclosed with windows. The second deck is a sitting salon with tables and benches fixed in rows perpendicular to the sides with a similar row down the middle. The third deck is the top and is an open observation deck with seating under a canopy aft and exposed bench seating forward. In between on the top deck is the helm cabin from where the ship is controlled.



Taking pictures was an exercise. The crowd on the top deck bow had the best vantage point as we passed under the Bridge of the Americas and especially as we entered the locks. On the middle deck, picture taking was pretty much limited to what could be seen out the window on one side or the other.

However, the middle deck is open at the stern that provides unobstructed panoramic views to the sides and aft of the boat. On the top deck, one could walk all around the entire vessel for pictures from any point of interest. The struggle, of course, was to get right to the front of the bow for best pictures.

Most photos were taken between heads to get a clear shot. By running up and down stairs and going to and fro a good collection of photos could be taken.

As we emerged from the first two steps of locks - the Miraflores Locks - we saw the Miraflores Tourist Center Building on the east side that houses a museum that relates the construction of the locks. The four-story building provides two upper levels of outdoor overview of ships going through the two locks.

We were to visit the Visitors' Center the next day. Opposite the Visitor's Center is the Miraflores Locks Control Building in between the two sets of locks.

Moving out of the second lock we entered Miraflores Lake. The small Miraflores Lake separates the first two sets of locks on the Pacific end from the third set. The reason all three sets of locks were not built together, as were the Atlantic side Gatun Locks, was because the builders ran into a 'bottomless' swamp where the lake is now. They were obliged to move the Pedro Miquel set of locks to the north the distance of the length of the present Miraflores Lake in order to find sufficiently solid bedrock upon which to build the massive third lock.



At first they tried to fill the swamp and drive the water back. But there was no hardening of the earth as they went deeper. They could not fill in enough load-bearing earth sufficient to support the last lock. So rather than fight it, the designers moved north to solid ground and built the third lock - the Pedro Miquel Lock. Thus they created Miraflores Lake in between locks two and three.

Once clear of the Pedro Miquel Lock, we continued on into Gatun Lake. The area where the biggest amount of mountainside had to be removed to build the canal is a nine-mile stretch encountered soon after entering Gatun Lake. The stretch was originally named the Culebra Cut for a town in the area but it was later renamed as the Gaillard Cut to honor the man who directed the excavation during the ten years it took to lower the mountain saddleback there to the level of the canal for traffic to cross the Continental Divide.

The Panama saddleback route selected for the canal was the lowest point in the mountain range of the Continental Divide from Alaska to Chile. This lowest point was only 365 above sea level. For the ships to sail through the cut at the canal design level of water at 85 feet above sea level, the saddleback had to be cut down more than 300 feet in all (which included enough depth for the draft of the ships). The French Canal Company worked on the cut for almost 20 years with modest equipment and the Americans worked on the cut for ten more years with modern equipment to achieve the goal. In all the final excavation amounted to 96,000,000 cubic yards of dirt and rock removed to clear the Gaillard Cut.



As we moved into the nine-mile passage of the Gaillard Cut we passed under the Centennial Suspension Bridge, only the second major road crossing of the Panama Canal, the first being the Bridge of the Americas. Both bridges are on the Pacific side of Panama.

Small service bridges are built into the lock structures at Miraflores and Gatun Locks, but those bridges are only usable when the lock gates are closed and have limited capacity.

The Centennial Bridge is located nine miles north of the Bridge of the Americas and crosses the Gaillard Cut at the Continental Divide.

The bridge was named for Panama's Centennial, which occurred on November 3, 2003. It was completed on the 90th anniversary of the first ship transit of the Panama Canal by the cargo ship Ancon on August 15, 1914. The bridge was inaugurated on schedule, although it was not opened for traffic until September 2, 2005 when the new highways leading to it were completed. It was built to relieve the crowding on the Bridge of the Americas that had grown from 9,500 vehicles per day in the 1962 era to 35,000 vehicles at the time the Centennial Bridge opened.



On our way through the Culebra Cut in our small tourist excursion boat we encountered the enormous Celebrity Cruise Ship *Celebration* coming at us through the narrow channel. Side by side going in different directions, they were a monster and we were like a bug on the water. Six decks of people hung over the rail waving and watching progress of their great ship through the canal. How majestic they were! Yet how remote from the real experience of seeing, hearing, smelling, feeling, sensing the emotion of being in the canal that we

were privileged to enjoy on this IEEE Tour.

Our tourist boat voyage through the Pacific side locks and into the Gatun Lake ended at a dock in Gamboa, the headquarters town for on-going dredging of the Panama Canal passages. The Pesantez bus picked us up and we moved on to stop at IEEE Panama Chapter's Enrique Tejera's Panama Canal Authority's managerial area.

We visited the motor and generator repair and rewinding workshop of the ACP Division de Energia. We observed repair of GE generators and a Siemen's motor from a giant German crane the authority obtained after WWII. We heard that



Enrique Tejera leads a division with 1,500 employees. It was thanks to Enrique that our group was able to schedule so many behind-the-scenes activities on the tour. Enrique also plays the guitar and entertained us one day to help pass the time on one of our longer bus rides.



After the motor-generator workshop stop, the bus took us again way out to the end of the Pacific causeway where our day had begun. This was to visit the Smithsonian Tropical Research Institute Aquarium on the edge of the ocean.

The Smithsonian Institute has several locations in Panama including the aquarium and classrooms and headquarters in the City College area of Gamboa. Perhaps the most important, STRI has Barro del Colorado Island - 12 square kilometers of isolated plant and animal and bug populations to study - that we were scheduled to visit on Day 5, Sunday, March 7th.



Time was running short when we arrived at the Aquarium so we did not take full advantage of an indoor exhibition open to the public. We did observe several small outdoor aquarium tanks with various kinds of fish and sea life.

The most exciting moment was to walk to the sea wall and see truly strange rock formations. The burnt umber colored rocks were hard eruptions from volcanic activity millions of years ago. The rocks were all split up in striking patterns.

Giant crabs lived in in full view. We the rail at the around the base. Sea waiting at anchor for horizon. Beyond Ocean all the way to



those rocks and sunned themselves could see them as we looked over isolated rocks and the sea crashing birds were there, too, and the ships passage through the canal lined the that was the deep blue Pacific Asia.

The bus returned our 5:00 pm as everyone left for dinner on the bus at 7:30 pm. Dinner was included in the tour at the Tinajas Restaurant. We were simply too tired to carry on in the evening and decided to have dinner in the Flamingo Restaurant at the hotel instead. The Tinajas dinner included a folkloric show of dance and costumes that lasted about an hour. Those who attended the dinner had a good time. The group returned to the hotel at 10 p.m.

Day 3 - Friday, March 5, 2010

This was to be another outstanding day of the trip. We left by bus at 9:00 am to go see the Miraflores Locks Control Building - a true 'insiders' privilege not accorded to regular tourists. If you have seen the Nova 1987 CD one-hour program about the Panama Canal hosted and narrated by David McCullough, "A man, A Plan, A Canal", you will get a good idea of our experience in the control room from which the three lock steps on the Pacific side are operated.

