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www.ieee.org/lmc

IEEE life members newsletter

contents

Grants, Tours, and LM Groups Galore

Luis T. Gandia, Chair, IEEE Life Members Committee

It has been my privilege to work with the Life Members Committee (LMC) this past year, and I would like to thank them for their support and hard work in conducting the business of the LMC. There are a few items I would like to bring to your attention.

Submission of Grant Requests: Due to the generosity of IEEE Life Members, the balance for the IEEE Life Members Fund (LMF) has increased in recent years. Since more funds are available for distribution, the LMC is taking steps to ensure that a greater variety of proposals are submitted to the LMC for consideration. To accomplish this goal, the LMC has consolidated the LMF/LMC grant proposal submission process with the IEEE Foundation process.

Under this approved process, there is one point of submission for grants (http://www.ieee.org/organizations/foundation/grants.html). Neither organization will accept proposals submitted in any other mode except in the case of a need for emergency funding or for renewal of ongoing projects. Any proposal submitted will be a candidate for either fund.

A joint grants committee consisting of representatives from the foundation and the LMC will evaluate the proposals and make a funding recommendation. The IEEE Foundation Board of Directors or the IEEE Life Members Committee will make the final decision regarding whether or not to provide funding.

We have implemented this process regarding the review of grant requests, and the LMC recently approved seven grant requests totaling over US$79,000 (see "Life Committee Announces Grant Approvals" on page 3).

LMF Incentive Recognition Program: The LMC has continued the LMF incentive program. Under this program, for a gift of US$100 or more to the LMF, an individual will receive a limited edition pewter coaster depicting an historic IEEE Engineering Milestone. The first of these engraved coasters depicted the TELSTAR IEEE Milestone, which represents the first transatlantic television signal that was sent via satellite in 1962. The second IEEE Milestone to be represented on a coaster will be the Panama Canal. Future Milestones to be recognized include the Bullet Train (in Japan) and the ENIAC Computer. See "Pewter Coaster to Commemorate Life Members Fund Support" on page 5 for more information.

Life Member Technology Travel/Tours: The LMC plans to offer an IEEE-sponsored travel program for Life Members. The focus of these tours would be an IEEE Historical Milestone or a similar attraction that is of interest to IEEE Life Members.

The LMC has approved the implementation of the Life Members Technical Tour Program. The initial schedule of this tour may include the Itaipu Binational hydroelectric power plant, the world's largest power producing project. This Furnas substation is where 50 Hz power is changed to dc and sent by UHV lines to Rio de Janeiro and Sao Paulo, Brazil, where it is then changed to 60 Hz ac. Additional arrangements may also include a visit to the Bariloche Foundation, an R&D organization and university in Argentina. Cultural visits will be made to other popular locations in Brazil, Argentina, and Chile. Depending on the success of the pilot program, additional trips/locations may be offered and technical tours could be expanded upon. The LMC will also contact local Life Member Groups to encourage their participation in the program. This tour may be offered in October 2009 or later. More information on this program will be provided in 2009.

Life Member Groups: The LMC has

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conducted an ongoing program to establish Life Member Groups to encourage Life Members to take an active part in local IEEE Sections. A total of 54 groups have been formed. I would like to congratulate the following Sections for forming a Life Members Affinity Group in 2008:

Region 1 – North Jersey Section
Region 2 – Cleveland Section
Region 8 – Croatia Section
Region 9 – Argentina Section
Region 9 – Colombia Section
Region 9 – Panama Section

Visit the LMC Web site (http://www.ieee.org/lmc) if you would like to see a complete list of Life Member Affinity Groups and for information on how to form a group in your local area. If your unit has a Life Members Group, we would be interested in receiving feedback on your thoughts regarding the following questions:

- What is the role of a Life Members Group in your local Section?
- Do you consider your Life Members Group a success? If so, how do you measure the success of your group?
- What are the challenges you are facing?

Please send your comments to life-members@ieee.org.

Life Members Elevations: Effective 1 January 2009, an additional 2,294 members will be elevated to Life Member status. Individuals who are being elevated to Life Member status have received a letter and certificate from the IEEE president. I would like to thank all Life Members for their many years of service to the profession.

IEEE Sections Congress in Quebec Produces Largest Turnout

The Member and Geographic Activities (MGA) Board partnered with Region 7 and the Quebec Section to host Sections Congress 2008 in Quebec City, Quebec, Canada, 19–22 September. This was the largest Sections Congress ever, including 1,072 attendees from 89 countries representing 293 Sections.

The Life Members Committee (LMC) had an exhibit table at IEEE Sections Congress. We used this event to broaden the awareness of the LMC and its programs. In addition to setting up an exhibit table and providing brochures, LMC members participated in breakout sessions, reminding the Sections Congress delegates on how they can make use of Life Members as an important resource for the Sections. Key messages communicated to all Sections delegates expressed the following:

Active and engaged Life Members are a key component to the success of the IEEE in local IEEE activities.

- There are over 25,000 Life Members and many of them have the skills and time to contribute to your local activities.
- IEEE Life Members Affinity Groups can play a key role in the local activities.

IEEE Sections and Chapters would be able to conduct more or improve current programs/projects if they were aware of the funding available through the IEEE Life Members Fund.

- The LMC wants to help your unit by serving as a catalyst and providing seed money to units that have an interest in creating programs and projects that will make a lasting impression on electro technology and related fields.

Increasing the contributions to the IEEE Life Members Fund will benefit your unit, the individual member, and the public.

- Units will benefit since more funds would be available for projects.
- Individuals will benefit since they would get greater satisfaction in knowing that the funds they contribute are being used to support the IEEE mission. Additionally, U.S. Members receive a tax benefit.
- The public will become more aware of the value of electro technology in their lives since more programs can be conducted.