It was a half-hour ride to Miraflores Visitors Center Building. As we turned into the road to the Visitors Center, we saw the Miraflores Dam that holds the water back in Miraflores Lake. Water was coming over the spillway, which was a good sign that there was plenty of water to operate the locks even though it was toward the end of the dry season.

At the Visitors Center we watched a long line of tourists filing into that building that overlooks the second stage in the series of locks. Our group did not have to wait in line. It was our privilege to go around to the side of the building where we were welcomed by an official and guided out onto the top of the second lock across from the Miraflores Lock Control Building.

The control building is situated between the two locks in the second stage of the three-lock set of locks. Our group of 32 was divided in half, one half at a time to cross over the lock and visit the control center to be followed later by the others.

The second lock at the time was full of water ready to receive a ship coming from the north out of the Pedro Miquel lock. The first lock was nearly empty with the water level that of the Pacific Ocean. Ships at this time were moving south through the locks.

The closed lock gates holding the water in the second lock provided us the opportunity to walk across the canal on top of those gates to reach the Control Building (the big white building that is the hallmark of the



Miraflores Locks). When the lock gates are closed in a 'V' facing into the lock the water pressure keeps them sealed. As the lock gates move to the closed position, a collapsible set of hand rails raises up to protect employees who walk across the top of the gates to get to the other side.



It was the thrill of the trip to fight the wind and, hanging onto the rails, to cross over the canal. On the right side (second lock) the water level was about six feet below us being at the level for the ship entering from the third lock to descend to the ocean. On the left side (the first lock), the open drop had to be at least 60 feet to water in that first lock that was at the level of the ocean. That was the scary part - the long drop from the top of the closed gates on the left (south) side of the walkway.

The walkway was about two-feet wide. Employees had no problem with the wind or the height - they just marched across without using the handrails. But most of we visitors used both hands on the rails for sure footing.

One lady who walked with a cane was surely brave. As we watched her slowly proceed step by step across the canal we feared for her safety. At each end of the rails there is a space of five feet with no rail although the steel floor of the walkway extends properly to conduct one safely to the concrete deck at the sides of the lock. The first (and last) few steps at each end were the most nervous part of walking across the 112-foot width of the lock gates in the wind. But we all made the crossing in good shape.

We found that the Control Building has an access breezeway through the ground floor parallel to the orientation of the locks. From that breezeway is a narrow carpeted stairway inside the building that leads to the upper levels. We mounted the steps in single file and climbed to the third level above the ground.

It was on the third level that we found the original manual control table that was installed when the locks were built and used to operate the locks until four years prior to our visit. The entire scheme of the two sets of three locks was laid out on a long table about thirty feet long and four feet wide. There were hand 'valves' operated manually by canal personnel to work a ship from one end of the set of three locks through each to complete passage.



Tall barometer-like encased glass tubes with a scale and arrowhead kept track in live action of the level of water in each of the six lock chambers (two rows of three locks each to make up the set of locks).

The mechanical valve system was designed so that every step in 'locking through' a ship occurred in precisely the correct order without variation. Interlocks in the control system prevented any step to occur out of order.

One can imagine the disaster that would occur if lock gates would open or close while a ship was halfway between locks. The manual control table sent signals to electric motors that controlled

the movement of not only the visible lock gates, but also of hydraulically operated underground gate valves that controlled release of the water underground from one lock to another.



Four years ago, a computer control system was installed to replace the mechanical hand-operated lock system on the big table. Today, computer software issues the commands to the electrical system to perform the stream of activities to 'lock through' a ship. With the aid of computer surveillance, lock operators can keep track visually of all aspects of the ship and lock gate movements into the far corners. They can spot problems more easily and more quickly than could the manual system.

The computer system also compiles saved records logging each vessel that goes through the locks with all the particulars of time, size, capacity, billing charges, extra charges, and other administrative requirements formerly kept by hand.

We had the privilege of watching a big container ship clear the Miraflores Locks from the vantage point of the Control Building both through large windows looking out upon the locks and from an outside balcony on that third level.



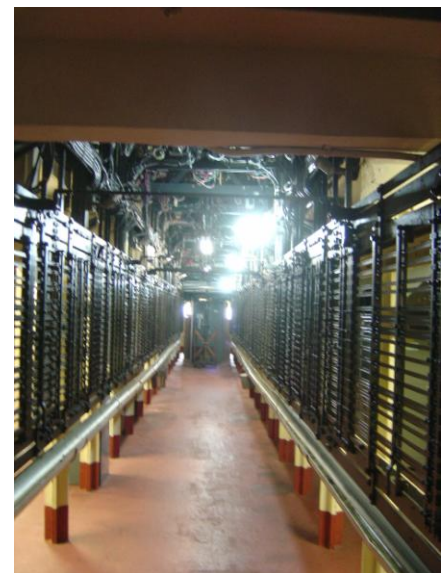
There were only four people at work in the Control Building on the day shift to perform the necessary tasks to run the locks. Most likely with the old manual system there had to have been a half-dozen to run the control table plus another half dozen to perform administrative and record keeping chores.



From the operation control third level we went down to the second level to see what went on in years past underneath the manual control table.

It was on the second level that we saw how the manual valves and other settings manipulated on the big table were

translated into sequential control signals to operate the locks. Electric servomotors stepped the switching mechanism through the sequence signaled by the operators manipulating handles on the big control table upstairs. What we saw was a wall of metal slide pieces each driven by a neighboring slide piece into the proper contact sequence to send electric signals to the motors and controls that operated the lock system. It was a real 'Rube Goldberg' set-up that worked for a hundred years before computers came.



When we had seen everything, we left the building and walked back across the 112-foot track on top of the closed lock gates and let the other half of our group cross over to visit the Miraflores Control Building.

While we were waiting for the second half to complete their visit to the Control Building, we visited the Miraflores Visitors Center and climbed up to the open observation decks for a panoramic view of the Pacific locks.



Once our group had reassembled, we visited an extensive museum in the Miraflores Visitors Center that described in words, graphics, photos, and videos the history and construction of the Panama Canal. We also sat in an auditorium to see a movie about the history and construction of the canal. In our free time we watch ships move through the canal and had a look at the gift shop.

It was at the Miraflores Visitors Center Museum that we saw a video of President and Mrs. Carter and Panamanian Officials in the ceremony at the time of official handing over of the Panama Canal by America to Panama in 1999. In part of that ceremony it showed President Carter and the officials walking across the canal on the very same two lock gates that our IEEE group had crossed over.

When it was time for lunch, we went by elevator to the third level and enjoyed a grand buffet in a room with panoramic views of the canal and the ships going through at the time. It was a white tablecloth setting in a truly fine restaurant. The Miraflores Restaurant is open to the public by reservation only as it can seat only seventy people at a time.



From the rooftop observation deck on the Visitors Center we could see in the distance the excavation going on for the addition of a single-lock set of three new gigantic locks being built to accommodate the Super Tankers in the world.

The so-called Postpanamax Locks will be built about a quarter mile west of the existing set of three-stage locks on both the Pacific and Atlantic sides of the Panama Canal. The Postpanamax locks will be 40% longer and 60% wider than the existing locks (1200 feet long vs. 985 feet and 180 feet wide vs. 110 feet).

Officials predict that the new Postpanamax Locks will enable the canal to double the existing capacity of cargo moving through the canal.



At the conclusion of our visit, Ted Bickart, as the IEEE LMC tour organizer, presented to the Manager of the Miraflores Visitors Center an IEEE LMC pewter coaster commemorating the recognition of the Panama Canal Electrical and Control Installations of 1914 as an

historic technical milestone. This gesture was in thanks to the lady Manager who, in the prior year, as an official of the Panama Canal Authority Administration, had authorized our tour's VIP time at the Miraflores Visitors' Center and access to the Miraflores Locks Control Building.



After lunch we carried on by bus to the Panama Canal Authority Administration Building. The Administration Building is on a high hill that overlooks the Panama Railroad yards as well as affording a fine view toward the city to the south.



It was while enjoying the view from the Administration Building Plaza that I realized for the first time how truly important the railroad is for revenue for the Country of Panama. From there one can see acres and acres of stacked shipping containers waiting to be transported across the isthmus by train.

Apparently, for some shippers it is cheaper to off-load the containers from a ship at either the Pacific or Atlantic side, send them across Panama by train (each flat car with either two 40-foot containers or one 40-foot and two 20-

foot) to be reloaded, very often on several other ships, at the other side to continue their journey to various ports.

It is clear from the thousands of containers that it must be a profitable solution for some shippers and clearly a source of significant revenue for Panama. Three long trains of two diesel electric locomotives pull the long trains across the isthmus, back and forth, back and forth.

The Panama Railroad is a one-track system. The distance is so short (50 miles) that there apparently is no loss of efficiency or cost effectiveness with just one track. Rail yards at both ends enable three or four trains to be made up and travel continually following a tight schedule.

I imagine that it takes only an hour for a train to cross Panama where the rail yards provide extra rails at each end.

There is only one passenger train in the system and it makes two trips back and forth each day - one in early morning and one late at night - scheduled in between container train runs.

Inside the Administration Building It was exciting to see a large bronze plaque on the central rotunda wall from the IEEE heralding the accomplishment of the Panama Canal as one of the world's major milestones in application of electrical power. It was presented in 2003.



In that same hall were busts of Ferdinand de Lesseps and Theodore Roosevelt along with



beautiful painted murals in the rotunda dome of scenes from the construction era.

At the conclusion of our visit to the Panama Canal Authority Administration Building, Ted Bickart also presented an LMC pewter coaster to the Vice President of Corporate Affairs with the Panama Canal Authority.

From there we went by bus to an organization housed in a building in the City College Center named CATHALAC (the Water Center for the Humid Tropics of Latin America and the Caribbean). This international organization was established in 1992. The Mission as stated is: "To promote integrated watershed management in Latin America and the Caribbean through applied research, education, and technology transfer."

It is essentially a Non-Government Organization the sponsors of which were not fully disclosed, but cooperation and/or financial support, at least in part, for various activities was noted as deriving from NASA, USAID, CCAD (Central American Commission for Environment and Development), the World Bank, and various degree granting universities.

Research there is devoted to study of weather patterns, flooding, volcanic activity and gravitational pull through computer overlay patterns and satellite images of such phenomenon. The resulting studies presumably enable the researchers to predict disaster threats and benefit urban, suburban, and rural planning and improvement in Central and South America.

It all sounded very 'soft' and more an opportunity for young college students and recent graduates to study and work in Panama. It was noted to the presenters that linkages to the humanitarian engineering programs of universities and professional organizations for urban, suburban, and rural improvement might better showcase their contributions to enabling the improvement of the human condition within the context of a sustainable environment.

That ended the day's activities and the bus took us back to our hotel by 4:00 p.m.

At 7:00 p.m., we went on the bus to have dinner at the Los Anos Locos Restaurant in Panama City. Rather than being seated in the big restaurant, we were shunted to a small, quite cold room all by ourselves and served ourselves from a meager buffet. There was no entertainment or speakers and we were returned to our hotel by 9:00 pm.

Day 4 - Saturday, March 6, 2010

We left by bus from the hotel at 9:00 a.m. and went east along the coast from Panama City about five miles out to Old Panama of the 1500's - Panama Viejo. It was in those early days that pirates from the sea invaded the town and raised havoc. For even back then, the short distance (80 km - 50 miles) to cross Panama from the Atlantic to the Pacific was known, well traveled, and envied.

The old Panama property on the shoreline is comprised of only about four acres today. At this location we found ruins from even earlier days. The modern town has been built up around the site and compressed the space. A major concrete highway passes right next to the land. The Museum for the Archeological Site of Panama Viejo is next to the highway.

This is an excellent museum in a building of very modern architecture that depicts life back in the 1500's and teaches the story of the people and their tribulations. There are several statues and busts in the courtyard of early notable figures in the history of the town. In particular there is a statue of Pedro Orias de Avila 1440-1517 who is credited with founding the City of Panama Viejo.

The town was built at the edge of a tidewater flat. A means of defense was to retreat to higher ground and repulse attack as invaders struggled across the slushy consistency of a wide expanse of the mud flat to reach the town. The 21-foot Pacific tide worked in favor of the people as a first line of defense providing a wide barrier of mud and water between the sea and the town. Text of graphics in the museum is in Spanish and also in English language.

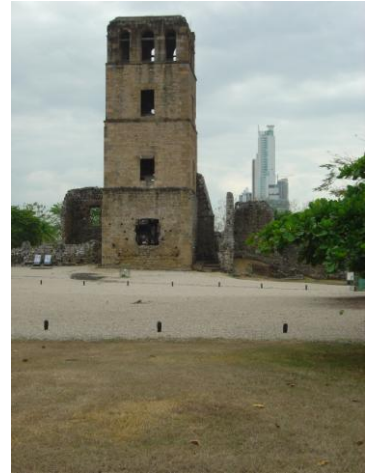


A main feature of the museum is a twenty-foot square tabletop layout of models of all the buildings in the early town made to scale. Graphics and paintings and videos combine to tell an engrossing story of what life was like way back then.

A mile inland from the shoreline beginnings of Panama Viejo we visited a large park dedicated to preservation of a Cathedral built in the time of the old city. Streets and modern city growth surround the park. But the park itself has been kept the same as in the old times with stone foundations and partial walls that delineate where original buildings stood.



The most complete structure that remains almost intact is the 30-meter (98-foot) high Tower of the Cathedral. Beyond are walls of the Cathedral compound with outlines of the church itself and surrounding buildings.



Some of the walls are still standing. A major restoration project is underway to shore up the ruins that show the most promise for providing an idea of what the compound looked like in 1500.