You can access the material presented at Sections Congress 2008, find updates on the recommendations prioritized by the delegates, and view pictures of the events on the IEEE Sections Congress Web page (www.ieee.org/sc2008). The following video highlights from the IEEE Sections Congress are available via IEEEtv:

- Sections Congress Highlights: Inspire, Enable, Empower, and Engage
- Sections Congress Opening Highlights
- 2008 Honors Ceremony Program
- Profile of 2008 Medal of Honor winner Gordon Moore
- IEEE Presidential Panel Section: The panelists, all IEEE presidents—past, present and future—explained why they joined the IEEE and the impact participating in the IEEE has had on their careers.

IEEE Sections Congress in Quebec featured 293 Sections.

Life Members that have donated US$50 or more to the Life Members Fund will receive a pin in accordance with their membership grade. Limit one pin per IEEE Member.

Life Members Committee Announces Grant Approvals

The Life Members Committee (LMC) is pleased to announce that it will support the programs in the following areas of interest:

Potential Young Electrical/ Computer Engineers

- Podcast Community Outreach. The US$4,800 provided to the Woodbridge Township, New Jersey, middle school will teach middle school youth students to create video podcasts (short digital computer movies) that promote local community groups and their causes. The project teaches technology skills to young people and shows them how to use those skills to benefit their community. The podcasts will be made available via the Web site, schools, volunteer directory, and through the Web sites of the participating groups.
- Patriot Learning Center Middle School Robotics Lab. The US$2,800 provided by the LMC will support a project that introduces 6th, 7th, and 8th grade students to the engineering process by providing a curriculum focused on developing a space mission at the Patriot Learning Center in Falcon, Colorado. The focus of the project is to develop interest in science and engineering through interaction with LEGO MINDSTORMS, microcontrollers, and AGI Satellite Tool Kit software. The students will develop a space mission plan, design a robotic sensor, and then build and test the design. Learning how engineers use math and science to solve problems is the intent of the project. The Falcon area has many technical professionals working in the space arena that are invited to be guest speakers. The ultimate goal is to spark interest in engineering so students are more likely to choose math and science studies.
- Technology Poster Contest. The US$6,000 provided by the LMC will engage Washington, D.C. and Northern Virginia area high school students in technology-inspired innovative competition in preparation for college. Students will learn about technology, enhance skills such as time management, and explore innovation. The IEEE Washington and Northern Virginia sections will participate to stimulate activity in community service and inspire prospective college students to consider careers in science and engineering fields. The measures of success will be the number and quality of student entries, member participation, and increased community awareness of the IEEE.

Professional Development, Young Electrical/Computer Engineers:

- IEEE Student Branch Eindhoven Study to China. The US$2,000 provided by the LMC will assist the electrical engineering students from the IEEE Eindhoven Student Branch to visit industry/companies in the electrical engineering branch as well as a number of significant sites and institutions in the cities of Beijing, Shanghai, Hangzhou, and Hong Kong. This cultural aspect is one of the major focuses of the trip, as it will help prepare the students for their future careers in the industry by giving them an insight into a culture they will undoubtedly come into contact with during their professional careers.

History of Electrical/Computer Engineering

- Conference on the History of Technical Societies. The LMC agreed to provide US$20,000 in support of the 2009 IEEE Conference on the History of Technical Societies, which will take place in Philadelphia 5–7 August 2009 at the University of Pennsylvania, Drexel University, and the Franklin Institute. The theme of the conference is the history of professional technical associations. The conference will bring together members of engineering societies and historians of technology. The conference will benefit the engineering profession by increasing communication among diverse engineering societies, raising awareness in those societies of the value of history, facilitating communication between the engineering community and the professional historical community, and increasing the awareness among the general public of the importance of engineers and their organizations in the building of the modern world.
- Science Shapers Speak, Online Interviews with Icons of Science. The LMC agreed to provide US$4,400 to the Center for Science Writings (CSW) of Stevens Institute of Technology. This funding will support the creation of an online audio and text archive of interviews with major figures of 20th century science and technology. Called "Science Shapers Speak: Online Interviews with Icons of Science," this free, open-access archive will consist of in-depth interviews with scores of historically significant technological and scientific figures that were previously tape recorded over the past two decades. Many of these figures rarely granted lengthy interviews, and some have passed away. These interviews represent a unique educational and scholarly resource for historians, philosophers, sociologists, and other scholars specializing in science and technology; for teachers and students in science-related courses from high school through graduate school; for scientists and engineers interested in the history of their fields; for science and technology journalists; and for lay people interested in science and technology.
- IEEE Presidents' Change the World Competition. The LMC agreed to provide US$39,000 in 2009 to support the IEEE Presidents Change the World Competition. This student-focused competition is designed to inspire new discoveries that will better an entrant's local community or the global community through the use of a student's leadership, scientific, and technology skills. The student must identify a problem, create a solution, and implement the solution. This competition is open to individuals and teams alike. The leader of each team or the individual entrant must be an IEEE Student or Graduate Student Member.

The inaugural year of the competition has already generated over 45 registrations with the majority of entries coming from outside the United States. Entries will be accepted 1 September 2008 through 28 February 2009. Regional Student Activity Chairs will assess the entries and identify the top 50. Those 50 will be brought to a global panel (appointed by the IEEE president), which will narrow the finalists to the top 15. The top 15 will be brought before the IEEE presidents for consideration. The top three finalists will be identified, and a representative from each team will be offered the option to attend the IEEE Honors Ceremony where prizes will be awarded. The top 15 will be posted to an online voting Web site so that the public and members will be able to vote for a people's choice winner. The initial launch of the IEEE Presidents' Change the World Competition has been scheduled with the IEEE's 125th Anniversary program but will be continued in the years to come.

IEEE Global History Network Looking for Input

All IEEE Life Members are invited to visit the new IEEE Global History Network (GHN) to share their experiences in developing the products and services that have changed the world. Introduced at IEEE Sections Congress 2008, the GHN is prepared to chronicle historical information from individuals, groups, and organizations to become the premier public record for preserving and interpreting the history of technological innovation.

The GHN was developed through the IEEE History Center and is the Web site for historical activities including milestones, oral and video histories, and other history programs. The GHN provides the author of a historical experience with both the ability to determine who may edit the material shared and the ability to classify their experiences for access by others, including the public. A joint-authorship feature allows members of a group, such as a research and development lab design team, to join together to share their experiences.

This feature will also allow IEEE organizational units to preserve and present their heritage. To see if your Section is listed on the Web site, you have two options: type the name of the Section into the Search box or, under the Topics browse list, look for IEEE and the appropriate subcategory (Sections).

You are also encouraged to participate in the building of a Wiki-style article about the history of a technical area of interest to you or contribute to the history of one of your organizational units.

The GHN provides immediate authoring access for IEEE Members using their IEEE Web account (username/password). There is a registration process for nonmembers. Please visit www.ieeeghn.org and share your experiences in developing our technologies.

IEEE Launches memberNet Online Directory

The IEEE has launched an online member directory designed to encourage peer-to-peer networking within the IEEE membership. memberNet is the first step in a series of next-generation capabilities that will encourage virtual collaborations between members with similar technical interests, regardless of geography. While the basic member profile in memberNet contains every member's name and membership grade, each member can indicate what additional information they would like to appear. This may include technical interests, local Section, or IEEE Society affiliation. The memberNet directory, and its opt-in management, is accessible from myIEEE (http://www.ieee.org/myieee). For more information about IEEE memberNet, visit http://www.ieee.org/membernet.

Celebrate IEEE—125 Years of Engineering the Future

In 2009, the IEEE will commemorate 125 years of fostering technological innovation and excellence for the public good. Although 13 May 2009 is IEEE's official anniversary date, based on the founding of the American Institute of Electrical Engineers on 13 May 1884, the "Engineering the Future" celebration will include a year full of activities, events, and the first IEEE Presidents' Change the World Competition for students. All IEEE groups are being encouraged to take part by using the anniversary mark throughout the year and by planning their own celebrations and publicizing them on the calendar found at ieee125.org.

Some of the IEEE 125th Anniversary activities will include the following:

IEEE Presidents' Change the World Competition: The competition is open to college and university students who demonstrate excellence in the design and implementation of technology that solves a challenge for the benefit of humanity. The competition's goal is to recognize and reward individual students, or teams of students, who identify a real-world problem and apply engineering, science, computing, and leadership skills to solve it. Submissions are being accepted from 1 September 2008 to 28 February 2009. The winning submission will receive US$10,000. Additional prizes are US$5,000, US$2,500, and up to six US$1,000 awards. Those selected for the top three prizes will be invited to accept their awards in person in June 2009 at the Annual IEEE Honors Ceremony. Funding for prizes and student travel is being provided through a grant from the Life Member Fund. (Additional details and competition rules can be found at ieee125.org.)

IEEE125.org: The focal point for all IEEE 125th Anniversary activities, ieee125.org keeps visitors abreast of how the IEEE is celebrating this momentous milestone. The site contains a multimedia center for uploading congratulatory messages, videos or photos, commemorative vignettes from well-known influencers, members, staff and customers, an interactive calendar of events, and materials to help individuals plan and host their own celebratory activities. The anniversary mark can also be downloaded from the site.

IEEE Engineering the Future Media Roundtable: IEEE members and technology notables will address emerging technologies that they believe will have world-changing implications during a media event scheduled for 10 March 2009 in New York City. The event will celebrate IEEE's anniversary year and facilitate an open dialogue among some of the most respected names in the engineering and technology sectors.

IEEE Global Engineering the Future Day: 13 May 2009, the IEEE's official anniversary, is being designated IEEE Global Engineering the Future Day to help increase technology awareness and advancements around the world. It also encourages the public to recognize the impact technology has on their every day life and promotes continued innovation to create positive change.

IEEE Global Engineering the Future Series: A series of eight events celebrating the IEEE's 125 Years of Engineering the Future will take place in major world cities throughout 2009. Host cities include Austin, Texas, USA; Bangalore, India; Beijing, China; Boston, Massachusetts, USA; London, U.K.; Munich, Germany; San Jose, California, USA; and Tokyo, Japan. In addition, local celebrations and anniversary activities will be conducted by IEEE groups around the world.

For More Information: Detailed and regularly updated information about the IEEE's 125th Anniversary is available at www.ieee125.org.

Deadline for Submission of Grants Requests

The IEEE Life Members Committee (LMC) is committed to responding to the need to recognize engineering achievements, to support education at all levels, and to help support special projects including education and information exchange efforts, the IEEE History Center, and the IEEE Awards program.

The intention of the LMC is to be an advocate and supporter of programs that reflect the breadth and range of the engineering field and to make a significant, positive, global impact on the profession. To be considered for funding by the LMC, a project should have a clearly defined objective and usually supports the following primary areas of interest:

- young electrical/computer engineers
- potential electrical/computer engineers
- IEEE Life Members
- mature IEEE Members not yet qualified for Life Member status
- history of electrical/computer engineering.

The 2009 deadline for submitting a grant request to be considered by the IEEE Life Members Committees are:

Monday, 5 January 2009
Friday, 24 April 2009
Friday, 11 September 2009.

Please visit the LMC Web page (www.ieee.org/lmc) for more information.

Pewter Coaster to Commemorate Life Members Fund Support

Individuals who donate US$100 or more to the IEEE Life Members Fund (LMF) from October 2008 to September 2009 will receive a Life Members Pewter Coaster as a thank you gift. The 2009 limited edition pewter coaster will commemorate the Panama Canal Electric and Control Installation, 1914, as an IEEE Milestone. One coaster will be given per donor, per year.

This is the second in a series of coasters depicting various IEEE Milestones. The 2007 coaster depicts the TELSTAR IEEE Milestone, which was the first transatlantic television signal sent via satellite in 1962. The TELSTAR coaster was offered to donors in recognition of contributions received through September 2008. A total of six coasters are planned. The coaster program runs in addition to the IEEE Life Member Pin program, which recognizes IEEE Life Member gifts totaling US$50+ to the IEEE LMF (one pin per Life Member).