There is a big souvenir store just off the edge of the preservation property.

From the Old Panama property we went back toward modern day Panama and worked our way out to the waterfront to visit Colonial Panama from the 1870's. The buildings remain today as they were when the French Canal Company was at work building a Panama Canal.



Approach to Colonial Panama is by a really curious route that seems to be the only motor vehicle access. Panama's Chinatown has grown up all around the preserved Colonial section. Chinatown is crowded right up tight against the backside of the old buildings and the access road is barely wide enough for cars to pass. Sometimes our tour bus took up the whole street as we struggled our way through for a quarter of a mile along the backside of Colonial Panama.

But once we burst out into the Revolutionary Square (now called Independence Square) it was like the sun rose in one quick swoop. The beautiful buildings of the period are all there just as they stood in 1870.



The most significant edifice on the square is the original French Canal Administration Building, which now houses the Museum of the Interocean Canal of Panama that was inaugurated on September 9, 1997. The museum relates the story of the French Company's efforts over 20 years to build the canal followed by the tale of completion by the Americans.

At right angles to the French Canal Company

Administration Building, is the original two-towered church that faces the sea and is the centerpiece of the square. Past the church, across the square from the Administration Building are other government buildings including soldiers' barracks from the old days.



This is the square where the group of eight revolution leaders declared independence from Columbia and hoisted a new flag for a new Panama. This is where those leaders lured the commander of the Columbian Army (cleverly separated from his troops back on the Atlantic side in Colon) and persuaded him to acknowledge the birth of a new Panamanian State. It was here that independence from Columbia was announced to the world on November 3, 1903.

It was also on this square that U. S. President Theodore Roosevelt was welcomed in November 1906 on his one and only trip to Panama to observe the work in progress on the canal by the Americans by then.



The museum in the French Canal Administration Building is on four walk-up floors. The entrance lobby features a magnificent chandelier hanging in an atrium. All finished work is in shining polished wood with imposing staircases.

It is a marvelous museum that is truly informative. On each floor there are exhibits and extensive texts and graphics to relate as fully as possible the French experience in Panama.

There are many video presentations on flat-screen TVs throughout the museum. They were self-explanatory so there was no need for sound. Thus they did not interfere with the many patterns of visitors' interests. We could have spent a great deal more time at this museum for there was so much to learn and digest of the history of the building of the Panama Canal.

There is a glass case with a display of a wide selection of pamphlets that were published in 1914 and 1915 to promote and advertise the successful opening of the canal that occurred on August 15, 1914. We are proud owners of a pamphlet published in 1915 entitled, "Official Handbook of the Panama Canal - 1915." A copy of our particular pamphlet is not among the dozen displayed in the glass case. Perhaps we have a rather rare publication! It has 58 pages and includes a folded map of the canal. The Washington Government Printing Office published it in 1915. There are ten pages of photos plus a cover photo.

All graphic texts in this museum are in Spanish language. There is no addition of English language text to help non-Spanish speaking visitors. One is tempted to observe that this is a chauvinistic assertion that the Panama Canal is now locally owned and operated. Curiously, we did not encounter any French language either during our visit there or anywhere else during our tour in Panama.



When we left the museum it was lunchtime and we walked across the square that now has a town center band concert gazebo in the middle all in white and reminiscent of those early days when there were Sunday afternoon concerts for the town people.



We ate outside under an umbrella at a small restaurant named Rene that could not hold all thirty-two of us inside. So much for the better for some of us for we who sat outside had a fine view of the square with tall trees of yellow blooms and trees with pink blooms. We had lunch in the sunshine on a balmy 76 degree F day with a light breeze making the occasion a delight.



After lunch we left the square and walked down a colonial street to the waterfront. From there we could see the modern skyline of Panama City across the bay. The tide was out and the high retaining wall and a building on stilts emphasized the phenomena of the twice daily 21-foot tide of the Pacific.

We left Colonial Panama in time to be back at our hotel at 3:00 p.m. to rest up for

dinner out. Some in the group used the extra time for late afternoon shopping.



At 7:00 p.m. we again boarded the bus for an excursion out the length of the causeway by Panama Bay where the restaurant was located. It was fun to see all the weekend activities enjoyed by local people on the causeway that is really a very long public park. There are benches all along the way from which one can enjoy the lights of the skyline of Panama. There are bicycle rental shops for individual and twosome riding along the causeway. For the more sports minded, there are jogging paths. There were families with baby buggies enjoying the evening air on a long walk.

We had dinner on the terrace of the Pencas Restaurant that is about three-quarters of the way out on the causeway. Our group sat at a long table from which we could look out over the sea and admire the lights of Panama City.

We had a very good buffet dinner. Everyone was bubbling along having a good time. The weather was still about 76F with a very light breeze to everyone's content. It was Saturday night and the restaurant was crowded as were all the restaurants on the causeway. We were back to the hotel by 10:00 pm.

Day 5 - Sunday, March 7, 2010

This day was for our big boat trip on Gatun Lake to visit Barro del Colorado Island, a jungle preserve run by the Smithsonian Institute of Washington, DC. We were up early and on the bus by 7:00 a.m. That meant we were up at six in order to have a big breakfast in the Flamingo Restaurant at the hotel before leaving. That breakfast was a highlight of each day. No one wanted to miss it.

We had to leave early because the bus would drive 35 minutes to Gamboa Pier where the boat to Barro Island would leave promptly at 8:00 a.m. The problem was that on Sunday, long distance bikers used the road to Gamboa for sports runs. The bus had to thread its way through the bikers on the narrow two-lane road. Fortunately, there were not too many on the road at the time when we drove through and we were at dockside in plenty of time to catch the boat. There were 'port-o-lets' at the dock. I mention this because there were not always ready toilet facilities along the way on our tour trips.



The boat to Barro Island turned out to be small with seating for only half of our group under cover. The rest of us sat up front in the wind and spray. But it was a fun trip racing west cross Gatun Lake and a bit north to reach the dock at Barro. It was an exciting ride, a treat. Some got pretty wet from spray but the breeze and warm air quickly dried their clothing.

Barro Island is the top of a high hill that was not quite submerged when water filled the valleys upon creation of Gatun Lake. The Smithsonian buildings are built on the hill up into the jungle. The island is a completely isolated 3,700 acres and is a little more than 7 square miles in area. The highest point is 476 feet.

Our first effort was to climb about a hundred steps up the hill from the dock to reach the reception building of the Smithsonian Tropical Research Institute.



Four Smithsonian researchers who were to be our guides during the visit welcomed us. They offered us coffee and donuts when we arrived.

The first thing we learned was that it is quite special to be granted a visit. Because they do not want their research work interrupted, they welcome only 10 visitors a day during five days in the week and about 30 each on Saturday and Sundays. Demand for visits is so great that reservations must be made six months in advance.

In a welcome talk we were introduced to the guides and an overview of the work going on at Barro del Colorado was presented. We were

shown a short video of birds and animals catalogued on the island. Then we divided into four groups to hike on trails on the island to learn first hand about life in the jungle.