If you make a US$100 or higher gift today to the IEEE LMF by visiting www.ieeefoundation.org and clicking on the "Donate Online" button, you will receive the coaster depicting the Panama Canal Electric and Control Installation IEEE Milestone. Coasters will be distributed in January 2009.

2009 Membership Renewal Notice

The IEEE 2009 Membership Notices have been distributed. If you haven't already done so, please return the renewal notice as soon as possible. A prompt response to the renewal notice will ensure that you continue to receive the benefits of your IEEE membership.

The benefits of IEEE Life Membership have remained the same. The base membership dues and assessments continue to be waived for IEEE Life Members. Additionally, an individual who possesses not less than five years of society or IEEE Standards Association (IEEE-SA) membership, immediately prior to attaining Life Membership, or completes such five-year period of membership while a Life Member, may continue a Life Membership in such society or IEEE-SA, respectively, with dues waived. Life Members, as determined by the conference organizing committee, may receive a reduced member rate at IEEE sponsored conferences.

An individual who is retired, and at least 62 years old, may apply for a 50% reduction in dues, assessments, and society publications, but Life Members are not eligible to receive this discount. This policy (IEEE policy 16.3) includes subscriptions to IEEE society magazines and journals not covered under the basic society dues or IEEE-SA dues. Once a Life Member maintains membership in a society for five or more years, they are eligible to maintain this membership without payment.

As part of its 2009 activities, the IEEE Life Members Committee will be discussing IEEE Life Member benefits. If you have questions regarding your IEEE membership renewal, please visit the IEEE Contact Center at www.ieee.org/web/aboutus/help/contact.

Take Advantage of the IRA Charitable Rollover Extension

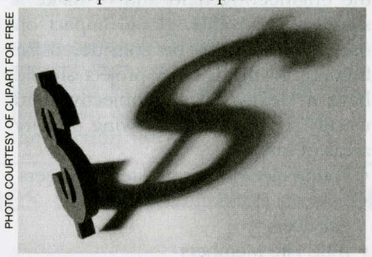
Karen Galuchie, IEEE Development Office

The Individual Retirement Account (IRA) charitable rollover provision originally created by the U.S. Federal Government in 2006 has been extended through 2009. The "rollover" provision permits U.S. taxpayers, age 70 1/2 and older, to make tax-free charitable distributions up to US$100,000 in both 2008 and 2009 from their IRAs directly to eligible charities, such as the IEEE Foundation. Charitable distributions from an IRA are excluded from federal income taxes and can be used to satisfy the annual IRA required minimum distribution (RMD).

While you consider this opportunity, remember that IRAs are among the most heavily taxed assets if they remain in your estate upon death. If left to a beneficiary other than your spouse, a combination of estate taxes and state and federal income taxes can take 60% or more of the retirement accounts, leaving little remaining for heirs.

How to qualify for the IRA charitable rollover:

- Donor must be age 70 1/2 or older
- Distributions of any amount up to US$100,000 are allowed in both 2008 and 2009 (gift must be received by 31 December of each year)
- Couples with separate IRAs can each gift up to US$100,000
- Gifts must be transmitted directly to the IEEE Foundation from the IRA plan administrator
- Gifts may be applied to satisfy RMD
- Only IRAs are eligible; 401(k) and 403(b) are excluded from this opportunity
- Gift will be excluded from taxable income
- Donor will not receive a charitable income tax deduction for the gift
- A gift receipt from the IEEE Foundation is required to substantiate a charitable IRA distribution.



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To make a gift to the IEEE Life Members Fund, contact your IRA manager and direct them to transfer the funds to the IEEE Foundation. Instruct your IRA manager to make the gift payable to the "IEEE Foundation—IEEE Life Members Fund." To receive proper acknowledgement for your gift, be sure to share your intentions with Karen Galuchie from the IEEE Development Office, by telephone at +1 732 562 3860 or via e-mail at k.galuchie@ieee.org. If you have any additional questions, please contact Karen Galuchie.

The IEEE Life Members Fund (LMF) is one of the 120+ funds administered by the IEEE Foundation. The LMF supports educational and professional projects that interest IEEE Life Members and reflect the breadth and range of the engineering field and make a significant, positive, global impact on the profession.

The IEEE Foundation is an organization qualified under U.S. Internal Revenue Code 501(c)(3). Its U.S. Employer Identification Number (EIN) is 23-7310664. Mail checks to IEEE Foundation, 445 Hoes Lane, Piscataway, NJ 08854 USA.

The information in this article is for educational purposes only and is not intended as legal, tax, or investment advice. If you are considering a planned gift to the IEEE Foundation, we highly recommend you consult with your own tax and legal advisors to determine the best options for you.

Life Members Show Potential(s)

Current Life Members Committee members Arthur Winston and Lyle Feisel were featured in recent issues of *IEEE Potentials* magazine, providing insight to students regarding their first professional experiences as a part of the "My First Job" ongoing column. Winston spoke of his time at Schlumberger in the September/October 2008 issue, while Feisel focused on his work at the Collins Radio Company, Honeywell, and in academia in the November/December 2008 issue.

Life Members interested in contributing future "My First Job" columns for *IEEE Potentials* should e-mail potentials@ieee.org for more details.

The November/December 2008 issue also featured a story on Life Senior Member Jack Salin. In remembrance of Pearl Harbor Day on 7 December 1941, Salin recounted his service in the U.S. Navy during World War II and how it served as a springboard to his engineering career. You can read about Salin's recollections of working as a project engineer assigned to the Navy's AN/APS 4 (ASH) radar project in "Rising From the ASHes" on page 9.

A reserve officer in the U.S. Navy, Salin was called to active duty in 1943 and sent to Washington, D.C., where he worked with the radio division of the Bureau of Ships in its airborne section.