We knew that there were no malaria or yellow fever mosquitoes in the Panama Canal Zone (we had not yet seen one single mosquito in five days), but were leery about walking in the jungle of the Barro Island despite the fact that it was in the middle of the Canal Zone Gatun Lake. We were pleasantly surprised to learn that the island, too, was mosquito free and thus free of those maladies.

Nevertheless, it was suggested that we put bug spray on our shoes and sox and on the clothing around our waists. This was to keep ants away from bothering us. Actually, we did not encounter any bugs or ants or flying insects while walking in the jungle and wondered afterwards if even that amount of spraying was really necessary.

The four groups were divided into those who would take a long, a medium, or a short trail walk. Seven of us - four women and three men, opted for the short walk and trudged off together. Despite the fact that we chose the short trail, we were three and a half hours on foot climbing and descending through narrow leaf covered paths among the trees and bushes of the real jungle. The paths had wood steps for the up and down climbs and sometimes even four-inch concrete blocks as steps along the way. Steep places had concrete steps with handrails.

We got off to a good start learning about the names of trees and bushes and seeing termite clumps and the like. But as we went along it seemed we were climbing, climbing, climbing. Those who wished took along a walking stick provided by Institute.



One of the ladies had trouble walking. Our guide, who was the most senior of the guides, used patience and kindness to help the lady along. She made frequent stops to lecture about what we could see as we moved along the trail.



The fact was, we did not get to see many birds (one woodpecker), few ground animals (two tiny poisonous South American frogs), and almost no insects (only a swarm of tiny non-threatening bees around their hive). We personally did not see any monkeys (the howling monkeys



were said to be in abundance). We did see a few bats sleeping under the eave of one of the buildings. The Kapok Tree was the most impressive tree we saw.

We finally came to a recreation building that was a hundred steps higher than the reception building where there was a small museum of recorded bird and animal sounds that we could listen to and a gift shop. We found it curious that the gift shop was way up the hill instead of in the reception building. Not everyone passed by the recreation building. It seemed be a quite out of place for a gift shop. Happily, we got a short rest there before continuing our hike.

Walking became such a problem for the one lady that our guide said we would head back to the reception building. Fine, we thought, because we, too, had enough of walking and climbing and seeing nothing. But it was another hour before we started our descent.



To our surprise, the final stage was to go down 193 concrete steps to the arrival dock and then to climb the hundred more up to the reception building over the same steps we had taken when we first arrived. The jungle was such a maze that it was really difficult to understand exactly where we were at any given moment.

The four groups were scheduled to be back to the reception building between noon and 12:30 p.m. Our 'short walk' group arrived back at 12:30 and waited for the other groups to come in. The long walk groups did see some howler monkeys, but little else more than what we saw in the short walk group.

Lunch was a hot dinner of broccoli soup, chicken, rice, vegetables, creamed potatoes, salad, bread, and a soft drink. Dessert was chunks of fresh pineapple. After lunch we watched two more videos of STRI Center work.

At 2:30, the boat took us back to the dock at Gamboa. This time it was a bigger boat in which all of us could sit under cover. We re-boarded our Pesantez Tour bus and headed back toward Panama City.



On the way we made a quick stop to photograph a gigantic crane the Canal Authority acquired from the Germans after WWII. It purportedly was used to lift submarines up out of the water for under hull maintenance. It was not clear to what use it was put to on the Panama Canal. It was painted red and white and stuck out in the sky like a sore thumb.

Then, like any tour around the world, our bus stopped at a souvenir shop building that was like a weekend flea market in the States except that it specialized in Panamanian folkloric things.

We got back to the hotel at 4:30 p.m. Dinner was on our own and we decided to eat again in the hotel at the Flamingo Restaurant rather than go out to unknown areas of the city. This time we ordered from the menu and discovered that the buffet was a much option for better quality of food. We ordered sea bass and were disappointed. We were trying to get away from the chicken-beef-pork that was on every buffet we had had up until then.

Day 6 - Monday, March 8, 2010

On Monday we were up and out in the hotel lobby by 8:00 a.m. to board our tour bus for an hour ride on Route North on the west side of the canal to visit an aborigine Embera-Wounaan Indian village.

The Indian village was located 20 kilometers - 12 miles - from the Gatun Dam that is on the west side of the Atlantic set of locks. The Gatun Dam was for many years the biggest earth filled dam in the world. Many of us yearned to see the dam and the great turbine generator hall. But it was not included on this tour.

We were that close to Colon, too, but that Atlantic canal entrance town is on the east side of the Canal and cannot be reached from the Route North. There is no general traffic crossing of the Panama Canal at the Atlantic end. The Panama Canal can be crossed at the Atlantic end only on a roadway that is built on top of the lock gates. A bridge structure swings into place with the lock gates and can be traveled only when the lock gates are closed.

There is presently a study underway by the government to figure out a way that vehicles can pass west to east and east to west over the canal at the Atlantic end. (Refer to an article from the January 25, 2010 issue of ENR Magazine titled, "Panama Canal Authority Sees New Canal Crossing").

The Atlantic side locks are a duplication of the Pacific side except all three locks are together on the Atlantic side. One could say that having seen the Pacific locks, to see the Atlantic locks would be more of the same.

Our bus took us to a river dock just off the Route North Highway that was close to our Indian village destination. We were obliged to cross a small river that was about 50 feet wide to reach the property of the Indian tribe. It was much ado about very little when we were suited up with life preservers and seated two by two in a small boat slightly bigger than a dugout canoe and made ready to go.



As this was the dry season, the little river was very shallow. It was so shallow that two of the tribe simply waded out up to their knees in the water and pushed the small boat across in a matter of minutes. They had two such small boats and one trip for each completed the crossing of all 32 of our group.



It was the first day of elementary school for the Indian children and a half dozen in their school uniforms crossed over with us to return home after a short morning orientation session on that first day. The kids crossed without life preservers. Later we would see those same children in their native Indian garb having packed away their white shirts and black pants and skirts and fine shoes and sox for another day.

One little girl who sat next to me on the boat noticed that the color of my eyes was different from theirs. The kids were charming in their shy manners. They pointed to their eyes and said 'black'

in English. I pointed to my eyes and said 'blue.' They said no, 'azur', in Spanish. So from then on they had black eyes and I had 'azur' eyes. They had not yet learned much English in school, which would be a third language for them. They spoke their native Embara or Wounaan language and Spanish.

After we landed on the other side of the river we handed in our life preservers while the kids scurried on to get back to their village to change clothes before we visitors arrived.

It turned out that these Embara-Wounaan people, about a hundred of them in 30 families, are in a difficult position. They came from the dense Darien jungle to the west of the Panama Canal many years ago. The Darien area is virtually an impenetrable forest. It is said there are 22,000 Embara-Wounaan most all of whom live in the Darien. The hundred we were visiting had migrated to the west side of the canal and lived as gypsies seeking refuge wherever they could find acceptance. Finally, they had found the present big acreage by the river that serves all their needs for fish as primary food with berries and fruit from trees as a supplement. The men in the group found work in the surrounding communities as any Panamanian would, which enabled them to fill out their needs.