Flavor of the Weak

As a new graduate in my first job, I was once given the following "tongue-in-cheek" advice from the chief engineer: "John," he said, "If you are ever confronted with a marginally tolerable shortcoming in your product that is inherent in its design and cannot be adequately fixed, try and find a way to turn it into a feature."

As an example, he told me that during World War II he had worked as a project engineer on the development of a state-of-the-art, double superheterodyne military radio receiver. The performance of the equipment was superlative except for one problem—the two local oscillators in the receiver interacted to produce a squeal whenever the receiver was tuned to one specific frequency. It was inherent in the design, and no way could be found to suppress the squeal.

Pondering the disaster that faced him, he suddenly conceived a way out and instructed his technician to place a red line on the tuning dial at the frequency where the squeal occurred. He then added a note in the instruction manual explaining, "Frequency Calibration—To verify frequency calibration, check for a squeal at the red calibration mark on the tuning dial." This unique calibration feature was offered at no additional cost, and the military procurement agency was delighted to accept it.

Since then I have noted many instances where the features that were advertised for a product tended to highlight shortcomings that might or might not have been properly corrected. For example, I once owned a vehicle that developed a potentially dangerous steering shimmy when driven on unpaved roads. Advertising for the next year's model featured the inclusion of a steering damper purported to greatly reduce driver fatigue. In reality, the front-end design of the vehicle was such that even with a steering damper, the performance on unpaved roads was only marginally acceptable. It might also be noted that a cigarette company once advertised with the slogan "not a cough in a carload."

In the future, whenever you see an advertised feature, try to consider whether it might actually focus on an area of potential weakness in the product.

John D. Dorey, LM
Westmount, Quebec, Canada

Do you have personal, historical, or humorous engineering experiences to share? We would like to hear from you. Please e-mail your stories to lm-newsletter@ieee.org for inclusion in "Tales from the Vault."

How Not to Test a Pressure Vessel

Roger Richesson's tale "The Giant White Frog" (*IEEE Life Members Newsletter* December 2007) about how otherwise intelligent engineers can forget their basic studies into the properties of undamped spring-mass systems triggered the following memory from my own career. In this one, a group of otherwise intelligent test engineers apparently forgot about the perfect gas law. You remember. The one that goes: PV=nRT.

In the early 1950s, I worked at the Dynamic Test Laboratory of Convair, San Diego. Our building was a high-rise steel framed structure with corrugated tin siding and large barn door-like openings to the outside (fortunately, as it turns out). One day, a group of test engineers were proof-testing a new design for a large and very light pressurized CO_2 vessel in an adjacent test bay of about 2,500 square feet. Apparently, they wanted their test to be as realistic as possible, so they were pressurizing the unit under test with actual CO_2. Suddenly, we heard a loud explosion followed by a prolonged hissing sound. We ran to see what had happened and found to our amazement that the entire test bay was filled to a depth of about seven feet with the thickest pea soup fog bank we had ever seen. As we watched, we saw heads repeatedly pop up above the fog, frantically take a breath, and disappear again. I must confess, for a second or two I thought, "How hilarious." Fortunately, it quickly dawned on us that the place was filled with unbreathable CO_2 gas and the testers could suffocate. The rapid pressure release had turned it icy cold, hence the fog. People on the outside quickly began opening the large exterior doors, whereupon the fog flowed out like whipped cream and the testers could breathe again.

The moral of the story: Never, never, never test a pressure vessel with a compressible gas. Use only a nearly incompressible liquid such as water. Then, when the vessel fails (not if—Dr. Murphy yet lives, remember), the pressure immediately drops to ambient, a small amount of liquid leaks, and no further damage is done. I'm sure those involved in this ill-fated adventure remembered that lesson the rest of their careers. I can assure you I did.

Thomas I. Kirkpatrick, LM
Half Moon Bay, CA

**Interested in making a secure online gift to the IEEE Life Members Fund?
Visit www.ieeefoundation.org and click on the "Donate Online" tab.**

Rats All Folks

In the spring of 1945, I was a radio repairman with a radar outfit (1st Platoon, C Company, 568th Signal Aircraft and warning Battalion, 7th Army Air Force) whose radar and communications were set up atop the 500-ft Mount Suribachi on the southern end of the island of Iwo Jima. Since the Marines had "secured" the island several weeks earlier, and the Army was engaged in routing out the last defenders far to the north end of the island, we had no concern, except to stay on the air 24/7.

The equipment was well built and failures were relatively few. Troubleshooting was routine and the component laden chassis of the receivers were liberally coated with a fungicidal varnish that made the removal and replacement of faulty components a messy and time consuming procedure.

One night I was awakened and told to look at one of our transmitters that failed. I took a Jeep from the motor pool and drove to the top of the mountain to our transmitter shock (the road was another great example of what those "can do" seabears were capable of). There was no one around, the operators were at a different location, but I easily found the inoperative transmitter (BC610, which I think in another life was a Hammerland HT4). It had a pair of HK54s as power output tubes—about this time stupidity set in (probably because I was anxious to get back to my tent), so I decided on a short cut. I suspected a loss of plate voltage to the HK54s and I had a long screwdriver with a very heavy wooden handle, which I felt would give me plenty of insulation, and decided to tap down on the plate relay. With my left hand on this cabinet frame and thumb pushing closed the interlock, I tapped the relay. Not a good idea! To this day I don't know if I was out for one minute or 10 minutes, but when I recovered my senses I checked out that screwdriver. It did indeed have a substantial handle but the metal shaft went completely through it, right into the palm of my hand. I finally settled down and with more conventional (and softer) procedures, eventually got the transmitter back in the air and worked my way down the mountain.

About this time we had a problem with rats running through the area and tents at night. My solution was to affix to a 2-foot square piece of plywood, two bare wires spaced an inch apart, in a concentric spiral toward the center of the board. The end of each wire was attached across the high voltage secondary of a transformer I liberated from our spares. The idea was that, with a scrap of food at the center, the rats would electrocute themselves as they crossed and shorted out the wires. In theory I still think it was a great idea but after a week of "no takers" we finally figured out that the sensitive whiskers on the rats probably detected the high voltage electric field long before they got close to the wires.

In the early 1940s RCA introduced a set of miniature 1.5 V receiving tubes (IR3, IT4, &155, as best I can remember). I had built a small super-regenerative receiver with this and, with a 45 V battery for plate voltage, it gave a very good headphone performance. I had this little set with me on this island and often picked up XGO in Shanghai, some Tokyo stations and, of course, Armed Forces Radio (AFR), which boomed in, probably broadcasting from Hawaii. AFR played a lot of country music, i.e., the "Wabash Cannonball." One of the fellows in our outfit played it long and loud, far into the night. When this got to be too annoying I tuned in my little set to the AFR frequency and then increased the feedback into annihilation. This wiped out the AFR signal with a loud squeal, and he soon turned his set off. I didn't try this too often; our tents weren't too far apart and he was a pretty husky fellow, so it was a good thing he didn't suspect me as the culprit.

The war soon wound down, and in the following months we cut back on airtime and finally shut down and headed home.

My three years in army communications helped me get my first post-war job with Sylania's Advanced Development Labor on Long Island, New York. After seven great years there I enjoyed a different but equally satisfactory 37 years with the Electronic Industries Association. I'm ever grateful that the two rats didn't cooperate or I might have entered the extermination business!

Jean A. Caffiaux, LSM
Silver Spring, MD

Search and Destroyers

In October, 1942, Richard Carpenter and I were assigned to the G.E. Research Lab to work for Dr. Kingdon and Dr. Polloch in designing and building a device to enable the attack control officer (ACO — my name for him) on a destroyer to direct the ship to an enemy submarine, where depth charges could be dropped on it. At this time, the sonar operator had to give the officer directions as to the location of the sub so he could direct the ship to its location, which was inefficient and time consuming.

We had a machine ready by the time the U.S. Navy had scheduled tests with a tame sub out of New London, Connecticut. G.E. was one of four companies competing for a contract at this time. By the end of December, G.E. was designated the winner, and Richard and I were assigned to the Works Lab in Pittsfield, Massachusetts, to build 35 units and install them on destroyers and destroyer escorts while Bridgeport, Connecticut, set up a production line.

We were given a room and G.E. hired about 40 women to assemble the electronic units for the machines. Richard and I had to train the women to read electronic blueprints and to make proper solder joints. Richard and I would assemble the machines and test them for problems after which they would be shipped to a naval port where Richard or I would go and install it. I was quite proud of those women—in testing those 35 machines we never found a single problem with one. Those women were extremely careful to do a good job.

Incidentally, our machine plotted the course of the ship and of the submarine on a 12-inch CRT, which allowed the ACO to know exactly where the sub was, as well as how his ship was headed, so he could plan his attack without having to figure the directions in his head. None of the companies used a CRT in their machines, which is why the Navy chose us as the winner.

Grafton Clarke, LM
Grand Junction, CO

Rising From the ASHes

During World War II, I was in the Navy working as a project engineer assigned to the AN/APS 4 (ASH) radar project. The radar system was hung primarily on the wings of search planes, so there would be bombs housed beneath one wing and the radar set on the other. The ASH radar group was not concerned with targets—another group handled tracking radar for fighter planes, which contained conical scans that more accurately detected the deviations from the way the plane was flying to the location of the target.

One time, the aircraft carrier USS Hancock set sail from Norfolk, Virginia, and, as was habit, it flew the aircraft squadrons out to meet the carrier once it was already at sea. There were 15 ASH-equipped planes on that day. When the first radar-equipped plane came in and landed, the radar—which looked like a bomb—bounced off of the plane, rolled off the deck and went overboard. The next plane came in and did the same thing. Well, the planes didn't have any extra fuel to go back to the mainland so each and every one of the 15 landed and every one of the radar systems bounced off.

The airborne division of the Navy was a pretty hot place the next morning. I went to work and couldn't imagine what in the devil had happened. Basically, the housing wasn't strong enough to hold the radar to the wing during the aircraft's landing. The jolt was just enough to detach it.

There was an admiral on the aircraft carrier that practically flew off the thing without a plane to go back and let us know about the problem.

Jack Salin, LSM
Whiting, NJ

Circuit Training

During the first half of the 1960s, Philips Telecommunication in Hilversum, The Netherlands, developed a fully electronic public telephone exchange, which came into test operation in Aarhus, Denmark, and Utrecht, The Netherlands, from 1967 to 1973. The control was electronic (as in the simultaneous Morris exchange by AT&T) as well as the speech paths through the exchange, which were based on Germanium pnpn thyristors.

I was stationed in Hilversum by Philips Copenhagen from 1961 to 1963 (framed by the presidency of John F. Kennedy) to develop the interface to the existing exchanges in Denmark. These circuits contained many relays, and we kept the interface electronics-relay circuits in our own hands—no external inductive spikes to our electronics, thank you!

The subscriber circuit contained, in addition to the transformer between the balanced pair to the user and the unbalanced speech path through the thyristors (with earth as a common return), four ring-shaped ferrite cores, 2.5 mm in outer diameter. They were the M1, which was set by the user loop current and read by the control. M2 was set by the control whenever M1 gave an output and read by the control. M3 was set by the current through the thyristors (indicating that control of the user was transferred to a common connecting circuit) and read by the control (an output would cause the control to ignore possible signals from M1 and M2). Finally, M4 was set by the user loop current, read by a high frequent pulse, and its output injected on the speech path through the thyristors. The user loop current was isolated from the dc in the speech path (this dc was necessary to keep the thyristors on) by the transformer, but in this way the connecting circuit would know when a user—to whom a speech path existed—would take the phone off the hook or hang up.