But the land they settled on does not belong to them by deed. They are squatters. The land is provisionally a public park with a scattering of small farms for a few cattle and kitchen crops surrounding it. A big national beer company owns the land and wants them to move off. It is not clear what the beer company that also owns the land along the highway on the other side of the river wants to do with the designated park. The Indians have been helped by legal aid from a church, for they do not have enough money to engage in a big legal battle themselves. The outcome is not at all clear and the Indians live from month to month not really knowing what the outcome will be.



The Indians have one significant resource: The women of the Embara-Wounaan tribes are recognized as expert weavers of palm fiber baskets, trays, and small containers. Not only is their skill as weavers acknowledged, but also their craftsmanship in dyeing fibers to weave in the masterful designs on the baskets is widely respected.

It is unlikely that others will duplicate these skills, as the work is so tedious it takes a month to color the fibers and weave a basket. The result is that the baskets are quite expensive - \$60 for a dinner-plate size. Few workers in the world today have the patience for such creative and artistic endeavor.



The Embara-Wounaan people in this village have built a growing business of marketing the woven goods. They ship baskets to souvenir shops



around the country and have a shop on the park grounds of their village.

One can understand that they are ecstatic when a tour bus of curious foreigners visits their reservation. They no doubt anticipate a good sales day. For that reason, the Indians are very friendly and appreciative of the effort that visiting tourists have made to visit their tribe.



After our arrival and prior to lunch they presented native dances in a recital of their ancient customs that date back 400 years. The natives were dressed in their traditional skimpy clothing. The women apparently are not used to wearing covering on their upper bodies but accommodate modern day custom by wearing bibs. Nevertheless, the



women with babies nurse them as they sit in conversation with visitors. They all go barefoot. The men wear just a loincloth made of the fiber of a certain tree that gives the cloth some 'body.'



They are handsome people not at all difficult to look at and admire. In a way they resemble Polynesians that one sees in Hawaii. It is the body painting that sets them apart.



It was said that the body paint is not a tattoo and it wears off in a week or so when washed regularly. The designs were generally four-inch sided diamond shapes with some areas filled in solid.



Some of the young women speak English, as the law requires that young people attend school through the secondary level where languages are taught.



The people are genuinely kind, loving, gentle, pleasant and smiling not only to the visitors but among themselves. They are curious and helpful. Especially the children have great fun in charming the visitors - just like the black and the 'azur' eyes encounter.

Our visit included talks to us by the tribe 'elder' who was 32 years old. He was selected not because he was the oldest man but because he was a good negotiator to advance their cause to stay and live on the land. He spoke to us in Spanish and our tour guide, Theo, translated.

Theo, pronounced as a "T" followed by an "o" and is his nickname for Tiofilo, is of Negro descent from Jamaica, and the contrast with the members of the tribe was striking. He is tall and

robust. The Indians are short people with little indication of great strength. They are light skinned by contrast to Theo, but nevertheless brown to our Caucasian eyes.

The women of the tribe danced to drum and shell tapped rhythms provided by the men. The dances were rather simple - representation of vultures flying, eagles flying and the like. The little girls danced, too, representing butterflies.



They got many of the visitors in our group to dance in a circle with them. It was a little like a rhythmic conga line gently accented.

The United States has assigned a woman Peace Corps volunteer to help the tribe. She was not present the day we were there, but there was clear evidence of her efforts to help improve the living conditions in the village. For one thing, running water has been installed to a properly built and

secluded set of toilet stalls for use by tourists when present and by the villagers other times.

The Peace Corps worker lives in a house built on stilts (to survive the rising waters of the river in the rainy season). Stored under the small house was a gas powered lawn mower, a wheelbarrow, and bags of cement. The worker apparently is determined to build concrete pathways and foundations and to keep the constantly growing grass/hay down to reasonable height to help control the bug population that is endemic in Panama.



There was no sign of disease in the camp and it appeared that the success in keeping the Canal Zone free of malaria and yellow fever mosquitoes extended to this area, too. These days most people are vaccinated for yellow fever so that it is a disease of the past. Malaria is still a menace outside of the Canal Zone. I do not know how the Indians coped with that threat. In the dry season in the day- time in the hot sun mosquitoes are not active. It is at dawn and dusk that they fly. But this subject did not come up.

We toured the camp and learned a great deal about how the tribe lived. We learned that they have discovered over the centuries that certain leaves, bark, flowers, and fruit of some bushes and trees have medicinal benefits. They had a particular plant for each of a long list of maladies, many related to stomach upset.



After touring their site, they served us a delicious lunch of grilled Tilapia fish and corn 'bites' wrapped in palm leaves to be eaten hand held. We ate with our fingers. Fresh pineapple and watermelon was for dessert and soft drinks were offered.





We saw several Braham cattle and a horse on a small farm as we walked on the way to and from the Indian village. This little farm was not part of the Indian land. The ribs of the cows were all too evident and it was clear that such farm animals have a difficult time surviving in the jungle climate. There was also one Holstein cow that looked totally out of place. The farm was desolate.

We enjoyed ourselves at the village for about five hours and then crossed back over the river - all again life-vested with two Indian men pushing our small craft back across as they waded in knee deep water. Goodbyes were said all around.

The last bit of information was that the Embara-Wounaan village has a website to keep us posted on their progress in winning the right to stay on the land and to show us their latest woven fiber baskets: <http://www.elladruaembera.com>.



We were back to our hotel by 4:00 p.m. Members of our group were dropped off a few blocks from the hotel so that they could do some serious shopping at the finer stores in Panama that sell worldwide celebrated brands of goods.

There was no dinner provided for our group on the last three days of our trip, Sunday, Monday and Tuesday. Once again we opted to eat in the El Panama Hotel because it had the best restaurant we had encountered thus far.

We had dinner with two from our group in the Bar-B-Q restaurant of the hotel at poolside. We had a good meal, a fine time and hoped to meet with them again.

We discussed whether or not to go on the next day's trip to "Tour Gatun Lake", which to us seemed to be a replay of the boat trip to Barra del Colorado Island. But, being loyal to the program, we decided not to jump ship.

Day 7 - Tuesday, March 9, 2010

The outing for this day was a Tour of Gatun Lake by small boat. We left the hotel by bus at 8:30 a.m. and drove for thirty minutes to a small boat dock near Gamboa.

The dock we went to was not the main Gamboa dock. It was a small private dock much the same as one would see in the States where boaters can launch car-towed pleasure craft. It was on the bank



of the Chagres River just west of the Chagres River Railroad Bridge. There were no port-o-lets there and we had to wait another hour and a half before reaching our destination.



A covered high-powered outboard motorboat and a smaller outboard motorboat without a cover carried our group of 32. The bigger boat held 26 and the smaller boat the remaining six people. We embarked on a long boat ride criss-crossing the lake to see bridges, drilling rigs, and hillside groups of bulldozers and trucks cutting away to lessen a sharp bend in the canal route. Much of this we had seen on our ride to Barro del Colorado two days before.



The captain/owner of the two boats was our guide (although Theo, our regular guide went along, too). The captain told us many interesting things about the canal, again, much of what we already had learned in our previous guided tours.



We played hopscotch with a big oil freighter that was moving through Gatun Lake at a steady clip under its own power. Our small outboard boats could keep up with the big tanker and it was fun first to be behind, then along side and then to drop back cross over and catch up with the



other side. Splashing of the water over the small boat bow was less of a problem this day than it had been on the trip to Barro Island. Wind conditions seemed quieter.

Toward the end of the hour and a half ride, we came to a narrow passage along the shore that let us penetrate into the jungle. The sides of the bigger boat were rubbing against the brush on the sharply cut bank and the water depth there was only a couple of feet. After about a hundred yards in this narrow passage we came out into a small bay and there we saw a large houseboat, our destination.



The houseboat was actually two vessels anchored within four feet of each other and joined solidly side-by-side by gangways. The vessel side-by-side behind was a houseboat that the captain had sailed into place no doubt via another much wider access to the bay. Once in anchored position it served as the workboat from which the other vessel in front was constructed in place.

The two boats each had two decks. The bottom deck of the back vessel had an open bow with two chairs, a public toilet spaces at the stern for visitors. The upper deck on this vessel could be reached by a circular stair next to the toilets.

The upper deck was covered and set up with tables and chairs for dining room seating. helm cabin, the living quarters for the captain, and two public toilet spaces at the stern for visitors. The upper deck on this vessel could be reached by a circular stair next to the toilets.

The vessel behind was attached side-by-side to the front unit by short wooden bridges with handrails on the upper and the lower decks. The upper deck of the front unit was a continuation of the restaurant seating although with mostly wide open spaces for standing, a gift shop, and for several cages of birds, monkeys, and reptiles on display. The captain told us about the creatures during the visit.



The lower deck of the front unit was the arrival 'foyer' for the two houseboat units. It was there where swimmers, kayak enthusiasts, and fishermen arranged to enjoy those sports. A half dozen of our group elected to take out



the two-person kayaks for a self-guided tour around the houseboat and around a tiny island. One in our group went for a swim. Theo, our daily guide, went out in a very light aluminum canoe

and tried to fish but did not have any luck. He found the boat was very difficult to handle because it was so light.

Lunch was pleasant with grilled chicken, corn casserole, rice, lettuce, tomatoes, and cucumbers. Soft drinks were free and beer was sold.

The facilities of the houseboat included fresh water, refrigeration, kitchen appliances, a treated water waste system and electric lights. A gasoline operated generator provided electricity that was stored in a bank of batteries to operate the needs of the houseboat as needed twenty-four hours a day.



Another, tourist group came up to visit the houseboat shortly before we left. It was evident that the captain, an American from Texas, has a good business.

At 2:00 p.m. we departed on an hour and a quarter boat ride back to Gamboa. On the way we paused along side the jungle shoreline and saw capuchin and three other kinds of monkeys in the wild.

We were able to feed pieces of bananas to some tiny monkeys that came down the tree branches to eat from our boat rail. We saw sloth's sleeping in the trees, a crocodile, birds, and were told about many different trees.

Without a doubt the captain was both an entertaining and a well-informed guide. But we had already heard most of what he had to say. The trip would have been well worthwhile had we not already toured the Gatun Lake on our adventure to Barro del Colorado Island.



We reached the little Chagres River boat launch area at 3:15 where our Pesantez Tour Bus was waiting for us. One thing I must emphasize is that the Pesantez Bus was always on time, always waiting for us, and was first-class transportation in every manner. Bolivar, the driver, was most capable.

On the way to the Chagres dock in the morning at the beginning of this day, one couple had to stop the bus and take a taxi back to the hotel. They had left the safe in their room open with their passports and other valuables at risk. Happily, they found that nothing had been touched when they got back to their room.

This unexpected event allowed them to spend the day back at the Miraflores Visitors Center for more photos of ships transiting the canal and a chance to really study the excellent museum displays there. We had talked about skipping the Tour of Gatun Lake and doing something else. They got their chance.

Day 8 - Wednesday, March 10, 2010

This was our final day. Our airplane was scheduled for 4:00 p.m. takeoff. We could have gone shopping in the morning, but decided to just take it easy and enjoy the hotel. We enjoyed the wonderful breakfast buffet that carried us to the one-o'clock Pesantez car pick-up time to go to the airport.

At the airport, there were folks here and there from about half of our group who were waiting for their scheduled airplane departures. We said many goodbyes.

We had lunch at the airport because we were through security with almost two hours to wait for our plane to leave.

The flight home was smooth. The wait between planes in Miami was only a little over an hour, half the time of the wait there starting out on this trip. It was pretty chilly in Jacksonville when we arrived, got our luggage, and walked to our car that we had parked in the outside airport garage parking. Already we missed the balmy 76 degree F climate in Panama! We arrived home at 11:00 p.m. and all was well.

Observations about Panama City and the Canal

Panama City is considered the open mouth of the funnel that feeds illegal drugs to the United States. On Sunday, there were police checkpoints on every road out of Panama City. Policemen stopped cars and checked licenses and in some cases inspected the cars. But they were not around on other days perhaps because the traffic is so heavy on workdays the entire city would come to a stop.

The barricaded windows, doors, walls, and entryways everywhere were indicative of ravaged housing and most likely indicated a high rate of crime in Panama City. Razor wire was used extensively not only around businesses, but also on walls around private dwellings.

True, there were about twenty high-rise buildings under construction, but actual work was taking place on only a half dozen. Apparently the economic downturn has put a serious damper on the construction business.

Oddly, one high-rise building opposite our hotel had window air-conditioners in it. They were not modern room units with heat exchanger grills in the wall. They were old-fashioned a/c units mounted on the windowsills. Curious.

The tourist industry in Panama is in the infant stage. There was tourist industry run by Panamanians when the Americans owned the canal. It is only since the end of 1999 (say since 2000) that the business has taken root. Even now, it is Costa Rica that leads the tourist industry. Most people are booked to Costa Rica with a couple of days included for people to see the Panama Canal.

A curious thing about the airport was there was not one single newsstand in the place either before or after security. We couldn't figure it out. We could buy the Miami Herald in our hotel but no newspapers were on sale at the airport.

There are only two significant tourist companies in Panama today - Pesantez and one other. One difficulty they have is finding knowledgeable people for guides who speak fluent English. And there are only a few 'resort' hotels keyed to entertaining tourists. But such businesses will grow over time and flourish. There is nothing that competes with the Panama Canal!

Our IEEE group was made up of well-educated, well-traveled people many of whom were or had been university professors. They were all electrical engineers who had worked mostly with big companies such as IBM and General Electric. All were openly friendly and genuinely interested in the technical aspects of the Panama Canal. The wives, too, were very considerate and attentive on the tour. Happily, everyone got along well and happy conversation flowed easily.