Ringing was sent from the connecting circuit over the speech path to the user. Of course, not the heavy ac ringing normally used in telephony, but a special tone signal compatible with the thyristors. This required special telephone sets with tone ringers, which was part of our delivery.

The M1, M2, and M3 cores were distributed over a whole cabinet for each of the 526 users. Their output was about 0.1 V, and it was quite a problem to detect this signal in spite of the electrical noise injected on the sense wires.

Each sense wire was terminated on the emitters of two transistors in a balanced setup. Each base was connected to earth through a large resistor and a large capacitor in parallel. Any common-mode noise would block or saturate the transistors—there was no common-mode rejection. I had recently read an article in the *Proceedings of the IRE* on balanced amplifiers and suggested to connect the two capacitors in series between the two bases with a large resistor from their common point to earth. It worked immediately.

But it was not used. Maybe it was due to the "not invented here" syndrome, no stranger should come and modify circuits that had been refined over a long period! Maybe it was just that the work to properly examine the changed circuit would be more comprehensive than revising once more how the sense wire was led through the cabinet, such that no common mode voltage would be injected to it. Anyway, the latter method was preferred and worked.

Swenn Poulsen, LSM
Hvidovre, Denmark

Paging Dr. Roys

I would like to add my memories of Dr. Carl Roys to those previously printed. He was my favorite professor when I was a returning veteran student at the University of Massachusetts in 1948–1950. I did not find him stern, but rather agreeable. He presented basic theory first and then the application of that theory. I learned a lot from him.

Dr. Roys was one of the first to earn a Ph.D. in electrical engineering. He had a tale about registering at a hotel as "Dr. Carl Roys," which turned into a problem when he was awakened in the middle of the night because of a medical emergency. He avoided this problem thereafter.

Paul Bennett, LSM
Evansville, IN

The Two-Second Burp

During the early 1960s, I was helping design the instrumentation and control systems at the Stanford Linear Accelerator Center (SLAC). This two-mile long, linear electron accelerator was being built on Stanford University land, just west of the campus. Construction started in 1963, and the first beam traveled the full length of the machine in early 1966. For the discovery of fundamental atomic particles within the nucleus, four Nobel Prizes were subsequently awarded to physicists at this national facility.

Shortly after the full 24-hour operation began, the control room operators began receiving complaints from neighbors in the nearby communities. Typical concerns were that the public address system was audible at night and that the audio buzzing from the 240 high-power modulators and klystrons used to accelerate the electron beam was annoying. Some complained of electromagnetic interference with their television reception, while others were worried about the possibility of escaping radiation. To help operators field these calls, some of the designers were assigned to work the swing shift in the control room. One night, the chief operator handed me the phone and asked me to pacify the pastor of a nearby church who was complaining that the music from his audio system was being ruined by a loud buzzing from the accelerator. "My congregation is very upset. You have to come immediately," he demanded.

Armed with a small tool box and some clip leads, I drove to the church and knocked on the side door as instructed by the pastor. I was let in by a bearded young man, dressed not in black but in a brightly colored shirt and slacks. This was the 1960s, and the hippie culture was alive and well in California.

He led me to the church's audio system that was housed in a rack on a raised stage area. The church was in almost complete darkness but I could dimly make out that there were no pews—or even chairs—and that the congregation was on the floor, arms raised with hands making circles in the air. Some seemed to be slithering back and forth, while others were writhing to and fro.

"Hear that," said the pastor, "that awful buzzing sound every 13 seconds. It's ruining my music."

Yes, there it was, a giant burping sound lasting for a couple of seconds, drowning out the soft mood music. I knew immediately that the accelerator wasn't the culprit—nothing in the machine operated with that period. By chance I also knew the source. Recently, a high-powered air traffic control radar had been installed on a mountaintop some 20 miles to the south, and it was well known to be the cause of unpleasant interference in hi-fi systems in the area, particularly those with imperfect grounding. With the confidence of a seasoned professional, I reached for a clip lead, searched for a nearby ground point and connected it to the ground terminal on the back of the audio amplifier. I stood back, waiting for the required 13 seconds before pronouncing a successful cure. The pastor was ecstatic, shaking my hand warmly, and escorting me out of the church, this time through the front door.

A sidelong glance at the congregation revealed the writhing and hand waving still in progress, but perhaps with renewed vigor.

Ken Crook, LM
San Carlos, CA

Serendipity

From 1962 to 1963 I operated a field site on the island of Malta for the Stanford University Radioscience Laboratory. The project was under the direction of Dr. O.G. "Mike" Villard. We were analyzing HF (shortwave) radio propagation during the sunspot minimum and thus the project was called "Minispot Malta."

The (British) Royal Army had given us a space for our equipment in an old powder magazine at Fort Bingemma, which was was built in 1875 as part of the Victoria Lines. A dry moat, cut into the native limestone, surrounded three sides of the fort. The fourth side was a cliff, part of the escarpment that crosses the island. Several abandoned gun emplacements were located along the cliff edge. The fort was then part of a Royal Army Signals "torn tape" teleprinter relay station. We had space for our HF beam antennas as well as a very effective sloping-V antenna that dropped over the cliff edge down to a farmer's field. It was an excellent site for HF radio reception.

Our equipment consisted of a number of Collins 75S-1 HF receivers and a Sanborn-Ampex FM tape recorder. On Malta, ac power is 240 V, 50 Hz. We had a large 240–120 V transformer to operate our equipment. The power supply transformers tolerated the 50 Hz power, though some ran a bit hotter. The tape recorder deck was an Ampex 350 unit. The recorder was special ordered with a capstan diameter ground for 50 Hz since the ac line frequency determined the tape motor speed.

At the end of the project I, as well as all of the equipment, returned to Stanford. The Radioscience Lab had numerous projects that made use of this equipment pool. We needed the tape recorder, and I was requested to have it modified to operate on 60 Hz power. It took some time to find the proper department at Ampex that knew anything about this type of deck. Ampex said that a new capstan would have to be made, and there would be a considerable cost as well as time in obtaining the part as it was not a stocked part. The lady I was talking to said that a Mr. "Smith" in the engineering department might have more information on how long the part might take to be built.

I called Mr. Smith and described the problem. After looking up production times he commented that he might have a part that was removed from a deck several years earlier. He then looked in his desk drawer and pulled out a capstan unit. It was a 60 Hz capstan. The attached tag noted the serial number of the deck from which the part had been removed. It was our serial number! Mr. Smith said to come on over and he would give it to me, which he did.

Clint Gilliland, LM
Menlo Park, CA

Live and Let Diode

Before electronics, logic and switching was with relays and make, break, and make-before-break contacts were wired to provide "and," "or," "nand," and "nor" logic. North Electric Company engineers in Galion, Ohio, used +48, −48 V, ground, diodes, and resistors to provide different directions and levels of current flows. Various schemes were used to send and receive different signals over a single conductor. Bob Slemmer and Joe Long of the Crossbar Systems circuit design department were competitors of unique designs. I was writing circuit descriptions and developing relay operation sequencing diagrams of their circuit designs. I used those documents to teach customer maintenance people and our North Electric production and field testers and installers.

In 1953 I was in Greenland in the Air Force, serving at remote Ice Cap Radar sites. In 1955, I was learning and teaching the purpose of every conductor in every cable and every contact on every relay in every rack and frame of our crossbar and all relay switching systems.

In 1959, I was in Greenland as a civilian with an RCA Service Company team installing and maintaining various communications systems of the Ballistic Missile Early Warning System (BMEWS). After the system was in service, I discovered a relay that was operating when it shouldn't have been. I checked the wiring to be sure it was connected according to the circuit diagram. I could not understand how that relay could be operating by any other than intended conditions. It was somehow operating when not intended and locking up on its holding circuit. Finding the root cause of unexpected symptoms was the challenge. As often happens, possible solutions to problems come up in the subconscious when one is not working on the problem. It happens when doing something other than "troubleshooting."

The subconscious works with the fundamentals of electricity. Ohms and Kirchoffs laws get reviewed along with early learning of the rise and fall of dc current waves. Teletype mark to space and space to mark delays learned in 1948 were revisited. The right-hand fist and thumb rule for current flow and magnetic field directions along with magnetic field expanding and collapsing impacts pop up. Wow—just maybe my problem relay had a closed circuit by way of having the same electrical potential on both ends of the circuit. No current flow but a closed loop. Maybe a pulse of current in a wire next to my wire of concern had an expanding field that was inducing a current into the closed loop of my problem relay. Maybe my problem relay got just enough magnetic kick from an induced current to get up and latch on its holding circuit. I added a diode in the circuit that would only be present when the circuit was such that there was a closed loop around the coil at the time the pulse inducing current would occur. With the right-hand rule guide, the diode was positioned to block the induced current from the pulse in the identified adjacent circuit wiring. The circuit and the unit then worked as the designer intended.

J.A. Baude, LSM
Acworth, GA

A Successful Failure

In 1953, when I worked for Sylvania's military product group in Boston, my group developed the D807 cryptographic device for the U.S. Army Signal Corps in Fort Monmouth, New Jersey, It encrypted and decrypted pulse-code-modulation (PCM) signals from a 48-channel multiplexed voice communications system. It was ruggedized and had to work from −80 °F to +132 °F at high humidity. Each system was mounted in eight relay racks and had to pass vibration and shock tests. The system operated at 1.15 megacycles (now MHz), and used about 1,500 subminiature vacuum tubes. We designed the circuits to function when the ac voltage fluctuated by 50% and the vacuum tube filaments were held at 50% of rated voltage.

One major problem was testing. With two units, we could have connected them as a coder-decoder pair, but that would have required building the complete system before we could test any part. With only part of the system, we only had random signals. Each coder-decoder unit had eight cyclic shift registers and the register signals were combined with exclusive OR circuits to give a single encrypt-decrypt signal. When this signal was combined with the multiplexed signal, it produced the coded message. Then, when the coded message was combined with an identical encrypt-decrypt signal from the decoder, the clear PCM signal was recovered. After considerable analysis, we found that if we connected the output of a single unit to its own input and set the code switches in specific patterns, we could generate digital standing waves. We worked out several alternate test patterns.

Our lab was in the basement of an old factory in downtown Boston. In October, after the prototype unit completed preliminary testing, we scheduled a Signal Corps demo. On Saturday, a hurricane hit and the chief guard called me at home to say that they expected flooding. When we got there, water was bubbling up through cracks in the floor. We shut off all power and worked in the dark in deepening water to get the equipment high off the floor.

The next week, when the Signal Corps arrived, they had three National Security Agency (NSA) men with them. We proudly demonstrated how the signal patters snapped right in when the encoding switches were properly set. The Signal Corps project manager was ecstatic, but the NSA men didn't say anything. After equipment delivery, we expected additional orders but none came. It was only then that I realized that NSA was unhappy to see that some switch settings would produce predictable patterns. While our test had been a great success, it demonstrated that the product could not do its intended job.

In accordance with the original contract, we delivered four complete systems. One pair ran a secure link between the Pentagon and the NSA but I don't know about the others. It ran unattended for nearly five years without a single failure. The system was a truly successful failure.

Watts S. Humphrey, LF
Sarasota, FL

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We welcome articles for this newsletter. In particular, we seek articles about projects that are initiated at the Section and Region level by Life Members as well as "Tales from the Vault," which should focus on novel or interesting technical issues. The suggested length for "Tales from the Vault" submissions is 500 words.

Acronyms should be completely identified once. Reference dates (years) also should be included. Editing, including for length, may occur. If you wish to discuss a story idea before hand, you may contact Craig Causer, managing editor, by e-mail at lm-newsletter@ieee.org. The deadline to submit an article for possible inclusion in the next issue is 9 February 2009. Please include your Life grade, town, state, country, phone number, member number, and/or an e-mail address with your piece.

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