There was no final dinner with all the participants in the tour, which would have been a nice way to wind up the trip.

Questions that Remain

There are a great many questions engineers might have asked about the canal but there were no lectures that would have brought out more technical points.

We did have the sincere help of Enrique Tejera, a Panamanian IEEE Member who is Division 7 Director for the Panama Canal Authority. He answered a great many questions on a one-on-one basis when asked. But the participants would have benefited from a group discussion.

- How do they keep jungle trash out of the under lock conduits and the locks?
- What is the 'to do' list when a lock is closed for maintenance?
- Do they send divers down to tend to the underwater gate valves and systems?
- What safety measures have existed and still exist to prevent a ship from crashing into the lock gates?
- Is there a corrosion problem with underwater canal elements or with elements that are alternately under the water and then in the open air?
- What are the present arrangements to assure sufficient water to operate the locks at full capacity during the dry season; and what will be the impact on the reserve of water when the new super ship locks are operating?
- How will the 'bathtubs' of water tiered next to the new super locks work to achieve a 60% efficiency in the use of water.
- We learned that some electricity that is generated in Panama does not come from hydro facilities at the Gatun and other dams or from the thermal generating plant in the province of the Panama Canal Authority. How is this electricity produced and what is the distribution breakdown of electricity canal operation and for consumption not related to the canal?
- We were told that the canal authority is converting the motor force that operates the locks from electrical to hydraulic. What are the details and to what extent will it change the original concept of the canal design?
- How many people are required to operate the Panama Canal, in what categories, and where have modern methods saved manpower hours and related costs?
- Is it true that when the Americans owned the canal they ran it at cost and the fees for transiting the canal were much lower than they are today? Are the Panamanians tempting loss of transits because they raised the rates?
- What is the economic impact of the canal on the Panamanian economy today? Is there a 'trickle-down' effect that will help lift the general population out of poverty?
- Why is it an economic advantage for some shippers to off-load containers at one end of the canal to be re-loaded on other ships at the other end?

No doubt there are a hundred more questions worthy of discussion. Inclusion of some lectures would seem appropriate for an IEEE Technical Tour.

Of course, wives might not be enthusiastic about such meetings. For that reason it might be wise to provide an alternative tour program for wives to follow in parallel with the schedule for engineers.

Conclusion

Without hesitation we grade the IEEE Panama Canal Tour an "A" and thank all the members who worked so hard to make it the grand success that it was.

Disclaimer

This compilation was prepared to help us enjoy the trip again and, in the years to come, to remind us of the good time we had. The writer is solely responsible for opinions, omissions, mistakes of fact, spelling errors and use of grammar. Corrections will be gratefully accepted to improve the contents.

Richard Chelius
Jacksonville, FL
March 26, 2010

SECTION 5: RECORD OF CONTINUOUS IMPROVEMENT FINDINGS AND SUGGESTIONS

Finding 1: The Tour participants were apprised of \$150 per person surcharge by the IEEE included in the Tour fee paid to Pesantez Tours, the amount being nominally ten percent of the per person, double occupancy direct cost of the Tour. It was explained that this amount was deemed sufficient to cover IEEE administrative costs, with any remainder being added to the Life Member Fund corpus. The participants appeared to feel that this was fair and suggested that the actual amount which might be a gift tax deduction for some participants (such as in the United States) be reported to them when accounting for the Tour has been completed.

Finding 2: The frequency of a tour, subject to access to all the sites, should probably not exceed two or three times per year. Creation of at least one new tour each year was felt to be desirable.

Finding 3: Vigorous promotion, with good promotion materials, of a tour is imperative and was deemed somewhat lacking for the Tour of the Panama Canal.

Finding 4: The quality of the hotel(s) on a tour should be moderately high—comparable to El Panama Hotel for the Panama Canal Tour—with a description of features (including address and telephone and fax numbers) and standard and special amenities in the tour brochure or an Internet link should be given to the hotel website where features and standard amenities are described. In the latter case the brochure should provide a description of any special amenities negotiated for the tour participants, such as included cost of an in-room Internet connection.

Finding 5: A tour without frequent moves from one hotel to another is not desirable. Participants on the Panama Canal Tour liked having just one hotel as a “home” away from home.

Finding 6: A number of participants on the Panama Canal Tour indicated they were satisfied with the Internet access through the hotel’s business center. Other’s found the in-room Internet connection was reasonably priced at \$7.00 for four hours over a 24-hour period.

Finding 7: Participants on the Panama Canal Tour were generally satisfied with having all meals except four dinners included in the Tour fee. However, there was some dissatisfaction with the quality of one or two of the three provided dinners. Also, there was an expressed wish for the dinners to have been spaced over the course of the Tour, such as first or second night, last night, and an in between night or two.

Finding 8: Participants on the Panama Canal Tour were generally agreed that they felt all tours should begin with a scheduled briefing session at the beginning—such at dinner or later in the evening of Day 1—the inbound travel day—or first thing on Day 2. There was an informally scheduled briefing for the Panama Canal Tour participants at 9:30 pm of Day 1, but unfortunately, a few people had not yet arrived.

Finding 9: Participants on the Panama Canal Tour very much wanted everyone to have a durable name card and felt this should be done on all future tours.

Finding 10: Tip and dress guidelines should be distributed to participants on a tour well in advance of Day 1. Tip guidelines should include tips for tour guides and tour drivers.

Finding 11: Participants on the Panama Canal Tour were generally satisfied in having to make their own flight arrangements—for money or miles. This permitted participants to make their own commitments to pre- and/or post-tour excursions.

Finding 12: Though participants on the Panama Canal Tour were able, where desired, to secure their own travel and/or tour insurance, they generally thought it would be nice if the travel agency providing future tours could also provide travel and/or tour insurance.

Finding 13: Participants on the Panama Canal Tour were generally agreed that the responsiveness of the Tour's designated agent at Pesantez Tours was somewhat less than satisfactory and a few felt it was not acceptable. Responsiveness needs to be address in agreements with future tour providers. On the other hand, Tour arrangements were widely applauded.

Finding 14: Participants on the Panama Canal Tour generally agreed that the length of their Tour was about right, but a number of the participants felt that Day 7 was somewhat repetitious of Day 5. They also felt that 12 days—week and a half—to 16 days—two weeks and a weekend—would be acceptable with more technical content, such as is anticipated on the pending tour of technology in Great Britain.

Finding 15: Participants on the Panama Canal Tour suggested that tour hotel rates should be locked in for some number of days before and after a tour to permit individually arranged pre- and/or post-tour activities.

Finding 16: Participants on the Panama Canal Tour suggested that there should be one or two open afternoons during future tours for personally arranged activities.

Finding 17: Participants on the Panama Canal Tour suggested for future tours that *get-to-know-me* materials and contact information should be gathered ahead of time from each participant and provided to all participants.

Finding 18: Some participants on the Panama Canal Tour suggested for future tours that alternate opportunities be offered—but not required—for accompanying spouses and companions who are not engineers.